Improving the Provision of Mental Health Care in Small-Scale Fisheries to Boost Livelihood Outcomes: A Case Study of Chilika Lagoon in India

by

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Author’s Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Small-scale fisheries (SSF) support over 90 percent of the 120 million people engaged in capture fisheries globally. Due to their strong reliance on their surroundings, SSFs are in volatile positions. The ever-changing nature leads to social, economic, and environmental vulnerabilities, such as loss of biodiversity, institutional changes and loss of income or poverty. These put millions of individuals at risk for negative impacts, which include not only physical health but also severe mental health consequences. Hence, there is a need to better understand mental health as a significant vulnerability in SSF and in turn, find solutions for improvement to the provision of care.

Mental health is a state of mental well-being that enables people to cope with the stresses of life and contribute to their community. It has intrinsic and instrumental value and is integral to our well-being. Although most people are resilient, people who are exposed to adverse circumstances – including poverty, violence, disability, and inequality – are at higher risk of developing a mental health condition. Poor mental health leads to detrimental outcomes for fisher's already vulnerable livelihoods, and if untreated can lead to death. Currently, there is a lack of aid available in these communities for adequate mental health care. The purpose of this research is to discover and provide recommendations for better-supporting individuals suffering from mental illnesses in SSF. A qualitative research methods approach will be used to investigate this aspect. The administered household questionnaire will be used to gain insight into how mental health is understood by fishers, how it is influenced, the negative effects on fishers' livelihood, barriers present in improving their mental health and the overall needs of small-scale fishers - in the study area of Chilika Lagoon, India. This design will aid in unravelling the cultural context and experiences of the people.

The implications of this research will be to discover solutions for providing better mental health care, and ultimately create a set of guiding recommendations for best practices in mental health care within SSF. The goal is to increase viable, sustainable local governance response in policy and society. Reducing poor mental health outcomes will transition small-scale fisheries from vulnerability to viability. The importance of this research is seen through its originality as there is limited literature for bridging mental health care and viability in the SSF context. Future studies should focus on ongoing efforts to understand the complex existence of mental

health in small-scale fisheries, and the multidimensional response that is needed to address it. Consulting small-scale fishers to recognize their specific needs should continue to be prioritized in future solutions.

Keywords: Small-Scale fisheries, Vulnerability, Viability, Mental Health, Fisherfolk, Well-being, Governance, Public Policies, Best Practices

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List of Abbreviations

FAO – Food and Agricultural Organization of the United Nations

MVI – Multidimensional Vulnerability Index

NGOs – Non-Governmental Organizations

OECD – Organization for Economic Cooperation and Development

SLF – Sustainable Livelihoods Framework

SSF – Small-Scale Fisheries

V2V – Vulnerability to Viability

WHO – World Health Organization

Chapter 1: Introduction

Small-scale fisheries (SSF) are one of the most vulnerable systems in the world. An estimated 5.8 million fishers earn less than 1$/day (Aguilar-Perera et al., 2017). But poverty is not the only challenge faced – these communities are under constant threat of social, political, climate and environmental vulnerabilities (Béné & Friend, 2011). SSFs are built into the local environment and provide critical contributions to nutrition, food security, livelihood sustenance as well as the local economies, especially in developing countries (Nayak et al., 2014). Despite their importance, SSF are politically and economically marginalized. These factors, along with their high vulnerability to change, create a global crisis for SSF – yet the needs of this group remain neglected in policy debates and creation (Nayak et al., 2014). Public policies, inclusive of this community, need to be prioritized in order to ensure continued resilience (Strazdins & Broom, 2007).

One of the greatest strengths necessary for the survival of any population is good health – physical and mental. Due to its taboo nature and lack of understanding, mental health care is a severely neglected area (MacSubhne, 2009). Individuals suffering from mental health illnesses in SSF face an absence of available resources (Armitage, Berkes, Doubleday, 2007). Lack of accessibility stems from poor governance policies. There is currently minimal aid available to SSF for mental health care, hence this project focuses on generating the research necessary to bridge the knowledge gap present in understanding mental health in the context of SSF (Armitage, Charles, Berkes, 2017). This research aims to discover solutions for improving mental health outcomes for small-scale fishers. This is imperative for transitioning these communities from vulnerability to viability (Aguilar-Perera et al., 2017).

In order to move towards sustainability, SSFs need to be protected and adverse effects faced by them need to be mitigated (Charles, 2001). Strong mental health care policies are an indicator of a developed country (Aguilar-Perera et al., 2017). In North America, an area of the world considered developed and “first world”, 1 in 5 individuals experience mental illness in a given year and more than 50% will be diagnosed with a disorder at some point in their life (Canadian Mental Health Association, 2021). These statistics are for countries that are relatively safe, economically strong, filled with opportunity and have the Western moral of providing a good quality of life for citizens (Charles, 2001). Now imagine how these statistics and the

prevalence of mental illness would significantly increase in countries that are developing and are faced with extreme economic, political, and environmental turmoil. This describes the individuals living and surviving in SSFs (Charles, 2001). This study focuses on such a topic to hopefully contribute to mental health awareness and knowledge in developing countries. Their mental health needs are widely existing and need to be addressed (Chuenpagdee, 2011). There is minimum research done into the mental health of small-scale fisheries (Szabo, 2020010). For example, there are currently no available statistics on mental health prevalence in SSF – an indicator that research in this context is severely lacking. Hence, this research aims to examine this problem and fill this gap in the literature. It also aimed to take a deep dive into better understanding how fishers perceive mental health and therefore reduce mental health vulnerabilities effectively in small-scale fisheries. Mental health is a multidimensional vulnerability, and this research intended to unpack and understand it through that lens, in the context of small-scale fishers. This research can be used to guide a multidimensional response to mental health care.

1.1 Key Issues in Chilika Lagoon Impacting Wellbeing

Small-scale fisheries communities face marginalization and are vulnerable to the many challenges and exploitation they face. This includes globalization (e.g., encroachment from industrial fishing), and climate change (e.g., sea-level rise, loss of fish biodiversity) (FAO, 2014; Nayak et al., 2014; Wilkinson & Salvat, 2012). SSF face social, environmental and economic vulnerabilities daily that impact their well-being. Social vulnerabilities such as low literacy rate, lack of access to basic infrastructures and sanitation, unsafe housing and drinking water, and pressure of caste roles, all contribute to poor well-being. Gender discrimination is also common in negatively impacting women's lives, as their roles are shaped by the generationally patriarchal system (Dalgard & Tambs, 1995). Rising global temperatures have caused large-scale degradation in Chilika Lagoon's natural system, which has led to environmental vulnerabilities. Extreme natural events, coastal erosion, and human intervention resulted in the loss of biodiversity, decrease in fish resources, and disconnection from the Lagoon (Nayak, Oliveira, Berkes, 2014). This causes an unproductive biological ecosystem. These changes heavily affect the livelihoods of resource-dependent communities such as Chilika Lagoon (Speiser, 2014). Environmental vulnerabilities lead to economic vulnerabilities for fishers as their primary source of income comes from their fish catch. The various

environmental stressors that fishers are exposed to forces decreased income and forced migration, thereby impacting their livelihood (Nayak & Berkes, 2012). Environmental variability affecting the location and abundance of the fish resource increases economic burdens, with increased travel time, fuel usage and ice consumption to locate fish. These problems create extreme poverty and affect access and control over resources (Shukla, 2013). Decreasing access to resources makes SSF less resilient to any setbacks. These factors also contribute to marginalization in Chilika and affect the locals' access to the lagoon (Nayak & Berkes, 2011). When the ability of fishers to sustain their livelihood and provide for their families is compromised, it reduces their well-being. Poverty is the #1 driver of poor mental health in developing countries (Artazcoz, Benach, Borrell, & Cortès, 2004).

1.1.1 The prevalence and negative impacts of mental health issues in Chilika Lagoon

As mentioned above, the social, economic, and environmental vulnerabilities faced by small-scale fishers creates a dangerous atmosphere for fishers and makes them susceptible to mental health issues (Cánovas-Molina & García-Frapolli, 2022). The exact prevalence of mental health illnesses in Chilika Lagoon is currently unknown. However, emerging literature suggests that fishers are susceptible to a range of mental health issues, linked to the fundamental characteristics of fishing as a resource-dependent occupation, but also to uncertainties beyond the daily fishing operation (Chilika Development Authority, n.d.). High levels of mental health problems, such as depression, anxiety, self-harm, and suicide have been identified. Men and women may also express mental health problems and symptoms differently (Sobel, 1995). It is likely that the association between fishing as an occupation and the risk of mental health problems may be more widespread than the current literature is able to indicate.

This study aimed to add to the breadth of knowledge available on the prevalence and severity of mental health issues in Chilika Lagoon, by investigating how small-scale fishers understand mental health. It planned to uncover which mental illness symptoms are most commonly present and how the unique system of socioecological vulnerabilities fishers face contributes to its occurrence. As shown by research done in other small-scale fisheries, such as in the Australian Commercial Wild-Catch Fishery, it is predicted the level of self-reported

psychological distress, will demonstrate a greater occurrence of high to very high psychological distress among commercial fishers in comparison with the national population (King, Kilpatrick, Willis, & Speldewinde, 2015). Multiple studies show that the negative impacts of untreated or undiagnosed are detrimental to livelihood and have the ability to deeply affect one's well-being. Untreated mental illness can have detrimental effects on individuals and societies (World Health Organization, n.d.). The consequences of mental illness include unnecessary disability, unemployment, substance abuse, homelessness, inappropriate incarceration, suicide, and overall poor quality of life (World Health Organization, n.d.). There is also a lack of education about mental health within Small-scale fisheries (Barrera Jr., 2000).

1.1.2 The Lack of Mental health care and policies in Chilika Lagoon: The Perfect Storm

Many mental health conditions can be effectively treated at relatively low cost, yet health systems remain significantly under-resourced and treatment gaps are wide all over the world. Mental health care is often poor in quality when delivered. People with mental health conditions often also experience stigma, discrimination, and human rights violations (World Health Organization, n.d.). Currently, research indicates there is a lack of aid available in SSF. There is also a lack of policy governing mental health care in SSF (Aguilar-Perera et al., 2017). Hence, people suffering from these issues have difficulty accessing high-quality primary care services (Armitage, Charles, Berkes, 2017). Firstly, these individuals are less likely to ask for help, due to anxiety, psychosis and/or depression. More so, on average, they are less likely to have a regular primary care health provider they can see (Funk et al., 2008). Or practitioners may be unwilling to see people with mental illness due to their symptoms, disability, and instability causing discomfort. There may also be a level of disbelief between the care provider and patient on the extent of symptoms present (Keyes & Lopez, 2009). Some may not trust or see mental illness with the severity it requires. In other cases, which is common in developing countries and SSF, care providers may not even have the necessary knowledge to diagnose or treat mental illnesses as there is a lack of practice with the concept (Keyes & Lopez, 2009). There is also a large prevalence of societal and cultural challenges present in Chilika Lagoon – as these areas are less accepting of this illness (Lund, Tomlinson, Patel, 2016). These barriers in dealing with mental health causes a lack of governance and policy (Brown, 2012). Receiving proper screening,

diagnosis and treatment can be problematic for people with mental health problems and illnesses (Keyes & Lopez, 2009). Substance abuse, bipolar disorder, obsessive-compulsive disorder and posttraumatic stress disorder are frequently missed or misdiagnosed by primary care physicians, and when mental illnesses are correctly identified, pharmacological treatment is typically all that is provided (Funk et al., 2008). Children, youth, and seniors experience particular difficulties in getting their mental health problems and illnesses identified and treated in primary care settings (Lund, Tomlinson, Patel, 2016). Considering all these factors that affect the mental health of fishers', this research established mental health as a multidimensional vulnerability. This supported the need for a multidimensional policy framework embedded within governance that guides primary health care providers in diagnosing and treating mental health - such that adequate care can be given to the suffering (Funk et al., 2008). Taking reference from best practices in mental health care, guidelines can be created that aid in informing strong policy creation (Brown, 2014). It is time for a multilevel change.

1.2 Research Question and Objectives

Purpose Statement:

How can local government and societal responses be improved to provide better mental health care for small-scale fishers in Chilika Lagoon, India?

Objectives:

The research question will be guided by the following objectives of the study:

(O1) To understand the current perception of mental health in Chilika Lagoon fishers and define mental health as a multidimensional vulnerability in SSF communities.

(O2) To uncover the influential drivers that contribute to mental health prevalence.

(O3) To specify the negative impacts mental health has on the livelihood of small-scale fishers,

(O4) To provide set of recommendations that inform on best practices for improving mental health care in SSF, and advise public agents to create viable, holistic local governance response in policy, society, and community.

Objectives were fulfilled through a literature review of academic and grey literature as well as primary data collected from the fishers of Chilika Lagoon through household surveys.

1.3 Literature Summary

Overall, there is limited research on mental illness and small-scale fisheries. However, there is literature to indicate the impact of social, environmental, and economic vulnerabilities on fishers. Furthermore, the literature confirms the connection between mental health issues and poor livelihood, along with the negative impacts it has on individuals. This research will also overview the current best practices in mental health policies. Hence, the literature review will include three domains:

1) **Mental health and well-being literature:** This section will examine the economic, social, and environmental contributors of poor mental health, along with the negative impacts it has on livelihood. The value and benefits that arise from strong mental health will be discussed.
2) **Governance and Health Policy Literature:** Fishers are underrepresented in policy areas. This section will discuss the current lack of adequate mental health policies and its detrimental impact on SSF. Literature on the best practices available in mental health policies and the most effective practices in aiding individuals to gain accessible mental health care will be reviewed. Successful examples in utilizing multidimensional policy frameworks, that tackle assisting in all domains of livelihoods, will be discussed. This will aid in creating a set of recommendations for improving mental health care, with the involvement of local governance and community institutions.
3) **Vulnerability to viability (V2V) literature:** This is a key concept that is vital to this study. V2V is a spectrum and there are many routes to move along this spectrum. This section will discuss how one specific factor is not always clearly one or the other but falls on a spectrum of vulnerability to viability. A deeper look into the social, environmental, and economic vulnerabilities that lead to poor well-being, and how reducing the impact of these vulnerabilities can ultimately lead to greater viability in SSF, will be done. Better mental health care, and improvements in the mental health of individuals, leads to more viable communities.

These literature domain areas contribute to fulfilling the objectives, as this research focuses on improving mental health policies within SSF. Chapter 2 will further discuss these relevant areas of literature in detail and justify the conceptual understanding used in this study.

1.4 Key methods

The overall goal of this research is to investigate mental health in small-scale fisheries – its multidimensional nature, its drivers, its implications on the livelihoods of fishers and a call for action to improve. Chilika Lagoon was the case study used for this exploration. Research into the mental health care and policies within SSF is minimal, thus there is a lack of precedence on best research techniques (Satumanatpan & Pollnac, 2017). This study employed a qualitative methods research approach for investigation. Qualitative methodology focuses on understanding the meaning of concepts and experiences, which applies to this research as the objective is to better understand the cultural context and experiences of these fishers such that insights into the problem can be gained (Seixas, Esteves Dias, Feita de, 2017). From there, a solution towards better mental health care can be provided. This method is best used when the topic is novel and existing theories do not apply – both cases which are relevant to this research question. Qualitative research involves collecting and analyzing non-numerical data (Creswell, 2007).

For this research, data was obtained through first-hand observations in the form of administering household questionnaires to residents of Chilika Lagoon (Seixas, Esteves Dias, Feita de, 2017). Household surveys are questionnaires that are a form of primary data collection that are given to a sample of households in a population. Their primary advantage is to provide considerable discretion to the interviewer about the information requested from respondents (Creswell, 2007; Wolff, 2015). This research preferred semi-structured interviews over structured and unstructured interviews because this method provided a balance of structure and the freedom to explore emerging themes. It was implemented using a series of predetermined but open & closed-ended questions.

A field researcher in Chilika Lagoon was hired to carry out the household survey questionnaires, with open-ended questions to truly garner a full sense of the participant's full opinion on the question. 50 participants were interviewed. The field researcher was recruited with the help of the research supervisor and NIRMAN NGO allocating their personnel, who was most suitable and had aligned experiences/skills, to the project. Online training through telephone conversations was provided to the researcher to help them gain a foundational understanding of the research concepts such as vulnerability, mental health contributors and negative impacts, governance response, viability, mental health care, etc. Time was spent

answering any questions and providing clarifications. A focus on detailed training assisted the field researcher in having a strong grasp of the data collection objectives prior to beginning. The principal researcher followed up regularly to ensure data was valid and the ethical processes were adhered to. Consistent weekly check-ins were scheduled with the field researcher to ensure data collection was accurate. A 'trial run' of analyzing the responses to 3 household questionnaires was done, and feedback was provided to the field researcher. This ensured that the questionnaire was administered and understood correctly. These check-ins and monitoring methods also helped quickly address any challenges that arose through the collection process. 50 participants were interviewed, from three different villages in Chilika Lagoon, with the strategic goal of gaining a diverse and comprehensive data set. Random Sampling through random selection from a residents' phone number list, was utilized to decide which households were interviewed. Expert recommendations from the field researcher, who was a Chilika Lagoon resident, who effectively understood the cultural and social landscapes were also used in sampling. A review of previous similar studies indicated these sampling methods would be most suitable. A qualitative research method and data collection process were done to gain information on the adverse effects of mental health, the beliefs on what contributes to poor mental health, as well as what processes they in place to provide better mental health care and what improvements can be made in providing mental health care. These qualitative themes will aid in helping the communities through a culturally competent lens (Walker, Holling, Carpenter, Kinzig, 2004). Primary data collection, in the form of a household questionnaire administered in the study area itself, was required to fuel the achievement of all objectives.

Results were analyzed using a descriptive research design, because of its effectiveness in systematically discovering the associations or relationships between the selected variables. A thematic and qualitative analysis in MS Excel application was also performed to analyze the qualitative data. The literature review was a continuing component throughout the research, and fieldwork occurred throughout December 2022. The expected outcomes that are hoped to be obtained are the contribution to an area of well-being literature and V2V knowledge that is severely lacking. The audiences that will potentially benefit from and find the study of interest include individuals and researchers in scholarly literature, practice and policy. This study was meant to fill current gaps and uncover new connections and solutions for reducing mental health vulnerability and improving viability (Walker, Holling, Carpenter, Kinzig, 2004). This form of

data collection will aid in the expected outcomes of understanding mental health as a multidimensional vulnerability, discovering and highlighting the contributors of and negative impacts of mental health on SSF and most importantly, creating a set of recommendations on incorporating the best mental health care practices within health policies in SSF. The goal is to improve viable local governance response in policy, society and community.

1.5 Study Significance

The immense importance of protecting and fostering viability in SSF is shown in the fact that these communities contribute to 66% of the global fish that is used for human consumption. They are vital to the global economy, with total revenues from the first sale of SSF catch totalling USD 77 billion (Aguilar-Perera et al., 2017; Illuminating Hidden Harvest Report, 2022). Small-scale fisheries are also vital in providing essential nutrition. SSF landings could provide 987 million women globally with 50% of the recommended nutrient intake of omega-3 fatty acids (Illuminating Hidden Harvest Report, 2022). Due to their positive contributions to the global economy and well-being, protecting SSF should be prioritized. Research that aims to improve the overall well-being of fishers and their sustainable working within SSF, such as this thesis, is extremely crucial. Small-scale fisheries in developing countries are often found marginalized socially and economically (Béné & Friend, 2011). Alongside financial difficulties, factors such as climate change, along with migration, institutional change, etc., cause SSF to be vulnerable, ever-changing socio-ecological systems. Hence, in a state of constant change, the need for *resilience* is imperative, as it allows systems to withstand, adapt and cope with changes (Aguilar-Perera et al., 2017). It helps to mitigate the negative impacts a system may absorb after turbulence, such that the system does not crumple but can find an opportunity to improve. There are also high rates of suicide that are associated with untreated mental illnesses (Gough & McGregor, 2007). Work should be done to improve resilience in SSF communities especially, but with a holistic well-being approach, which is lacking. These vulnerabilities affect the livelihoods of millions of people, especially their mental health (Armitage, Charles, Berkes, 2017). However, there is no current focus on involving mental health in the spectrum of improving resilience.

The current standard of care for mental illness in SSF is non-existent or extremely lacking (Guillotreau, Bundy, Perry, 2017). The health policies are inadequate in providing the support

needed by individuals to sustain proper livelihoods (Armitage, Charles, Berkes, 2017). There are also huge barriers to accessing and following through with care that need to be addressed. Despite these negativities and the need for betterment, there is little research done into the mental health deterioration of individuals and thus it is a novel field that needs investigation (Hara, Donda, Njaya, 2015). Due to this being a taboo topic, it is not talked about or addressed within these communities, leading to deficiencies in the literature. However, it is time to help suffering individuals (Szabo, 2020). With the improvement of holistic well-being in these communities, there will be a positive impact on local and national economic growth (Aguilar-Perera et al., 2017). It will also push SSF closer to viability on the V2V spectrum. It is important to support governments to adopt mental health policies and to integrate mental health policy into public and social health policy (Lund, Tomlinson, Patel, 2016). Mental disorder causes a heavy burden for societies, impedes the development of other health and development targets, especially the SDGs, contributes to poverty and differentially affects the poor, last but not least, because mental health care itself is as much an intrinsic human right as is physical health (Berkes, 2007; Jenkins, 2003).

1.6 Study Limitations

Just as with any research, there are limitations that need to be considered. It is important to discuss and recognize ethical issues that come with qualitative research as research involving data collection from people will always have ethical concerns. Researchers need to protect the privacy and anonymity (if wished) of research participants and develop trust with research participants such that they feel free to answer prompts to their best ability (Creswell, 2014). One must ensure the survey questions are appropriate and not overbearing/uncomfortable. Researchers should also promote the integrity of research by guarding against misconduct as well as cope with new problems that emerge. Table 4.1 in Creswell, Research Design (see Table 3.1), showcases all the ethical concerns and situations that are to be considered prior to, beginning, during, analyzing and after the study. The code of ethics will be referred to regularly and approval from the institutional ethics review board will be needed. These anticipated ethical issues will be considered and addressed at each step. There will also be cost and resource limitations that need to be considered. The study involved remote data collection and thus the ability, level of knowledge on mental health, and time constraints of the appointed remote researcher impacted the study. Moreover, best practice models may require modifications as new

information is uncovered. Hence, uncertainties in the findings required appropriate robustness checks. Errors and biases must be minimized during the data collection process, and thus data from household questionnaires was properly documented. Furthermore, since the study area of this research was outside of Canada, there were language, education, and cultural barriers that impacted the effectiveness of data collection. Limitations were also exacerbated in training and working with a field researcher, vs if the principal researcher conducted the data collection.

1.7 Organization of Chapters

This thesis presents an empirical investigation of the vulnerabilities, livelihood, and well-being of Chilika lagoon fishers, regarding mental health and its pathways to improvements. The thesis comprises six chapters in total – (1) Introduction, (2) Literature Review, (3) Methods, (4) and (5) Results from Data, and (6) Conclusion. Chapter 1: Introduction describes the background of the study, its purpose and significance, objectives and research questions, methods, and limitations. Chapter 2: Literature Review defines the key concepts, terms, and theories that guide the research. It is a review of literature found on online academic databases regarding social, ecological, and economic vulnerabilities along with mental health and well-being. It dives deep into the effects of these vulnerabilities on livelihood from a non-physical perspective as well as how mental health care delivery and uptake can be improved. Using the improvement in mental health to transition from vulnerability to viability in SSF is highlighted. Chapter 3: Methods states the methodology used for the research and throughout the study to fulfill the objectives and research question. The steps taken within the mixed methods approach to obtain data and conduct the research have been outlined in depth. Chapters 4 and 5 are the results chapters. They discuss the key findings of the given research. Chapter 4 aims to satisfy objective one (1) to understand the current perception of mental health in Chilika Lagoon fishers and define mental health as a multidimensional vulnerability and objective (2) to uncover drivers and contributors of poor mental health. Chapter 5 focuses on objectives three (3) and four (4), therefore discussing the negative impacts of mental health and creating a set of practical guidelines or responses to improve mental health policies and care. Chapter 6: Conclusion gives an overview of the individual findings from the research, the implications of it in academia and beyond, and suggests future actionable steps that can be taken to continue to help move SSF from vulnerability to viability.

Chapter 2: Literature Review

The Exploration of Mental Health in the Context of Small-Scale Fisheries

2.1 Introduction

The Food and Agriculture Organization of the United Nations (FAO) defines small-scale and artisanal fisheries as "Fishing households [as opposed to commercial companies], using relatively small amounts of capital and energy, relatively small fishing vessels [if any], making short fishing trips, close to shore." (FAO, 2012)

Chilika Lagoon in Orissa, India is located on the eastern coast of India and is the largest lagoon in India. It is composed of biological and human systems. The biological system is composed of 225 fish species, 800 different types of fauna, and 710 different types of flora (Pattanaik, 2003; Zoological Survey of India 1987). The human system is composed of 150 villages surrounding the Lagoon with over 200,000 caste-based fishers in 40,000 households (Nayak & Berkes, 2010). With total global fisheries catch at 92 million tonnes, small-scale fisheries are estimated to contribute to 40%, 37 million tonnes of the total world catch (inland fisheries included) which is used primarily for domestic human consumption (BNP, 2008; Mills et al., 2011). 492 million people depend at least partially on engagement in SSF, with 60 million people employed part-time or full-time. This accounts for 90% of capture fisheries employment. 45 million women participate in SSF, with 4 out of 10 people in SSF being women (Illuminating Hidden Harvest Report, 2023). They are employed in the value chain, mostly through informal arrangements. These statistics showcase SSFs are rarely well accounted for (Mills et al., 2011), and are therefore an important but underrated source of employment, food security, and income (Béné et al., 2010; Jentoft and Eide, 2011), particularly in the developing world and in rural areas (Béné, 2006; Béné et al., 2009a).

For generations, the fishers have worked and thrived off the productive biological ecosystem of the Lagoon for their survival, and livelihood needs (Nayak, 2011). However, with rising global climate change impacts, Chilika Lagoon's natural system has experienced large-scale degradation. The ecosystem in Chilika Lagoon has significantly changed since the 1980s due to increased aquaculture operations by non-fishing communities and the dredging of a new sea

mouth in 2001 that changed the salinity of the Lagoon by increasing it (Nayak, Oliveira, Berkes, 2014). These environmental vulnerabilities have contributed to the marginalization of the fisher communities in Chilika Lagoon, which in turn has affected their livelihood, resource access and migration (Nayak, Oliveira, Berkes, 2014). Resource-dependent communities, such as Chilika Lagoon, are majorly affected by environmental variability. Migratory route changes, the dominance of macroalgae, the severity of extreme natural events, coastal erosions, all of which cause depletion and fluctuation of resources (Nayak, 2011). The environmental changes lead to harmful phenomena such as loss of biodiversity, decrease in fish resources, and disconnection from the Lagoon, which cause stress and commotion for fishers (Shukla, 2013). Externalities due to pollution also disproportionately affect small-scale fisheries in different parts of the world. For example, the flux of anthropogenic sewage, siltation from agriculture and forestry runoff, and coastal development contribute to the disappearance of certain aquatic species. These phenomena lead to emotional imbalances which contribute to poor mental in fisheries, and therefore pushes fishers towards vulnerability (Shukla, 2013).

This literature review is organized thematically and divided within 3 domains: vulnerability and viability literature, mental health and well-being literature, and governance/policy literature. This review will use a social-ecological and economic systems lens that supports viability in Chilika Lagoon and the thesis research.

2.2 Vulnerability and Viability of Small-Scale Fishers

For the first domain, existing literature defines vulnerability and what it means to be ‘vulnerable’. Vulnerability refers to the circumstances a community or system faces that make it susceptible to the negative impacts of a hazard (Kolding, Béné, Bavinck, 2014). Multidimensional vulnerability refers to a state of susceptibility or exposure to harm, risk, or adverse outcomes across multiple dimensions or domains of life. It recognizes that individuals or populations can face various interconnected challenges or stressors that increase their overall vulnerability to negative consequences (Assa & Meddeb, 2021). These dimensions may include social, economic, environmental, governance, health, and other factors that interact and compound each other, amplifying the overall level of vulnerability. For example, an individual experiencing poverty (economic dimension) may also lack access to healthcare (health dimension), face discrimination or social exclusion (social dimension), and reside in an area

(such as small-scale fisheries) that is prone to natural disasters (environmental dimension) and have a lack of government supports or strong public policies (governance dimension) (Assa & Meddeb, 2021). In this case, their vulnerability is not solely determined by one factor but is influenced by the complex interplay of multiple dimensions of disadvantage or risk. Understanding multidimensional vulnerability requires considering the intersecting factors that shape an individual's or a community's experiences and circumstances (Assa & Meddeb, 2021). Addressing multidimensional vulnerability often involves comprehensive, multidimensional approaches that target various dimensions simultaneously, aiming to mitigate risks, strengthen resilience, and promote equitable, viable outcomes across different aspects of life (Szabo, 2020; Assa & Meddeb, 2021). Vulnerabilities in Chilika Lagoon will be discussed through the social, ecological, economic and governance domains. These areas of vulnerability correspond to the four dimensions generally referred to when presenting the agenda of sustainable development. In these areas, vulnerability appears as the opposite of sustainability (Guillaumont, 2013).

There are major factors and changes that lead to vulnerabilities such as migration, biodiversity loss, low fish availability, loss of habitat, loss of income, and institutional change (Pollnac, Abbott-Jamieson, Smith, Miller, Clay, Oles, 2006). Literature shows that SSF are complex social-ecological systems that are vulnerable to changes (Weeratunge et al., 2014). This is shown by the negative impacts that arise from these factors listed above (Kolding, Béné, Bavinck, 2014). Economic vulnerabilities pose a major threat to small-scale fishers. Many fishing communities around the world face several challenges in maintaining their livelihoods, including limited access to resources, poor resource availability, overfishing, degradation of the marine environment, poor governance, climate phenomena, competition with industrial fisheries, globalized markets, and marginalization. (Allison et al. 2005; Andrew et al. 2007a; Chuenpagdee 2011b; Schuhbauer and Sumaila 2016; Song et al. 2018; Stoll et al. 2018; Bavinck et al. 2018; Chuenpagdee et al. 2019). The sea mouth widening, and climate change are also contributors to exacerbating these economic vulnerabilities. The opening of an artificial sea mouth in 2001 caused a lot of distress to the Lagoon’s biological ecosystem and the fishing economy (Nayak & Berkes, 2010). The location it was dredged increased the intensity of water inflow and outflow (Nayak & Berkes, 2012). The new sea mouth caused salinity to increase and brought new invasive species. The invasive species contributed to negative changes to the Lagoon’s species including the decline in certain native fish. (Nayak, 2014). Additionally, some of the invasive

species, such as barnacles and jellyfish, affected the fishers and their equipment (Nayak & Berkes, 2012). Consequently, the biological ecosystem of the Lagoon environment changed rapidly, which affected the fishing activity of the fishermen (Nayak & Berkes, 2010). The changes in salinity and increased competition for fishing grounds contributed to wetland habitat and biodiversity loss in the Lagoon (Nayak & Berkes, 2014). Additional practices, such as net enclosures and the use of nylon nets also contributed to decreasing amounts of fish stock in the Lagoon and catch in fish, prawn and crabs (Szabo, 2020). These net enclosures disrupt the levels of oxygen, salinity and tidal flushing, which reduce the natural growth of fish and the fish sizes are decreased. This makes it difficult for fishers to use traditional methods of fishing as (Pattanaik, 2007). These issues directly affect small-scale fishers' ability to sustain their livelihoods and respond to volatile conditions as it reduces their financial stability by reducing fish catch or fish production (Szabo, 2020). Fishers are trapped in a vicious cycle where reduced income causes stress and other vulnerabilities that further increase financial burden. This can lead to extensive and increased migration of fishers, which poses its own burdens (Pattanaik, 2007). For small-scale fisheries to deliver their full benefits to society, sources of vulnerability must be understood at the individual and community levels (Adger 1999; Andrew et al. 2007; Salas et al. 2019).

The literature indicates that small-scale fishers are prone to varying levels of vulnerabilities. The greater signs and symptoms of mental illness they possess can be used to determine the degree of vulnerability (Woodhead, Abernethy, Szaboova, Turner, 2018). The reduced access one has to resources, the lower one's well-being and resilience becomes (Pollnac, Abbott-Jamieson, Smith, Miller, Clay, Oles, 2006). Deficiencies in the literature lie in its lack of ability to effectively recognize mental health as a prominent vulnerability in SSF which massively affects livelihoods (Tuler, Agyeman, Agyeman, da Silva, LoRusso, Kay, 2008). The negative effects that arise from vulnerabilities in SSF and their overlap with mental health criteria will help to showcase connections between vulnerabilities causing mental health issues, which is deficient in the literature (Woodhead, Abernethy, Szaboova, Turner, 2018). Hence, this research will focus on defining mental health as a multidimensional vulnerability, in order to bridge the gap between these two ideas. This will be done by tying connections with mental health literature (Weeratunge et al., 2014).

Environmental changes have led to economic vulnerabilities such as decreases in income that impact the well-being of fishers. Small-scale fishers' primary source of income and means of sustaining livelihood comes from the fishery, and the surrounding environment they rely on (Chukwuorji, Ifeagwazi, Iorfa, 2015). The inability to provide for one's family, pay bills such as for housing and food, increases the pressure, worry and stress of the fishers. Environmental variability affecting the location and abundance of the fish resource also increases economic burdens, with increased travel time, fuel usage and ice consumption to locate fish (Chukwuorji, Ifeagwazi, Iorfa, 2015). Furthermore, the COVID-19 Pandemic has resulted in exacerbating economic vulnerabilities as well. Small-scale fishers and their families, whose livelihoods depend solely on fisheries and who may already be living in poor conditions, are among the most affected groups (Szabo, 2020). For many, the fishing way of life and the daily work came to a sudden halt due to global pandemic laws, throwing them into a dire situation of food insecurity and mental health risks. Lack of assets and income are endemic in small-scale fisheries among many countries, particularly in the global south, which makes fishers less resilient to any setback (Buheji et al., 2020). Furthermore, cold storage facilities and processing plants are poorly developed. This gross under-capacity of infrastructure, improper handling and low industrialization levels, especially during the peak period of fishing, may result in low-quality fish and thus a price drop of the catch (Iwasaki, Razafindrabe, Shaw, 2009; Szabo, 2020). The lack of industrial development reduces the fishers' socioeconomic statuses. Small-scale fishers also face intense competition in their fishing space, resulting in conflicts arising for fishing grounds and destruction, or losses of artisanal fishing gear caused by industrial fishing (Iwasaki, Razafindrabe, Shaw, 2009). Lack of income forces the fishers into the poverty cycle. Overfishing is a practice that causes detrimental economic vulnerabilities for small-scale fishers (Szabo, 2020). This economic-environmental inter-connectedness of vulnerabilities is an indicator of the multidimensional nature of mental health.

Social vulnerabilities also play a major role in contributing to poor well-being in small-scale fisheries. Small-scale fishers usually have a very low percentage of attendance and completion of secondary-level studies, as fishing business and trade are passed down through generations. Consequently, illiteracy becomes a barrier to developing capacity and entrepreneurial skills (Allison, Béné, Andrew, 2011). In Chilika Lagoon, along with other

small-scale fisheries, fishers are settled in places with no access to basic social infrastructures and good sanitation. Furthermore, the fishers are caste-based, meaning that their caste is primarily focused on fishing, while other castes are focused on other activities such as agriculture (Kawachi & Berkman, 2001). Once the fishers are not able to fish, they are not fulfilling their traditional caste roles so they are functioning out of the caste system, which can have major impacts on their well-being and livelihoods, as it causes fishers to face social and cultural isolation (Kawachi & Berkman, 2001). Additionally, changes in cultural identity are a common experience as migrants attempt to adapt to new environments (Bhugra & Becker, 2005). Culture shock for migrants in new environments can cause significant distress (Bhugra & Ayonrinde, 2004). Consequently, culture shock and cultural identity can lead to social alienation and depression (Béné, 2003). Unemployment is also associated with increased negative psychological effects. It can result in forced migration, which as mentioned, has many implications on psychological health (Hofsten and Backman, 2000). Also, socioeconomic status and living arrangements are shown to contribute to depression (Lorant et al., 2007). Fishers are also trapped in a vulnerability cycle as lack of access to adequate physical and mental health care is a factor that contributes to the social vulnerability of small-scale fisheries, and social vulnerabilities contribute to poor mental health (Szabo, 2020).

Vulnerability undermines the role of small-scale fisheries as providers of sustainable livelihoods, good health and wellbeing, food security, and economic development, thus hindering different targets of the United Nations Sustainable Development Goals (SDGs) from being achieved (Aday, 1994). While context-specific case studies in this research show unique aspects of life and struggles of small-scale fishers, a common threat to their vulnerable livelihoods is clearly identifiable, by applying the concept of resilience (Holling, 1973). In order to target vulnerability and move to viability, there is a need to build greater resilience in small-scale fisheries (Armitage, Béné, Charles, Johnson, & Allison, 2012a). Resilience refers to the ability of individuals, communities, or systems to effectively adapt, recover, or bounce back from adversity, trauma, or significant sources of stress. It involves the capacity to withstand and navigate through challenges, setbacks, or difficult circumstances while maintaining or regaining mental, emotional, and physical well-being (Holling, 1973). Achieving resilience involves developing and strengthening certain skills, attitudes, and behaviours that enable individuals to effectively cope with and bounce back from adversity, such as building strong social support

systems, practicing flexibility, investing in education and training, fostering community-based management, enhancing access to information and resources and promoting overall well-being (Béné, Evans, Mills D et al., 2011). Building resilience in small-scale fisheries involves empowering fishers and fishing communities to adapt to environmental, economic, and social challenges while sustaining their livelihoods and preserving marine ecosystems, rather than succumbing to them (Bene et al., 2008). The resilience of countries is strongly linked to their current policies, but also depends on structural factors such as the level of per capita income, of human capital, and infrastructure, among others (United Nations, 2021). Improving mental health care of fishers will build their resilience as it will strengthen their ability to respond to stressors. This resilience is necessary to achieve viability (Bene et al., 2008).

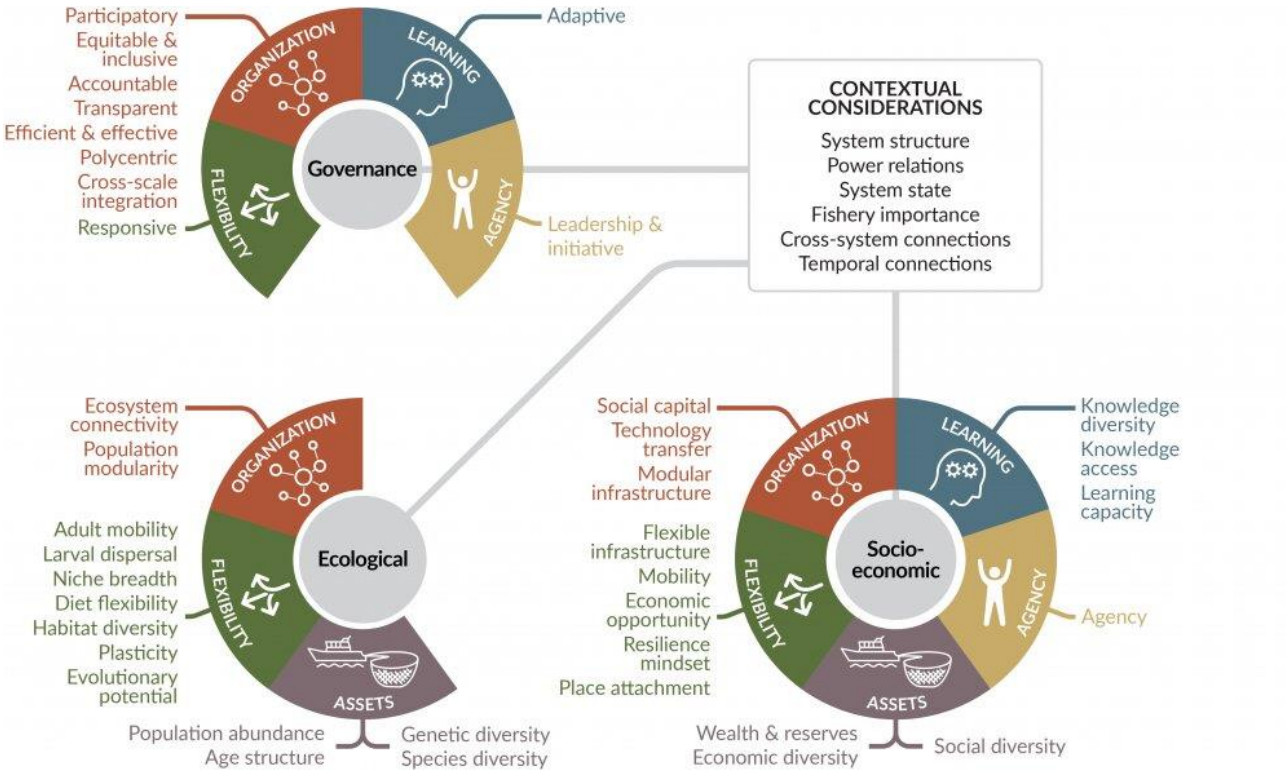

Figure 2.1 Understanding how to build Resilience in Small-scale fisheries (Mason et al., 2021)

2.3 The Relationship Between Viability of Small-Scale Fisheries and Mental Health

Mental health includes emotional, psychological, and social well-being. It affects how we think and act and thus determines how we make healthy choices. Mental health is equally important to physical health as both are strong components for overall good health (World Health Organization, n.d.). Factors affecting mental health include genetics and neurology, coping ability, access to adequate care and resources, traumatic experiences, childhood adversity, violence, abuse and negative life events (World Health Organization, n.d.). Cultural factors such as perceptions of mental health based off of values, norms and beliefs as well as protective factors such as strong supportive systems also impact mental health (Keyes & Lopez, 2009). Mental health issues are related to social and ecological changes. Social determinants of health, including socioeconomic status, education, employment, housing, access to healthcare, and social support networks, significantly influence mental health outcomes. Social isolation, discrimination, stigma, and interpersonal conflicts can also negatively affect mental well-being (Keyes & Lopez, 2009).

Using mental health literature, the negative impacts mental health has on the livelihood of the fishers will be uncovered (McGoodwin, 1995). There is little to no literature on the depth of negative impacts and destruction of livelihoods that mental health issues, specifically prolonged unresolved ones, have on fishers (Pollnac, Abbott-Jamieson, Smith, Miller, Clay, Oles, 2006). However, there is ample literature on the detrimental effects that mental health has on overall well-being (Gien, 2000)**.** Mental illness can result in intense feelings of unhappiness, lack of energy and participation in fishing, unemployment, homelessness, poverty & food insecurity, withdrawal from family/society, increased stress resulting in chronic health conditions such as diabetes or heart disease, and some cases even suicide (Gien, 2000; Regier, Kuhl, Kupfer, 2013). These are some of the many impacts. They justify the importance of the problem, and the need for this research to apply this information to the SSF sector (Gien, 2000). Hence, this research will analyze interviews and surveys of real-life experiences, to help fill this gap as well (Ommer, 2007). Mental health conditions cost the global economy US$ 1 trillion each year (Health, 2020). Mental disorders (depression & anxiety) are in the top 10 contributors to the global burden of disease. People with severe mental health conditions die 10 to 20 years ahead of the general population “premature mortality”, most often through unrecognized and untreated physical

health conditions (WHO, 2022). Mental disorders account for 1 in 6 years lived with disability (15.6% years lived with disability (YLDs)). Figures 2.2 and 2.3 below depict this further.

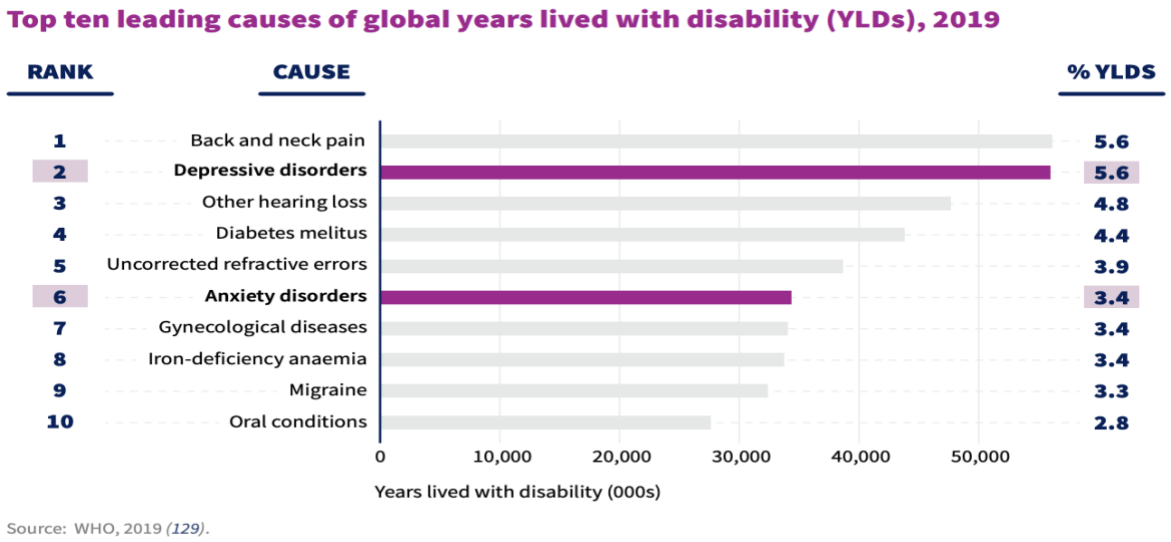

Figure 2.2 Mental Disorders as leading causes of global years lived with disability (WHO, 2022)

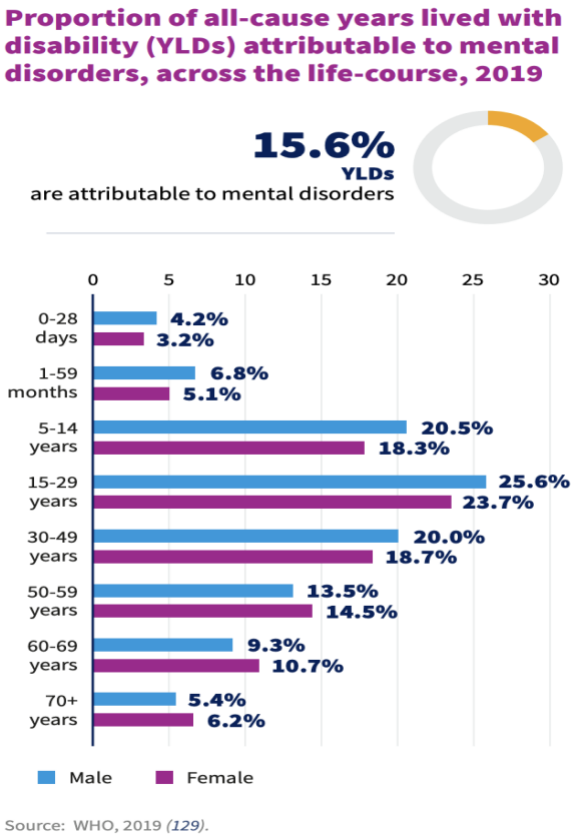

Figure 2.3 Proportion of Years lived Disability attributable to Mental Disorders (WHO, 2022)

There is a strong association between mental illnesses increasing the risk of various physical health conditions such as diabetes, heart disease and stroke. Poor mental health affects the entire production system for SSF and decreases any resistance to change (Keyes & Lopez, 2009). This in turn fosters an environment for greater vulnerability to poverty, which is already an existing problem. Creating better guidelines for mental health care will help the global challenge of sustaining SSF (Berkes & Nayak, 2019). Poor mental health results in detrimental impacts such as homelessness, poverty, job loss, personal safety, etc. Other aspects include decreased enjoyment of life, social isolation, greater likelihood of death/suicide, etc. Because of the high degree of severity that comes with mental illness, there is a need for resilience in this aspect (Keyes & Lopez, 2009). Resilience strategies will not only help with coping with mental illnesses but also can extend to better physical surroundings (Li, 2012). SSF constantly face an ever-changing livelihood, especially due to their reliance on environmental conditions, i.e. Fish availability (Biggs, Schlüter, Schoon, 2015). With an increase in the effects of climate change, finding solutions to the problem of mental health is more imperative than ever (Li, 2012). Loss of income for SSF results in negative effects on emotions such as lowering of mood, sleep deprivation, and reduction in self-esteem (Béné, 2009). The interesting connection is that these three negative impacts listed are all very common signs and symptoms of mental illness (Keyes & Lopez, 2009). Hence, by showcasing that the negative impacts from the vulnerability of loss of income equate to the symptoms of mental illness, it solidifies the connection that vulnerability leads to poor mental health (Pollnac, Abbott-Jamieson, Smith, Miller, Clay, Oles, 2006). As research indicates, fishers are exposed to various environmental and economic stressors. Furthermore, although illness may cause the sickest individuals not to fish, many fishers continue fishing but shift their methods. When sick, fishers use methods that are less physically demanding but illegal and environmentally destructive. It is suggested that environmental sustainability may be integrally shaped by the health of resource users (Pollnac, Abbott-Jamieson, Smith, Miller, Clay, Oles, 2006).

The fishers are caste-based, meaning that their caste is primarily focused on fishing, while other castes are focused on other activities such as agriculture (Szabo, 2020). If fishers are not fulfilling their traditional caste roles and functioning out of the caste system, their well-being and livelihoods can be negative effected (Nayak & Berkes, 2011). With these negative impacts on the local fishers discovered, there are reasons to believe that the psychological health of the

locals is affected. Studies show that unemployment that is not due to retirement has negative effects on physiological well-being (Taris, 2002). In addition, there is growing evidence that supports how unemployment may cause psychological effects, not just economic consequences (Hofsten and Backman, 2000). People in Chilika are experiencing unemployment, which is potentially affecting mental health in that region. Also, socioeconomic status and living arrangements are shown to contribute to depression (Lorant et al., 2007). It is important to examine the effects of unemployment on psychological health in Chilika. Furthermore, unemployment can result in forced migration, which has many implications on psychological health. Culture shock can cause significant distress in migrants due to the newness of environments (Bhugra & Ayonrinde, 2004). Additionally, changes in cultural identity are also a common experience as migrants attempt to adapt to new environments (Szabo, 2020). Consequently, culture shock and cultural identity can lead to social alienation and depression (Bhugra, 2003). With these unique characteristics of SSF systems, it is vital to examine how fishers understand mental health and consider how they express mental health in Chilika. This research aims to explore what mental health means for the people in Chilika Lagoon and small-scale fishing communities (Szabo, 2020).

Poverty is the #1 driver of poor mental health in developing countries. There is a well-established connection between financial security and mental health. The vast majority (over 95%) of small-scale fisherfolk (fish farmers, fishers, traders and related occupations) are from low-income developing countries (FAO, 2009). As large fisheries and aquaculture took over more and more of the resources in the lagoon, a battle ensued between the villagers and the commercial fisheries, marred with disputes and court cases. The livelihood of the small-scale fishers was affected, and many were forced into poverty (JICA-CDA Technical Cooperation Project, 2009). The introduction of shrimp aquaculture in the 1980s, resulted in a decrease in the production of natural fish and income for households, increased poverty, and environmental degradation (Doherty & Clayton, 2011). It is important to take note of the contributors to poverty in small-scale fisheries, which make fishers especially vulnerable to poverty-driven mental health issues. Solutions to poverty-driven mental health include advocating for increases in supportive housing, more employment support programs, and raising income support to reflect the actual cost of living (Doherty & Clayton, 2011). In addition, promoting mental health by identifying public issues and recommending options that can create supportive environments is

key. By advocating for healthy public policies that address the broad determinants of health, poverty-driven mental health can be tackled (Doherty & Clayton, 2011). Mental health care systems must be constructed with a user-centered and service integration focus. Responsive systems that systematically translate the knowledge acquired from the grassroots and subsequent innovations at the micro level into meso-level institutions and macro-level policy are needed. This can be achieved through dialogue and synergy between various stakeholders while steadfastly reflecting on the bigger picture (Narasimhan, Gopikumar, Jayakumar, Bunders, Regeer, 2019). One must push boundaries for what is aspired for change. Level of income and financial security is one of the biggest contributors to negative mental health outcomes (Marmot, 2002). Understanding this intersection is what implores this study to research how improvement in capture fisheries policies will improve mental health. Poor mental health makes SSF less resilient and therefore more vulnerable (Islam & Chuenpagdee, 2022; Murali & Oyebode, 2004).

This concept can also be understood through Maslow's hierarchy of needs. Maslow's Hierarchy of Needs is a psychological theory proposed by Abraham Maslow in 1943, which describes the hierarchy of human needs in a pyramid structure, with basic physiological needs at the bottom and higher-order psychological needs at the top (McLeod, 2007). The theory suggests that individuals are motivated to fulfill these needs in a hierarchical manner, starting with the most basic needs and progressing to higher levels as lower-level needs are met. Maslow identified five levels of needs (McLeod, 2007). See figure 2.4. Maslow suggested that individuals sequentially move through these levels, with lower-level needs serving as the foundation for higher-level needs. However, he also recognized that individuals may experience regression or fluctuation between levels, especially when facing stressors or life challenges (Poston, 2009). Additionally, not all individuals may reach the highest level of self-actualization, as this is considered a rare and exceptional state achieved by only a few (McLeod, 2007).

Overall, Maslow's Hierarchy of Needs provides a framework for understanding human motivation and behaviour, emphasizing the importance of addressing basic needs before higher-level needs can be fulfilled. It has been widely influential in various fields, including psychology, sociology, education, and business management (McLeod, 2007). It is important to acknowledge its purpose, as this concept will be used as a framework to understand why fisherfolk can't focus on improving their mental health (which lies higher up on the pyramid of

needs) until their basic, survival needs are met (which is the first requisite to fulfill for a sustainable livelihood).

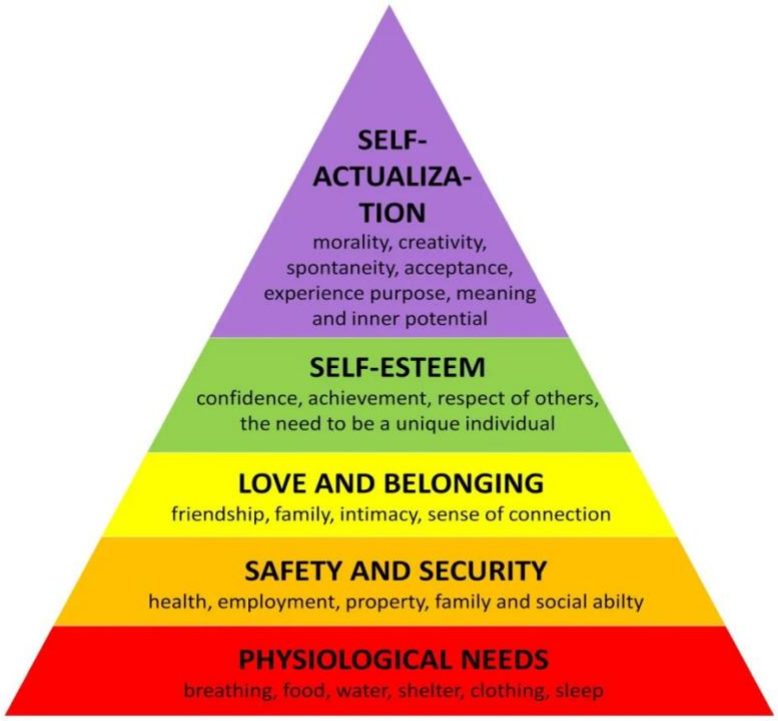

Figure 2.4 Maslow's Hierarchy of Needs (McLeod, 2007

Understanding the impacts of mental health can aid in creating better solutions as well as improving resilience and viability. It will create a link between better mental health conditions and better livelihoods as well (Pollnac, Abbott-Jamieson, Smith, Miller, Clay, Oles, 2006). Environmental factors such as climate change effects and natural disasters, economic factors such as poor governance, lack of policy, and social factors such as lack of help from civil institutions, poor connections with other members, stigma and isolation faced by the community and debt bondage are mentioned as contributing factors (Satumanatpan & Pollnac, 2017). The literature also argues that preventative measures for mitigating the negative impacts of poor mental health are needed. Currently, there is a lack of extensive and resourceful research about mental health in Chilika Lagoon and in small-scale fisheries. Noting this lack of current knowledge, this research aims to discover the negative impacts of mental health to the specific context of small-scale fisheries, thereby filling a gap in the literature.

2.4 Insights on Using Governance and Policy as a Tool to Address Mental Health Care Needs of Small-Scale Fisheries

This leads to the final domain of literature, governance. Existing literature gives guidance for best practices in mental health policies, which aids in achieving objective 4. Comparisons to other countries/systems are used to find commonalities in successful and effective health policies that lead to better-coping mechanisms (Mahon, McConney, Roy, 2008). Literature also showcases the current immense lack of adequate health policies in mental health for SSF communities (McGoodwin, 1995). There is little literature to showcase the current existence of them or any effectiveness studies (Armitage, Charles, Berkes, 2017). Small-scale fishers are unprivileged in the context of wider society as the fishing profession is seen as 'lower profession.' Fishers are also underrepresented in policy arenas. The research proposed will fill this gap in literature by not only investigating the current situation of mental health policies but by also creating a set of guidelines and recommendations that can help local governance (Nayak & Berkes, 2019), civil society and community response organizations to implement better health policies, that will in turn reduce mental health vulnerability and increase viability for fishers (Woodhead, Abernethy, Szaboova, Turner, 2018; Szabo, 2020). Advice on actions will arise from further investigation into literature on health care policies as well as qualitative evidence – hearing the needs of the people in SSF (Launer, 2011). What is it that they need and would prefer to have? How can it help them navigate their own mental issues? What are the criteria for Best Practices in mental health? Non-governmental organizations and community institutions will play a role in answering these difficult questions (Li, 2012). Small-scale fishers also become vulnerable when the government adopts fishery and development policies without due consideration to fishers' needs and concerns. Voices of fisher communities in the Chilika Lagoon should be an integral part of policy creation for lagoon governance. Current community-based institutions should be reviewed and reengaged in the management of capture fishery in order to strengthen fishery-based community livelihoods and food security (Szabo, 2020). Because mental health causes vulnerabilities to SSF, lowering the negative impact by improving the available support provided will shift SSF closer to viability.

A primary issue for lack of mental health care, is that it is an underfunded sector of governance. WHO's most recent Mental Health Atlas showed that, on average, 2% of health budgets go to mental health. Many low-income countries reported having fewer than 1 mental

health worker per 100 000 people (WHO, 2021). It is recommended that mental health funding be increased to match the increasing prevalence and importance of this widespread issue. As well, according to the literature, further best practices include the consideration of stigma about mental health issues (Armitage, Charles, Berkes, 2017). Stigma results in a lack of attention from political officials and the public, which then results in a lack of resources and morale, decaying institutions, lack of leadership, inadequate information systems, and inadequate legislation (Newnham & Page, 2010; Szabo, 2020). By resulting in social exclusion of people with mental illness, stigma is detrimental not just to people with mental illness, but also to the health of society as a whole. It is essential to eliminate intersectional stigma in order to achieve high-quality care (Newnham & Page, 2010). To continue, there needs to be an increase in education, information and support for primary care providers. They need greater access to resources and specialized training in mental illness-specific cases (Launer, 2011). Policy also needs to address compensation of practitioners. Blended capitation which allows physicians to receive a base payment for providing comprehensive care to each patient and special payments for providing patients with chronic disease management and preventative care is preferred as it allows care providers to be more flexible, take more time and prioritize patient care (Jentoft, 2005). There also needs to be communication in all levels of organization/government, from the bottom up, such that there is coherence in the implementation of health policy (Newnham & Page, 2010).

There needs to be a collaborative and integrated framework for mental health care that meets the needs of the patients, especially vulnerable ones (Jentoft & Chuenpagdee, 2015). This type of care is patient-centred and involves a team of practitioners (e.g., physician, nurse, psychologist, psychiatrist, social worker, occupational therapist, pharmacist, dietitian) working together to provide patients with all-around, seamless physical and mental health care (Newnham & Page, 2010). Collaborative and integrated primary care aligns with community support services and mental care facilities, secondary physical and mental health care, and hospitals to better serve people with complex mental health problems and illnesses (Jentoft & Chuenpagdee, 2015). It also invokes techniques for preventative care (Newnham & Page, 2010). It increases patients' access to mental health services and enhances their own knowledge about self-care – which it vital in SSF communities as they have little knowledge about what mental health is. There needs to be funding models in place in public policy that give the ability to hire sufficient mental health staff for delivering care but also increasing education and awareness of mental

health (Launer, 2011). Policy also needs to incorporate coping and adaptation mechanisms that help respond to mental health issues. Figure 2.5 further highlights some best practices in mental health care and public policy, which can be applied to small-scale fisheries.

Figure 2.5 OECD Mental Health Care System Performance Framework and Best Practices (OECD, 2019)

As well, since mental health is a vulnerability with multiple interconnecting dimensions, the literature suggests that it's response also be made keeping the multidimensional vulnerability index (Figure 2.6) in mind. A multidimensional vulnerability index (MVI) is a tool that can be used to assess the vulnerability of low-income countries, and serve as a criterion for access to

and allocation of resources within and among countries (United Nations, 2021). The index is structured around: a quantitative assessment of structural vulnerability and resilience using a common methodology for all developing countries, represented by MVI scores for individual countries; and a more detailed characterization of an individual country's vulnerability and resilience factors (United Nations, 2018). It is a vital means to help low-income countries gain access to the concessional financing that they need to survive the climate catastrophe, to improve their long-term national planning, as it recognizes environmental and economic vulnerabilities – both of which exist widely in small-scale fisheries (United Nations, 2021). This concept applies to SSF systems and communities as they are also struggling on the precipice of multidimensional vulnerabilities; hence, the MVI captures the vulnerabilities of SSF. Without an MVI that shows in a data-driven manner how some countries are more vulnerable than others, small-scale fisheries ability to withstand pandemics, economic shocks, disasters, and climate change will be diminished (United Nations, 2021). MVI's also provide an opportunity to gain more data that will give us a better understanding of the climate puzzle affecting a multitude of nations, including SSF. A well-designed MVI may guide policy in three main directions: Promoting resilient macroeconomic policies, reducing the social impact of vulnerabilities, and strengthening regional partnerships and regional integration (United Nations, 2021). A multidimensional vulnerability index has the potential to ensure truly inclusive sustainable development (United Nations, 2021), and thus should be used as a mechanism to drive sustainable, multidimensional systems change in mental health care provided to small-scale fisheries.

Overall, these are some of the best practices that are involved in providing strong mental health care (Launer, 2011). These broader ideas need to be implemented into the unique societal context of SSF. The thesis will share recommendations in order to help local governance health policies adopt these best practice frameworks. It is evident that better mental health conditions create better livelihoods and greater viability for small-scale fishers; and therefore, there is a need for the implementation of multidimensional solutions (Weeratunge et al., 2014).

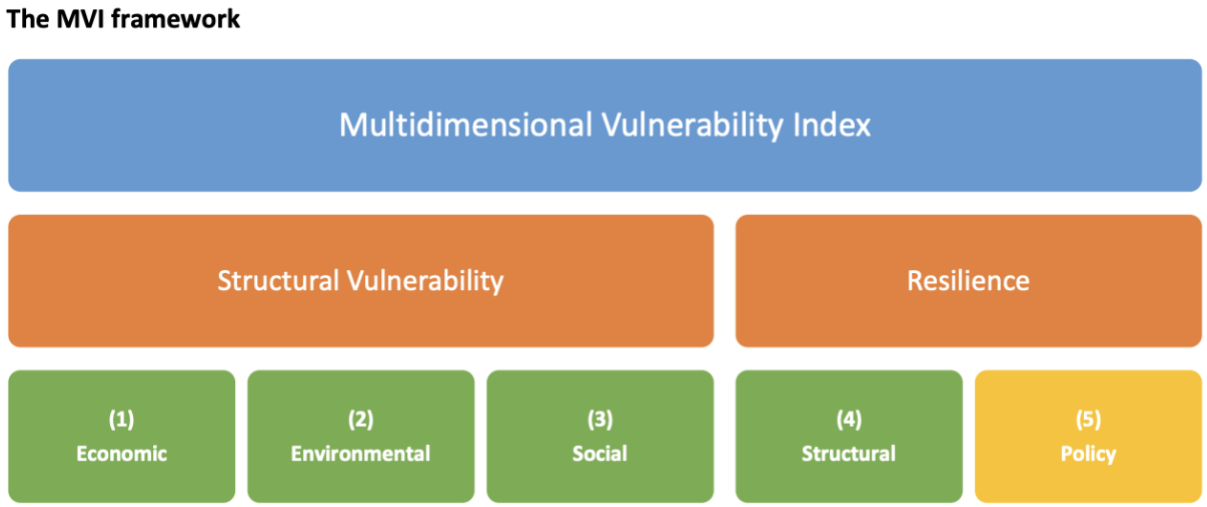

Figure 2.6 The Multidimensional Vulnerability Index (United Nations, 2021)

Mental health care is much needed in all societies, and especially in those that are extremely vulnerable like SSF (World Health Organization, 2023). Mental health care offers a wide range of benefits for individuals, families, communities, and society as a whole. Some of the key benefits include improved quality of life, enhanced functions and social relationships, improved physical health, increased personal and economic productivity, stronger communities, and most importantly, amplified resilience (World Health Organization, 2023). Strong mental health is also an indicator of wellbeing and thus, improved mental health outcomes lead to increased viability of societies. Increased knowledge of and awareness of mental health policies needed is also needed to achieve this (World Health Organization, 2023).

Sustainable Livelihoods is a holistic, evidence-based approach designed to capture the many effects of social and economic exclusion on people's lives. The sustainable livelihoods framework (SLF) presents the main factors affecting people's livelihoods, and typical relationships between these (Natarajan, Newsham, Rigg, Suhardiman, 2022). The framework can be used in both planning new development activities and assessing the contribution to livelihood sustainability made by existing activities. In particular the framework showcases important issues and their intersections with each other; draws attention to core influences and processes; and emphasizes the multiple interactions between the various factors affecting livelihoods. The framework aims to help stakeholders engage in structured and coherent conversations on the many factors affecting livelihoods and their relative importance (Natarajan, Newsham, Rigg,

Suhardiman, 2022). In the case of small-scale fisheries, the framework should help exploring linkages between environmental, social, and economic factors as well as local knowledge to better understand their potential in contributing to improved livelihoods. The sustainable livelihoods approach can be used to capture, and provide a means of understanding, the fundamental causes and dimensions of mental health without collapsing the focus onto just a few factors (e.g. economic issues, climate change, social systems, etc.). It helps to sketch out the relationships between the different aspects (causes and manifestations), allowing for more effective prioritization of action at an operational level (Natarajan, Newsham, Rigg, Suhardiman, 2022). Figure 2.7 showcases a graphic representation of the SLF. Livelihoods of fishers are shaped by a multitude of different forces and factors, which are themselves constantly changing and thus a people-centered analysis is needed. Hence, mental health care policy needs to be built using the sustainable livelihood framework, as that will help transition SSF to sustainability, and from vulnerability to viability (Natarajan, Newsham, Rigg, Suhardiman, 2022).

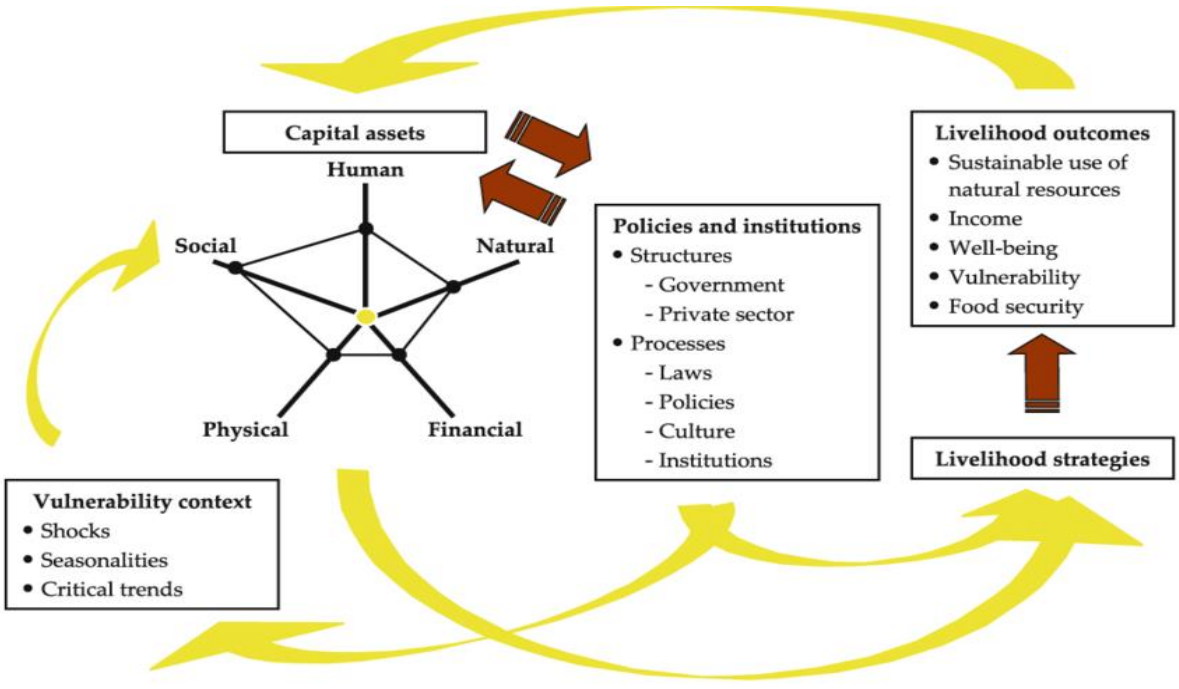

Figure 2.7 The sustainable livelihoods framework (Serrat, 2017)

2.5 Conceptual Framework and Literature Gaps

Based on the literature reviewed in the 3 domains of vulnerability and viability, mental health and governance, it is clear that the recommendations guideline needs to be integrated, adaptive and multidimensional (Saxena, Funk, Chisholm, 2014). Hence the underlying theoretical framework for this research will be based on the following attributes, as discovered through insights drawn from the three literature areas:

- A clear vision for betterment of mental health
- distinguished role clarity for community member, care practitioners' civil institutions and government sectors
- respectful group culture, reducing stigma and discrimination.
- practitioner education and increase in available tools, i.e. increased education of target audience.
- tools for effective communication at intra- and inter-community/government levels
- quality collaboration between all parties
- monitoring and accountability structures
- commitment to patient-centred care
- innovative methods to include and empower populations to participate in governance and decision-making models.
- strong governance presence and implementation follow-through
- mental health care requires an interdisciplinary and multidimensional approach.
- improvement of public policies in social-ecological and economic domains, not just health care

This theoretical framework, which is heavy on the involvement of fishers' perspectives, inspired the qualitative research method as well. There are several benefits in engaging communities for determining both vulnerability and solutions for viability given that they can become real actors in working towards better livelihoods, as opposed to being seen only as a problem (Chuenpagdee 2011a).

The proposed recommendations will ensure to target these aspects to promote sustainable, long term, and effective change (Saxena, Funk, Chisholm, 2014). This framework will guide the creation of a best practices outline. This tool will also aid in understanding the relationship between lack of support and/or funding for strong public policies and its cause in higher rates of mental illness in society, i.e. poorer livelihood, a major concept demonstrated through this research (Keyes & Lopez, 2009). Bringing all three literature areas together also highlighted some key gaps. Mental health studied as a multidimensional vulnerability is underrepresented in small-scale fisheries literature. Understanding the different perspectives that small-scale fishers have about mental health, its drivers and negative impacts is also lacking. Improving governance structures and policies in SSFs context is also not researched well. This research aims to fill these gaps. The response to tackling mental health inequities and care limitations requires a multidimensional framework and solution (Chuenpagdee 2011a). Furthermore, addressing priorities revealed from understanding how mental health is a tool and mechanism for the vulnerability to viability transition of small-scale fisheries, will push fishers to the viability end of the spectrum. This research aims to take a deeper and more holistic investigation of literature gaps identified through the different domains discussed.

2.6 Conclusions from Literature

Overall, this research encompasses three domains of literature: vulnerability to viability, mental health and governance. Social, economic, and environmental vulnerabilities, negative impacts of mental health and best practices in mental health care were discussed. A theoretical framework created from the literature highlighted the importance of integrated and adaptive systems-level change. This chapter presented on what is included in current literature about these topics as well as what is not included in the literature. Therefore, this research study will lie on the junction of these two attributes, by focusing on addressing the identified gaps in literature. There is mental health literature and there is governance literature but there is limited literature about mental health AND governance in small-scale fisheries. This research is built on the interdisciplinary and interconnected space of improving multidimensional mental health responses and outcomes through governance structures, in small-scale fisheries like Chilika Lagoon. To highlight this, a thematic organization was used for the literature review. By investigating the domains separately but also injunction with each other, the objectives for this research were made clear. This realm of knowledge, although very important to the well-being of small-scale fishers, is currently lacking. Hence, the literature review revealed a need to focus on how local governance can adopt and implement effective policies to improve the mental health care provided to fisher populations. By doing this, the resilience of fishers will be increased. This emphasized that improving mental health care and outcomes will result in a shift from vulnerability to viability in small-scale fisheries.

Chapter 3: Methodology and Research Methods

3.1 Summary of Research Approach

This chapter defines the methodology and data collection methods employed to execute the research study, including the role of the researcher and the types of sampling used. Details regarding justifications and limitations in research methods are also included. This research used a qualitative method approach to tackle the objectives stated for this thesis. The initial phase of the research involves observing the study location, followed by data collection methods and then data analysis. The findings were triangulated to ensure accuracy.

3.1.1 Case Study: Chilika Lagoon, India

A case study is "a research approach used to generate an in-depth, multi-faceted understanding of complex issues in its real-life context" (Crowe et al., 2011). Case studies can be used to explain, describe, or explore phenomena in the everyday contexts in which they occur, as compared to setting up an experimental design to reach conclusions (Yin, 2009). The case study for this research is Chilika Lagoon, India. Chilika Lagoon, also called Chilika Lake, is the largest lagoon in India and the largest in Asia, with an area of 1165 km2. It is in the State of Odisha on the east coast of India on the Bay of Bengal, south of Kolkata (Calcutta). Connected to the Bay of Bengal in the south, with the Eastern Ghats Mountain ranges forming most of its catchment in the north and the west, Chilika is a Ramsar Site of international conservation importance and a biodiversity hotspot. Some rare, vulnerable, and endangered species listed on the International Union for the Conservation of Nature's (IUCN) Red List of threatened animals inhabit the lagoon. It is the largest wintering ground for migratory waterfowl found anywhere on the Indian subcontinent and home to 44 Irrawaddy dolphins (Orcaella brevirostris) (Nayak, 2014). It is a productive area with fish fauna adapted to a mix of freshwater and seawater that characterizes lagoon ecosystems (Nayak and Fikret, 2010). Its beauty attracts many bird watchers, tourists, and ecologists. Chilika's biodiversity is also an integral part of sustaining the culture and livelihoods of about 200,000 fishers and their families, in 40, 000 households, who belong to specific caste groups and live in more than 150 villages (Nayak, 2014).

Chilika Lagoon provides the main livelihood to over 200,000 fishers across 150 fishing villages located around the lagoon (Nayak 2014; Nayak & Berkes 2010). Fishing has become the main livelihood for local community members in Chilika, with many locals changing their occupations to fishing since it was a very profitable livelihood option (D'Lima, 2014). Before 1980, fishing in Chilika was mainly based on capture fisheries, and traditional fishers were allowed to extract resources from the lagoon (Nayak, 2014). However, after 1980 due to the growth of the international tiger prawn market, fishing in the lagoon became even more profitable, which led to the development of prawn aquaculture, and consequently, the fishing in Chilika shifted from capture to culture (D'Lima, 2014; Nayak, 2014). The encroachment of traditional fishing areas by non-traditional fishers was challenged by traditional fisher cooperatives, leading to the ban of shrimp aquaculture in 1997 (D'Lima, 2014). However, illegal shrimp aquaculture continues in Chilika and has led to the marginalization of traditional fishers as well as the "decommonisation" of Chilika Lagoon (D'Lima, 2014; Nayak, 2014; Nayak & Berkes, 2010).

3.2 Research Design

Research design, is the plan or proposal to conduct research, involves the intersection of philosophy, strategies of inquiry, and specific methods. The Philosophical Worldview means "a basic set of beliefs that guide action" (Guba, 1990, p. 17). The research embraces a pragmatic worldview as it is more problem centred and focuses on real world practice (Creswell & Creswell, 2017). For a researcher, pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as different forms of data collection and analysis. Pragmatism involves research designs that incorporate operational decisions based on 'what will work best' in finding answers for the questions under investigation and this enables pragmatic researchers to conduct research in innovative and dynamic ways to find solutions to research problems. While predominantly pragmatic, this study also has traces of constructivism as the study seeks understanding of the world in which fishers live and work, to better comprehend the contextual situation that effects their health. The goal of this research is to rely on the participants' views of the situation being studied and remain culturally competent to highest level (Creswell, 2014). The questions asked in the questionnaire are broad and general so that the participants can construct the meaning of a situation, typically forged in discussions or interactions with other persons. The more open ended the questioning, the better, as the

researcher listens carefully to what people say or do in their life settings (Creswell and Creswell 2008). This lens provides a framework for topics of interest, methods for collecting data, and outcomes or changes anticipated by the study. In this research the theoretical framework focused on understanding perspectives of fishers, complex vulnerabilities faced by fisherfolk such as mental health, drivers on the concepts of wellbeing, viability, and multidimensional livelihood issues and solutions in the three domains of social, economic and environmental impacts.

Qualitative Research uses qualitative research methods to ask emerging questions, collect data, and explore emerging themes in the participant's settings (Creswell, 2007). This involved semi-structured interviews with open-ended questions for the participants, that helped uncover and understand concepts such as the negative impacts residents feel caused by their mental health issues and what improvements they feel are necessary in health policy. These were important questions because they addressed a novel phenomenon – one which had limited previous research done on the problem or population (Saldaña, 2009). Moreover, for this research, it is key that data be collected at the research site with information being received from the study population, and thus data collection is in natural settings where the participants experience mental distress (Creswell, 2007). It is the perspectives and experiences of the SSF that this study is looking for as the improvements in care for mental health problems are to be made within them. Hence, data collection in the participant's setting is imperative to answering the research question (Creswell, 2002). The data collected was analyzed, along with an informal literature review on best practices in mental health care, to find common themes that create adequate holistic public policies. Information gathered created a set of recommendations for local governance response. Qualitative methods are the most applicable form of data collection for this type of research because they only involve gaining the perspectives of the population sample. This helps to gather in-depth insights into the given problem and generate new ideas for solutions that are built within the needs of the community context (Creswell, 2002; Saldaña, 2009). This was the motivation and main reasoning for choosing this type of method as one of the goals of this research is to stay culturally competent.

Research into the mental health policies of SSF is novel, thus there is a lack of precedence on best research techniques (Satumanatpan & Pollnac, 2017). Qualitative research is a collection of primary data from the research area with the help of survey questionnaires for a

thematic analysis to follow (Creswell, 2002). A qualitative design is useful to best understand a research problem. Qualitative research allows you to ask questions that cannot be easily put into numbers to understand human experience. Getting at the everyday realities of social phenomena and studying important questions as they are truly practiced helps extend knowledge and strengthen understanding. Collecting both closed-ended and open-ended qualitative data proves advantageous (Creswell and Creswell, 2008). Section 3.4 describes the data collection methods. Qualitative methodology focuses on understanding the meaning of concepts and experiences, which is applicable to this research as the objective is to better understand the cultural context and experiences of these fishers such that insights into the problem can be gained (Seixas, Esteves Dias, Feita de, 2017). From there, a solution towards better mental health care can be provided. This method is best used when the topic is novel and existing theories do not apply – both cases which are relevant to this research question (Saldaña, 2009). The qualitative research aspect of this study involves collecting and analyzing non-numerical data which was the case with this research as primary data was obtained through first-hand observations in the form of an administrable semi-structured interview questionnaire (Seixas, Esteves Dias, Feita de, 2017).

Data collection methods also involved an informal literature review on related topics through multiple academic databases (Bundy et al., 2016). The secondary data collected helped to support the findings discovered from primary data. As well, the literature review provided a strong foundation for conceptual understanding of previous research conducted in this field (Saldaña, 2009). A qualitative research method and data collection process were done to gain information on the adverse effects of mental health, the beliefs on what contributes to poor mental health, as well as what processes are in place to provide better mental health care. These qualitative themes will aid in helping the communities in the way they need (Walker, Holling, Carpenter, Kinzig, 2004). The expected outcomes that are hoped to be obtained from problem analysis is the contribution to an area of common literature and V2V knowledge that is severely lacking. The audiences that will potentially benefit from and find the study of interest include individuals and researchers in scholarly literature, practice and policy. This study is meant to fill current gaps and uncover new connections and solutions for reducing mental health vulnerability and improving viability (Walker, Holling, Carpenter, Kinzig, 2004). This form of data collection assisted in the expected outcomes of understanding mental health as a multidimensional vulnerability, discovering, and highlighting the negative impacts of mental health on SSF and

most importantly, creating a set of recommendations on incorporating best mental health care practices through a multidimensional policy framework in SSF. The goal is to improve viable local governance response in policy, society and community.

Sequential design was preferred for the study because the purpose of the qualitative method research is development, such that the findings from the first method inform the use of the second method (Onwuegbuzie, 2007). This thesis involved a sequential design using identical samples for both qualitative and literature components of the study. Fisherfolk residing in Chilika and engaged in fishing activities were asked questions on both qualitative and quantitative components. Literature sources were used to support the analysis and conclusions discovered from primary data collection.

3.3 Data Collection Methods

This research used two types of data collection: qualitative household surveys and an informal literature review.

3.3.1 Informal Literature Review

The literature review for this research was used to examine available knowledge and theories, including up-to-date information about the relevant topic, is common in both quantitative and qualitative research (Elliott and Timulak, 2005). In this process, the purpose, objectives, methodology and significance of the research work have to be decided beforehand to reduce bias during the review process. A regular literature review focuses on starting from a broad overview of the issues that is eventually narrowed down (Štrukelj, 2018). Evidence is gathered surrounding a series of topics and problems. Overall, the literature review helps examine diverse findings and identify concepts and theories that require further research.

A preliminary literature review was conducted to obtain a conceptual and theoretical understanding of previous research conducted on three fundamental areas of interest: vulnerability and viability, mental health and its impact on small-scale fisheries, as well as the use of governance and policy to effectively respond to and improve mental health care needs of fisherfolk. The literature review examined scholarly articles, books, thesis dissertations, and other secondary sources relevant to the three areas of research. It allowed for a structured

theoretical understanding, which allowed the researcher to practice gap spotting, and problematization to justify the need for further research (Creswell, 2014). A literature review allowed for a thorough understanding of existing theories related to mental health in small-scale fisheries and its best practices for response. The literature review for this study was conducted through various secondary sources of information such as Google Scholar, SCOPUS, JSTOR, and several other websites. The data reviewed included book chapters, academic journal articles, magazine articles, grey literature, government reports, and online news materials. Data was searched using broad keywords such as Chilika Lagoon, Small-Scale Fisheries, Small-scale Fishers, Mental Health, Vulnerability to Viability, Wellbeing, Resilience, Governance, Policy Change, Adaptation, Coping, Negative Impacts, Contributors, Multidimensional, Mental health care, Mental Health Outcomes, Poverty-Driven Mental Health, Best Practices, etc. These terms were used in combinations with each other to get the desired information. For example: Small-scale fisheries + Vulnerability to Viability + Mental Health would be one search, and so forth.

3.3.2 Semi Structured Household Surveys

Household surveys are a process of collecting and analyzing data to help us understand the general situation and specific characteristics of individual households or all households in the population (UNESCO 2019). A typical household survey selects a sample of households from the population of interest for the research. In many cases, the frame is a census, and the sample is representative of a geographic area (Thomas, 2007). The simplest sampling strategy randomly selects households from the frame. In practice, most household surveys follow a two-stage (or multi-stage) sampling design in which clusters are selected and then households are selected from those clusters (Thomas, 2007). Survey techniques involve personal interviews or telephonic interviews. The interview/survey is an important data-gathering technique involving verbal communication between the researcher and the participant. Interviews are commonly used in survey designs and in exploratory and descriptive studies (Thomas, 2007). This research employed a semi-structured one-to-one interview with respondents. The closed-ended questions asked in the questionnaire were followed by open-ended answers to understand the scenario in depth. The quality of the data collected in an interview will depend on both the interview design and on the skill of the interviewer (Fox, 2007). Semi-structured interviews are similar to structured interviews in that the topics or questions to be asked are planned in advance, but instead of using closed questions, semi-structured interviews are based on open-ended questions.

For this study, the geographical location chosen was Chilika Lagoon, India, and the households residing in the villages in Chilika engaged in fishing activities were surveyed. Surveys helped in capturing the livelihood and wellbeing of fisherfolk. Surveys seek to create meaning just as interviews do; however, they involve standardization procedures which restrict interviewee responses (Kelley-Quon, 2018). This allowed for the surveys to be completed with a wider range of participants and took less time compared to interviews. Surveys can take place with interviewers; however, they are not allowed to influence answers in any way and are given standardized questions they need to follow exactly (Sue & Ritter, 2011).

Due to pandemic-related travel restrictions, all surveys took place through community researchers hired through the V2V Global Partnership. Community researchers taking part in the questionnaire went through two rounds of training. They were trained remotely by the lead researcher (Astha Priya) on methodology as well as the goal of the research and questionnaire. Each question was examined, creating a clear understanding of its intended purpose. The answer options were created by the main researcher based on information learned from the literature review as well as the insights of the community researchers. Community researchers also participated in mock surveys to find any discrepancies or issues with the questionnaire and its delivery. After recording responses, the community researchers were also responsible for translating questionnaire data from the local language, Odia to English, for interpretation by the lead researcher. Survey participants were sampled from SSF local community households using random sampling techniques. Random sampling was utilized by choosing phone numbers from a curated list provided by the V2V Global Partnership when selecting individual respondents. Snowball sampling was also used as the field researcher took advantage of any strong connections' participants had to fishers with useful knowledge on a complex topic such as mental health.

Criteria for survey participants included 18 to 65-year-old individuals residing in local caste-based fisher communities of Chilika Lagoon and occupied in fishing related activities. Every individual interviewed has either lived in the community their whole lives or has moved into the community from a different fisher caste community through marriage. Men and women both were invited as participants of the study. The researcher was told to aim for a balance of gender in questionnaires administered. The study targeted attainment of 50 fisher surveys, from

those residing in 3 different surrounding villages. There are roughly 150 communities surrounding Chilika Lagoon, which includes 200,000 caste-based fishers in 40,000 fisher households (Nayak & Berkes, 2010). This study assumes that five participants per community will saturate the data, as long as all five participants provide similar findings regarding vulnerabilities, mental health drivers and impact on livelihood, and governance issues and solutions (Fusch & Ness, 2015). In-depth notes were taken on answers, and the researcher was instructed to ask for elaborations or related follow-up questions as needed, to collect strong qualitative data. This study can be used to generalize the total population of the 3 communities in Chilika that were studied.

3.4 Data Analysis

Data analysis is the process of reducing substantial amounts of collected data to make sense of them. Patton (1987) indicates that three things occur during analysis: data are organized, data are reduced through summarization, and patterns and themes in the data are identified and linked. This section explains how the data collected using the methods described in previous sections was analyzed. Due to the COVID pandemic and travel restrictions, the qualitative data is analyzed based on knowledge the remote field researcher acquired from the household survey (Creswell, 2007). To put it in much more precise terms, this process paves the way for a researcher to draw conclusions through inductive reasoning. Qualitative data analysis is a "dynamic and creative process of inductive reasoning, thinking and theory" (Basit, 2003).

While conducting household surveys, the community researchers provided insights and updates regarding the surveys taking place. Survey data results were organized using Microsoft Excel spreadsheet. In this study, a total of 50 participants were randomly selected residing in Chilika. The response rate was 100% for demographic and research objective questions as all respondents voluntarily participated in the questionnaire interview session, which consisted of male and female respondents. 29 females (58% of respondents) and 21 males (42% of respondents) were interviewed. The focus of the study was to conduct a study on fisherfolk residing in Chilika despite of any gender, income level and education.

Methods used to analyze the collected data involved using Counting as a method to represent the qualitative data regarding the number of and types of drivers of mental health and

adverse effects resulting from mental health issues. It was quantified the number of times fishers stated common answers in the questionnaire. This same idea was used to quantify data regarding ideas of ways to improve mental health care by the participants. A simultaneous thematic analysis was also conducted with the data such that common themes can be identified and grouped. The themes were supported with additional literature sources. Analysis such as this will help with decisions and evaluations on where to most effectively allocate available health resources to reduce vulnerability in these SSFs. Counting and thematic analysis help the researcher discover what is of most importance to the needs and wants of the populations and therefore build greater strength (Naeem, Ozuem, Howell, Ranfagni, 2023). Furthermore, grouping common responses together and calculating percentages from the responses, was done through Excel sheet analysis. Each survey question helped analyze the data and reveal patterns and common themes from all survey participants' responses. Tables and charts were prepared to highlight the qualitative data. Both closed and open-ended questions were analyzed in Microsoft Excel spreadsheet. Survey results provided descriptive and quantifiable statistics (used in the form of quotes and percents) regarding fishers' livelihood and deliberations on contributors and negative impacts of mental health, as well as their needs for improving the care they receive. Conducting the survey added a qualitative element to this research leading to the depth and validity of the results from comprehensive, detailed household surveys (Thomas, 2007). Overall, qualitative data from the household questionnaire was represented in the forms of quotes, percents, tables, and figures – all highlighting mutual themes. A comparative analysis is a side-by-side comparison that systematically compares two or more things to pinpoint their similarities and differences (Creswell, 2014). This was conducted to identify mental health as a multidimensional vulnerability.

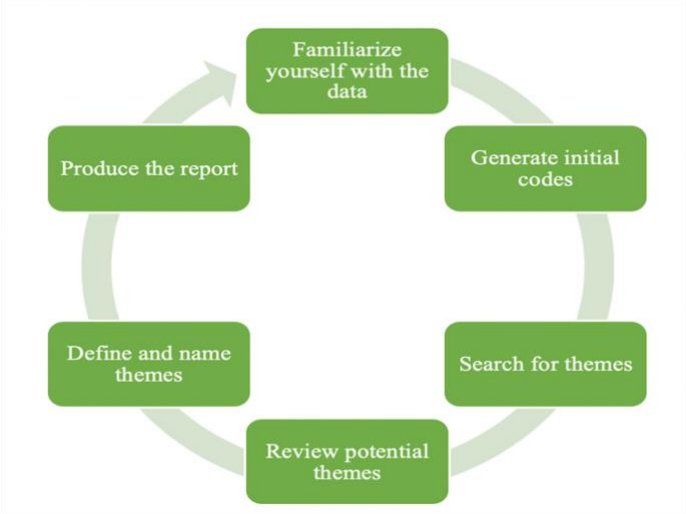

Figure 3.1 Visualization of Thematic Analysis Approaches (Naeem, Ozuem, Howell, Ranfagni, 2023)

3.5 Limitations and Boundaries

It is important to discuss and recognize ethical issues that come with qualitative research as research involving data collection from people will always have ethical concerns. Researchers need to protect the privacy and anonymity (if wished) of research participants and develop trust with research participants such that they feel free to answer prompts to their best ability (Creswell, 2014). One must ensure the survey questions are appropriate and not overbearing/uncomfortable, especially in research that addresses a delicate and sensitive topic like mental health. Researchers should also promote the integrity of research by guarding against misconduct as well as coping with new problems that emerge (Creswell and Creswell, 2018). Table 4.1 in Creswell, Research Design (Table 3.1), showcases all the ethical concerns and situations that are to be considered prior to beginning, during, analyzing and after the study. These anticipated ethical issues were considered and addressed at each step (Creswell, 2014). There will also be cost and resource limitations that need to be considered. The study involved remote data collection and thus the adeptness and time constraints of the appointed remote researcher impacted the study. Moreover, best practice model modifications may be made as new information is uncovered.

Furthermore, a main limitation identified in this study was the issue of language barriers. This posed a large limitation in conducting data collection, as there was a lack of understanding among respondents about the survey questions. Simple answers were given to complex questions. It is also believed many things were lost in translation from Odia to English, showcasing the challenges of remote data collection (Fox, 2009). A suggestion for improvement is to give more multiple-choice questions rather than open-ended ones as this can help increase understanding of fishers on the topic of mental health. It would also be beneficial to use layman, simple language to improve understanding and therefore improve the data collected. For example, the questionnaire was adapted to fishers after receiving preliminary feedback from field researchers on the difficulty of administering questionnaires. Originally, mental health terminology was stated for Section 3 of the survey, but then changed to emotion/feelings for better understanding. Adaptive changes like this should have been done more.

Data collection was also limited in this study due to researcher and participants' knowledge limitations on mental health. This was a 2-prong challenge – consisting of the field researcher's limitations on understanding the topic as well as the participants' capabilities. This negatively affected data collection and resulted in the answers to the majority of the mental health-related questions being "Don't know", "No idea", "N/A", "Can't say", 'silence', etc. The limitation of mental health research is the respondent's lack of understanding on the topic. Fishers have little to no knowledge about mental health as a concept and thus were unable to effectively answer the questionnaire. This is likely due to low levels of mental health education delivered in the schooling system as well as a lack of conversations on mental health in social, and community settings (Walker, Holling, Carpenter, Kinzig, 2004). It is assumed the exposure of fishers to the concept of mental health is minimal. This caused barriers in articulating the perspectives of fishers as the data collected indicated that it was mostly nonexistent for them - this notion was articulated by the field researcher. This lack of understanding on the topic of mental health increased the difficulty in administering the questionnaire as well as the ability to receive adequate responses for data. A limitation of this research is that there was a lack of responses on certain questions from participants due to a lack of knowledge and education within them. Moreover, the study of investigating the prevalence of mental illnesses or poor mental health in Chilika lagoon is challenging as well, as its terminology and labels is not understood. So even if mental illnesses do exist in the population, and most likely do because ill health does

not see any boundary, fishers won't be able to quantify, test or identify it as a mental illness. This limitation contributes to the larger conversation as to why greater mental health research, education and advocacy in small-scale fisheries is critically imperative.

3.6 Ethics

This research project received full ethics clearance from the University of Waterloo Office of Research Ethics under ORE #43511 on September 12, 2022 (Appendix B).

Table 3.1 Ethical Considerations during Research

Table 4.1 Ethical Issues in Qualitative, Quantitative, and Mixed Methods Research

Where in the Process of Research the Ethical Issue Occurs	Type of Ethical Issue	How to Address the Issue
Prior to conducting the study	• Examine professional association standards. • Seek college/university approval on campus through an institutional review board (IRB). • Gain local permission from site and participants. • Select a site without a vested interest in outcome of study. • Negotiate authorship for publication.	• Consult the code of ethics for professional association in your area. • Submit proposal for IRB approval. • Identify and go through local approvals; find gatekeepers or key personnel to help. • Select sites that will not raise power issues with researchers. • Give credit for work done on the project; decide on author order in future publication.
Beginning the study	• Identify a research problem that will benefit participants. • Disclose purpose of the study. • Do not pressure participants into signing consent forms. • Respect norms and charters of indigenous societies. • Be sensitive to needs of vulnerable populations (e.g., children).	• Conduct a needs assessment or informal conversation with participants about their needs. • Contact participants, and inform them of the general purpose of the study. • Tell participants that they do not have to sign form. • Find out about cultural, religious, gender, and other differences that need to be respected. • Obtain appropriate consent (e.g., parents, as well as children).
Collecting data	• Respect the site, and disrupt as little as possible. • Make certain that all participants receive the same treatment. • Avoid deceiving participants. • Respect potential power imbalances and exploitation of participants (e.g., interviewing, observing). • Do not "use" participants by gathering data and leaving site. • Avoid collecting harmful information.	• Build trust, and convey extent of anticipated disruption in gaining access. • Put into place wait list provisions for treatment for controls. • Discuss purpose of the study and how data will be used. • Avoid leading questions. Withhold sharing personal impressions. Avoid disclosing sensitive information. Involve participants as collaborators. • Provide rewards for participating. • Stick to questions stated in an interview protocol.
Analyzing data	• Avoid siding with participants (going native). • Avoid disclosing only positive results. • Respect the privacy and anonymity of participants.	• Report multiple perspectives. • Report contrary findings. • Assign fictitious names or aliases; develop composite profiles of participants.

Reporting, sharing, and storing data	• Avoid falsifying authorship, evidence, data, findings, and conclusions. • Do not plagiarize. • Avoid disclosing information that would harm participants. • Communicate in clear, straightforward, appropriate language. • Share data with others. • Keep raw data and other materials (e.g., details of procedures,	• Report honestly. • See APA (2010) guidelines for permissions needed to reprint or adapt work of others. • Use composite stories so that individuals cannot be identified. • Use unbiased language appropriate for audiences of the research. • Provide copies of report to participants and stakeholders. Share results with other researchers. Consider website distribution. Consider publishing in different

3.7 Researcher's Reflection

After conducting this research, I better understand the immense lack of knowledge on mental health in small-scale fisheries. With this in mind, I would have asked the questions differently, i.e. more simply, more broken down to the layman's terms - so that the fishers could answer it. In retrospect, this area of questionnaire delivery could have been improved and better adapted to the education level of the participants. For example, instead of 'What do you do when you need mental health care?', I would change it to 'Do you know what a mental health service is? And if so, are you aware of any around you?". Considerations should also be made to create a shorter, more concise survey for fishers, in order to improve efficacy in survey deliverance to society. This is what I would do differently now that I know about mental health education and awareness levels in small-scale fishers. Furthermore, there were many challenges of remote data collection present, such as language barrier challenges as well as working with and guiding a field researcher remotely. It is likely many complex concepts got lost in translation from Odia to English. These challenges created many barriers to data collection that took time to overcome and thus delayed deadlines. Reflections and learnings from this experience highlight the need for future qualitative studies to be created with more effective surveys, that incorporate greater cultural competence and address the unique, individual fisher-centered, societal needs of small-scale fisheries (Elliott & Timulak, 2015).

This paper aims to serve as a recommendation that greater focus should be put on providing fishers in SSF with mental health education. Currently, there is a lack of research conducted on this intersection of mental health policy and small-scale fisheries, as well as the availability of educational resources on this topic to the population. It aims to showcase a need

for future, ongoing research to be conducted in this field. The need to continue forward the education on this topic is highlighted. This research develops the idea that mental health research in SSF is currently a gap in the literature and more work needs to be done to address it. Good mental health is important to the holistic well-being of fishers. Only with this holistic well-being can fishers truly move to viability.

3.8 Conclusions

Overall, the methodology of this research was catered towards answering the research question - 'How can local government and societal responses be improved to provide better mental health care for small-scale fishers in Chilika Lagoon, India?' A qualitative research design was conducted with semi-structured interviews and open-ended questions, that gained insight into how the fishery community is suffering from mental health issues as well as what can be done to help them receive better care. This was done through remote data collection. Conclusions and analyses were supported and supplemented with an informal systematic literature review. It adds to the available knowledge on using this method such that future researchers can use this study as a foundation or guideline for further qualitative research in mental health and SSF. This can be done by taking learnings about the specific pros and cons involved with using this method for mental health research or deeply analyzing this method to determine ideas for improving future research. Qualitative methods apply to the research as it is the best possible way to answer the research question, with consideration of all stakeholders (Creswell, 2014). It will give the results needed most efficiently, properly and foster the expected outcomes. It has shown to be effective in past research designs for similar research questions and thus can help in coming up with the best solutions for the problems. Hence, the expected outcomes do lie in creating a set of recommendations to inform local governance responses in SSF on best practices within mental health care in SSF, such that care can be improved. The goal is to advise holistic agents in private and public policy, society and community, such that viability is improved, and vulnerability is reduced. It is imperative to have a strong and appropriate research design approach for good-quality and applicable research. The key limitations of this research such as language and education barriers should be noted and improved on for future research. As seen through this proposal, the correct methodology has been chosen, and this allowed the study the ability to help the target population improve livelihood.

Chapter 4: Mental Health as a Multidimensional Vulnerability in Small-Scale Fisheries Communities

4.1 Introduction

Small-Scale fisheries are vulnerable systems, that face a multitude of exposures due to their unique reliance on their environment. Fishers/dried fish producers associated with them are geographically isolated, economically deprived, politically voiceless, and are considered culturally low class (Islam, 2011; Rahman et al., 2002). Due to this, small-scale fisheries remain understated worldwide. Majority of research is limited to the economic aspects of SSF. However, health is an equally important in contributing to the wellbeing of fishers (Allison, Béné, & Andrew, 2011). Specially, mental health, which is a global epidemic increasingly affecting millions of lives. Mental health is a complex vulnerability as it not only causes vulnerabilities but is also created by existing ones (Alvidrez & Barksdale, 2022). Hence, unidimensional approaches to mental health are deficient when it comes to tackling thiscomplex, multilayered issue. In this chapter, perspectives on mental health from fisherfolks in Chilika Lagoon will be analyzed to better understand the intersectionalities influencing mental health. Capturing this view is essential to the holistic well-being and sustainability of small-scale fisheries (Serrat, 2017).

4.1.1 Research Objectives 1 and 2: Overview

Objective 1 of this thesis is to understand the current perception of mental health in Chilika Lagoon fishers and define mental health as a multidimensional vulnerability in SSF.

Objective 2 of this thesis is to uncover the influential drivers that contribute to mental health prevalence.

This chapter explores the findings of objectives 1 and 2 by presenting an overview of vulnerabilities in small-scale fisheries, specifically focusing on its relation to mental health. The qualitative data collected is also analyzed to gain a better understanding of how fishers in Chilika Lagoon understand mental health. This chapter will investigate and showcase in detail the main contributors to poor mental health in small-scale fisheries. The chapter argues that by studying the perceptions of mental health, one can conclude that mental health is a multidimensional

vulnerability in small-scale fisheries, and one that is embedded in the economic, social, political and environmental domains (Nayak and Berkes 2019).

4.2 Assessment of Current Vulnerabilities for Small-scale Fishers

Many fishing communities around the world face several challenges in maintaining their livelihoods, including limited access to resources, poor resource availability, overfishing, degradation of the marine environment, poor governance, climate phenomena, competition with industrial fisheries, globalized markets, and marginalization (Allison et al. 2005; Andrew et al. 2007a; Chuenpagdee 2011b; Schuhbauer and Sumaila 2016; Song et al. 2018; Stoll et al. 2018; Bavinck et al. 2018; Chuenpagdee et al. 2019; Nakyak, 2017). These issues directly affect small-scale fishers' ability to sustain their livelihoods and respond to changing conditions. These vulnerabilities can arise from a combination of social, economic, environmental, and governance factors (Armitage, Béné, Charles, Johnson, Allison, 2012; Nayak and Berkes, 2010, 2019). This was further discussed in Chapter 2: Literature Review Sec. 1. Here are some key aspects of vulnerability in small-scale fisheries:

> Economic Vulnerability: Small-scale fishers often face economic challenges, including limited access to credit, lack of market opportunities, low bargaining power, and inadequate infrastructure. Fluctuating fish prices, competition from larger fishing operations, and reduced catches can further exacerbate their economic vulnerability (Islam, 2011; Nakyak, 2017). For example, overfishing and presence of non-fishers in Chilika results in less available fish for fisher families, and therefore less catch and income.
>
> Social Vulnerability: Small-scale fisheries communities may experience social vulnerability due to factors such as poverty, limited access to education and healthcare, inadequate social support systems, migration, and gender inequalities. They may also face challenges related to cultural erosion, loss of traditional knowledge, and social exclusion (Ranci & Migliavacca, 2010; Nayak, 2017). An example of systems perpetuating social isolation was discovered through the qualitative data. Originally, there was a collective fishing but now it's a watering system. This means that everyone gets designated time to fish. Fishers, especially seniors, are really affected by this as now

there is limited opportunity for fishers to socialize and interact with each other. Many stated it gives them “no reason to leave house”.

Environmental Vulnerability: Small-scale fisheries are vulnerable to various environmental factors, such as overfishing, habitat degradation, pollution, climate change, and natural disasters. These factors can lead to declining fish stocks, reduced biodiversity, loss of livelihoods, and increased risks to fishers' safety and well-being (Cánovas-Molina & García-Frapolli, 2022; Nayak and Berkes, 2019). For example, the increasing number of motorboats and their oil spilling into the lagoon, causes fish death and therefore less fish is available for production chains. As well, small-scale fisheries are particularly susceptible to climate change impacts, such as rising sea levels, ocean acidification, and changes in water temperature and currents. These changes can affect the distribution and abundance of fish species, disrupt fishing seasons, and impact the overall productivity and sustainability of small-scale fisheries operations. Specifically, for Chilika Lagoon, the creation of the sea mouth and its widening brought many environmental challenges for fishers (Iwasaki, Razafindrabe, & Shaw, 2009; Nayak and Berkes, 2019).

Governance Vulnerability: Weak governance and inadequate legal frameworks can contribute to vulnerability in small-scale fisheries, specifically a lack of appropriate capture fisheries policies (Cánovas-Molina & García-Frapolli, 2022). As well, lower educational levels of public policy result in limited participation in decision-making governance processes, lack of secure human rights, and ineffective management measures can undermine the resilience of fishing communities and their ability to adapt to changing conditions (Nayak & Berkes, 2010).

For small-scale fisheries to deliver their full benefits to society, sources of vulnerability must be understood at the individual and community levels (Adger 1999; Andrew et al. 2007; Salas et al. 2019).

4.2.1 Existing Vulnerabilities leading to Mental Health Vulnerability

Small-scale fisheries face varying levels of constant changes. The most common and known vulnerabilities faced by fishers are shown in Table 4.1 below. This list is curated from a

literature review that overviewed and studied 78 cases worldwide to discover the common drivers of vulnerability in SSF (Cánovas-Molina & García-Frapolli, 2022).

Table 4.1: List of Top Vulnerabilities in Small-scale Fisheries Worldwide

TABLE 2 Main drivers of vulnerability in SSF, their description, and their associated dimension of vulnerability

Dimension	Main drivers of vulnerability	Description
E	1. Declining fish catches	Fall in fish catches due to a decrease in fish stocks or spatial restrictions to fish
S	2. Marginalization	Relegation can be geographical (remote areas), political, social, or institutional. Other economic activities are being prioritized over SSF
S	3. High dependence on fisheries	Fishing is the main source of income, nutrition, and employment. High dependence on one target species
E	4. Environment issues	Fluctuation of intensity and duration of dry, rainy seasons and temperature anomalies. El Niño-Southern Oscillation (ENSO) events. Pollution from rivers
E	5. Fishing regulations	Closed fishing seasons and quotas can lead to food shortages and income cut downs in highly dependent fishing households. Regulations can also fail to formally recognize SSF and adequately secure them with access rights to marine resources. Marine protected areas can also restrict fishing activities and rights to fish
E	6. Industrial impacts	Presence of sea oil platforms leading to fishing spatial restrictions/hydraulic infrastructures leading to changes of river flow regime. Mine wastes, dredging, and oil industry pollution. Large-scale infrastructures
S	7. Lack of access to formal credit	Fishers are not recipients of formal credits due to their lack of consistent income
E	8. Conflicts with LSF	Competition for the fishing grounds/species with LSF. LSF fishing pressure may lead to ecosystem destruction/may fish illegally
S	9. Poor services and infrastructure	Poor access to education, health services, electricity, road infrastructure, or transport availability
E	10. Exposure to natural calamities	Cyclones, typhons, and floods are common in the area
E	11. Forced to sell at low prices	Price is determined by middlemen. There is a lack of fish preservation facilities and market access. Market circumstances can fluctuate prices
E	12. Disease and health issues	High prevalence of water-borne diseases/AIDS/decompression illness related to longer diving hours/other diseases
E	13. Increasing costs	Costs have gone up due to fishing intensification/rising fuel gas prices/rising cost of living
E	14. Aquaculture pressure	Aquaculture industry may lead to loss of access to fishing grounds, threats, mangrove deforestation, pollution, or fish bycatch during larvae gathering
S	15. Food insecurity	Poor access to food and income to buy food
E	16. Increase in the number of fishers	Presence of migrant fishers in the area that can be seasonal, permanent, or occasional leading to an increase in fishing pressure
E	17. Supply chain disruption	Mobility restrictions or market closure as a result of COVID-19 pandemic
S	18. Lack of access to cultivable land	No access to land for farming, hindering alternative livelihoods
E	19. Fishing communities' displacement	Fishing communities have been expelled from their homes
N/A	20. Abandonment of the fishing activity	Disappearance or drastically reduction of the SSF activity
E	21. Exposure to wildlife attacks	Hippopotamus/crocodile attacks while fishing

Abbreviations: E, exposure; N/A, not applicable; S, sensitivity.

Source: Adapted from Cánovas-Molina, A., & García-Frapolli, E. (2022: pp495)

The following table showcases the most common responses stated by the fishers during household surveys in Chilika, when asked what factors affect your mental health. The table is divided by social, ecological, and environmental domains. The most common answer is bolded.

Table 4.2: List of Drivers Affecting the Mental Health of Chilika Lagoon Fishers: A Brief Overview of Most Common Responses from Household Questionnaire

Domain	**Main Drivers Influencing Mental Health**	**Participants Response in % (N=50)**
Social	**Strong Relationships with each other** (spending time with friends and family, celebrate festival together, attachment to village people, socializing)	90%
	Political Interests Disturbing Social Cohesion (fishers deprived of rights), Unable to maintain family health or educate children	14%
Economic	**Low Fish Production/ Shortage of Fish** (low income reducing livelihood)	92%
	Low Fish Price/Rate	84%
	No Government Support, Increase in Non-Fishers, No other income source than fishing, Everything is more Expensive, Lack of loans	44%

	available, Forced Migration out of Village to make money	
Environmental	**Natural Disasters and Climate Change** (especially cyclones and floods)	88%
	Increase in Prawn Gheries/ Benami prawn farming and cultivation is declining water quality	76%
	Pollution (air and water quality decreasing due to industrial development, agricultural drainage and tourist use)	52%
	Sea Mouth Creation and Widening	10%

*Note: Open- Ended Questions allowed for Multiple Answers

Comparative analysis of Table 4.1 and Table 4.2 showcases that the data is quite similar in each table. The most common factors listed by fishers for what impacts their emotions/feelings (i.e., mental health), are majoritively the same as those listed under common, known vulnerabilities faced by small-scale fisheries. Hence, by this relation, it can be determined that existing vulnerabilities lead to or cause mental health vulnerabilities in fisherfolk. The comparative analysis is showcased below, with the similarities between both tables highlighted in matching colours.

Table 4.3: Comparative Analysis of Table 4.1 and 4.2: Using Colour Coordination to Showcase the Similar/Same Factors Mentioned in Both

Table 4.1 Factors: Vulnerabilities in SSF	**Table 4.2 Factors: Causes Affecting Mental Health of Fishers**	**% SIMILAR**
Declining fish catches	Existence of Strong Social Relationships with each other	From Table 4.1: 18/21 factors **(86%)** were also mentioned in Table 4.2 either directly or with very close similarity. Likewise… From Table 4.2: 14/16 factors **(87%)** were mentioned in Table 4.1 either directly or with very close similarity. Hence, it can be said that these two tables are **highly comparable (with a matching level of 86.5%).**
Social and Economic Marginalization	Political Interests Disturbing Social Cohesion	
High dependence on fisheries	Unable to maintain family health and educate children	
Environment issues	Forced Migration out of Village to make money	
Fishing regulations	Low Fish Production/ Shortage of Fish	
Industrial impacts	Low income Reducing Livelihood	
Lack of access to formal credit	Low Fish Price/Rate	
Conflicts with LSF	Everything is more Expensive	
Poor services and infrastructure	No Government Support	
Exposure to natural calamities	Increase in Fishers/Non-Fishers	

Forced to sell at low prices	No other income source than fishing	
Disease and health issues	Lack of loans available	
Increasing costs	Natural Disasters and Climate Change	
Aquaculture pressure	Increase in Prawn Gheries/ Benami prawn farming and cultivation	
Food insecurity	Air and Water Pollution	
Increase in the number of fishers	Sea Mouth Creation and Widening	
Supply chain disruption		
Lack of access to cultivable land		
Fishing communities' displacement		
Abandonment of the fishing activity		
Exposure to wildlife attacks		

Research showcases that the existing vulnerabilities in SSF that were outlined through literature in Table 4.1, are also contributing factors to **poor mental health of fishers.** These vulnerabilities include low fish production, increase in adverse climate change events affecting the lagoon characteristics, marginalization, industrial impacts, etc. Table 4.3 displays the similarities and differences between the factors across Table 4.1 and 4.2. The tables had an 86.5% similarity rate, with only 3 factors in Table 4.1 and 2 factors in Table 4.2 not overlapping

with each other. Key vulnerabilities such as declining fish catches/production, marginalization, lack of government support, poor social infrastructures for health and education, were all discussed in both tables. Another main similarity between tables 4.1 and 4.2 was the emphasis on environmental changes causing vulnerabilities. Many of the factors such as pollution, sea mouth creation, natural disasters, environment issues, industrial impacts similarly indicated the effect of climate change increasing fishers' vulnerabilities, by negatively impacting their ability to engage in fishing activities and produce high fish catches. A difference between the tables was how Table 4.2 discussed poor social cohesion and lack of time spent with loved ones as vulnerabilities, while Table 4.1 mentioned no such thing. This was interesting as literature does indicate close ties between levels of social supports and mental health or livelihood outcomes (Stokols, 1992). This was reflected in the qualitative data collection (Table 4.2) but not in Table 4.1 received from a literature review. This highlights the importance of learning from fishers' first-hand perspectives and including their voices in small-scale fisheries research to uncover valuable data (Smith & Basurto, 2019).

When asked about the biggest contributor to mental health, 100% of respondents indicated it was a low fish catch, leading to low income. This is their priority of focus as it is what sustains their livelihood and families. This decline in fish catch was also the #1 vulnerability in SSF, as listed in Table 4.1 and 4.2. This is a result of environmental vulnerability such as climate change and loss of biodiversity that causes financial vulnerability and instability (Armitage et al. 2012). Another example is how the migration of fishers results from this lack of financial stability, which in turn causes more vulnerability for the women left in Chilika Lagoon (Appiah et al., 2021). This showcases that the vulnerabilities in Chilika Lagoon are all inter-connected, with one influencing the other, and mental health is no exception. The comparative analysis from Table 4.3 indicated that mental health illness and its vulnerability is an unfortunate consequence of other existing vulnerabilities. The current vulnerable system of Chilika Lagoon has made small-scale fishers more susceptible to poor mental health conditions (Andrew, Béné, Hall, Allison, Heck & Ratner, 2007). Figure 4.1 below showcases this pathway to poor mental health outcomes as a result of existing economic vulnerabilities in SSF. Fishers are most vulnerable due to changes in the environmental surroundings they depend on for their livelihood (Appiah et al., 2021).

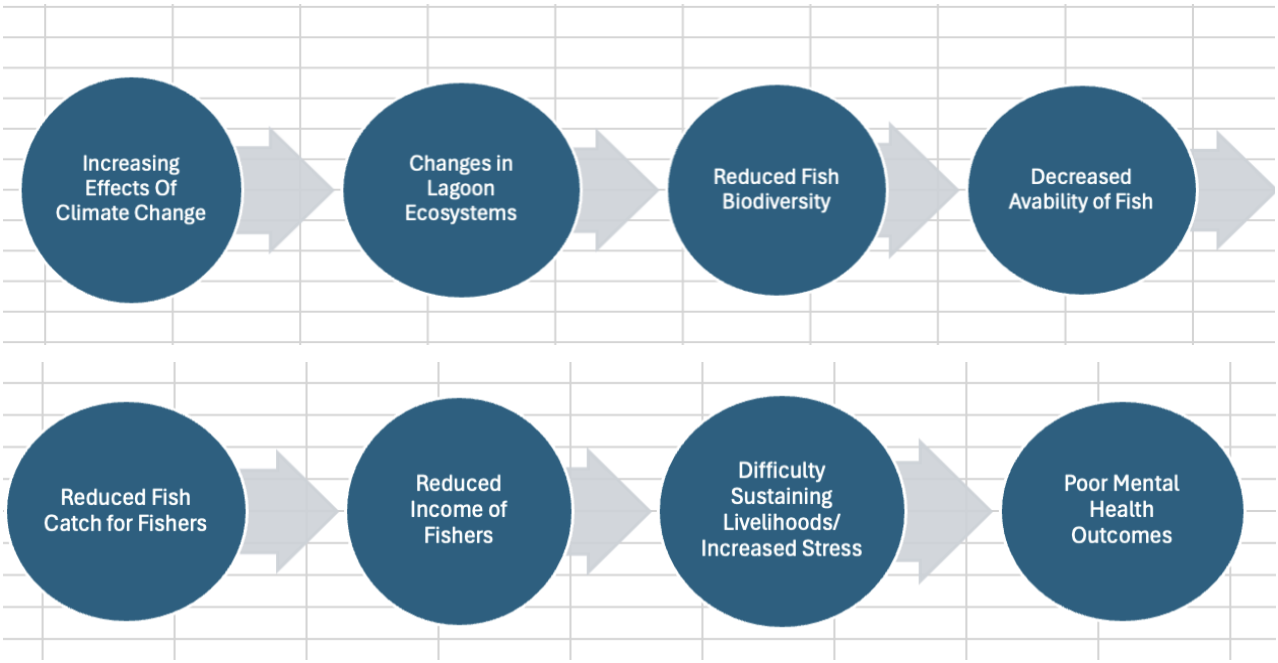

Figure 4.1 Pathway to Poor Mental Health Outcomes in Small-Scale Fisheries

4.2.2 Chilika Lagoon Fishers Response to Additional Known Contributors of Poor Mental Health

The household questionnaire also specifically asked fishers about their experiences with additional contributors of mental health, which literature has indicated may result in poor mental health outcomes. These may not fall within the social, economic, and environmental domains, but they are important to evaluate when understanding what affects the mental health of fishers. This also sheds light on the surroundings that encompass fishers' livelihood and contextual circumstances. The figures below showcase their responses to known contributors and drivers of mental health status.

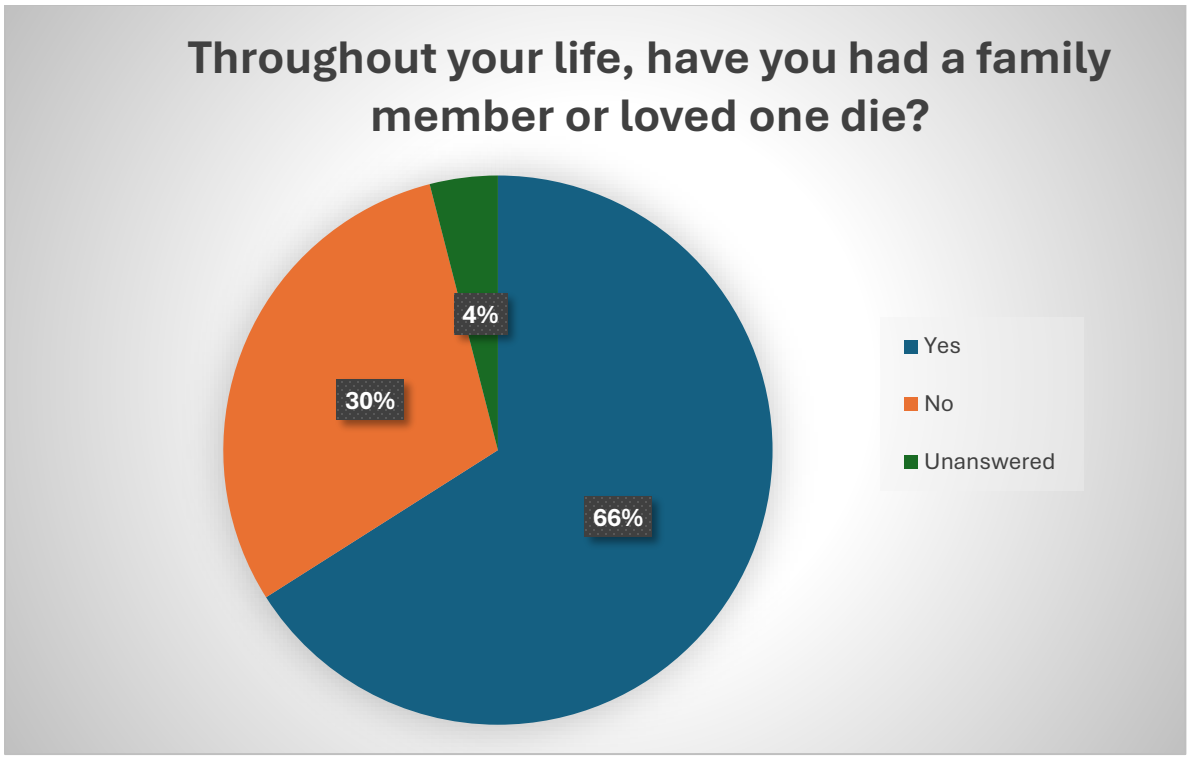

Figure 4.2 Fishers response to Death of Family Members or Loved One

Majority of fishers have had a family member or someone they love die. The loss of a loved one is a huge contributor to poor mental health in individuals. Hence, it is important to keep this in mind when discovering how fishers perceive mental health; and also necessary to understand how this aspect affects fishers' livelihoods (Connell, O'Cathain, Brazier, 2014).

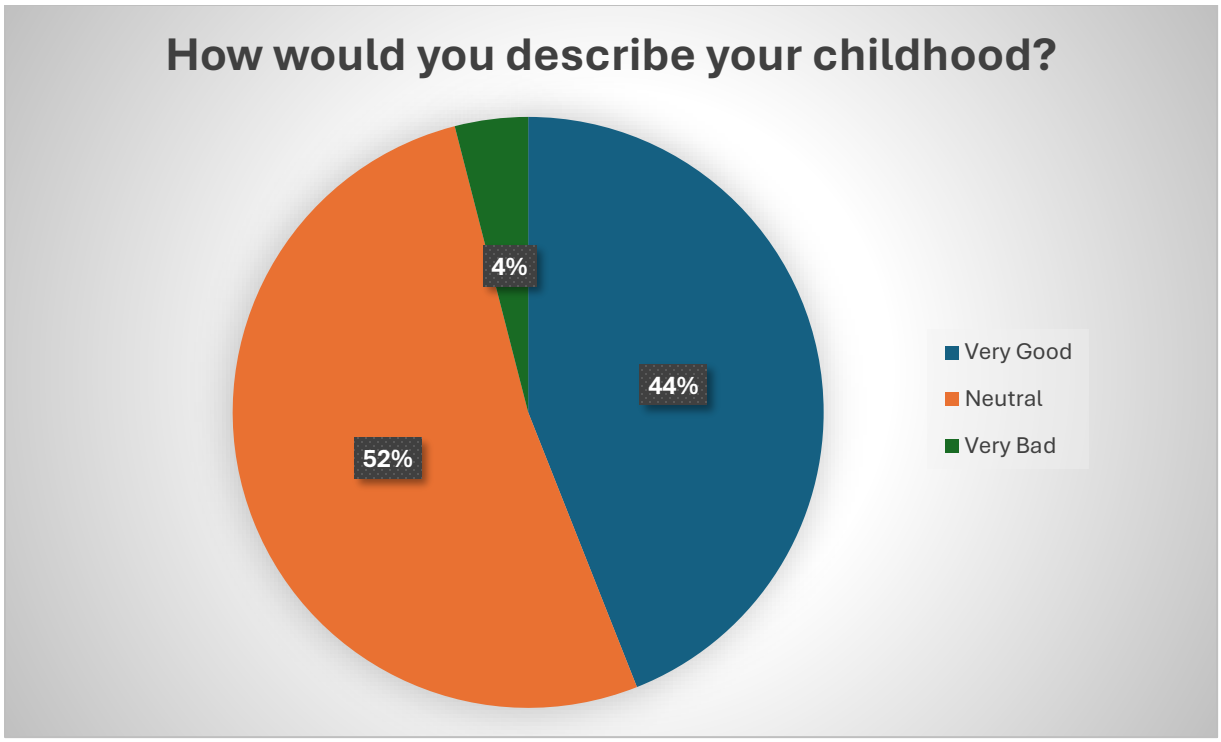

Figure 4.3 Fishers Descriptions on Quality of Childhood

It is important to note that when fishers were asked to elaborate on their answer to this question, it was almost always tied to income levels. For example, the 2 individuals who stated their childhood was ‘very bad’, followed up by saying that “it was because my childhood was filled with financial crises”. Likewise, fishers who reported ‘very good’ childhoods stated things like “No financial problem at all”, “family managed by parents properly” “no loan to pay”, etc. Many participants repeatedly brought in an environmental connection by stating “fish production was high, so income was high, so family was managed properly.” Participant 1 stated, “fish production high so life is easy”. This further correlates to the idea of how the quality of life for fishers depends on levels of fish production. It is critical to discover the reasoning behind the responses of the fishers, to uncover deeper levels of understanding of mental health in the context of small-scale fisheries.

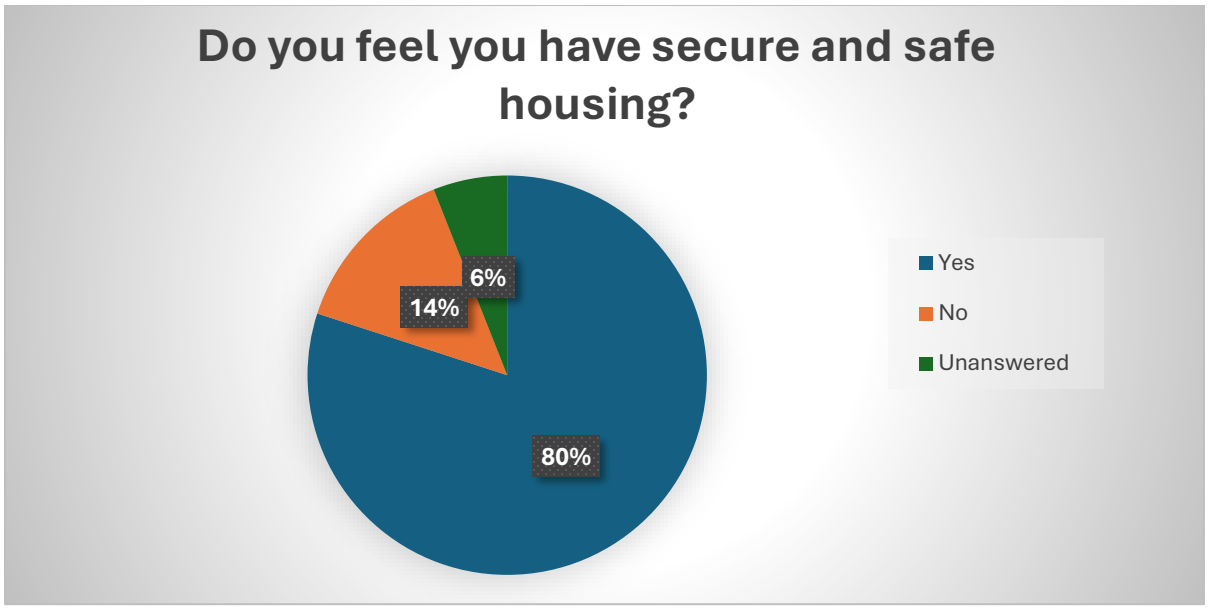

Figure 4.4 Level of safe and secure housing for fishers

80% of fishers stated they have secure and safe housing. When asked why, their answer was simply "because I have a concrete roof." It is interesting to recognize how fishers' definition of "safe and secure housing" revolves around simple physical aspects of just having a roof over their head. They are in survival mode, focusing on their bare necessities (Iwasaki, 2016). The participants who indicated "No" stated it was because "asbestos roof" or "cyclone destroy things", showcasing another prominent negative impact of climate change.

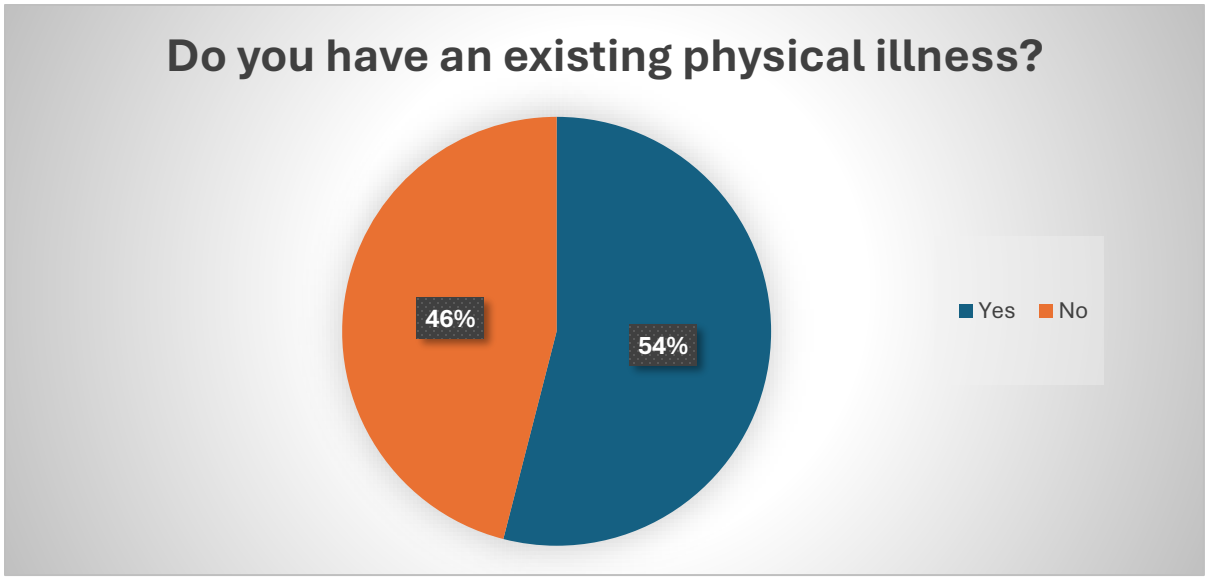

Figure 4.5 Fishers response to existing physical illnesses

More participants were suffering from an existing physical illness than not. When asked to describe it, fishers mentioned back pain, blood pressure, joint pain, and diabetes. Pre-existing physical illnesses such as these that are chronic, and untreatable are a huge driver of poor mental health outcomes (Saxena, Thornicroft, Knapp, Whiteford, 2007).

4.2.3 Mental Health as a key driver for Increasing Existing Vulnerability of Fishers

Section 4.2.1 explained how existing vulnerabilities led to Mental Health Vulnerability (MHV). However, this relation is cyclical (Serrat, 2017). Mental health also leads to the existing vulnerabilities that small-scale fishers face. 34% of fishers stated 'No motivation of Work' or 'No work done properly' when asked their definition of mental illness (See Figure 4.8). This was the most common answer from the respondents. This is an example of how mental health contributes to low fish catch, and subsequent financial vulnerabilities – which is the #1 existing vulnerability fishers encounter (Cánovas-Molina & García-Frapolli, 2022). These two narratives are both simultaneously true and are explained by the similarity of their impacts. For example, financial difficulties are the most prevalent contributor to poor mental health outcomes. One of the consequences of poor mental health is the reduced ability to participate in fishing activities. Subsequently, catching fewer fish results in financial difficulties, which is what originally caused poor mental health outcomes. This describes the cyclical nature of mental health and existing vulnerabilities in small-scale fisheries. Both are strongly interconnected, with one causing the other and vice versa. Further investigation and analysis on the negative impacts of poor mental health increasing vulnerability of fishers is discussed in Chapter 5.

4.3 Understanding Mental Health: Perspectives of Chilika Lagoon Fishers

In order to effectively respond to the mental health needs of Chilika Lagoon fishers, their perceptions and perspectives on mental health need to be understood. This analysis of their perceptions and perspectives allows for the response to be built within a system that uniquely caters to fishers and their livelihood (Haddadi & Besharat, 2010). Understanding their perspectives on mental health allows the researcher to immerse themselves in the outlooks of the participants and gain a better understanding of their needs as well as best practices for how a community of people receives or responds to aid. It increases cultural competency and therefore effective implementation and uptake of designed responses and resources (Lajoie, Poleksic, Bracken-Roche, MacDonald, & Racine, 2020). Mental health is a complex, multifaceted topic

that is difficult to define, due to the personal and individualistic nature of its impact (Haddadi & Besharat, 2010). However, the sections below aim to grasp and overview the current perceptions that Chilika lagoon fishers hold for mental health.

4.3.1 Overview of Demographics

The first section of the household questionnaire was created to gain a sense of the demographic of the population from which data is being collected. This was done to gain a better understanding of fisher's livelihood and situate it in the socioeconomic context. Below is a table showcasing this demographic analysis, including information such as gender, age, educational level and more. The most common group in each demographic area is bolded and italicized.

Table 4.4: Demographics Analysis of Household Questionnaire Respondents (Chilika Lagoon Fisherfolk)

Demographic Focus		**Respondents % (N=50)**
Age (years)	20-30	6
	31-40	***42***
	41-50	20
	51-60	22
	60-65	10
Gender	Male	42
	Female	***58***
Fisher Caste	***Khatia***	***92***
	Mahajan	6
	Kaibartta	2
Length of Residency in Chilika Lagoon	"Very Long Time"	44
	"200/300/400 years"	***56***

Highest Level of Education	***Completed 0-5th Grade***	***36***
	Completed 6th-8th Grade	34
	Completed 9-10th Grade	28
	BA	2
Religious Beliefs	***Very Religious***	***100***
Relationship Status	Single	2
	Married/ Common Law	***92***
	Divorced/ Widow	6
Number of Children	0	2
	1-2	***68***
	3-4	30
Primary Occupation	No Occupation	2
	Fishing Related (Fishing or Tourist Boating)	***94***
	Salaried Government Job	4
Annual Income (Indian Rupee)	***30 000 – 40 000***	***54***
	41 000 – 50 000	38
	51 000 – 60 000	4
	61 000 – 70 000	0
	71 000 +	4

4.3.2 Fishers' Connection to Chilika Lagoon

Chilika Lagoon is not only a home to an abundance of aquatic species, but it is also home to hundreds of thousands of small-scale fishers (Chilika Development Authority). The household questionnaire revealed that there is an emotional attachment that fishers have to the land and Chilika Lagoon. The main contributing factor to this is that it is their home, and they have lived their "whole life" there. Out of 50 participants, 100% of them indicated that they have lived in Chilika "a very long time" or for "200/300/400 years", as shown in Table 4.4. None of them travelled or moved out of this area, and so they have spent their whole life, and in their perception 'forever', with Chilika. The respondents, who are indicative of the larger population, have no exposure to anything but this fishing village environment, and thus Chilika Lagoon is all these fishers know to be true. These emotional attachments fishers have due to their long-standing habitancy in Chilika is important to note as it is a leading factor to the next analysis piece – the happiness of fisherfolk (Weeratunge, et al., 2014).

When asked if fishers were happy living in Chilika, 96% responded with yes. The most common explanation as to why was "we have no other option for resettlement", with over 50% of those who stated 'Yes' indicating something related to this reasoning. Other common responses were "Chilika is the one place that gives us food and shelter" and "Chilika support our livelihoods". Respondent 8 even stated "Chilika is our Mother, she provide for us". These explanations given why asked "Why you are happy living in Chilika Lagoon?" are interesting to document, as they dictate the emotional attachment and level of gratitude that fishers have with the land. On the flip side, this can be interpreted as how many fishers feel this is the only option for livelihoods that exists for them, so they choose to be happy. Whether this is out of this hopelessness, or because of the emotional connection fishers have to Chilika as their home, is uncertain. However, there is clarity in the fact that happiness of fishers is closely connected to Chilika Lagoon. This is explained by place attachment theory, which refers to the positive emotional link or relationship between people and their living environment (Liu et al., 2022). It is a bond between people and places. Research has explored this symbolic meaning of place attachment and established a connection on its ability to influence positive health outcomes (Liu et al., 2022).

Hence, by understanding this, it is revealed that improving the Chilika Lagoon environment and the laws that govern it, will expand the happiness of fishers, which will result in better mental health outcomes. Despite the vulnerabilities fishers face on their livelihoods, many expressed substantial appreciation to Chilika Lagoon. For example, Respondent 16 stated "all fisherman households and community depend on Chilika", and this was a common theme in the reasoning for their happiness. This aspect also relates back to how Chilika fulfills a financial need for the fishers (Nayak, 2014). Another reason for the emotional attachment and happiness of fishers was "Chilika provide education to children" and "our friends and relatives are also here" (Respondent 36). As shown in Table 4.2, strong relationships with each other (family/community) are a main social factor that impacts the mental health of the fishers. Thus, this connection present for fishers is important in understanding how they perceive mental health.

Analysis of this showcases that Chilika as a geographic location is in fact a vital aspect of fishers' lives, not just as a means for livelihood but emotionally as well (Liu et al., 2022). This affecting tie with Chilika that the majority of fishers expressed shapes fishers' understanding of mental health. Their understanding is not only impacted by it but also constructed around this emotional truth in their life. As further exploration is done to understand how fishers view mental health, it is necessary to realize this emotional connection that fishers have to their environment – despite any hardships or troubles it may give them (Haddadi & Besharat, 2010).

4.3.3 Connection between Mental Health and Fishing Capacity

Fishing is the main source of livelihood and income for folks in Chilika Lagoon (Weeratunge, et al., 2014). As discussed in section 4.2.1, **100%** of fishers stated their biggest contributor to poor mental health is low fish catch/low income. It is analyzed that fishers indicated a strong correlation of understanding mental health through their ability to fish and its outcomes. Therefore, logically, it is concluded that fishers understand the concept of mental health through a financial lens. For them, the two seemed to be one and the same, consistently correlating and contributing to one another. If fishers were making money and feeling financially comfortable, it meant mental health was strong. However, if the opposite existed and fishers faced financial difficulty, then mental health was poor. The connection between the financial aspect and mental health is strong, and this can be explained with poverty-driven mental health

literature (Woodhead, Abernethy, Szaboova, & Turner, 2018; Trani & Bakhshi, 2017; Islam, 2011), as well as the household questionnaire results. 96% of respondents stated that fishing does not pay for their living expenses and so they do not feel financially secure. Refer to Figure 4.6 below.

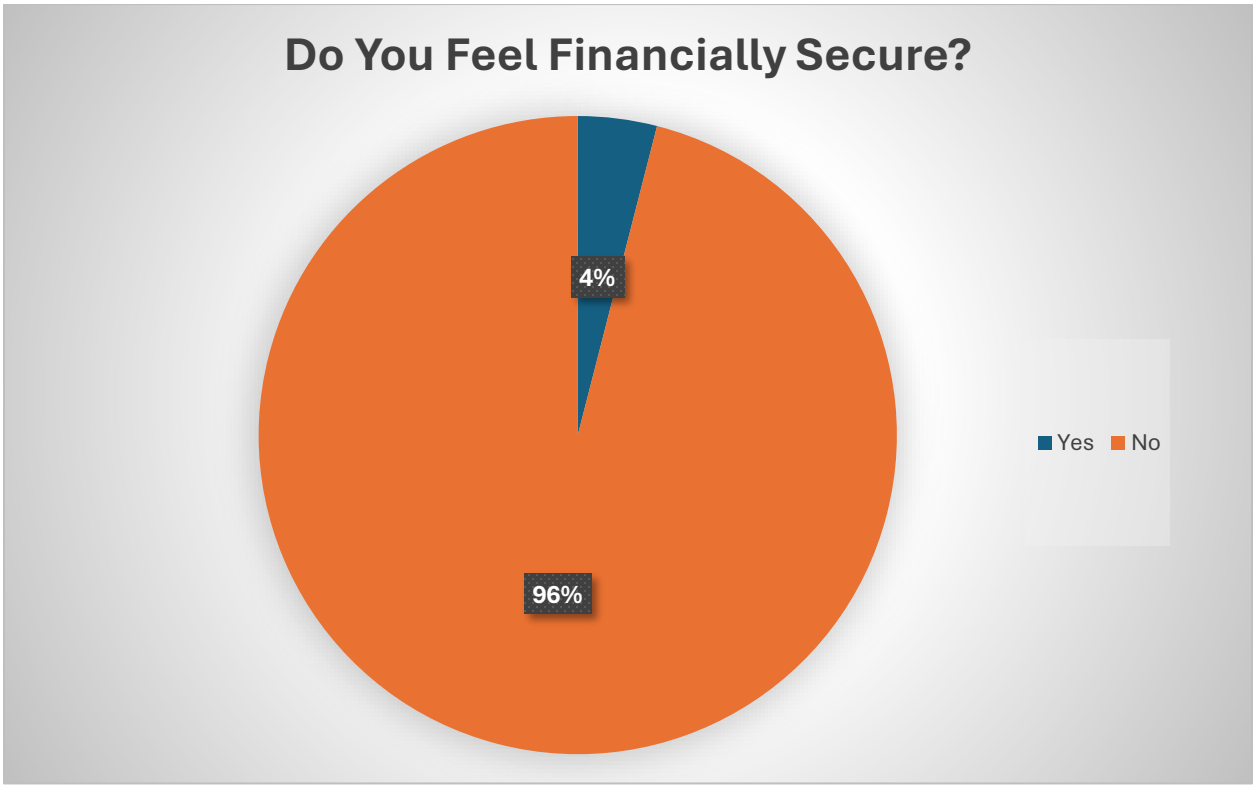

Figure 4.6: Fishers Response on Financial Security

From the 48 respondents, who said no, they do not feel financially secure, the most common responses as to why were "income doesn't cover expenses" / "lots of money issues" (74%), "lots of private loans to pay" (70%), "can't maintain family health or educate children" (14%), and "job/livelihood stopped during Covid so more issue" (10%). However, the most common response which 80% of fishers stated was that "fish production low so no feel secure". Respondent 44 stated "All family depends on fishing". Living in SSF, fishers understand the means needed for their livelihood to succeed. This idea is further exaggerated for fishers as their income, aka fishing capacity, depends on climate change and other environmental factors that are out of their control (Iwasaki, Razafindrabe, & Shaw, 2009). Over 10 fishers mentioned this lack of control on the volatility of the environment and its impacts in their additional reasoning for financial insecurity. Climate change increases their financial insecurity as the environment they

rely on is volatile and can change at any time, with little notice. Raising global temperatures and climate change lead to greater negative environmental impacts, which also contribute to increasing the financial insecurity of fishers. This leads to further vulnerability of SSF (Iwasaki, Razafindrabe, & Shaw, 2009).

At a global level, many countries that have poor environmental policies and a history of ecological degradation harbour large populations affected by poverty, hunger, lack of minimum income, and acute shortage of life's basic necessities (Szabo, 2020). Poverty is undeniably linked to mental health problems, and individuals in poverty-stricken communities are significantly more susceptible to mental health challenges. Poverty can create an environment of chronic stress, limited access to resources and opportunities, inability to access basic health or livelihood services, inability to take care of family members, adverse childhood experiences, and stigma and social exclusion, all of which contribute to poor mental well-being (Allison, Béné, & Andrew, 2011; Islam, 2011; Olsson, Opondo, Tschakert, Agrawal, & Eriksen, 2014). Literature on poverty-driven health impacts also confirms this close association of mental health and financial level. This was further discussed in Section 2.3 of the literature review.

4.3.2 mentioned how fishers are happy with Chilika because it provides for them and their livelihood – thereby showcasing another example of the connection between mental health and financial dependence that fishers have. This continues to show that fishers view mental health through a financial lens. Moreover, when analyzed closely, it can be seen that the majority of the factors listed in Tables 4.1 and 4.2 all correlate to the outcome being a negative impact on income levels. This further emphasizes the close connection that financial capability has on small-scale fisher's livelihoods and mental state (Islam, 2011)**.** Overall, recognizing the relationship between poverty, mental health, and small-scale fisheries is crucial for developing effective interventions and support systems to improve the well-being of fishers and their communities (Trani & Bakhshi, 2017).

4.3.4 An Overall lack of Knowledge about mental health in Chilika Lagoon Fishers

Due to the lower mental health education, knowledge and awareness levels of fishers, the fishing community in Chilika Lagoon has little to no support to face and cope with complex issues such as mental health (Buck & Deutsch, 2014). This lower educational level is showcased in the demographics section as 98% of participants had less than 10^{th} grade education. However,

it is noted that fishers hold high level of knowledge on all concepts related to small-scale fisheries, despite level of education. This comes through continuous learnings from their lived experiences of actively participating in fishing societies. The low understanding of the concept of mental health comes from a lack of discussions and opportunities to comprehend about it in or out of educational systems. This lower mental health education, knowledge and awareness levels of fishers were understood from the analysis of the household questionnaires. The respondents were asked to indicate their level of knowledge on the topic of mental health. Refer to Figure 4.6 below.

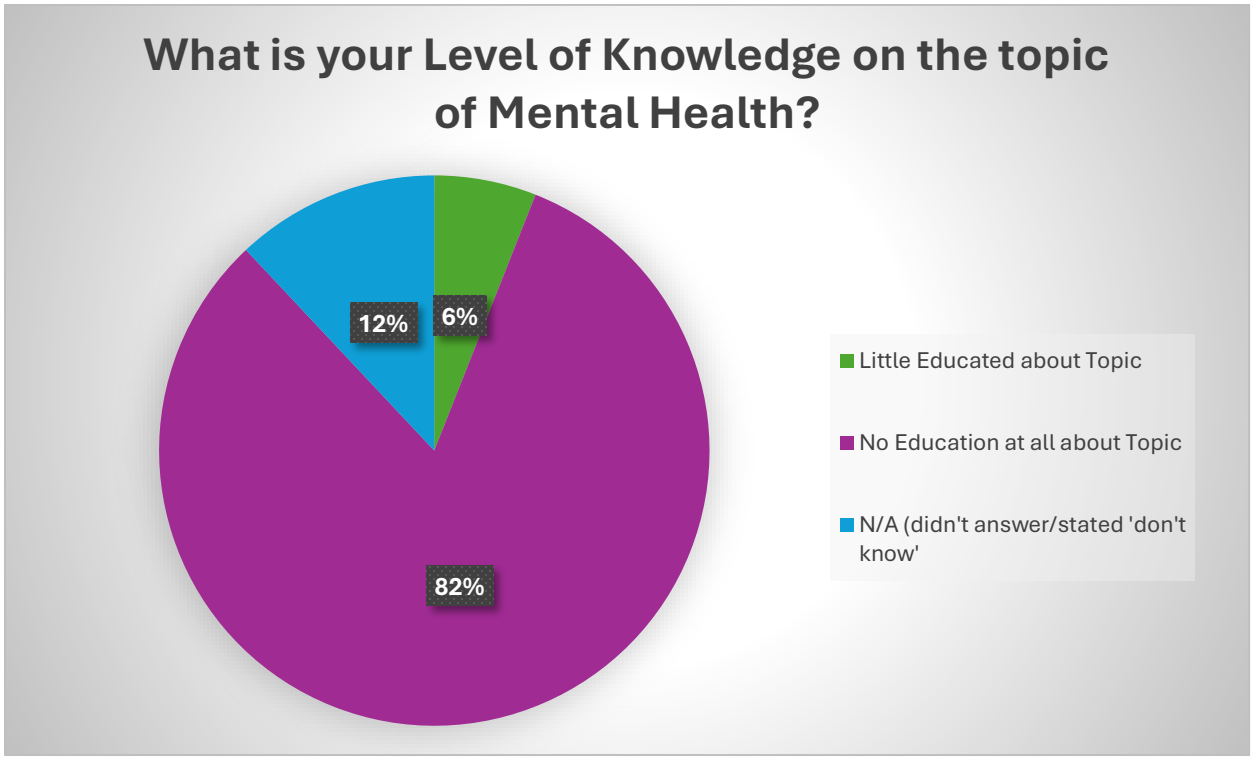

Figure 4.7: Mental Health Knowledge Levels in Chilika Lagoon Fishers

This low awareness of mental health can be explained by the fact that the basic needs of fishers are not met so they cannot focus on higher-level needs such as mental wellbeing (Watson, 2014). Referring to Maslow's Hierarchy of Needs (Figure 2.2 in the Literature Review), the physiological needs of the fishers such as food, shelter, water, etc. are not met and thus they cannot input time or energy into needs that fall in the higher hierarchy of safety needs such as mental health (McLeod, 2007). In fact, mental health most likely doesn't fit in that level for fishers as before they can focus on mental health, they focus on their physical health. This

Hierarchy of Needs built in psychology can be used to understand this phenomenon (Hopper, 2020). The lack of time spent on thinking about mental health provides an explanation for the lack of knowledge about mental health in Chilika lagoon fishers (Buck & Deutsch, 2014). It also explains why a common answer received from fishers throughout the household questionnaires, especially in the more technical questions (see Question Sections 2-4 in Appendix A), was 'Don't know', 'No idea', 'Can't Say', etc. It is important to note that the perception of mental health that fishers have on mental health is heavily influenced by this concept as well (Buck & Deutsch, 2014). The data indicates that understanding of mental health is low in the Chilika lagoon fishers. Figure 4.8 below shows that when asked to define mental health, 32% of fishers responded with "No Idea/ Don't know". This results from a two-prong system: a) a lack of education on this complex problem leading to a lack of knowledge about it and b) a systemic societal issue that influences ignorance on the topic and prevents open discussion on mental health (Woodhead, Abernethy, Szaboova, & Turner, 2018). Due to mental health being considered differently than physical health, it is a taboo topic in many developing countries like India, and within SSF. This collective societal shame associated with mental health prevents conversations on mental health, which further prevents fishers from having the ability or capacity to understand it (Ventura, 2017). It also contributes to fishers wrongfully understanding mental health with an extremely negative and shameful connotation. This contributes to the cycle of society being less accepting of mental health discussions and its taboo existence within the fisher population (King, Turner, Versace, Abernethy, Kilpatrick, Brumby, 2021)

Furthermore, because fishers are unknowledgeable about 'mental health' as a topic and therefore its terminology, they understand mental health through things they do understand. This means seeing mental health through the lens of action items that occupy and constitute their livelihood (Szabo, 2020). Their perceptions of mental health are also simple in the sense that it is seen majoritively as having "no motivation of work", being "sad all the time" or being "silent/social isolated". Figure 4.8 below further describes respondents' answers when asked to define mental illness. This showcases they do not understand the depths of mental illnesses beyond the feelings of their symptoms, for example, illnesses such as schizophrenia, split personality disorder, bipolar, etc. are foreign concepts for many. However, it is vital to note that the definitions of mental health/illness that fishers provided is similar to the common, identified symptoms of many mental disorders. For example, long periods of sadness are a common result

of depression. The complexity of mental health as being more than just ‘feeling sad’ is not understood by Chilika Lagoon fishers, but they can understand how feeling sad reduces their ability to sustain their livelihoods. This further solidifies why financial stability is the lens which fishers understand mental health through, and not a scientific lens (Béné, 2003). It is important to note this surface-level understanding of mental health that fishers have and how this lack of knowledge currently present needs to be improved, such that mental health can be better understood (Weeratunge, et al., 2014). Noting the background contributing to their current perceptions of mental health will also aid in creating effective responses that primarily target the basic needs of fishers (Berkes & Ross, 2013).

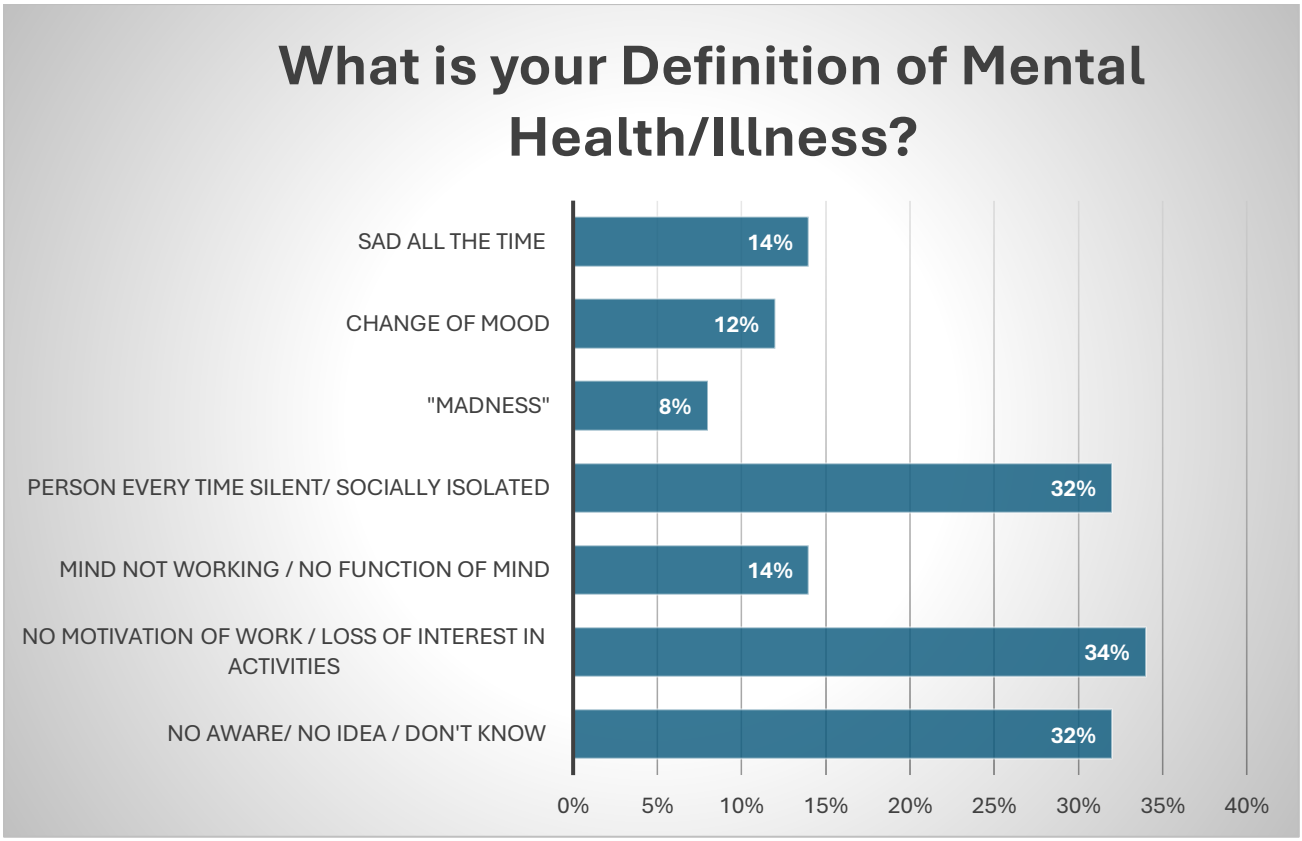

Figure 4.8: Chilika Lagoon Fishers’ definition of Mental Health

4.4 Mental Health as a Multidimensional Vulnerability in Small-Scale Fisheries

Mental Health Vulnerability is a multidimensional concept, reaching far beyond the boundaries of just a health vulnerability. Adger (2006) conceptualized the term vulnerability by establishing linkages between vulnerability, adaptive capacity, and resilience in natural and social systems. Exposure and vulnerability are highly dynamic phenomena influenced by social, economic, environmental, and political or governance factors. The degree of vulnerability is directly impacted by socioeconomic inequality, poverty, population growth, lack of awareness and infrastructure, and weak institutions (Adger, 2006). Mental health is also an affecting factor to the Sustainable Livelihood Framework, a multidisciplinary approach to sustainability, as discussed in the literature review. Mental health contributes to and influences the different capital assets in the SLF (Serrat, 2017). This influence on different domains such as economic, environmental, social, and governance is described below. It further enforces the multidimensional aspect of mental health.

Mental health is a complex vulnerability which is situated in and affected by multiple intersecting dimensions of livelihood, not just the health sector. Hence, it is a vulnerability that can only be understood with a multidimensional lens, as it impacts all domains of sustainable livelihood (United Nations, 2018). The following sections summarize secondary literature as well as primary data collection to overview this intersecting aspect. The list below outlines how mental health is closely connected with social, economic, and environmental vulnerabilities. It outlines examples specific to the Chilika Lagoon context and those identified from the questionnaire administered to fisherfolk. In addition to this, and in interest to increase applicability of this research, this section describes aspects that are more general drivers, and can be relevant to fisherfolk globally. Small-Scale Fishers worldwide face similar social, economic, and environmental vulnerabilities, and thus this multidimensional nature of mental health can exist far beyond Chilika Lagoon. Subsequently, the following list is aimed to be comprehensive in nature with knowledge from qualitative data collection as well as secondary literature reviews.

4.4.1 Economic Domain

Mental health and economic vulnerabilities are closely intertwined, with economic factors playing a significant role in shaping individuals' mental well-being, and vice versa (Frasquilho, et al., 2015). Research in Chilika Lagoon indicated that the fisher's livelihood strongly depends on their income levels and financial securities. Poor mental health affects their ability to work and income levels. Fishers described this by quoting "when I sad, I have no motivation to work and so I cannot pay for my family" (Participant 8). Here are some key aspects of the correlation between mental health and economic vulnerabilities:

a) **Financial Stress:** Economic vulnerabilities, such as unemployment, low income, or financial instability, can lead to chronic stress and anxiety. Financial stressors, such as struggling to meet basic needs, can significantly impact mental health. Financial worries, which are quite common in SSF (Allison, Béné, & Andrew, 2011) may contribute to the development or exacerbation of conditions like anxiety disorders and depression. (Frasquilho, et al., 2015).

b) **Cycle of Poverty and Mental Health:** Poverty and mental health often create a cyclical relationship. Mental health problems can hinder individuals' ability to maintain employment, pursue education, or access support systems, leading to a higher risk of persistent poverty (Fisheries, 2015). Conversely, living in poverty can exacerbate mental health issues, making it challenging to break free from the cycle (Allison & Horemans, 2005). Many fishers mentioned that when they were 'sad' they couldn't go out fishing or do their job, which resulted in more dire financial consequences. Poor mental health affected their motivation and interest levels which in turn caused low income. Hence, these are intersecting vulnerabilities (Allison & Horemans, 2005).

c) **Inequality and Social Determinants:** Economic disparities and inequalities can create social determinants of mental health. Factors like limited access to education, healthcare, housing, and social support systems are associated with higher rates of mental health problems. Individuals facing economic vulnerabilities may experience a lack of opportunities and resources that promote mental well-being (Frasquilho, et al., 2015). Economic vulnerabilities impede access to physical healthcare services and mental health support. Limited financial resources, lack of health insurance, lack of public health care services, and inability to pay healthcare costs can prevent individuals from seeking

necessary mental health treatment (Aday, 1994). This lack of access may exacerbate mental health conditions. Furthermore, the inability to treat physical illnesses also contributes to deteriorating mental health (Frasquilho, et al., 2015).

d) **Employment Insecurity:** Unemployment or precarious employment, characterized by job instability and low wages can negatively impact mental health. The uncertainty and stress associated with job insecurity can contribute to anxiety, depression, and decreased self-esteem (Alvidrez & Barksdale, 2022). Job loss or underemployment can also lead to feelings of hopelessness and distress. This is especially common for small-scale fishers as their livelihood and employment depends on an uncertain environment and is embedded in highly vulnerable systems (Islam, 2011).

e) **Debt and Financial Burden***:* Accumulating debt and financial burdens can have detrimental effects on mental health. Struggling with debt repayment, living in financial hardship, or facing bankruptcy can create persistent stress, shame, and feelings of failure, leading to anxiety, depression, and other mental health challenges (Satumanatpan & Pollnac, 2017). Furthermore, fishers struggle to get bank loans to help pay for livelihood needs during non-fishing seasons, which is 8 months of the year. Hence, they are usually forced to get private loans which come at high interest rates, further increasing financial burden. On average, a small-scale fisher has 5-6 private loans (Islam, 2011). Fishers get loans from private financial institutions when the fish catch is low to sustain their livelihood, but with no alternate option than participating in fishing activities that yield minimal income – they are stuck in a continuous, vicious cycle of paying off loans and economic hardships (Satumanatpan & Pollnac, 2017)

Economic vulnerabilities and mental health create a cycle, with one reinforcing the other. Recognizing the impact of economic factors on mental health is crucial for developing effective policies, interventions, and support systems that can improve overall mental well-being and reduce disparities (Trani & Bakhshi, 2017).

4.4.2 Social Domain

Mental health and social vulnerabilities are interconnected, with social factors consistently influencing mental well-being (Didoné, et al., 2022). Through research in Chilika Lagoon, social vulnerability was understood through the level of social connection fishers had with their families and communities. Many participants described social vulnerabilities that impact their mental health as “good relation with each other”, “celebrate festivals with friends and relatives”, “attachment with village people”, “time with family”. This aligns with the literature as social support has a large contribution to coping strategies and driving resilience in individuals (Greenglass, 1993). Here are some key aspects of the correlation between mental health and social vulnerabilities:

a) **Social Support Networks:** Social vulnerabilities, such as social isolation, lack of social support, and weak social connections, can contribute to poor mental health outcomes. Having a strong support network of family, friends, and community members is crucial for maintaining mental well-being (Turner & Brown, 2010). This was supported by the household data as the majority of fishers stated that relationships with their community is the social factor that affected their mental health the most. Positive and healthy interpersonal relationships and interactions are vital for mental well-being. Social vulnerabilities can strain relationships, leading to conflicts, social stress, and a lack of emotional support. Troubled or abusive relationships can have severe consequences on mental health (Turner & Brown, 2010). Due to the vulnerable system fishers reside in, their social systems are at constant risk. Forced migration of fishers out of the village due to low income is a commonality in SSF. Furthermore, due to the nature of fishing occupations (with the season only peaking for about 4 months of the year), many fishers migrate elsewhere for the other 8 months of the year. Migration affects the social support of the families they leave behind (Cánovas-Molina & García-Frapolli, 2022). Lacking these support systems increases their risk of mental health problems (Woodhead, Abernethy, Szaboova, & Turner, 2018).

b) **Discrimination and Stigma:** Experiencing discrimination, stigma, or prejudice based on factors like caste, gender, disability, or existing mental health conditions can significantly impact mental health (Ventura, 2017) Social vulnerabilities associated with discrimination and stigma can lead to increased stress, low self-esteem, social exclusion,

and the development or exacerbation of mental health disorders. Casteism is a prevalent and continuing problem in India (Ventura, 2017).

c) **Trauma and Adverse Experiences:** Social vulnerabilities, such as exposure to violence, neglect, or other adverse experiences, can have profound effects on the developing brains of children and on their future mental health (Ranci & Migliavacca, 2010). Traumatic events and adverse childhood experiences (ACEs) can in fisher children due to financial conditions, lack of education, child labour, or unfortunate helplessness of parents to work long hours to provide can lead to conditions like post-traumatic stress disorder (PTSD), depression, anxiety disorders, and other mental health challenges (Ranci & Migliavacca, 2010).

d) **Marginalization and Exclusion:** Social vulnerabilities can result in marginalization and social exclusion, contributing to mental health issues. Being marginalized from mainstream society, experiencing social exclusion, or feeling disconnected from social networks can lead to feelings of loneliness, depression, and anxiety (Weeratunge, et al., 2014; Kittinger, 2013). Lack of inclusion and belongingness can have detrimental effects on mental well-being (Mezzina, Gopikumar, Jenkins, Saraceno, & Sashidharan, 2022). Small-scale fisheries are an especially marginalized population at the global level (Nayak & Berkes, 2010). Respondents similarly expressed the importance of social networks on mental health.

e) **Access to Healthcare and Support:** Social vulnerabilities can impede access to healthcare services and mental health support (Kittinger, 2013). Disadvantaged populations may face barriers such as limited financial resources, lack of health insurance, language barriers, or stigma, preventing them from seeking timely mental health care. This lack of access exacerbates mental health challenges (Mezzina, Gopikumar, Jenkins, Saraceno, & Sashidharan, 2022).

f) **Socioeconomic Disparities:** Social vulnerabilities often intersect with economic disparities, creating a complex web of challenges. Individuals facing social vulnerabilities, such as poverty, limited access to education, employment discrimination, or housing instability, are at higher risk of mental health problems (Nayak, 2014). Socioeconomic disparities can create stress, inequality, and limited opportunities,

negatively impacting mental well-being (Mezzina, Gopikumar, Jenkins, Saraceno, & Sashidharan, 2022).

Addressing the correlation between mental health and social vulnerabilities requires comprehensive approaches that promote social inclusion, reduce discrimination and stigma, provide access to healthcare and mental health services, and strengthen social support networks (Mezzina, Gopikumar, Jenkins, Saraceno, & Sashidharan, 2022).

4.4.3 Environmental Domain

Environmental factors play a significant role in shaping individuals' mental well-being. These factors are more so interconnected when it comes to the environment-dependent systems of small-scale fisheries (Fritze, Blashki, Burke, & Wiseman, 2008). Data collection in Chilika Lagoon showcased that fishers are widely facing the negative impacts of climate change. From reducing levels of biodiversity in the Lagoon to reducing the fish production, to presence of invasive species and increased pollution making life difficult for fishers, to forcing migrations, to natural disasters destroying their boats, fishing supplies, and homes, plus more – environmental impacts have largely affected the mental health of fishers. Participant 6 shed clarity on the distress faced by fishers by stating “Every year, cyclone affects Chilika Lagoon, our boat and house are not safe, we lost many things due to cyclone Fani, we lost our money so how can we provide for family”. Here are some key aspects of this connection between mental health and environmental vulnerabilities:

a) **Natural Disasters and Trauma:** Exposure to natural disasters such as hurricanes, earthquakes, tsunamis, or wildfires, and specifically cyclones and floods in small-scale fisheries, can lead to traumatic experiences that have lasting effects on mental health. The loss of homes, livelihoods, and loved ones can contribute to the development of mental health conditions like post-traumatic stress disorder (PTSD), depression, and anxiety (Hahn, Van Wyck, Lessard, & Fried, 2022).
b) **Climate Change and Anxiety:** The impacts of climate change, including rising temperatures, changes in sea life, extreme weather events/disasters, and environmental degradation, can contribute to anxiety and distress (Donohue & Biggs, 2015). Concerns about the future, ecological disruptions, and the loss of ecosystems and biodiversity can lead to a condition known as "ecological grief" and increase the

risk of mental health problems. Ecological Grief is most prevalent in communities that rely heavily on the environment for their livelihoods, such as small-scale fisheries (Hayes & Poland, 2018). These environmental vulnerabilities also have a direct negative impact on financial stability (Islam, 2011). Climate change awareness and concern for the environment can contribute to a phenomenon known as "climate anxiety" or "eco-anxiety." The growing realization of environmental challenges and the urgency to address them can lead to feelings of helplessness, distress, and anxiety (Hayes & Poland, 2018).

c) **Vulnerability of Environment-Dependent Occupations:** Designated, specific fishing seasons also impact the vulnerability and exposure of SSF population (Kumar, Pattnaik & Finlayson, 2020). Fishing season lasts for about 4 months a year, making the activities and outcomes a higher priority for fishers during this time. Fish catch is high, income is high, and fishers are preoccupied with their employment (Islam & Chuenpagdee, 2022). Hence, during data collection conversations, fishers reported being happiest during these 4 months, with fewer worries. In the other 8 months fish catch is low and so is their working activity. This is when they use leftover money from the fishing season, private loans and financing organizations to meet the needs of their livelihood and manage families (Nayak, 2017). Multiple Fishers stated “lots of struggle, lots of sadness” during this time.

d) **Displacement and Forced Migration:** Environmental vulnerabilities such as land degradation/deforestation, loss of aquatic biodiversity, loss of habitats, and water scarcity can contribute to displacement and forced migration (Iwasaki, Razafindrabe & Shaw, 2009). Individuals who are uprooted from their homes and communities due to environmental factors and subsequent financial issues, often face increased risks of mental health issues, including depression, anxiety, and post-migration stress (Satumanatpan & Pollnac, 2017).

e) **Environmental Pollution and Health:** Exposure to environmental pollutants, such as air pollution, water contamination, or hazardous waste, can have detrimental effects on physical health. These adverse health impacts can also extend to mental well-being, with studies suggesting links between environmental pollution and mental health disorders (Hayes & Poland, 2018; Dash, 2020). Water and Air Pollution due to

(prawn) gheries or increased tourism is a common negative impact mentioned by Chilika Lagoon Fishers as well.

f) **Environmental Injustice and Mental Health Disparities:** Environmental vulnerabilities often intersect with social inequalities and environmental injustices. Marginalized communities, including low-income communities and minority populations, are disproportionately affected by environmental hazards and impacts (Chakraborty, 2017). These disparities contribute to mental health inequalities, with vulnerable populations such as SSF experiencing higher rates of mental health problems (Kittinger, et al., 2013).

Addressing the correlation between mental health and environmental vulnerabilities requires comprehensive approaches that prioritize environmental sustainability, resilience, and mental well-being (Kumar, Pattnaik, & Finlayson, 2020).

4.4.4 Governance Domain

Social, economic, and environmental domains of vulnerabilities connected to mental health are fairly well known. However, an equally important but far less discussed aspect is how mental health and governance vulnerabilities are greatly interconnected, with governance factors playing a sizable role in determining mental well-being (Acott, 2014). This research paper aims to shed light on this crucial connection between the two aspects, as research in Chilika Lagoon showcased that there is currently little knowledge available. Participants reiterated a lack of government support affecting their livelihood and mental health. Examples of this can be described through quotes from participants such as “there are no fishing law for protecting chilika fishery system or fisher safety during disaster” or “the high number of benami prawn gheries declining water quality and so there are less fish in lagoon. The government is not helping, [we] need help”. Stronger governance structures are needed to support livelihoods essentials and financial security of small-scale fisheries, thereby initiating pathways for positive mental health (Strazdins & Broom, 2007). Below are some key examples of this relationship:

a) **Social Inequality and Marginalization:** Governance vulnerabilities often intersect with social inequalities and marginalization, contributing to mental health disparities. Systemic injustice and exclusion from decision-making processes can result in increased stress, diminished self-worth, and reduced access to resources, leading to

mental health problems (Bernardi & Bolano, 2023). Small-scale fisheries are geographically isolated, economically deprived, politically voiceless, and are considered culturally low class. They are marginalized at the global level and excluded from policymaking (Islam, 2011; Rahman et al., 2002).

b) **Lack of Access to Basic Services:** Governance vulnerabilities can result in limited access to basic services such as healthcare, education, and social support systems. Inadequate provision of mental health services, lack of trained healthcare professionals, and barriers to accessing care contribute to mental health challenges. Disparities in resource allocation and unequal distribution of services exacerbate mental health inequalities (Charles, 2011).

c) **Corruption and Lack of Transparency:** Governance vulnerabilities related to corruption, lack of transparency, and mismanagement of resources can impact mental health. Corruption undermines trust in institutions, hampers social cohesion, and erodes the delivery of essential services (Howe, 2012). The resulting frustration, disillusionment, and feelings of powerlessness can negatively affect mental well-being. Corruption widely exists within the Indian governance system (Nayak & Berkes, 2010)

d) **Limited Civic Participation and Empowerment:** Governance vulnerabilities can hinder civic participation, meaningful engagement, and individual empowerment (Miller, 2022). Lack of opportunities for participation in decision-making and implementation processes, limited access to information, and restricted freedom of expression can impact mental health by undermining a sense of control, agency, and personal autonomy (Berkes & Ross, 2013).

e) **Social Cohesion and Trust:** Effective governance plays a crucial role in fostering social cohesion, trust, and community resilience. Governance vulnerabilities, such as weak institutions, corruption, or lack of accountability, can erode social trust and cohesion (Miller, 2022). In turn, this can contribute to social isolation, interpersonal conflicts, and reduced social support, negatively affecting mental well-being (Ventura, 2017; United Nations, 2018).

Addressing the correlation between mental health and governance vulnerabilities requires efforts to strengthen governance systems, promote transparency, accountability, and the

protection of basic human rights. Ensuring equitable access to essential services, including mental health services, is vital (Howe, 2020).

It is important to note that not only does mental health vulnerability run through these domains, but each domain is interconnected with each other. For example, social vulnerabilities are impacted by environmental vulnerabilities and/or financial vulnerabilities are impacted by governance vulnerabilities and so on (Cannon, 2006). For example, the loss of biodiversity in fish causing low income, and therefore forcing men fishes to migrate out of the fishing community and into the city for financial necessities – is an example of where environmental, economic and social vulnerabilities intersect and co-occurrence exists (Cánovas-Molina & García-Frapolli, 2022). The state of vulnerabilities in SSF is a complex spectrum encompassing with many interconnecting domains and factors. Mental health is a multidimensional part of this spectrum (Bernardi & Bolano, 2023).

4.4.5 Benefits of defining Mental Health as Multidimensional vulnerability

Defining mental health from this perspective is essential. Only when it is seen from this lens, as a true, serious problem existing over small-scale fishers, can efforts toward solutions be made (Acott, 2014). As well, this clear definition can guide the need for future research as well as influence it in a more effective, holistic manner (Alvidrez & Barksdale, 2022). In recent years, there has been increasing acknowledgement of the important role mental health plays in achieving global development goals, as illustrated by the inclusion of mental health in the Sustainable Development Goals. Depression is one of the leading causes of disability (World Health Organization). Suicide is the fourth leading cause of death among 15-29-year-olds. People with severe mental health conditions die prematurely – as much as two decades early – due to preventable physical conditions (World Health Organization).

Despite progress in some countries, people with mental health conditions often experience severe human rights violations, discrimination, and stigma (World Health Organization). This is more common in lower-income countries and environments such as small-scale fisheries (Woodhead, Abernethy, Szaboova, & Turner, 2018). Hence it is important to define it such that its significance, prevalence and need for improvement can also be prioritized (Islam & Chuenpagdee, 2022).

4.5 Conclusions and Chapter Summary

Chapter 4 covered Objectives 1 and 2 which focused on comprehending Chilika Lagoon Fishers' understanding of mental health, the key drivers and contributors of poor mental health in small-scale fisheries, as well as defining mental health as a multidimensional vulnerability (Serrat, 2017). Through analysis of the household questionnaire data and supplemented with secondary literature, it was discovered that majorly fishers understood mental health through the lens of financial stability and outcomes (Trani & Bakhshi, 2017). Data indicated that for fishers, financial status and mental health are a direct correlation. If financial levels are high, it would mean good mental health. Likewise, if financial status is low, it means bad mental health. Primary Data Analysis concluding extremely low educational and knowledge levels of fishers, along with their emotional connection to Chilika Lagoon as their only option for home and gratitude for it as the provider of livelihood, explained this understanding. The phenomena of Poverty-Driven mental health and Maslow's Hierarchy of Needs were discussed in relation to its effect on the habitants of Chilika Lagoon (Allison & Horemans, 2005; Haddadi & Besharat, 2010; Islam & Chuenpagdee, 2022; (Weeratunge, et al., 2014)). 96% of fishers did not feel financially secure and were affected by this experience. Fishing capacity and subsequently financial instability is impacted by socioeconomic and environmental domains of livelihood (Islam, 2011). Living in SSF, fishers understand the means needed for their livelihood to succeed. They also know that until they can fulfill their life's basic necessities, they cannot focus on higher level needs such as mental health (Hopper, 2020). This further enforced the financial lens depicting their understanding of mental health, with it being directly correlated to and impacted by income levels (Cánovas-Molina & García-Frapolli, 2022). The demographics of the 50 questionnaire respondents were also analyzed and displayed. Furthermore, a comparative analysis was conducted on the most common vulnerabilities faced by small-scale fishers and the most common factors contributing to the mental health of fishers. Analysis showed an 86.5% similarity in this data and thereby confirmed that existing vulnerabilities do contribute to mental health vulnerability and vice versa.

This chapter also focused on the second part of Objective 1, which entailed defining mental health as multidimensional vulnerability, especially in small-scale fisheries such as Chilika Lagoon. Through analysis of data, it was showcased with examples how mental health is

embedded in social, economic, environmental and governance vulnerabilities (Donohue & Biggs, 2015). These domains are interconnected and occur simultaneously. Multidimensional vulnerabilities such as Mental Health are driven by intersecting dimensions of inequality, socioeconomic development pathways, and climate change and climate change responses (United Nations, 2018). Vulnerability depends on the structures in society that trigger or perpetuate inequality and marginalization—such as income-poverty, location, governance, and multiple dimensions of inequality. It is vital to note that these vulnerabilities intersect, influence, and exist with each other (Adger, 2006). Economic vulnerabilities often intersect with other forms of vulnerability, such as gender, race, ethnicity, disability, climate change, and social marginalization. These intersections can compound the impact on mental health, as individuals may face multiple barriers to economic opportunities, social inclusion, and healthcare access (Alvidrez & Barksdale, 2022). This multidimensional lens was also seen when analyzing how Chilika lagoon fishers understand mental health. It is an aspect that is integrated in and impacted by all domains of their life (King, Turner, Versace, Abernethy, Kilpatrick & Brumby, 2021).

Lastly, this chapter provided a list of contributors or drivers of poor mental health by thematically analyzing the qualitative data received from household questionnaires (Table 4.1 and 4.2). In the survey, fishers were asked what the largest contributor to poor mental health was for them, and 100% of respondents said it was low fish catch, meaning lower income levels. Contributors can be further categorized in three domains: social, economic, and environmental, all of which one way or another relate back and lead to reduced financial security of fishers. Social contributors included poor relationships with family or community members (lack of time spent with loved ones), weak attachment to village people, lack of socialization, inability to maintain family health or educate children, increase in prevalence of non-fishers, feeling deprived of rights and disturbances of social cohesion. Economic contributors included low fish production/ shortage of fish, low fish price/rate, lack of government support, increase in non-fishers, no other income source available than fishing, increased expenses, lack of loans available or loans with unsustainably high-interest rates, forced migration out of their village. The economic vulnerabilities revolved around aspects that led to low income, which further reduced livelihoods and increased negative mental health outcomes. Lastly, environmental vulnerabilities included natural disasters (especially cyclones and floods destroying homes + fishing supplies), adverse effects of climate change/global warming causing lagoon degradation, reduced fish

biodiversity, increases in invasive species such as prawn gheries, benami prawn farming and cultivation, pollution (air and water quality decreasing due to industrial development), agricultural drainage, sea mouth creation and widening and tourism. Economic vulnerabilities identified by fishers for affecting mental health, also align with those that reduce their ability to fish and income received from fishing.

Mental health needs to be understood from the perspectives of the target population, Chilika Lagoon Fishers, as well as a multidimensional vulnerability. Only with this understanding can effective, culturally appropriate responses to mental health issues be discovered (Howe, 2012). The response must also be built within a multidimensional lens (Serrat, 2017; World Health Organization). The following chapter 5 will discuss this further.

Chapter 5: Negative Effects of Poor Mental Health and Recommendations for Improving Governance Responses in Policy and Community

5.1 Introduction

Millions of lives worldwide rely on and are impacted by Small-Scale Fisheries, often leading to multidimensional vulnerabilities (Speiser, 2014). It is imperative to not only fully understand these vulnerabilities but also to discuss how these currently neglected and marginalized SSF communities can be better supported; therebyenabling them to respond to these disparities (Smith & Basurto, 2019; Berkes and Nayak 2018). In order to discover modes for improving resilience, the nexus of contributors that lead to an individual's vulnerable state should be identified (Smith & Basurto, 2019). Chapter 4 reviewed the complexity of influential drivers that contribute to mental health, and defined mental health as a multidimensional vulnerability. The following chapter will discuss the negative impacts of mental health on the livelihoods of small-scale fishers. It will outline a series of recommendations and best practices to improve the response to mental health issues faced by the fisherfolk, through improving local governance policies and practices. It is imperative to realize that the solution for a complex, multi-faceted issue like mental health is built in the multidisciplinary domain. Policy change is required in all domains in which vulnerabilities are present, not just in health care.

5.1.1 Research Objectives Overview

(O3) specifying the negative impacts mental health has on the livelihoods of small-scale fishers.

(O4) creating a set of recommendations to inform on best practices within mental health policies in SSF, that can advise holistic public agents and improve viable local governance response in policy, society, and community.

This chapter will focus on defining the negative impacts that poor mental health has on the livelihoods of fisherfolks. This will help to better understand the affect that mental health has on preventing the viability of small-scale fishers, and therefore showcase the need for implementing solutions to combat it. Secondly, this chapter will discuss the best practices existing in mental health and community policies. This will help guide local governance and holistic public agents

in responding to the mental health issues of small-scale fisheries. This will include analysis of existing research as well as informing on what the fisher folk community stated their needs are through the primary data collection. Improving only mental health policies will not be enough to respond to the currently neglected mental health crisis in small-scale fisheries. A multidimensional response, spanning across social, economic and environmental policies, is needed. The chapter will aid in discovering how this can be implemented, such that the mental health of small-scale fishers can be enhanced.

5.2 Negative Impacts of Poor Mental Health on Livelihoods of Small-Scale Fishers

Poor mental health can significantly reduce the quality of life of individuals (WHO, 2023). Untreated mental health conditions can result in unnecessary disability, unemployment, substance abuse, homelessness, inappropriate incarceration, poor quality of life, and ultimately suicide. According to the World Health Organization (WHO), **1 in every 8 people in the world live with a mental disorder (WHO, 2023).** Mental disorders are also top contributors in global burden of disease and global years lived with disability (WHO, 2022). Mental health disorders involve significant disturbances in thinking, emotional regulation, or behaviour. Effective prevention and treatment options exist but most people do not have access to effective care (WHO, 2023).

When asked the fishers of Chilika Lagoon 'How much do you agree that bad mental health will reduce the quality of life?', the responses were overwhelmingly associated with being in agreement with the statement. It is a universal understanding that poor mental health reduces one's ability to live a fully healthy life (in a holistic sense). This is because it prevents an individual from achieving their full capacity of a healthy lifestyle (Natarajan, Newsham, Rigg, & Suhardiman, 2022). If ones' mind is not operating in balance, all aspects of life are negatively affected. Figure 5.1 outlines the responses from the fishers in Chilika Lagoon.

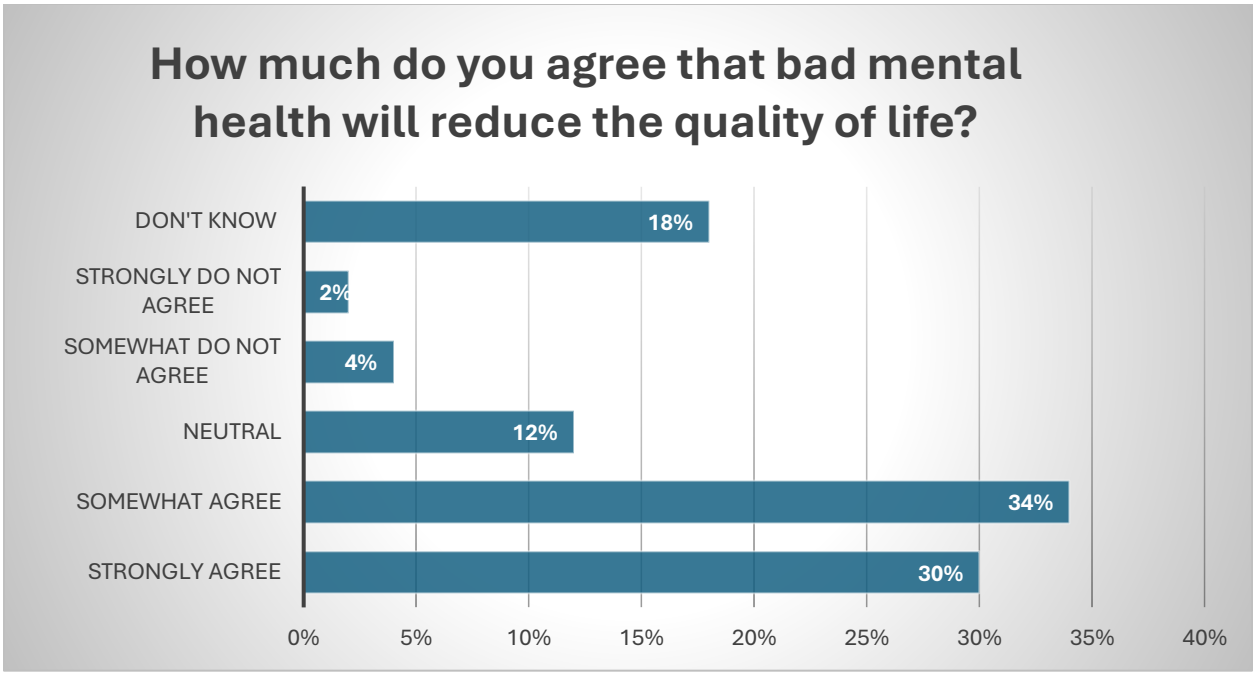

Figure 5.1 Fishers responses to the relationships between poor mental health and quality of life

Majority of fishers did agree that mental health reduces the quality of life, and how it makes life worse. When asked why, given reasons related to effects on income level or reasons related to increasing problems with family and/or interactions with other people. Fishers stated, “no motivation to work”, “no willingness to work”, “lower income”, “lots of loans to pay” or “silent every time”, “misunderstandings in family increase”, “impacts family, friends and relatives”, respectively. This showcases how negative mental health causes vulnerability to increase in the lives of fishers. For example, when a fisher states, “no willingness to work”, it indicates that they lack the motivation to participate in the fishing activities that provide for their livelihoods. This will in turn decrease their income levels and financial stability. This constitutes as a factor contributing to their mental health conditions as poverty-associated negative effects are the #1 driver of worsening mental health in small-scale fishers (Desjarlais, 1995). This same connecting concept applies to many of the reasons for mental health reducing the quality of life given by fishers. They all circle back to affecting income levels in various ways because fishers see this as the major factor impacting their livelihoods. It also reinforces the connection between poverty and poor mental health, but with the added layer of how mental health issues reduce quality of life (Neighbors and Laveist, 1989).

5.2.1. Social, Environmental and Economic Dimensions

Poor mental health can negatively affect all aspects of one's life (Natarajan, Newsham, Rigg, & Suhardiman, 2022). The fishers of Chilika Lagoon were asked about the negative impacts of mental health issues on the social, environmental, and economic domains of livelihoods. The answers revealed an overwhelming sense of lack of knowledge about this topic from the fishers. Majority of answers, especially for the social and environmental domains, were "I don't know", "no idea', "can't say". Furthermore, the answers that were given were similar to those of answers related to contributors to mental health, NOT about how mental health has negative impacts. When asked about this confusion of answers received, the field researcher mentioned "they don't know what the question means". It is analyzed that the fishers have little knowledge which made answering the questions difficult. Hence, to gain a better understanding, questions were asked about fishers' opinions on a specific known negative impact. Figure 5.2 below showcases the fishers' answers on the negative impacts of mental health through the economic lens.

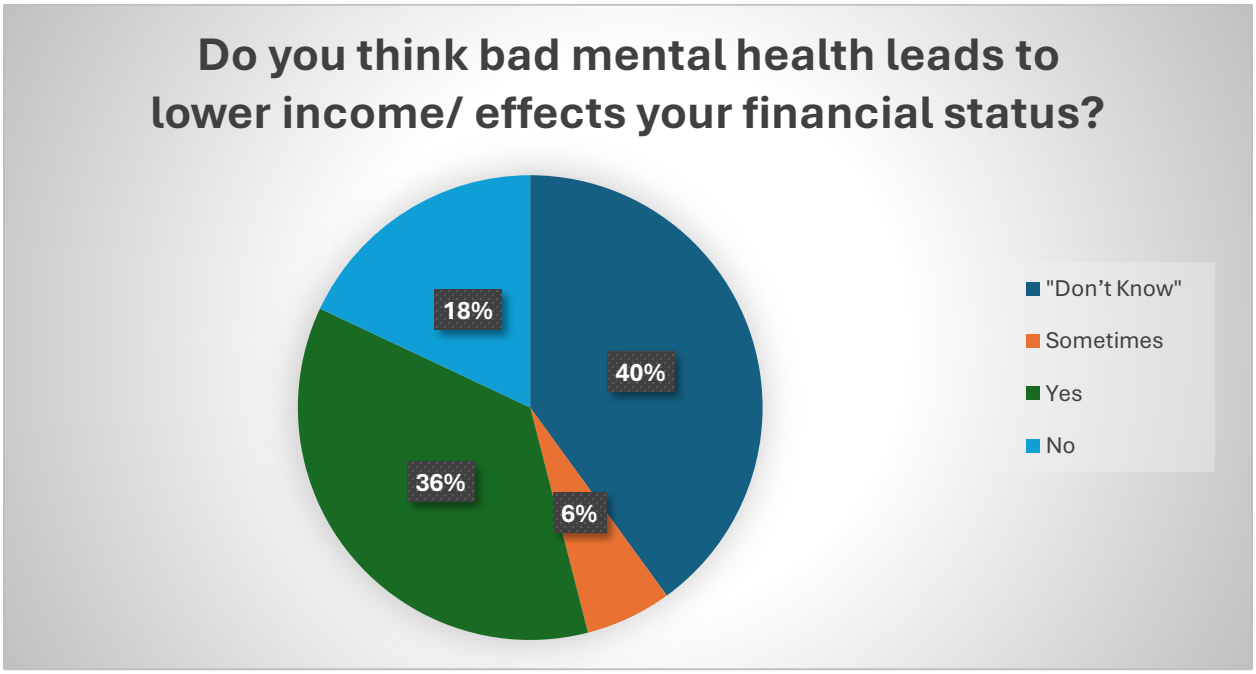

Figure 5.2 Fishers Opinion on Correlation between Poor Mental Health and Financial Status

When negative impacts were asked as general questions, fishers were unable to understand the question and therefore answers did not relate to what was being asked. It was invalid. However, when asked about specific negative impacts of mental health, like social isolation, decreased financial status, and physical health impacts - it was revealed fishers are experiencing these negative effects. Figure 5.2 is an example of this as 36% of fishers believed that poor mental health leads to lower income. Furthermore, 42% of participants agreed that poor mental health can contribute to bad physical health. As well, 34% of fishers believed that having a mental health issue would result in increased social isolation, due to the community being less accepting. Participants mentioned "it impact our brain how other people think of us". People who are not aware about mental health issues and cannot understand them may think less of those with mental health disorders (Senapati and Gupta, 2015). Social connection is an important part of fisher livelihoods, and thus the fear of being judged by their community can prevent them from accessing mental health services. It is recommended that this barrier to receiving help, created by stigma in society, be further investigated once greater services are available (Demyttenaere et al., 2004). Poor mental health affects fishers' ability to work, and it has been shown in the research that financial status and income are what contribute the most to worsening mental health (Taris, 2002). This is the vicious cycle that fishers are trapped in, and the escape out of this is with education and resources (Pattanaik, 2007).

Majority of data from asking fishers about negative impacts they perceive revolved around the economic domains, aka reduced financial stability, as poor mental health leads to "no interest in activities", "activities not done properly" or "shortage of money". Participant 12 mentioned *"Lots of private loan to pay. During covid period there is a lot of financial problem. No work, no income".* Participant 39 mentioned "*Family members health is not maintained properly due to financial problem."* This means fishers understand that poor mental health affects their ability and willingness to work. The economic dimension is where the fishers feel the highest degree of negative impact. It is also the domain where fishers felt most comfortable in describing how they are negatively impacted. It is understood from the fishers that the lack of money is what leads to a multitude of negative impacts on their livelihoods. It is vital to note once again the connection between these two facets.

The idea of no available government support for themselves to navigate the mental health domain and its impacts was a recurring theme in the qualitative analysis. The fishers may not be able to articulate the negative effects they are facing due to lack of knowledge on the topic, but they still expressed the overall idea that they are struggling. They are affected and they need support to fix these negative impacts they are facing. The environmental surroundings of fishers are constantly changing, and therefore so is their socioeconomic status (Natarajan, Newsham, Rigg, & Suhardiman, 2022). When the capacity to sustain their livelihoods worsens, so does the negative impact of mental health (fishers said that reduced income is the main negative effect). This reduces the fisher's resilience and increases vulnerability (Speiser, 2014).

The following section uses secondary literature to fill in the blanks and better understand the existing, proven negative influences of poor mental health, that the primary data failed to highlight comprehensively - due to lower mental health education and awareness levels of fishers. Small-scale fishers are susceptible to and at a high risk of facing these negative impacts.

5.2.2 Existing Negative Outcomes Analyzed from Secondary Literature Sources

It is important to understand that the negative outcomes of mental health intertwine within each of the social, economic, and environmental dimensions. Often a mental health issue spreads across and has synergies within all domains of life (Desjarlais, 1995; Speiser, 2014). For example, depression can lead to lower energy levels or lack of motivation which results in employment challenges as well as social isolation. Also, these outcomes create a vicious cycle of poor mental health. Social isolation harms mental health, but social isolation is also a driver/contributor to poor mental health. It is important to recognize the duality of these vulnerable livelihoods' situations present for fishers (Desjarlais, 1995).

5.2.2.1 Social Dimension

Mental health issues can have significant negative impacts in a social context. These impacts can affect not only the individuals struggling with mental health problems but also their families, friends, and communities (Lauber & Rössler, 2007). Fishers overwhelming (over 50%) mentioned lack of government support available, and how fishers are deprived of their rights. Another common response was "sometimes trouble Happens with the relatives / friends", showcasing how poor mental health can negatively impact the social relationships and

community that fishers value so highly. Here are some of the negative impacts of mental health in the social context (Lauber & Rössler, 2007):

a) **Stigmatization and Discrimination:** People with mental health issues often face stigma, negative judgment and discrimination, which can lead to social isolation, reduced opportunities for employment and housing, and overall exclusion from various aspects of society. Individuals can also face hostility or rudeness from societal members who may not understand mental health due to its taboo nature (Lauber & Rössler, 2007). Poor mental health also results in increased marginalization of vulnerable populations such as small-scale fishers. Furthermore, data indicated the importance fishers place on family and village people, and how their opinions of them affect their mental health and livelihoods.
b) **Strained Relationships:** Mental health problems can strain relationships with family and friends. The symptoms of conditions like depression, anxiety, or schizophrenia can lead to misunderstandings, conflicts, and emotional distance (Lauber & Rössler, 2007). Not having positive relationships with others or strong family ties was mentioned as a major contributor to poor mental health for fishers.
c) **Reduced Social Participation:** Individuals with mental health issues may withdraw from social activities and events, leading to reduced social participation. This isolation can exacerbate their conditions and hinder their ability to form healthy relationships. Joint community living and social connections are a big part of the small-scale fishery lifestyle (Lauber & Rössler, 2007).
d) **Employment and Economic Challenges:** Mental health problems can lead to difficulties in maintaining stable employment. This can result in financial instability, poverty, and increased reliance on social services. Mental health can reduce the ability of small-scale fishers to continue their role of fishing. Reduced fishing capacity directly reduces their income (Neighbors and Laveist, 1989). This can also result in homelessness. Many homeless individuals have underlying mental health issues. A lack of access to mental health services, combined with the stigma around homelessness, can make it challenging for these individuals to integrate with society (Desjarlais, 1995).

e) **Substance Abuse:** Some individuals with mental health issues turn to substance abuse as a coping mechanism, which can lead to addiction and further social issues, such as strained relationships with loved ones (Desjarlais, 1995).
f) **Caregiver Stress:** Family members and friends who provide care and support for individuals with mental health issues often experience caregiver stress and burnout. This can strain their own mental and emotional well-being (Desjarlais, 1995).
g) **Impact on Children:** When parents or caregivers struggle with mental health issues, children can be negatively affected in various ways, such as neglect, and emotional trauma. They are also at risk of inheriting genetic predispositions to mental health conditions. For example, schizophrenia has a history of being hereditary (Desjarlais, 1995).
h) **Crime and Incarceration:** Individuals with untreated mental health issues have a higher likelihood of being involved in criminal activities and therefore at higher risk of getting incarcerated. Furthermore, the criminal justice system may not always adequately address the underlying mental health needs of these individuals, perpetuating a cycle of reoffending (Desjarlais, 1995).
i) **Reduced Community Well-being:** Widespread mental health issues within a community can harm the overall well-being of that community. This can manifest in higher crime rates, decreased economic productivity, and a less cohesive, positive social fabric (Javed, 2021). Untreated mental illnesses can also reduce overall education levels in a community as individuals may lack the ability to focus on studies or the motivation to prioritize education.
j) **Decreased physical well-being:** Poor mental health conditions have been widely linked to various physical health disorders such as increased diabetes, weakened immune system, weakened cognitive function, increased hypertension, chronic diseases, muscle tension, gastrointestinal issues, cardiovascular and respiratory diseases, and in some cases, it can even lead to death by suicide (Sowers, Rowe, & Clay, 2009). Moreover, physical health problems significantly increase the risk of developing mental health problems. Nearly one in three people with a long-term physical health condition also has a mental health problem, most often depression or anxiety (Sowers, Rowe, & Clay,

2009). 42% of fishers interviewed mentioned that they do strongly believe poor mental health contributes to poor physical health because it “slowly damages the mind”.

It's important to recognize that these negative impacts are not solely the result of mental health conditions themselves but are often exacerbated by societal factors such as stigma, lack of access to mental health care, health disparities, and inadequate support systems (Javed, 2021). Addressing mental health issues from both an individual and societal perspective is crucial to mitigating these negative impacts and fostering a more inclusive and supportive social environment (Lauber & Rössler, 2007).

5.2.2.2 Economic Dimension

Mental health issues can have significant negative impacts in an economic context, affecting both individuals and the broader economy (Taris, 2002). Participants’ responses were focused on poor mental health affecting their income levels and lack of financial safety. Shortage of income, no other income options, and no money for fishing supplies were also mentioned. Fishers described how these financial problems and mental health impacts were exacerbated by the COVID-19 pandemic. Participant 3 also cited how “family member health is not maintained properly due to financial problem”, showing how income levels affect the ability to mitigate negative impacts. “No support from government” or “no support for fishers” was also highlighted. Here are some of the negative impacts of mental health on the economic context (Knapp & Wong, 2020):

a) **Reduced Work Productivity:** Mental health problems can lead to decreased work performance, absenteeism, and presenteeism. This lack of focus, in turn, can result in lower productivity for fishers and a decrease in overall economic output at the individual and community levels (Taris, 2002). Fishers may feel unable to do the job that provides for their households, families, and livelihoods (Knapp & Wong, 2020). This can lead to a decrease in fishing activity in small-scale fisheries, which can have an international negative impact as the global world relies on harvesting aquatic foods to provide essential nutrients (Illuminating Hidden Harvest Report, 2022).
b) **Loss of Employment:** Individuals struggling with mental health issues may lose their jobs or experience long periods of unemployment due to their condition. This can result in a loss of income and increased reliance on social safety nets (Szabo, 2020). Fishers are

put in a more dire situation when social systems do not exist and are unable to help them at times of unemployment. Mental health and income have vast, prominent and important ties with each other as depicted by the qualitative responses of fishers and discussed in Chapter 4.

c) **Reduced Innovation:** Mental health issues can inhibit creativity, problem-solving abilities, and innovative thinking, which can negatively the resilience of fishers. It can decrease entrepreneurship as individuals with untreated mental health problems may be less likely to start their own businesses or engage in entrepreneurial activities, which can stifle job creation and decrease their financial-building capacity. (Knapp & Wong, 2020)

d) **Impact on Caregivers:** Family members and friends who provide care and support to individuals with mental health issues may need to reduce their work hours or take time off, leading to lost wages and reduced economic contributions (Knapp & Wong, 2020). This can have high negative impacts in small-scale fisheries communities where activities resulting in success are intertwined and interdependent with each other (Sowers, Rowe, & Clay, 2009).

e) **Increased Migration**: Poor mental health issues and its subsequent economic decline can force societal members and loved ones to migrate out of the fishing community for additional work/income (Knapp & Wong, 2020). This further degrades the social cohesion of the small-scale fishery as a whole and within individual families. It also exacerbates existing poor mental health. Fisheries migration has a vast impact on fisheries management and resource access.

f) **Reduced Economic Participation:** People with mental health problems may withdraw from social and economic activities, leading to reduced consumer spending and economic decline in various sectors (Knapp & Wong, 2020).

g) **Impact on Education and Training:** Individuals in educational or training programs may struggle to perform well or complete their training due to mental health issues, which can affect their earning potential and career prospects within the fishing community (Knapp & Wong, 2020). Fishers mentioned there was “no proper education for their child” due to their circumstances.

h) **Negative Impact on Economic Development:** When a significant portion of the population faces mental health challenges, it can hinder a country's overall economic

development, as a mentally healthy and productive workforce is a key driver of economic growth (Knapp & Wong, 2020). Sale of SSF catch yields USD 77 billion in total global revenue. Hence, it is more imperative than ever for the mental health care of small-scale fishers to be prioritized (Illuminating Hidden Harvest Report, 2022).

As discussed in 5.2.1, the economic dimension is where the small-scale fishers stated they face the most negative impact from poor mental health. Poor mental health affecting their economic condition is where fishers were most worried as well. When their livelihoods are affected, the fisher's ability to sustain themselves is strongly diminished. This creates havoc in not only their life but their families as well (Julia et al., 2021). Fishers already face a precarious economic system and thus any changes in their income, such as those caused by poor mental health, can have massive effects on their livelihoods (Taris, 2002).

Addressing the negative economic impacts of mental health issues requires comprehensive strategies, including promoting mental health awareness, reducing stigma, providing access to affordable and effective mental health services, and implementing mental health programs for small-scale fisheries, that are relevant and specific to their means of livelihoods (Knapp & Wong, 2020). By doing so, individuals and economies can mitigate the costs associated with mental health problems and promote overall well-being and productivity (Knapp & Wong, 2020).

5.2.2.3 Environmental Dimension

Mental health can have indirect but notable negative impacts on the environmental context, particularly when individuals who are experiencing mental health issues engage in behaviours or actions that harm the environment (Islam, Ghani, Sultana, Mahyudin, 2022). The most common response from fishers was how "many diseases increase in polluted environment". Fishers worry that there will be increased chances of physical disease as poor mental health causes increased levels of harmful behaviours. Many fishers stated, "government is not taking constructive steps for Chilika Lagoon as well as for fishers", thereby expressing the lack of support to combat the negative impacts of poor mental health outcomes, especially in the environmental domain. These impacts may include:

a) **Littering and Pollution:** Individuals with mental health challenges may engage in harmful behaviours like littering or dumping waste in public spaces. This contributes to

environmental pollution and can damage ecosystems. It is of the utmost importance for fishers to protect the environment that their livelihoods depend on (Islam, Ghani, Sultana, Mahyudin, 2022). Fishers also expressed this negative impact in the household questionnaire by stating that the environment is more polluted with motorboats and other harmful fishing practices.

b) **Substance Abuse and Environmental Degradation:** Substance abuse disorders, which are often intertwined with mental health issues, can lead to environmentally harmful actions such as the production and disposal of drugs like alcohol. These activities can lead to soil and water contamination (Islam, Ghani, Sultana, Mahyudin, 2022).
c) **Neglect of Personal Environment:** People facing severe mental health challenges may neglect the maintenance of their homes, leading to infestations or structural issues that can impact their immediate environment and even neighbouring properties (Islam, Ghani, Sultana, Mahyudin, 2022).
d) **Disconnection from Conservation Efforts**: Mental health issues can lead to isolation and disengagement from community activities, including conservation efforts and environmental advocacy (Islam, Ghani, Sultana, Mahyudin, 2022). It can prevent fishers from advocating for better environmental conditions and lagoon protection laws that would benefit them vastly.
e) **Resource Overconsumption:** Some individuals with compulsive behaviours related to mental health conditions may knowingly or unknowingly engage in activities, such as overfishing, increased issues with non-fishers, etc. that contribute to environmental and economic degradation (Islam, Ghani, Sultana, Mahyudin, 2022).
f) **Fishing Neglect**: Fishers with mental health challenges may neglect their fishing responsibilities, which can lead to degradation of the surrounding Chilika lagoon environment (Islam, Ghani, Sultana, Mahyudin, 2022).

Environmental negative impacts may seem trivial and small, but they are still worth noting. Precarious environmental conditions, such as the negative impacts of climate change, are often vulnerabilities leading to mental health rather than the negative impacts that come from it (Islam, Ghani, Sultana, Mahyudin, 2022). Fishers rely heavily on their environment to provide for their livelihoods, hence the impact of untreated mental health issues on this domain must be considered (Padhy, Sakar, Panigrahi, Paul, 2015). It's essential to approach these negative

impacts in a compassionate and understanding manner, recognizing that individuals facing mental health challenges require support and treatment to address the root causes of their behaviour (Islam, Ghani, Sultana, Mahyudin, 2022). It is important to recognize the lack of support from the government, civil organizations and societal systems, fishers are overpoweringly feeling. By providing access to mental health care, support services, and social programs, it is possible to reduce these indirect negative environmental impacts and help individuals lead healthier and more sustainable lives (Speiser, 2014). Moreover, community and public health initiatives can also play a role in addressing the intersection of mental health and environmental issues (Islam, Ghani, Sultana, Mahyudin, 2022).

5.2.3 Chilika Lagoon Fishers: Mental Health Symptoms

It should be clearly noted that having one or more of these feelings or experiences does not diagnose an individual with a mental health condition. Consultation with a professional medical doctor is needed for further concrete understanding and establishing a medical relationship. This question focused on asking the fishers if they have experienced feelings related to what is listed. Fishers were asked to select **all** answers they strongly resonated with. The list is comprised of common emotional symptoms associated with and used as indicators for poor mental health and illnesses. However, it is to be noted that the question did not analyze to what degree these indicators resonate with the small-scale fishers of Chilika Lagoon. Regardless, it can be seen that majority of the community is experiencing these associated emotions. The qualitative data below indicates fishers are experiencing a vast array of negative effects that are in line with poor mental health.

Table 5.1 Analyzing the Emotional and Physical Feelings of Fishers in relation to Indicators of Poor Mental Health

Types of Feeling or Emotion used as Indicators for Poor Mental Health	**% of Fishers who Resonated Strongly with the Feeling or Experience**
Sad /unhappy all the time	42%
Thinking about dying	16%
Low energy levels, laziness, sleeping a lot, or hard to get out of bed in morning	10%
No motivation, no hope for better future	22%
self-hate, feel ashamed, withdrawing from family and friends	8%
High-stress levels and lots of worrying	16%
Difficulty in focusing on job or other activities	54%
Quickly changing mood, or having lots of anger	0%
Increased alcohol drinking or not wanting to eat food	0%
Hallucinations	0%
Any other feelings you have: ‘Silent every time’	2%
Don’t know/ Can’t say/ No idea	26%

Key insights can be gained from reading this data set, as it reveals important information about the mental health situation in Chilika Lagoon. The data in table 5.1 showcases that fishers are feeling the physiological and emotional symptoms associated with poor mental health, without knowing or understanding what mental health is. With 26% of fishers stating, “don’t know, no idea, etc.”, the data indicates that there is a need for greater awareness of mental health in small-scale fisheries. The most common symptoms experienced by fishers were feeling sad all the time (42%) and difficulty focusing on their job or other activities (54%). This along with other symptoms that fishers indicated feelings such as lower energy levels, lack of motivation, and self-hate – are all general symptoms of depression. This is interesting because depression is one of the most common mental health disorders (National Collaborating Centre for Mental Health, 2011). This showcases how small-scale fisheries are no different than the rest of the world’s populations, in terms of prevalence of mental health conditions. Issues common in North America, will be common in Chilika as well (Disorders in the World Health Organization, n.d.). This helps to advise public policies and resource distribution for effective care. It gives direction for which mental health conditions require the most support, based on prevalence levels (Fritze, Blashki, Burke, Wiseman, 2008). For example, the sample size from this research data indicates that more fishers suffer from depression than other disorders like schizophrenia. Hence, by just using this data set as an example, it was discovered that solutions for helping manage depression should be prioritized first. This exhibits how data is a powerful tool, that when used effectively can arise evolution at the systemic level. This urgent need to help fishers with adequate and appropriate mental health services is further emphasized by the 16% of fishers of think about dying.

5.2.4 Poor Mental Health: A Mechanism for Increasing Vulnerability of Those Already Vulnerable

Mental health includes our emotional, psychological, and social well-being. It affects how we think, feel, and act. It also helps determine how we handle stress, relate to others, form healthy decisions as well as overall decision-making throughout our life (Sowers, Rowe, & Clay, 2009). The vast number of negative impacts of mental health increases the vulnerability of small-scale fishers in all domains of life – from social, to environmental to most predominantly economic. 30% of fishers strongly agreed that poor mental health reduces quality of life, while 34% of fishers somewhat agreed. Mental illness can impact social and cognitive function and

decrease energy levels, which can negatively impact the adoption of healthy behaviours (Sowers, Rowe, & Clay, 2009). People may lack motivation to take care of their health as well as participate in the systems that rule their survival. Its effect on our physical health along with cognitive function can severely impact the financial stability and fishing capacity of those living in small-scale fisheries (Sowers, Rowe, & Clay, 2009). 36% of fishers stated that they believe poor mental health leads to lower income levels. This aligns with the data that shows 54% of fishers indicated difficulty focusing on fishing jobs. Facing a high number of vulnerabilities from multiple social, economic, and environmental factors, fishers already face perilous circumstances that impact their daily livelihoods and financial security. Fishers are even now increasingly susceptible to poverty-driven mental health than the average due to their vulnerable surroundings (Weeratunge, et al., 2014). Thus, the data indicates that fishers are confronting poor mental health conditions, and that it only intensifies their existing vulnerability. Fishers, an already vulnerable population, are now left open to further harmful consequences (Weeratunge, et al., 2014). Mental health and healthy lifestyle choices are equally important aspects of overall health and wellness. Without improvements in mental health and mitigation of its subsequent consequences, small-scale fishers cannot move towards true viability (Weeratunge, et al., 2014).

5.3. Recommendations for Using Governance and Policy to Effectively Respond to the Mental Health Care Needs of Small-Scale Fisheries

A Multifaceted Response: Multidimensional Approach to Mental Health Care

As discussed in Chapter 4, mental health is a multidimensional vulnerability. Hence, the response for it also needs to be built within all sectors of fisher livelihoods – including social, environmental, and economic domains (Palmboom & Willems, 2014). The research indicates that effective care for mental health is not solely based on improving mental health policies, but it is built within holistic policy improvement at the local governance level. This issue is more than just health sector related as it is impacted by all sectors (Palmboom & Willems, 2014). Contributors of poor mental health lie within the social, environmental, and economic space. Hence, there is a need for parallel multidimensional policies in these sectors (Palmboom & Willems, 2014). For an effective response to the mental health of small-scale fishers, policies need to be transdisciplinary and encompass targeting multiple vulnerabilities. Change lies within this interconnected space (Armitage, et al., 2017). Figure 5.3 below showcases an example of a

multidimensional policy responses/frameworks. Integrated models of care like this are effective in giving individuals holistic, comprehensive, and specialized care. They consider and work to mitigate vulnerabilities and diverse contributors associated with the larger problem (Palmboom & Willems, 2014).

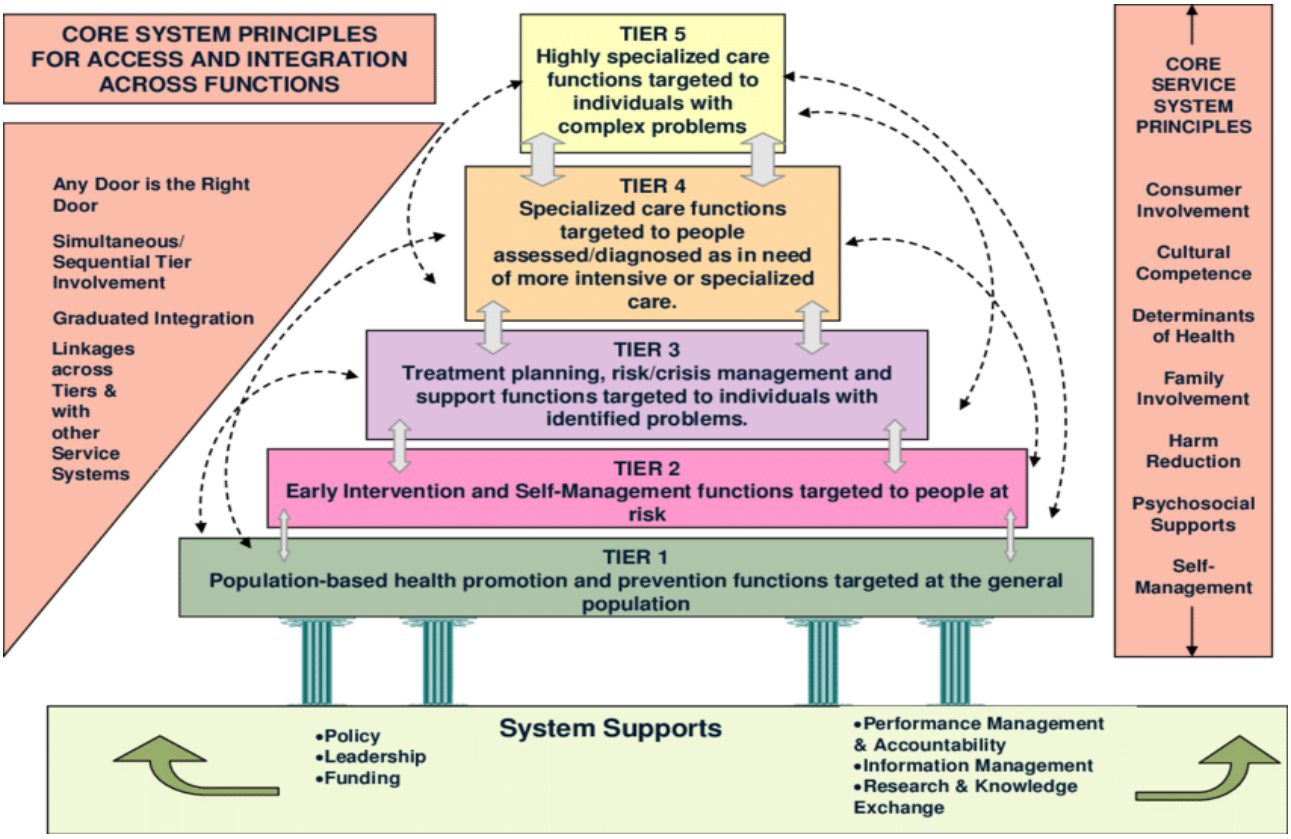

Figure 5.3 Integrated Tiered Policy Framework for addressing Mental Health Issues (Rush et al., 2014)

Predominantly, the research found that improvement in mental health comes by addressing the economic domain. This is because fishers dominantly and most frequently mentioned that lower income and inability to sustain livelihoods were their biggest cause of poor mental health, while similarly being the biggest negative impact of untreated mental conditions (Armitage, et al., 2017). The importance of income and financial stability is extremely high in the livelihoods structure of fishers and significantly impacts their health conditions (FAO, 2022). Hence, there is a need to prioritize this domain in the multidimensional approach to mental health care. Better regulation is necessary to increase the financial stability of fishers (Armitage, et al., 2017).

5.3.1 Improving Capture Fisheries Policies and Fisheries Management

The most effective way to improve and increase the financial stability of fishers is through capture fisheries policies. Predominantly, it is uncontrollable and volatile environmental changes that negatively affect fishers the most and causes further vulnerabilities. Hence, policies are needed to mitigate these negative impacts (Armitage, et al., 2017). Suggested domains for improvement in capture fisheries policies and fisheries management laws and governance includes threshold on fish price, or cap on its minimal price that matches the cost of living, implementing strategies that improve fish production, managing negative effects of sea mouth creation, methods to increase the biodiversity of lake and/or reduce negative effects of invasive species, etc. (FAO, 2002; FAO, 2016).

Capture fisheries management must be science-based, context-specific, based on inclusive, transparent, and multidisciplinary policies, and resulting in equitable plans and actions developed. Managers must use targets based on both biological and social science parameters. Local governments should draw on community knowledge to establish management objectives and regulations, to collect, analyze and evaluate data, and to monitor fisheries management effectiveness (FAO, 2022). Recognizing the small-scale fisheries' important role for food security and nutrition, economic development, protection of the environment and the well-being of people, the international community has adopted a legal framework for supporting sustainable fisheries. The basic international instrument is the United Nations Convention on the Law of the Sea (UNCLOS), adopted in 1982, which provides the legal framework for all maritime activities, including the conservation and utilization of living marine resources (FAO, 2022). It is recommended capture fisheries policies, and subsequent improvements in mental health care and policies be made, referencing this framework. It should be a guideline for future change.

With the sponsorship of FAO, several global instruments for fisheries management have been established. The Code of Conduct for Responsible Fisheries (the Code), adopted in 1995, provides detailed provisions for the responsible and sustainable management and use of living aquatic resources, with due respect for the ecosystem and biodiversity (FAO, 1995; FAO, 2021c). This code is probably the most cited, high-profile, and widely circulated and used global fisheries instrument after UNCLOS. In its framework, four international plans of action and six international guidelines for responsible fisheries management have been developed (FAO, 1995).

This includes the domains of Fisheries Management, Fishing Operations, Aquaculture Development, Integration of Fisheries into Coastal Area Management 26, Post-harvest Practices and Trade and Fisheries Research. There is also a section on special requirements of developing countries, which is additionally relevant to small-scale fisheries like those in Chilika Lagoon (FAO, 1995). The objectives of the code are outlined below, in Table 5.2 below. It is crucial policies governing mental health care in small-scale fisheries utilize the Code to guide best practices for improvement. This will result in culturally competent and tailored policy systems change.

Table 5.2 Objectives of The Code of Conduct for Responsible Fisheries (FAO, 1995)

The objectives of the Code are to:

a) establish principles, in accordance with the relevant rules of international law, for responsible fishing and fisheries activities, taking into account all their relevant biological, technological, economic, social, environmental and commercial aspects;

b) establish principles and criteria for the elaboration and implementation of national policies for responsible conservation of fisheries resources and fisheries management and development;

c) serve as an instrument of reference to help States to establish or to improve the legal and institutional framework required for the exercise of responsible fisheries and in the formulation and implementation of appropriate measures;

d) provide guidance which may be used where appropriate in the formulation and implementation of international agreements and other legal instruments, both binding and voluntary;

e) facilitate and promote technical, financial and other cooperation in conservation of fisheries resources and fisheries management and development;

f) promote the contribution of fisheries to food security and food quality, giving priority to the nutritional needs of local communities;

g) promote protection of living aquatic resources and their environments and coastal areas;

h) promote the trade of fish and fishery products in conformity with relevant international rules and avoid the use of measures that constitute hidden barriers to such trade;

i) promote research on fisheries as well as on associated ecosystems and relevant environmental factors; and

j) provide standards of conduct for all persons involved in the fisheries sector.

To continue, fisheries management includes three main steps in fisheries management: (i) data and information gathering and processing; (ii) assessment and production of management advice; and (iii) enforcement, monitoring and reporting of management measures. Capacity development initiatives are needed to cover all these processes (FAO, 2022). The importance of personalized approaches that can be implemented within the constraints of financial and human capacity limitations and the complex governance challenges for developing world fisheries cannot be overstated (FAO, 2022). For example, promoting complex models that are data-intensive and catered primarily to the developed world as the basis for determining fleet capacity for catch allocations has shown restrictions, as it is unrealistic for most of the world's fisheries, particularly inland and small-scale fisheries (Hilborn et al., 2020). Fortunately, previous research on capacity development in fisheries management has taught valuable lessons about what sort of processes are fundamental to increasing countries' capacity to achieve effective fisheries management (FAO, 2022). Table 5.3 further outlines strategic issues and solutions for solidifying the capacity of fisheries management.

Table 5.3 Key Issues and Solutions for Strengthening Fisheries Management Capacity (FAO, 2022)

Process	Problem	Solutions
Data and information gathering and processing	Inefficient or ineffective data and information collection, as well as non-accessible or unused available data due to lack of rigorous methodologies and suitable tools, insufficient human and financial resources, and weak technical capacities of institutions.	Develop tools and train staff in data management, exploration and curation (i.e. quality control) Develop cost-efficient data collection programmes to optimize limited human and financial resources. Promote and support participation of fishing communities in data gathering and interpretation. Facilitate technology and knowledge transfer in the collection of data and information. Ensure qualitative, expert-based information is rigorously collected and integrated.
Assessment and production of management advice	Need for fishery management plans to be highly participatory and consider the socio-economic, ecological and cultural contexts of fisheries and countries.	Develop tools and train staff in the use of suitable assessment approaches (e.g. data-limited, simple indicator-based methods). Support the development of practical management plans in line with the EAF and using co-management. Develop and promote the use of pre-agreed decision rules (e.g. harvest control rules). Improve decision-making through science–policy–industry dialogues.
Enforcement and monitoring of management measures	Weak enforcement and monitoring systems unable to ensure the effectiveness of management decisions.	Assess and strengthen technical capacities for compliance and enforcement Develop and promote innovative mechanisms for collecting compliance data, particularly for small-scale fisheries. Develop and implement monitoring processes to understand the social and economic implications of management actions.

NOTE: EAF = ecosystem approach to fisheries.
SOURCE: FAO.

This thesis reveals these key recommendations in environmental management and captures fisheries policies that governments can adopt and support, which will help fishers sustain their livelihood and maintain their income source – thereby, improving mental health outcomes as well (Hilborn et al., 2020).

5.3.2 A Need for Increasing Government Support for Mental Health

As mentioned earlier, Chilika Lagoon fishers indicated a lack of government support when it comes to mental health. There is a requirement for this to be increased, as the fishers themselves indicated a want and need for it. Qualitative data showed an overwhelming call for support and help from the fishers. Figure 5.4 shows fishers' responses when asked about the level of government support. Although majority of fishers were unsure what this means, a substantial 42% still indicated that there is a need for greater available help.

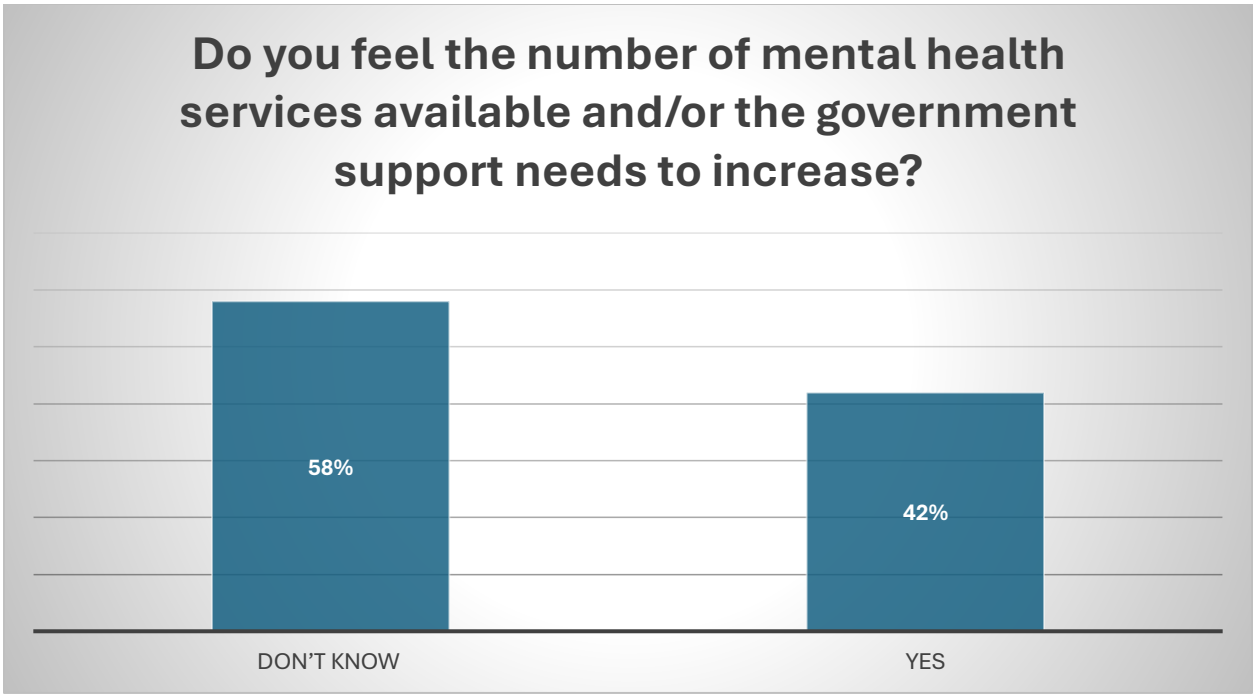

Figure 5.4 Fishers' response to need of Increased Government Support and Service for Mental Health

Government support should be increased through adequate policies, especially when it comes to negating the impact that environmental changes have on the income and livelihoods of small-scale fisheries (Armitage, et al., 2017). Better government policies are needed to address these effects, as a lack of financial stability has been consistently identified as a key contributor to poor mental health. There also needs to be an increase of general mental health care, services, and treatment available and provided by the government (Armitage, et al., 2017). Currently, there is a lacking existence of these services. The chart below shows fishers' responses when asked 'What barriers do you face when trying to access mental health services. This analysis indicates the above notion described, where small-scale fishers feel unsupported and unaware of their care options. 38% of fishers mentioned that there is no mental health care available, while 62% stated they had no idea what this means.

Overall, the response from fishers showcases that there is a wide need for increased support from the government in regard to supporting mental health. The provision of holistic health care of fishers is severely absent in this domain.

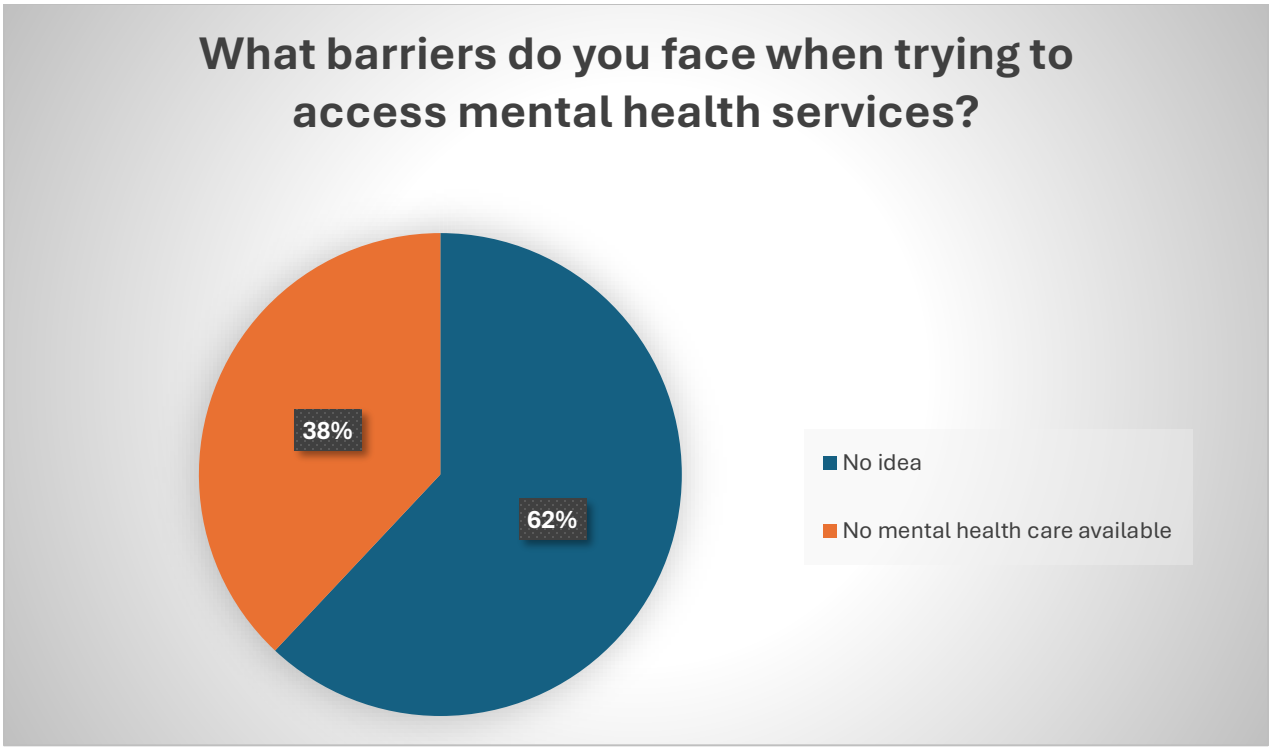

Figure 5.5 Understanding barriers to Accessing Mental Health Services in Small-scale Fisheries

Some predictions as to why 62% of fishers stated ‘don’t know’ is because of the taboo nature of mental health. It is unheard of and discussions on it might be non-existent in society. This would prevent fishers from being able to answer the question as they can’t speak on something they’ve never seen or used before. Furthermore, it should be noted that fishers cannot access services if they don’t exist and are unavailable, so this can also inhibit them from describing barriers. Hence, the data indicates that the true barriers that exist for fishers is that they have a lack of education and knowledge about mental health and any services that might exist, which prevents them from even trying to get help. Another issue that needs to be highlighted here is the issue of ignorance that is also present. It is not only the taboo nature of mental health that can affect the fisherfolk’s answers, but it is also ignorance on the topic that has influence. Fishers may have a lack of will or inability to focus on mental health due to a multitude of reasons, such as lack of knowledge, additional pressing personal or societal issues, or a lack of time (Szabo, 2020). This can reduce efforts inputted to provide improvements. Discussing mental health topics helps improve communities by making it more acceptable for those suffering from mental illnesses to seek help, learn to cope, and get on the road to recovery. Adequate mental health care requires community centered approaches (Szabo, 2020).

5.3.3 An Increase in Mental Health Knowledge of Fishers

Data indicated that there needs to be more mental health education and awareness given to small-scale fishers on the concept of mental health. What it is, the various forms of its prevalence i.e. types of mental illnesses, how to get help for it, different pathways for care, its negative impacts, etc. are all aspects that fishers should be educated on so they can have a greater understanding about this important part of their health (Sekhar, 2007). Table 5.4 below indicates how there is a current severe lack of knowledge about mental health, its policies, and its care within the Chilika Lagoon fishers' population. 82% of fishers stated no knowledge at all about the topic of mental health and 88% stated no knowledge at all about existing mental health services or policies. This overwhelming response to a lack of education on mental health in small-scale fisheries is vital to observe and improve on.

Table 5.4 Lack of knowledge about Mental Health in Small-scale Fisheries

Level of knowledge on the topic of mental health		**Level of knowledge on existing mental health services or policies**	
Response	**% of Fishers**	**Response**	**% of Fishers**
Very educated about topic	0	Very educated about topic	0
Fairly educated about topic	0	Fairly educated about topic	0
Little educated about topic	6	Little educated about topic	0
No education at all about topic	82	No education at all about topic	88
N/A	12	N/A	12

There are ample benefits of increasing knowledge and awareness about health-related topics. Patients are able to advocate for themselves if they are more educated about their own needs and the benefits of receiving good-quality care (Sekhar, 2007). This reduces a sense of helplessness and increases individual and community empowerment. Individuals should be educated about their health-related rights and what level of care is available for them (Kohrt et al., 2018). Mental health education helps to broaden perspectives and support a more empathetic response (Sekhar, 2007). It can reduce existing stigma and social backlash for taboo health topics, which can create more supportive environments. Mental health education also has positive economic impacts (Sekhar, 2007). The World Health Organization reports that the global economy loses $1.3 trillion in productivity due to people experiencing depression and anxiety (WHO, 2023). Hence, this research paper advocates for the conclusion that increased education about mental health is necessary and should be given to small-scale fishers.

When asked about how the government can help increase knowledge on mental health services and policies, 50% answered “Don’t know’ and 26% said that there is a need to create awareness among the community. Effective and innovative methods for increasing mental health education should be investigated and implemented. The solution needs to be built in educational policy and through greater advocacy efforts by community members, civil organizations and NGOs present in Chilika Lagoon. Best practices, practices and methods for increasing mental health education and awareness of fishers are showcased in Table 5.5 below. It gives examples of how to educate and teach fishers about mental health.

Table 5.5 Competencies for Community Mental Health Education & Care (Kohrt et al., 2018)

	Domains	Competencies	Examples
A.	*Partnerships and collaboration with service users, families, and other organizations*	• Engaging with service users and family members • Empowering services users for participation in community components • Engaging with other service sectors: physical health, education, livelihood, law enforcement, and social programs	• Community based participatory techniques (e.g., rural appraisal, participatory policy analysis, theory of change workshops with service users, PhotoVoice with service users) • Integration of maternal and child mental health into nutrition and reproductive health services • Integration of stress reduction and substance use risk reduction into the workplace • Integration of conflict reduction programs and peace programs into schools and communities • Training Crisis Intervention Teams (CIT)
B.	*Mental health literacy and attitudes*	• Teaching basic mental health literacy • Reducing stigma against persons with mental illness • Psychoeducation for specific conditions • Respecting the rights of persons with mental illness • Awareness and reporting of human rights abuses • Promoting social inclusion • Awareness of co-occurring and chronic illnesses	• Conducting individual, family, and community psychoeducation and mental health literacy programs (e.g., VISHRAM in India) • Designing radio program, street dramas, etc. • Training for inclusion based on United Nations Convention on the Rights of Persons with Disabilities for service users, service providers, and legal and law enforcement communities • Training on treatment of chronic illnesses based on the WHO Innovative Care for Chronic Conditions: Building Blocks for Action • Designing and implementing social contact interventions
C.	*Mental health promotion and mental illness prevention*	• Promoting hope, coping behaviors, and self-care • Training adolescents and adults on life skills • Delivering parenting programs • Promoting community policies and legislation for risk reduction	• Manualized interventions such as Life-training Skills, Good Behavior Game, and Classroom Based Intervention • Training caregivers about child development • Enforcing tax on alcohol and restricting access to firearms and pesticides • Addressing structural violence (exclusion) and direct violence
D.	*Identification of and service engagement for persons with mental illness*	• Ability to perform pro-active case finding, and/or universal or targeted screening • Facilitating treatment initiation and referrals to assure entry into care	• Community Informant Detection Tools (CIDT) for pro-active case finding • Using and interpreting validated screening tools • Using technology to facilitate referrals and monitor entry into care

5.3.3.1 Limitations to Data Collection and Analysis due to Lack of Knowledge

Due to a lack of knowledge on the topic of mental health, fishers answered ‘I don’t know’, ‘not sure’, ‘no idea’ or ‘N/A’ to many questions, multiple times. Hence, data collection was affected in its ability to be comprehensive and of high quality. The lack of knowledge can especially be seen in specific responses. For example, when asked about the negative effects of mental health on one’s livelihoods, fishers misunderstood that and gave examples of contributors to mental health instead. They were unable to understand the question or had zero knowledge about it. It is also noted that language barriers between the field researcher and the participants, also contributed to this lack of understanding. The most common answer given by fishers was ‘I don’t know’. This created difficulty in analyzing and understanding the data in regard to improving mental health care in SSF; however, alternately, it provided clear data on the need for

increased mental health education in small-scale fisheries. This common theme in the primary data collection and field research depicted overall how mental health is an unknown, unaddressed, and complex topic for Chilika Lagoon fishers.

5.3.4 Analysis of Chilika Fishers' Responses on How to Improve Mental Health Care

The household questionnaires administered to the Chilika Lagoon fisherfolk included a series of questions asking the participants how their mental health can be improved. When asked how fishers would define mental health care, 88% stated "Hospital" or "Mental Hospital". It is understood that fishers increasingly associated mental health care with the existence of 'mental health hospitals', as that is their current logic on receiving help for poor health. This indicates how fishers relate treatment processes for physical health and mental health to be similar. Hence, a rightful suggestion for the regular health care system (hospitals, doctors, medications, etc.) that fishers are familiar with, is to increase the provision of mental health services. The second most common answer from fisherfolk suggested that increased financial aid and support from the government would improve their mental health care needs. This relates back to the defined relationship between financial stability and mental health identified in small-scale fisheries. This is also seen in Figure 5.6 below which highlights the fishers' responses when asked **'What is the biggest contributor to improving your mental health**?'. All answers were related to the economic dimension of increasing financial support and income levels. There was also overlap within the fishers' answers as they had similar views on this topic of improving mental health. This thesis recommends that local governance improve the capture fisheries policies that will effectively regulate and protect small-scale fishers from economic, social, and environmental vulnerabilities that affect their fishing capacity and therefore increase their financial stability. Local governance policies should support and build the financial stability of fishers, which will, in turn, be a strong first step to improving their mental health care.

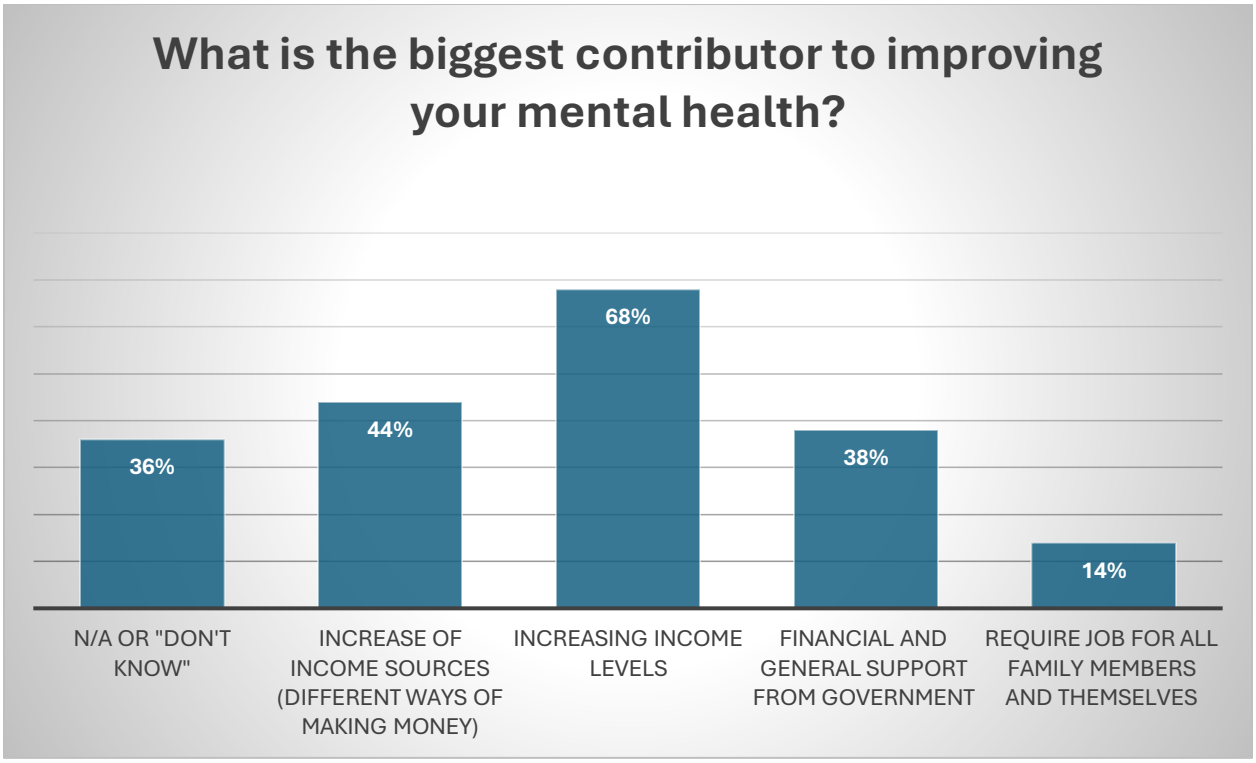

Figure 5.6 Understanding Effective Ways to Improve Mental Health from the Perspective of Fishers' Needs

The household questionnaires asked additional open-ended questions about methods to improve mental health care, such that the fishers' perspectives, thoughts and individual needs could be discovered. However, the overwhelming response to these questions was "don't know", "no idea" or "no knowledge". For example, when fishers were asked 'What are the **most valuable** mental health services that would help Chilika Lagoon?' in the questionnaire, 76% stated "don't know or no knowledge". 18% stated "not any mental health service", and 6% stated "mental health care in hospital". This indicates a further lack of mental health education and awareness in small-scale fisheries. In response to the question 'What changes in Chilika Lagoon can be made to help access mental health services?', majority of fishers (68%) stated "don't know/ can't say". 14% stated "insurance and other financial support from government", 12% said "stop benami prawn farming", 12% proclaimed the need to "stop non-fishers" and 8% stated "Sufficient fish production, increase of fish variety price rate". Out of the 50 household surveys, only 5 responses related to mental health - 3 fishers mentioned to "add mental health care facilities" and 2 stated "mental health hospital". These responses indicated a lack of mental

health knowledge but also how changes in the Chilika Lagoon fishing communities need to be related to increasing the fisher's financial capacity. Fishers once again related financial circumstances to mental health levels in their responses. It is interesting to note that the changes fishers stated were associated with stopping factors that decreased their fish catch/income, and not related to mental health services. This reinforces how small-scale fishers understand mental health through a financial lens.

Similarly, the responses to the open-ended question "What actions can the local government take to help with improving mental health of the community?" indicated the same conclusions revealed from the above two questions. 60% of respondents stated, "don't know". The responses from the remaining 20 fishers were associated with impacts on income levels. 18% indicated "support from government to fisherman family", 16% discussed answers related to "Loan for all fishers/fisherman family" / "Increase income source" / "other income source", 12% stated "increase awareness", 10% said "create mental health hospital", 4% "proper justice for fisherman family" and finally 8% of fishers stated answers such as "Stop the non-fishers from fishing" and "compensation for damaged boats by cyclone". Again, most actions suggested for improving mental health care are either related to the ability of effectively conducting fishing activities which are affected by environmental and social vulnerabilities; or related to increasing financial competence and security. But there is a call to notice the 12% who indicated a need for raising mental health awareness. This sheds light on how fishers are also understanding their critical need to increase capacity in this domain.

5.3.5 Existing Best Practices for Responding to Mental Health Care Needs

Addressing poor mental health is crucial not only for psychological well-being but also for maintaining overall physical health (Smallhorn-West, 2022). Seeking professional help, practicing stress management techniques, maintaining a healthy lifestyle, and building a strong support system are important steps in promoting mental and physical well-being (Smallhorn-West, 2022). It's important to note that the relationship between mental and physical health is complex and bidirectional. This section discusses the best practices for mental health care analyzed from the literature and discovered from the data collection.

Access to high-quality primary health care is imperative for mental and physical well-being. Various policies and programs have been introduced to increase access to primary care for residents (Demyttenaere et al., 2004). However, people with mental health problems and illnesses continue to experience challenges in accessing and receiving high-quality primary care (Smallhorn-West, 2022). A social justice approach that examines the reasons for inequitable primary care among this population and seeks to address this inequity through policies and programs can help to ensure that people with mental health problems and illnesses receive the health care to which they are entitled as a human right (Fernandes et al., 2021; Smallhorn-West, 2022).

In the context of national efforts to strengthen mental health, it is vital to not only protect and promote the mental well-being of all, but also to address the needs of people with mental health conditions (Smallhorn-West, 2022). According to the World Health Organization, this should be done through community-based mental health care, which is more accessible and acceptable than institutional care, helps prevent human rights violations and delivers better recovery outcomes for people with mental health conditions (WHO, 2023). Community-based mental health care should be provided through a network of interrelated services that comprise (WHO, 2023):

- mental health services that are integrated into general health care, typically in general hospitals and through task-sharing with non-specialist care providers in primary health care.
- community mental health services that may involve community mental health centers and teams, psychosocial rehabilitation, peer support services and supported living services; and
- services that deliver mental health care in social services and non-health settings, such as child protection, school health services, fisheries management, workplace environments, prisons.

The vast care gap for common mental health conditions such as depression and anxiety mean countries must also find innovative ways to diversify and scale up care for these conditions, for example through non-specialist psychological counselling or digital self-help (WHO, 2023).

The “Comprehensive mental health action plan 2013–2030", aims to improve mental health by strengthening effective leadership and governance, providing comprehensive, integrated, and responsive community-based care, implementing promotion and prevention strategies, and strengthening information systems, evidence, and research (WHO, 2022). This research paper calls on the National Governance of India as well as the local governance of Odissa to accelerate the implementation of the action plan in its small-scale fisheries, especially its largest: Chilika Lagoon. The paper argues that all countries can achieve meaningful progress towards better mental health for their populations by focusing on three “paths to transformation” (WHO, 2022):

- deepen the value given to mental health by individuals, communities, and governments; and match that value with commitment, engagement, and investment by all stakeholders, across all sectors.
- reshape the physical, social, and economic characteristics of environments – in homes, schools, fisheries/workplaces, and the wider community – to better protect mental health and prevent mental health conditions; and
- strengthen mental health care so that the full spectrum of mental health needs is met through a community-based network of accessible, affordable, and quality services and supports.

WHO gives particular emphasis to protecting and promoting human rights, empowering people with lived experience and ensuring a multisectoral and multistakeholder approach (WHO, 2023). It is imperative that the community continues to work nationally and internationally – including in humanitarian settings – to provide governments and community partners with the strategic leadership, evidence, tools and technical support to strengthen a collective response to mental health and enable a transformation towards better mental health for all (WHO, 2022). Creating supportive environments, fostering community engagement, and promoting mental health awareness and education are essential to improve mental well-being and reduce the impact of social vulnerabilities on mental health (WHO, 2023).

Within the context of best practices for mental health care in Chilika Lagoon, it was hoped that the research data collection (household questionnaires) would shed valuable light on this. However, due to lack of mental health knowledge and awareness in fishers, the data collection

was limited. It was difficult to uncover what the specific, culturally competent needs of fishers were as the response to many of these questions was “don’t know”, “no idea”, “can’t say”, etc. This was discussed in 5.3.3. However, despite this limitation in data collection, there were some areas of improvement identified through data analysis of the questionnaire answers. Prioritization for addressing these basics is vital to effective mental health care in SSF (OECD, 2021). They are outlined below and can be seen as the current best practices for care in Chilika Lagoon. These aspects are the ultimate current needs of the fishing community, as summarized by the data.

1. **More mental health education and awareness** through public and private educational systems and policies. There should also be greater spreading of awareness in society through informal dialogues and discussions. Conducting regular outreach programs to raise awareness about mental health issues, reduce stigma, and promote mental well-being can be very effective. This can include workshops, seminars, and campaigns in local communities. Education is needed on mental health but also on the rights fishers have, and policies that govern their livelihoods.
2. **Creation of additional local, accessible ‘Mental health hospitals’** – this was the answer fishers stated the most when asked what type of care or service would benefit them the most. When asked “what is your definition of mental health care” to fishers, 88% said “Hospital/ Mental Hospital” and 18% stated, “don’t know”. Integrating mental health services into primary health care settings can make them more accessible to people in need. This involves training primary care providers, such as family medicine doctors, in basic mental health screening and treatment.
3. **Better Capture Fisheries Policies and Fisheries Management –** these are imperative in helping fishers mitigate negative impacts on income levels that may arise from their vulnerable social-economic systems. Fishers specifically asked for support to stop benami/venami prawn farming and stop non-fisheries. Policies that better govern fishing activities, fish price rate, supply chain models, etc. As well, policies and protocols that provide aid to fishers when disaster strikes are needed. An example of this is compensation for boats destroyed in cyclones.

4. **Policies should be targeted specifically to the domain of poverty-driven mental health** – Low-income levels and inability to sustain the basic livelihood needs of oneself/their family is a main driver of poor mental health outcomes. There needs to be increased efforts in providing fishers with income outlets other than fishing (Allison & Horemans, 2005). Diversifying employment opportunities in the lagoon will reduce the reliance on fishing as their sole income source, and hence provide fishers with resilience if fishing activities decline and income is negatively impacted (Allison & Horemans, 2005). This will also mitigate the negative effects of migration.
5. Efforts should also be made to **reduce the negative impacts of a deteriorating climate** on fishers. Environmental vulnerabilities, such as reducing lagoon biodiversity, invasive species, impact of non-fishers and tourism, overfishing, etc. need to be addressed.
6. **Increased government support –** increased levels of financial and general supports were widely requested by fishers. Better governance of the harsh loan processes and high-interest rates fishers encounter is needed. Collaborating with non-governmental organizations (NGOs) such as NIRMAN and community-based organizations can help in reaching marginalized populations and providing targeted mental health support.
7. **Increased research and data collection for mental health in Chilika -** investing in mental health research and data collection can help in understanding local mental health needs, evaluating the effectiveness of interventions, and guiding policy decisions. Due to limited knowledge of fishers and studies in this domain, the research conducted indicates a need for future work to be done (OECD, 2021).

These practices, when implemented together as part of a comprehensive mental health care strategy, can contribute significantly to improving mental health outcomes in Chilika Lagoon (Zhao, 2020; WHO, 2023). Additionally, as stated above, more accessible data on SSF mental health care is needed (Zhao, 2020). This research paper is advocating for more documentation, data collection, and data transparency from organizations. It argues that more data and education can help stakeholders better understand and advocate for improved mental health policies and programs (Fusch & Ness, 2015). It is important to create inclusive and participatory governance structures that engage marginalized communities and promote social cohesion can have positive impacts on mental well-being (Zhao, 2020).

Lastly, the need for a multidimensional approach in policymaking is emphasized. Mental health care response for SSF cannot be solely embedded in health policy (Fiori & Denckla, 2012). The response must be built within a socioeconomic and environmental aspect to be more effective in providing adequate mental health care. Figure 5.7 below shows how good quality mental health care is embedded within the various thematic areas of health care and sustainable livelihoods (Fiori & Denckla, 2012). This is because, as discussed in Chapter 4, mental health itself is a multidimensional vulnerability, whose contributors lie in the economic, social and environmental domains. Policies need to be built within the sustainable livelihoods framework. Proactive policy (e.g. creating mental health treatment, diagnosis and support centers) is needed more than reactive policy (Fiori & Denckla, 2012). The paper recommends that these ideas are the best practices for improving mental health outcomes in small-scale fishers. This will increase and build the resilience of SSF and therefore aid in transitioning from vulnerability to viability.

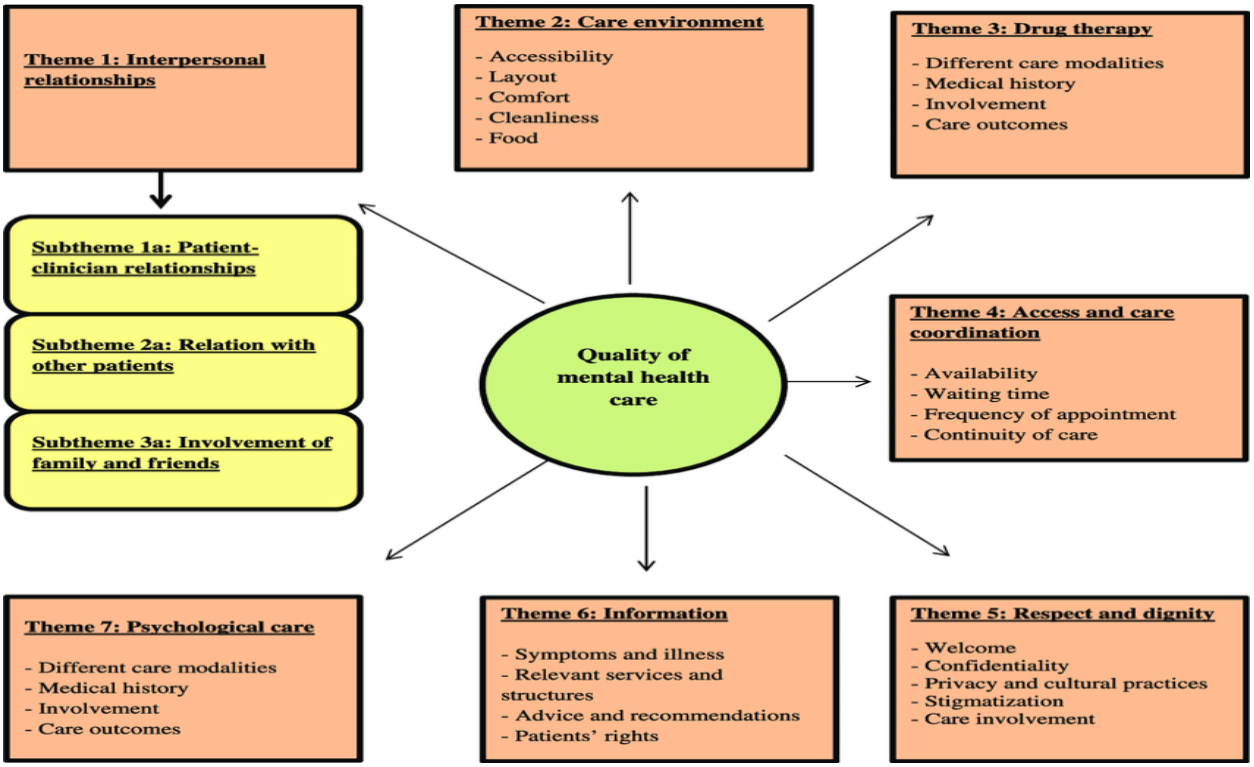

Figure 5.7 Conceptual Framework for Understanding Contributors to Quality of Mental Health Care (Fernandes et al., 2021)

5.3.5.1 Focusing on Economic Policies to Improve Mental Health of Fishers

The qualitative data showcased a need to increase the financial capability of fishers. This sector is critical to address in policy change because of how fishers understand mental health is strongly associated with the economic dimension. Low financial status means bad mental health for them and likewise, high financial status means good mental health. The data indicated that fishers vastly equated their mental health to income level and financial stability. Hence, there is an overwhelming need for stronger policies in this domain as data indicated it is the most important one to target. Money is strongly tied with sustainable, happy livelihoods (Krumer-Nevo, 2005). The majority of answers given by fishers during the qualitative questionnaire revolved around either having a lack of financial stability or the need for increased income. This is explained by Maslow's hierarchy of needs. Maslow describes how human behavior relies first on full-filling the basic and highest-priority needs that are essential for survival (Benson & Dundis, 2003). When this is full-filled, then only one can focus on other higher-level priorities such as self-esteem and self-actualization – both aspects that aid in supporting and improving one's mental health (Benson & Dundis, 2003). This model for understanding human needs explains why helping fishers gain financial stability that successfully allows them to meet their basic needs, is a first step necessity for providing better mental health care and improving their mental health (Benson & Dundis, 2003).

The occupation of small-scale fishers relies heavily on the environment and thus it is vital to create policy change that helps mitigate the negative impacts of a volatile environment on the income capacity of fishers (Devaraj & Vivekanandan, 1999). There is a need for better capture fisheries policies that protect fishers and the environment that sustains their livelihoods income (Krumer-Nevo, 2005). Regulation for the activities of fishing fleets to better protect the socioeconomic rights of local fishers should be incorporated. Policies should also help fishers cope with invasive species, tourism, non-fishing activities, lack of fish biodiversity, reduced fish price rate, etc. that currently negatively impact their finances (Devaraj & Vivekanandan, 1999). Solutions should be investigated to help give fishers more options for making money, and therefore increasing their financial stability (Devaraj & Vivekanandan, 1999). Discovering additional income sources for fishers when fish catch is low can also help to reduce migration of fishers during off seasons (Krumer-Nevo, 2005). This will aid in reducing the negative social impacts migration has on families and communities, especially woman, and their consequential

mental health (Benson & Dundis, 2003). Addressing the correlation between mental health and economic vulnerabilities requires comprehensive approaches that tackle socioeconomic inequalities, promote fair economic opportunities, provide access to affordable healthcare and mental health services, and address social determinants of mental well-being (Krumer-Nevo, 2005).

This importance of focusing on economic policies is showcased in literature but can also be supported by the qualitative data collection of this research. The answers for when fishers were asked about how happiness levels in Chilika Lagoon can be increased, overwhelming matched the fishers' responses for what contributes the greatest to their economic vulnerabilities. This is a very interesting, distinctive analysis that arose from the data. The similarity in the responses further established the connection between low financial levels and mental health. The most common answer (46% of fishers) was requesting full support from the government. This need was discussed in 5.3.2. If vulnerabilities are mitigated, it would increase their financial security and ability to sustain their livelihoods. Fishers described how the government should take constructive steps for Chilika Lagoon as well as for fishers, highlighting a want for better capture fisheries policies for the land they are dependent on and emotionally connected to. Figure 5.8 below displays the fishers' responses in more detail.

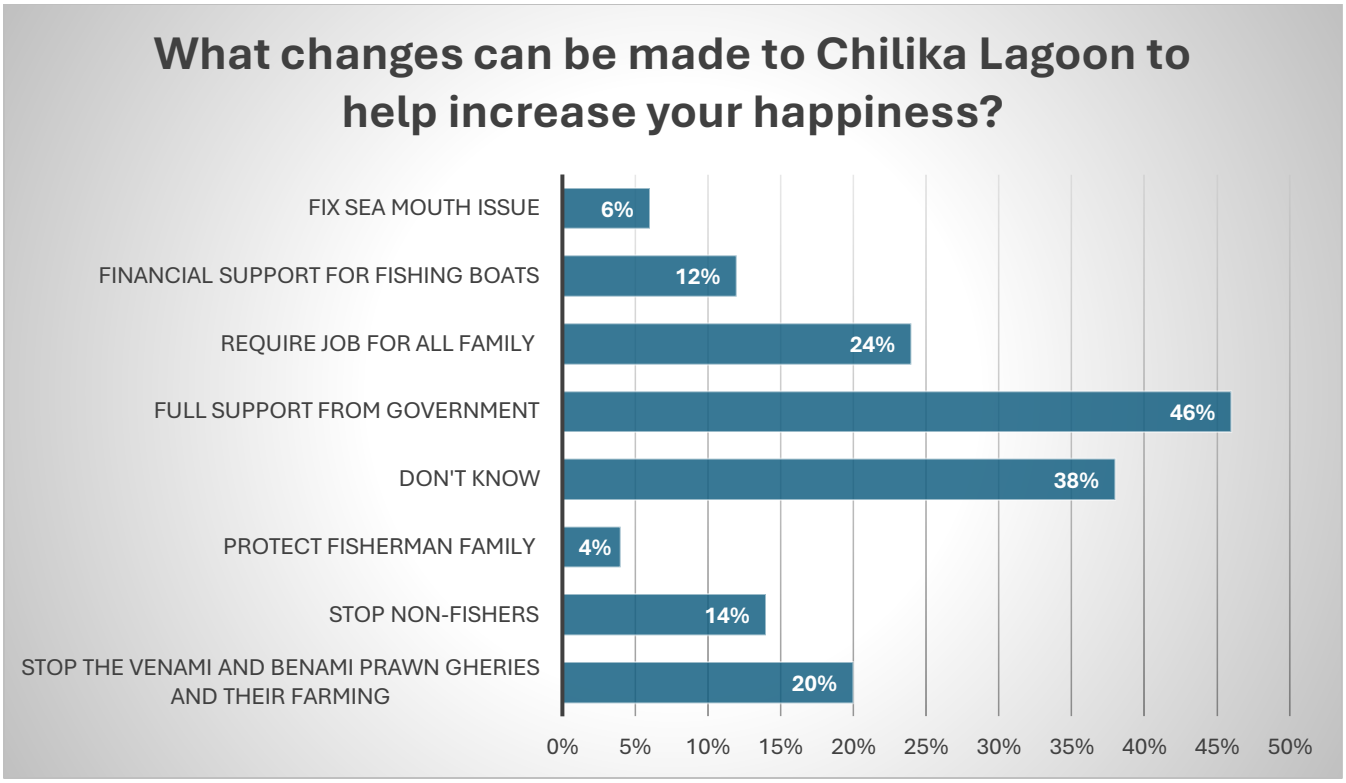

Figure 5.8 Fishers Responses to Changes in Chilika Lagoon that will Help Increase their Happiness

5.3.6 Necessity of Building Change within Governance and Policy Change

Policy is an extremely effective pathway for transformative change as revolution needs to be built within public policy for everlasting change (Zhao, 2020). This research aims to make note of the importance of using policy reformation for sustainable, long-term solutions (Natarajan, Newsham, Rigg, & Suhardiman, 2022). As a result, this thesis offers policy recommendations and places a significant emphasis on discussing comprehensive governance, a perspective that diverges from the current norm. Mental health as being linked to other dimensions and realms of literature is non-existent right now (Fusch & Ness, 2015). Hence, this research is unique because it takes a more transdisciplinary approach by showing the interconnectedness of mental health with social, economic and environmental dimensions of life (Fiori & Denckla, 2012). It argues that a holistic perspective of care is needed for mental health care improvements in small-scale fisheries (Natarajan, Newsham, Rigg, & Suhardiman, 2022).

A key recommendation of this paper in terms of governance is highlighting the necessity of including small-scale fishers' voices, perspectives and thoughts in policy making and decision-making platforms. It is imperative to increase cultural competency in policy making and ask the target population what they need (Smallhorn-West, 2022). Fishers have been marginalized and excluded for far too long. They are the most vital stakeholder and hence their voice needs to be at the planning and implementation tables/stages. This aspect also helps to build resilience, which is essential to increase the viability of small-scale fisheries (Smallhorn-West, 2022). To involve SSF in planning decisions, it is suggested to create a strategic planning committee which allows them to share their voice and feel empowered when it comes to discussing improvements for mental health care in small-scale fisheries. There needs to be increased government funding to support the meaningful engagement of civil society and rights holders, or to facilitate community leadership, education, and organizing around systemic issues (Smallhorn-West, 2022). This will aid in supporting and empowering advocates and rights holders to meaningfully participate in identifying systemic mental health issues, barriers and crafting innovative solutions (Institute of Health Metrics and Evaluation, 2023; Smallhorn-West, 2022).

Mental health intervention is placed everywhere, not just in mental health policies. It requires a multidimensional approach to tackle it, starting with improvements in providing financial stability to fishers (Fiori & Denckla, 2012). It is difficult for fishers as their surroundings are modified due to actions out of their control. This adds complexity to the situation as finding solutions to pressing issues on their own is harder, especially since they are not causing the problem (Sekhar, 2007). The issues affecting their livelihoods are a result of government regulations or global contributions to increased climate change (Szabo, 2020). This reduces their resilience and increases vulnerability, as fishers struggle with the lack of control and feeling of disempowerment over their situation and the factors that affect their mental health (Sekhar, 2007). Hence, it is imperative to advocate for higher-level solutions for these vulnerable populations in small-scale fisheries. It is proposed that the government assimilate fishers in policy and decision-making models and create accessible channels for voicing grievances (Sekhar, 2007). Furthermore, these policy recommendations and foundations for solutions can and should be applied to not just Chilika Lagoon but all small-scale fisheries in Asia and Africa

(OECD, 2021). Box 5.1 below captures the major recommendations for improving mental health care in small-scale fisheries, through a multifaceted approach and multidimensional response.

Box 5.1 List of Major recommendations to improve mental health care provision in small-scale fisheries, as uncovered by the data collection

Major Recommendations
Increased Research and Data Collection for Mental Health in Chilika: Investing in mental health research and data collection is needed to better understand local mental health needs, evaluate the effectiveness of interventions, and guide policy decisions.
Deepen the Value given to Mental Health by Individuals, Communities, and Government: This value should be matched with commitment, engagement, and investment by all stakeholders, across all sectors. This will also reduce the taboo nature of mental health conversations. Social inclusion of mental health discussions needs to be integrated into society, such that those individuals battling poor mental health can feel more comfortable and supported.
Creation of Community-Based Mental Health Care: According to the World Health Organization, community-based mental health care, which is more accessible and acceptable than institutional care, helps prevent human rights violations and delivers better recovery outcomes for people with mental health conditions. Mental health services should be integrated in general health care and in community support systems. There is a need to advocate for a larger number of accessible, available mental health treatment services in hospitals and community health care systems. This involves training and hiring additional mental health care professionals who can provide care within the cultural context of SSF communities.
Growth in Educating Fishers about Mental Health and Awareness: Data indicated that there needs to be more mental health education and awareness given to small-scale fishers on the concept of mental health. What it is, the different types of mental illnesses, how to get help for it, pathways for care, wide array of negative impacts, etc. are all aspects that fishers should be educated on so they can have greater understanding about this important part of their health. The goal is to also combat any influence existing ignorance has on fishers and their ability to learn about health topics.
Building Change within Governance and Public Policy: Policy is an extremely effective pathway for transformative change as change needs to be built within public policy for everlasting change. This research aims to make note of this importance and highlight the necessity for using policy reformation for sustainable, long-term solutions. It is imperative to empower and include fishers' voices when initiating & building culturally competent change. Community members should be included in decision-making models.

Increasing Government Support Allocated for Mental Health: Chilika lagoon fishers indicated a lack of government support when it comes to mental health. Fishers indicated a need for this to be improved in the form of better governing policies and an increase in mental health care, services, treatment options, etc. available and accessible to fishers.
Improvement of Capture Fisheries Policies and Fisheries Management: research found that improvement of mental health comes by addressing the economic domain should be prioritized. This is because fishers dominantly and most frequently mentioned that lower income and lack of ability to sustain life's necessities, were their biggest cause of poor mental health. Capture fisheries policies and fisheries management should be used to mitigate negative impacts on fishing capacity, which is what fishers primarily rely on to support their livelihood.
Focus on Solutions related to Poverty-Driven Mental Health: Low-income levels and inability to sustain oneself/their family is main driver of poor mental health outcomes. Policies for diversifying fishers' means of livelihood should be investigated and implemented. This thesis advocates for a focus on progressing economic policies to improve mental health of fishers.
Application of a Multidimensional Approach: The research indicates that effective care for mental health is not solely based in improving mental health policies, but it is built within holistic policy improvement and local governance level of the social, economic, and environmental domains that affect fishers' livelihoods. A multisectoral and multistakeholder approach is required for effective improvement of mental health care in small-scale fisheries.

5.3.7 Transitioning from Vulnerability to Viability by Improving Mental Health Care Policies

This research shows how mental health be used as a mechanism and tool for the transition of Chilika Lagoon and its fishers from vulnerability to viability. Mental health as being linked to other aspects and realms of literature is currently non-existent (Institute of Health Metrics and Evaluation, 2023). Hence, this research is unique because it takes a more transdisciplinary approach by presenting the interconnectedness and holistic response needed for mental health care improvements and solutions. This is key to note as vulnerability to viability is a spectrum – hence, improving government response and support regarding mental health care will push fishers to the viability end of the spectrum. Strong mental health is correlated with strong overall well-being. As shown in Figure 5.9, the V2V transition requires a community-centred, multidimensional approach that implements governance change in environmental, economic, social, and cultural domains.

Figure 5.9 Vulnerability to Viability Visualization (Dias et al. 2023; Nayak and Berkes, 2019)

5.4 Conclusions and Chapter Summary

This chapter discussed and shared results associated with full-filling *(O3) specifying the negative impacts mental health has on the livelihoods of small-scale fishers* ***and*** *(O4) providing a set of recommendations that inform on best practices for improving mental health care in SSF, and advice public agents to create viable, holistic local governance response in policy, society, and community.*

The negative impacts of poor mental health on the livelihoods of small-scale fishers were described. It was showcased, through the qualitative data and secondary literature sources, how the effects of poor mental health can also negatively impact fishers at the social, economic and environmental level. The economic level is where fishers felt most negatively affected. However, the detrimental consequences of mental health are interconnected, in the sense that a negative impact in one domain can cause a negative impact in another. For example, mental health negatively impacting one's relationships with loved ones can then in turn lead to lower productivity levels, which ultimately negatively impacts their ability to work and generate income.

Furthermore, this chapter suggests a response to the mental health ideas examined in Chapter 4. It discusses how policy and governance be used to respond to and create better mental health policies for small-scale fisheries. Noting the multidimensional nature of mental health, this chapter argued that the correct place for positive change in mental health care is in interconnected, multidimensional space not just in the health sector (Fiori & Denckla, 2012). Topics such as increasing government support, increasing education and awareness levels in regard to mental health, and discovering what can be done at the policy or government level, were explored. Literature from World Health Organization and other academic articles were analyzed to reveal best practices in responding to mental health care needs of fishers. The need for sustainable change to be built within the public policy space was also emphasized. It was revealed that currently there is a severe lack of mental health services in SSF. This thesis advocates for an increased number of accessible and available mental health treatment options for fishers. The chapter investigated how mental health care can be improved by creating policies in this interconnectedness/transdisciplinary space of health care and public policies. There is an

importance placed on improving environmental and economic policies that will protect fishers and their financial capacity (Fiori & Denckla, 2012).

Providing mental health care must be multidimensional, specifically focusing on bettering capture fisheries policies because of the strong link between financial security and mental health – which was a major finding of this paper. Change must be embedded in policy and practice to be sustainable (Fiori & Denckla, 2012). Through policies – education and awareness about what mental health is and how to get help is necessary (Zhao, 2020). Mental health is usually not talked about on the local level in small-scale fisheries, like Chilika Lagoon and so the community has little to no knowledge of this topic. Mental health can also be hidden in other physical issues, which may serve as a barrier for community members to receive the care they need. For a better response to the care needs of fisheries, transformative and holistic policy change is necessary (Drew & Funk, 2010). Fishers should be empowered to participate in decision-making processes at the local and national levels. Their perspectives on innovative, long-standing, resilient and effective change that will better their livelihoods as well as the communities should be understood and accentuated, in the planning and implementation processes (Sekhar, 2007). Improving mental health outcomes of small-scale fishers through a multidimensional governance approach will transition them from vulnerability to viability, by reducing the negative consequences that begin from poor, untreated mental health (Fiori & Denckla, 2012).

Chapter 6: Conclusions and Recommendations

6.1 Thesis Summary

"There is hope, even when your brain tells you there isn't." — John Green

This research thesis set out with the main goal of understanding how improving the mental health care of small-scale fishers, through policy change and governance, can push fishers from vulnerability to viability. Strong mental health of a population is an instrumental tool in reducing their vulnerabilities and building their resilience. Greater access and quality of mental health care is needed for holistic well-being of marginalized populations such as small-scale fisheries. Understanding the existence of mental health in the context of small-scale fisheries is an understudied domain, thus this research hoped to shed more light on this important aspect of wellbeing. Small-scale fishers residing in the Chilika Lagoon, India, are vulnerable to social, economic, and environmental dimensions. However, vulnerability provides an opportunity to bring change. This transformation can be brought through innovative ideas, planning and implementation. The thesis investigated the drivers of mental health and its subsequent negative effects. It defined mental health as a multidimensional vulnerability, and advocates for a multidimensional, innovative approach to improving mental health care be established by non-government institutions/organizations, or the government. Fishers must be empowered, and their voices need to be emphasized in the process of bringing positive change. In this chapter, these ideas will be explored further. A summary of key findings, conclusions and contributions of this thesis, recommendations for increasing viability of fishers, and the direction for future research is presented.

Through the literature review, gaps in small-scale fisheries and mental health literature were identified. Poor mental health outcomes were exacerbated by the COVID-19 pandemic, and so research in this field was more necessary than ever. The thesis comprised of 4 objectives. Firstly, it aimed to understand the current perception of mental health in Chilika Lagoon fishers and define mental health as a multidimensional vulnerability in SSF communities. Before discovering solutions, it is important to explore how mental health exists in the minds of fishers and prevails in small-scale fisheries. This objective aimed to comprehend how fishers understand mental health in their surroundings. The second objective involved uncovering the

influential drivers that contribute to mental health prevalence in small-scale fishers. Understanding what the driving factors are that influence poor mental health can provide guidance for where mental health care resources and solutions should be focused. Objective 3 had the goal of specifying the negative impacts mental health has on the livelihood of small-scale fishers. This objective further highlighted the importance of mental health care solutions and the need for research in this domain. It showcased how poor mental health negatively hinders the livelihoods of fishers, thus reducing their ability to move towards viability. Lastly, the thesis was used to provide a set of recommendations that inform on best practices for improving mental health care in small-scale fisheries. Once a deeper dive was taken into understanding the overall problem, the thesis hoped to answer, "what are the solutions?". Presenting learnings from this research was used to advise public agents of best practices in mental health care, such that a viable, holistic local governance response in policy, society, and community can be created.

This thesis presented an empirical investigation of the vulnerabilities, livelihood, and well-being of Chilika lagoon fishers, in regard to mental health and pathways to its improvements. The thesis began with the introduction, which described the background of the study, its purpose and significance, objectives and research questions, methods, and limitations. Then, a literature review was presented, which defined the key concepts, terms, and theories that guide the research. Literature domains included social, ecological, and economic vulnerabilities along with the transition to viability; mental health and well-being; and governance and policy structures in association with better care provision. It dived deep into the effects of these vulnerabilities on livelihood from a non-physical perspective as well as how mental health care delivery and uptake can be enhanced. A key theme throughout the literature review was how improving mental health can transition small-scale fisheries from vulnerability to viability. A conceptual framework for directing the research was shown. Peer-reviewed articles, papers and reports as well as grey literature found on online academic databases were reviewed. The third chapter was about methods. It stated the methodology used for the research and throughout the study to fulfill the objectives and research question. The steps taken with the qualitative research approach to obtain data through semi-structured household questionnaires and conduct the research were outlined in depth, as well as why qualitative research methods were the most effective choice. After this, the results were

discussed in chapters 4 and 5. They elaborated on the key findings of the research, which were in line with achieving the concrete, desired objectives. Chapter 4 provided insight into the current understanding of mental health by Chilika Lagoon fishers, uncovered drivers of poor mental health, and defined mental health as a multidimensional vulnerability. Chapter 5 focused on discussing the negative impacts of mental health and creating a set of practical guidelines or responses to improve mental health policies and care. Finally, the conclusion chapter gives an overview of the individual findings from the research, the implications in academia and beyond, and suggests future actions steps that can be taken to continue help moving SSF from vulnerability to viability.

6.2 Key Insights

6.2.1 Objective 1

understand the current perception of mental health in Chilika Lagoon fishers, and define mental health as a multidimensional vulnerability in SSF communities.

Through analysis of the household questionnaire data and supplemented with secondary literature, it was discovered that majoritively fishers understood mental health through the lens of financial stability and outcomes (Trani & Bakhshi, 2017). Data indicated that for fishers, financial status and mental health are a direct correlation. If financial levels are high, it would mean good mental health. Likewise, if financial status is low, it means bad mental health. Primary Data Analysis concluding extremely low mental health education and awareness levels of fishers, along with their emotional connection to Chilika Lagoon as their only option for a home and gratitude for it as the provider of livelihood, explained this understanding. The phenomena of Poverty-Driven mental health and Maslow's Hierarchy of Needs were discussed in relation to its effect on the habitants of Chilika Lagoon (Allison & Horemans, 2005; Haddadi & Besharat, 2010; Islam & Chuenpagdee, 2022; Weeratunge, et al., 2014). 96% of fishers did not feel financially secure and were affected by this experience. Fishing capacity and subsequently financial instability is impacted by socioeconomic and environmental domains of livelihood (Islam, 2011). Living in SSF, fishers understand the means needed for their livelihood to succeed. They also know that until they can fulfill their life's basic necessities, they cannot focus on higher-level needs such as mental health (Hopper, 2020). This further enforced the

financial lens depicting their understanding of mental health, with it being directly correlated to and impacted by income levels (Cánovas-Molina & García-Frapolli, 2022).

A comparative analysis was conducted on the most common vulnerabilities faced by small-scale fishers and the most common factors contributing to the mental health of fishers. Analysis showed an 86.5% similarity in this data and thereby confirmed that existing vulnerabilities do contribute to mental health vulnerability and vice versa. With this notion in mind, mental health as a multidimensional vulnerability was defined in small-scale fisheries such as Chilika Lagoon. Through analysis of data, it was showcased with examples of how mental health is embedded in social, economic, environmental and governance vulnerabilities (Donohue & Biggs, 2015). These domains are interconnected and occur simultaneously. Multidimensional vulnerabilities such as Mental Health are driven by intersecting dimensions of inequality, socioeconomic development pathways, and climate change and climate change responses (United Nations, 2018). Vulnerability depends on the structures in society that trigger or perpetuate inequality and marginalization—such as income-poverty, location, governance, and multiple dimensions of inequality. It is vital to note that these vulnerabilities intersect, influence, and exist with each other (Adger, 2006). Economic vulnerabilities often intersect with other forms of vulnerability, such as gender, race, ethnicity, disability, climate change, and social marginalization. These intersections can compound the impact on mental health, as individuals may face multiple barriers to economic opportunities, social inclusion, and healthcare access (Alvidrez & Barksdale, 2022). This multidimensional lens was also seen when analyzing how Chilika lagoon fishers understand mental health. It is an aspect that is integrated with and impacted by all domains of their life.

This objective and its findings emphasized that mental health needs to be understood from the perspectives of the target population, Chilika Lagoon Fishers, as well as a multidimensional vulnerability. Only with this understanding can effective responses to mental health issues be discovered.

6.2.2 Objective 2

uncovering the influential drivers that contribute to mental health prevalence

Qualitative research data received from household questionnaires was thematically analyzed to gain key findings for this objective. In the survey, fishers were asked what the largest contributor to poor mental health was for them, and **100% of respondents** said it was low fish catch, meaning lower income levels. Main contributors of poor mental health in small-scale fisheries can be further categorized in three domains: social, economic and environmental. Social contributors included poor relationships with family or community members (lack of time spent with loved ones), weak attachment to village people, lack of socialization, inability to maintain family health or educate children, increase in prevalence of non-fishers, feeling deprived of rights and disturbances of social cohesion. Economic contributors included low fish production/ shortage of fish, low fish price/rate, lack of government support, increase in non-fishers, no other income source available than fishing, increased expenses, lack of loans available or loans with unsustainably high-interest rates, forced migration out of Village. The economic vulnerabilities revolved around aspects that led to low income, which further reduced livelihoods and increased negative mental health outcomes. Lastly, environmental vulnerabilities included natural disasters (especially cyclones and floods destroying homes), adverse effects of climate change causing lagoon degradation, reduced biodiversity, increases in invasive species such as prawn gheries, negative effects of benami prawn farming and cultivation, pollution (air and water quality decreasing due to industrial development), agricultural drainage, sea mouth creation and widening and tourism. Economic vulnerabilities identified by fishers for affecting mental health, also align with those that reduce their ability to fish and income made from fishing. It is important to note this vital finding from research – the impact that income level has on the mental health of fishers. Understanding the significance of financial status as a contributor to deteriorating mental health will guide a more effective focus and approach for policy creation and resource allocation. This finding shows the importance of building solutions that target poverty-driven mental health, and how it should be further investigated for effective implementation.

6.2.3 Objective 3

specifying the negative impacts mental health has on the livelihood of small-scale fishers

Poor Mental health can significantly reduce the quality of life of individuals (WHO, 2023). Untreated mental health conditions can result in unnecessary disability, unemployment, substance abuse, homelessness, inappropriate incarceration, poor quality of life, and ultimately suicide. The negative impacts of poor mental health on the livelihoods of small-scale fishers were discovered through secondary literature sources and qualitative research. Negative impacts in the social dimension involved stigmatization and discrimination, strained personal and familial relationships, reduced social participation and integration, substance abuse, increased crime, decreased physical and community wellbeing. Negative impacts highlighted in the economic dimension included reduced work productivity, loss of employment or inability to hold stable jobs, reduced innovation, increased migration, reduced economic participation, reduced education levels, and a negative impact on economic development in small-scale fisheries but also globally. Poor mental health can significantly impact the income level of fishers. Lastly, negative impacts in the environmental dimension are increased pollution, neglect of personal environment, disconnection from conservation efforts, environmental degradation, resource overconsumption and fishing neglect. These impacts are important to note as fishers depend largely on their environments to sustain their livelihoods. Hence, any impact on these processes can be detrimental for small-scale fisheries.

Key results of this objective included how the effects of poor mental health can also negatively impact fishers at the social, economic and environmental levels. The economic level is where fishers felt most negatively affected. However, the detrimental consequences of mental health are interconnected, in the sense that a negative impact in one domain can cause a negative impact in another. For example, mental health negatively impacting one's relationships with loved ones can then in turn lead to lower productivity levels, which negatively impacts their ability to work and make money. It was also found that a high majority of fishers also believed that poor mental health reduces the quality of life. The interconnectedness of negative impacts of mental health adversely impacting the livelihoods of fishers was a crucial finding from this thesis.

6.2.4 Objective 4

providing a set of recommendations that inform on best practices for improving mental health care in SSF, and advise public agents to create viable, holistic local governance response in policy, society, and community

The key findings of this thesis discussion were on how policy and governance can be used to respond to and create better mental health policies for small-scale fisheries. Noting the multidimensional nature of mental health, it was revealed that the correct place for positive change in mental health care is in the interconnected, multidimensional space - not just in the health sector. Key findings for improving mental health care included increasing government support, especially through financial investments, increasing education and awareness levels in regard to mental health, building change within the public policy space, increasing research and data collection, including fishers' voices and perspectives when initiating policy change, and most importantly, creating effective pathways to increase the overall financial capability of fishers. There is also a need to advocate for a larger number of accessible, available mental health treatment services in hospitals. This involves training and hiring additional mental health care professionals who can provide care within the cultural context of SSF communities. The research revealed that currently, mental health services are severely lacking in small-scale fisheries. An accurate diagnosis is often the first critical step towards receiving appropriate care and treatment. Clinicians must be supported to identify, diagnose and understand mental, behavioural and neurodevelopmental disorders, to ensure more people are able to access the quality care and treatment they need. Mental health care can be improved by creating policies in this interconnectedness and transdisciplinary space of health care and governance. There was an emphasis on improving environmental and economic policies that would protect fishers and their financial capacity. Specifics of these findings and recommendations are discussed in section 6.3 below.

Providing mental health care must be multidimensional, specifically focusing on capture fisheries policies because of the strong link between financial security and mental health – was a major finding of this paper. Change must be embedded in policy and practice to be sustainable. Through effective policies – education and awareness about what mental health is and how to get help is necessary. Mental health is usually not talked about on the local level in small-scale

fisheries, like Chilika Lagoon and so the community has little to no knowledge on this taboo topic. For a better response to the care needs of fisheries, transformative and holistic policy change is necessary. Fishers should be empowered to make and participate in innovative, long-standing, resilient and effective change that will better their livelihoods as well as the communities. Their voices and perspectives should be included in the planning and implementation processes. Key discoveries of this thesis involved understanding that healing needs to be a proactive, all-inclusive approach. Improving mental health outcomes of small-scale fishers through a multidimensional governance approach will transition them from vulnerability to viability, by reducing the negative consequences beginning from poor, untreated mental health.

6.3 Contributions and Recommendations

All around the world, the core challenges consistently compromising the right to health are political inaction coupled with a lack of accountability and funding, compounded by intolerance, discrimination and stigma (WHO, 2024). Populations facing marginalization or vulnerability such as small-scale fisheries, suffer the most. Inaction and injustice are the major drivers of the global failure to deliver on the right to adequate mental health care (WHO, 2024). This research study aims to inspire a call to action, by contributing to the literature on mental health and governance, to improve the provision of care in small-scale fisheries. After an in-depth thematic analysis of 50 household questionnaires administered to small-scale fishers, it was discovered that currently, as an initial step, it is not improving health care policies that SSF and fishers need but **it is an improvement in capture fisheries policies**. The immediate need of fishers involves getting support to sustain their income. This is the unique position and contribution this thesis makes to literature. This thesis advocates for a change in how mental health care is approached. Provision of care must take a multidimensional form, encroaching improvements in policies that govern social, economic, and environmental domains, and not one based solely focused in the health sector (Fiori & Denckla, 2012). This is the shift in perspectives that is needed and supported by the data collected in this research study.

Research data widely showcased that fishers' mental health is majorly influenced by their financial status and income levels. Small-scale fishers are affected by poverty-driven mental health issues. Hence, it is recommended that instead of health policy, fishers require better

environment and capture fisheries policies. This is because improvements in these policies are what will target the root causes and contributors of poor mental health outcomes. The ability to sustain their livelihoods comfortably and financially is what affects the mental health of small-scale fishers. This effect can be rationalized by Maslow's Hierarchy of Needs, which explains how one must sustain their basic needs for living before moving onto higher level needs and thinking (McLeod, 2007). Because of the vulnerable and marginalized position of small-scale fisheries, individuals residing in them are only able to currently focus on the first level of basic needs. Policies and frameworks of supportive care must help fishers sustain their livelihoods, as that is the fishers' main priority (Islam, 2011). Subsequently, the connection is made that the ability to meet basic needs is what predominantly affects fishers' quality of health (Fiori & Denckla, 2012).

Environmental factors predominantly affect the income levels of fishers as the economic activities of small-scale fisheries relies heavily on the environment (Iwasaki, Razafindrabe, Shaw, 2009). Hence, this paper recommends that environmental policies be improved, as they are necessary to improve mental health of fishers. Hearing the thoughts and perspectives of the fishers through the household questionnaires reinforced this concept. SSF do not operate on the same basis that Western ideals do, hence their needs are different as well. Hence, this paper supports the idea that helping fishers in middle to low-income countries is different than how help is given to individuals in developed countries (Ghosh, Pattnaik, Ballatoire, 2006). It was originally believed that improvement in health policies specifically was needed to improve mental health care. Conversely, this research contributes to the idea that small-scale fisheries are an example of poverty-driven mental illness/issues. Through data analysis and research, it was discovered that the key to improving mental health in SSFs is improving their financial security and income status. This thesis offered clarity on how fishers are subject to and victims of poverty-driven mental illness. The data reinforced the connection that financial position is what currently dictates the mental health status of fishers.

Recommendations from this research paper are vast and concrete. Firstly, an improvement in laws that govern and protect fisheries from non-fishers, climate change, widening of sea mouth, and additional vulnerabilities is required. Environmental and capture fisheries laws that help fishers maintain their income was highlighted as a strong solution (Iwasaki, Razafindrabe, Shaw,

2009). Examples include better governance to improve fish production and creating systemic change to reduce the impact that environmental factors, i.e. low biodiversity, low fish catch, effects of natural disasters, etc., have on fisher livelihoods. Furthermore, it is recommended to evaluate and improve the threshold on fish price, to match global inflation rates and economic markets. A cap on how low the fish rate can go, that matches the cost of living in small-scale fisheries, can provide financial security. Another recommendation is to engage fishers on conversations that help discover ways to diversify their income sources (Béné et al., 2011). Currently, small-scale fisheries rely solely on fishing activities, and this increases their vulnerability (Sekhar, 2007). Hence, government funding, support and policies are needed to expand employment opportunities and economic prosperity in small-scale fisheries. This will also help solve other social issues such as forced migration. It can help keep families together and social relations strong (Sekhar, 2007). It was stated that positive social relations with the community are important to fishers, hence impacting their mental health outcomes. Through the data, it was noted that fishers primarily asked for government support in these aspects, not in health policy aspects. They want protection for supporting their livelihood which is fishing. It is also essential to note that more research is needed to discover methods for effectively improving capture fisheries policies. It is recommended that research be conducted on which capture fisheries policies will be most beneficial for fishers, and how they can be implemented successfully.

To continue, there is a need to increase the quantifiable number of health treatment services, as that is severely lacking right now (WHO, 2022). This thesis recommends a need for increasing the prevalence of doctors and fully staffed mental health care institutions. Many fishers stated that they believe there is no treatment provided for mental health or if it does exist, they are unaware of it. So yes, there is a physical need for improving the healthcare systems and policies when it comes to providing effective mental health care (WHO, 2022). But this thesis research highlighted that effective care for fishers goes beyond just the "number of mental health services". A community-centered, multidimensional approach to mental health care will be most beneficial to fishers (FAO, 2022). This research emphasizes the notion that policy change is needed to reduce the contributors that cause mental health in SSF. This proactive process (building systems to prevent poor mental health) is equally important as a reactive one (treating mental illnesses once they arise). Through qualitative research, it was discovered that helping

fishers build their financial capacity is a solution to mental health care just as much as better mental health care treatment centers. This idea is a crucial contribution to the literature on reducing vulnerability and increasing viability in small-scale fisheries (Kolding, Bené, Bavinck, 2014).

Another main conclusion of this paper is that there is a need to increase education and awareness on the topic of mental health topic. Fishers need more knowledge to understand what they need and the levels of support present. This will increase resilience and move fishers to viability, which is a main overlying purpose of this research. Currently, as seen by the qualitative data and the discussion with fishers, there is a need for mental health support within the community. However, due to a lack of education on the topic and subsequent lack of knowledge, there is no awareness among fishers on their own mental health needs. Household questionnaires indicated that fishers are able to describe mental health as "feelings", but not in greater detail than that. The qualitative data showed a lack of knowledge and awareness on such issues. More knowledge sharing and education needs to be done through involvement in the curriculum of schooling systems or through increased conversations in society (Buck & Deutsch, 2014). A main recommendation resulting from this paper is the need for educating small-scale fishers on topics of mental health and holistic well-being as well as spreading awareness. This thesis also highlights the need for greater mental health research and investigation in the SSF context, in academic fields. There needs to be an advancement in the push for mental health resources in Chilika and therefore a push for creating mental health care. The goal is to promote the translation of mental health care best practices evidence into effective policies that enhance population health and well-being from a multidimensional lens (WHO, 2024). Key objectives for this include:

1. Efficiency and Synergy: Streamlining research efforts in Knowledge Translation (KT) and Evidence Informed Practice (EIP).
2. Strategic Funding: Directing research funding toward identified priority areas.
3. Effective Approaches: Enhancing understanding of evidence use for policymaking.
4. Collaboration: Promoting cross-sectoral collaboration in KT and EIP research.
5. Awareness: Championing for evidence-informed policymaking at all levels (WHO, 2024).

Moreover, another recommendation is to conduct further research on how resilience can be improved and built-in small-scale fisheries. Finding solutions and effective methods for this can help fishers cope with everyday instabilities that they are forced to face and are out of their control. Many small-scale fishers live in precarious, volatile situations, that are susceptible to change (Szabo, 2020). These shifts impact and fluctuate income levels of fishers as well. Hence, resilience is a necessary tool to reduce vulnerabilities. The adaptive nature of resilience can move small-scale fisheries closer to viability (Szabo, 2020).

Overall, this research paper strengthens the notion that the solution to improving mental health in small-scale fisheries is not solely an improvement in the provision of mental health services or policies; but requires a multidimensional approach to improve the laws and policies that protect and govern fishers' livelihood as well as income levels. This includes environmental and capture fisheries laws. It involves the social, economic, and environmental dimensions that contribute to mental health outcomes in small-scale fisheries (Donohue & Biggs, 2015). This thesis is a primary step recommendation and contributes to research that is at the intersection of small-scale fisheries and mental health. This is not a full, secure solution but a first stride in the right direction, for improving the mental health of fishers and positively transitioning from vulnerability to viability.

6.4 Directions for Future Research

Everyone deserves access to quality, timely and appropriate health services, without being subjected to discrimination or financial hardship (WHO, 2024). This paper displays an important and widespread need for continued and improved future research within the two research fields of mental health and small-scale fisheries literature. Learnings from this thesis can be used to direct and guide future research in the intersecting domains, in a more effective manner. It is just the beginning of this type of multidimensional research. A strong suggestion for future work is to ensure research is culturally competent and actively involves fishers' voices in decision-making models. Future research in this underrepresented side of literature should prioritized using qualitative research methods such that fisher perspectives are included. It is also recommended to conduct more research on bottom-up governance approaches for holistic, multidimensional mental health care. Government strategies must consider the long-term impacts of short-term or immediate responses. The general plans and policies require social, economic,

and environmental viability in Chilika Lagoon to be incorporated. Potential research could also involve a greater focus on certain vulnerabilities presenting in a specific age group, gender, education level, or economic status of fisherfolk. Increased research will support in truly moving small-scale fishers to complete viability. To expand coverage, an additional US$ 200–328 billion a year is needed globally to scale up primary health care in low- and middle-income countries. Progress has shown to be possible where there is political will (WHO, 2024). Recommendations for future research include investigating the most effective way to allocate funding and resources to the different domains of mental health care, such that it yields the greatest number of positive outcomes in populations.

Overall, it is clear from existing literature that mental health as a multidimensional vulnerability in SSF is a novel field of research (Satumanatpan & Pollnac, 2017). There is currently a lack of research conducted on this juncture. Therefore, there is little information on how mental health and its associated concepts exist in the context of SSF. However, this interdisciplinary research conducted aims to close gaps and create knowledge in this lacking field (Jentoft & Chuenpagdee, 2009). It is time that a holistic perspective for well-being in SSF is taken, as the constantly changing social, political, economic, and environmental circumstances locally and globally, increase the vulnerability of fishers (Armitage, Charles, Berkes, 2017). This problem of volatility showcases the growing needs of fishers, and further highlights the importance of the thesis purpose statement. Individuals, communities, and civil society have a right to mental health. By breaking down barriers and advocating for equity, improving access to healthcare services can occur care (WHO, 2024). This thesis appeals for the urgency of increased mental health awareness in small-scale fishers, so that they may know, protect and promote their mental health rights, including those related to safe and quality.

The audiences that will potentially benefit from and find the study of interest include individuals and researchers in scholarly literature, practice and policy. The study will be significant to academic researchers studying small-scale fisheries as it fulfills a current gap in this field of research (Aguilar-Perera et al., 2017). Hence, scholars can use this study as a baseline and guiding paper for similar future endeavours on mental health care and policy. This can help increase the wealth of knowledge available and also reduce any hesitations individuals may have on initiating such research (Satumanatpan & Pollnac, 2017). This study focused on

improving mental health care through a multifaceted governance approach and thus can be beneficial to policymakers in governance and civil society/institutions. This will add to resources for creating and implementing effective policies in social, economic, and environmental domains (Armitage, Charles, Berkes, 2017). Policy leads to practice and hence, this research will help individuals responsible for the implementation of mental health care practices and interventions (Armitage, Charles, Berkes, 2017). The purpose of this research is to create guidelines and recommendations that aid in improving the livelihood outcomes of individuals in SSF. Hence, it will be applicable to a wide range of audiences, especially those working to deliver better mental health care (Satumanatpan & Pollnac, 2017). The significance of this research also lies in its possible to benefit target audiences receiving in need of care, i.e. fishery communities in Chilika Lagoon but also internationally. This study is generalized enough that it can extrapolated to aid small-scale fisheries globally.

Mental health should be recognized as a human right —and a defining feature of this right is the meaningful participation of rights holders in health policy decisions that affect them (Satumanatpan & Chuenpagdee, 2015). The Western world and global organizations such as WHO are already moving towards this notion. In systemic reviews of mental health issues and solutions, there needs to be additional government funding allocated to support the meaningful engagement of civil society and rights holders or to facilitate community leadership, education, and organizing around complex, systemic issues (Zhao, 2020). Federal funding programs to encourage and empower advocates and rights holders to meaningfully participate in identifying systemic mental health care provision issues and crafting solutions is needed (Zhao, 2020). In the absence of a funding program, there is little to no capacity for individuals, non-governmental organizations, or other community organizations to advance systemic claims and exercise their rights to be part of the policy-making decisions for improving mental health care. This requires an urgent remedy to ensure envisioned equitable and equal access to care (WHO, 2024). "Realizing the right to health requires governments to pass and implement laws, invest, address discrimination and be held accountable by their populations," said WHO Director-General Dr Tedros Adhanom Ghebreyesus (WHO, 2024). Governments, partners, and communities need to make meaningful investments, and emphasize transparency and accountability - to ensure the highest attainable standard of health is achieved for vulnerable populations. WHO supports countries to legislate the right to health across sectors and integrate human rights into health

policies and programmes (WHO, 2024). This support aims to make health services available, accessible and responsive to the needs of the populations they serve and to increase community participation in health decision-making (WHO, 2024).

In conclusion, this thesis intended to shed light on the prevalence of mental health in small-scale fisheries, by defining it as a multidimensional vulnerability, as well as uncover contributors and negative impacts of poor mental health. It hoped to establish the need for multidimensional, multifaceted approaches and frameworks to effectively improve mental health care in small-scale fisheries. This thesis also serves as a recommendation that there needs to be greater focus and work done in this field. It aims to showcase a necessity for future, ongoing research to be conducted on this interdisciplinary intersection of mental health, governance, and small-scale fisheries. Mental health research, awareness and education must continue forward in academic circles as well as in discussions with small-scale fishers. It is important to help fishers increase their knowledge. By recognizing the interdependence between mental health and other domains of livelihoods, this research thesis calls for action in finance, aquaculture, environment, justice, labour, political and social affairs. For a population struggling to sustain their livelihood, financial security can have many positive effects, and be the push needed to improve mental health. Hence, greater research and advocacy on the role of increasing financial capacity to improve mental health outcomes in small-scale fisheries needs to be investigated. Only with holistic well-being can fishers truly move from vulnerability to viability.

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Appendices

Appendix A: Household Questionnaire

Title: Improving Mental Health Care in Small-Scale Fisheries: A Chilika Lagoon Case Study

Name of the Field Researcher:

The following demographic questions are asked to gain background information that can help us better understand your specific situation within the community context. This will help understand your perspective, your viability and its influence on the capacity of responding to vulnerabilities.

Demographic Questions:

1. What is your full name?

2. What is your age?

3. What is your address?

4. What is the gender you most identify with?
    a. Male
    b. b. Female
    c. Other
    d. Do not want to Answer

5. What FISHER Caste are you part of?

6. What is your place of Origin?

7. How long have you lived in Chilika Lagoon?

8. What is your highest level of education?

9. Please select your level of religious involvement/beliefs
    a. very religious
    b. religious sometimes
    c. not religious at all

10. What is your relationship status?
    a. Single
    b. Married/Common Law
    c. Divorced/Widow
    d. Other

11. Do you have any children? If so, how many:

12. What is your primary occupation?

13. Are you happy living in Chilika Lagoon?

a. Yes
b. No

Please Explain:

_____

_____

_____

14. Does small-scale fishing pay for your living expenses? What is your annual income?

15. Do you feel financially secure? **Why?**

Contributors and Drivers of Mental Health:

1. What **factors** in Chilika Lagoon have affected your family's livelihood? **Please describe them:**

2. What **social factors** in Chilika Lagoon have affected your emotions/feelings? **Please describe them:**

3. What **economic factors** in Chilika Lagoon have affected your emotions/feelings? **Please describe them:**

4. What **<u>environmental factors</u>** in Chilika Lagoon have affected your emotions/feelings? **Please describe them:**

5. **How do your emotions change** because of your surroundings? What thoughts do you have?

6. What is the biggest contributor that **worsens mental health**?

7. Throughout your life, have you had a family member or loved one die?

8. How would you describe your childhood?
    a. Very good
    b. Fairly good
    c. Very bad

Please state Why:

_____

_____

9. Do you feel you have secure and safe housing? **Why?**

10. Do you have an existing physical illness? **Please describe:**

11. How much do you agree that bad mental health will reduce the quality of life?
    a. Strongly Agree
    b. Agree 50%
    c. Neutral
    d. Do Not Agree 50%
    e. Strongly do not agree

Please state Why:

_____

_____

_____

12. What **social negative impacts (on everyday living)** do you think come from bad mental health? Please list:

a.

b.

c.

13. What **economic negative impacts (on everyday living)** do you think come from bad mental health? Please list:

a.

b.

c.

14. What **environmental negative impacts (on everyday living)** do you think come from bad mental health? Please list:

a.

b.

c.

Exposure to Mental Health Issues:

1. What is your definition of mental illness?

2. Please select if you relate strongly with any of the following feelings or experiences:

a. Sad all the time
b. Thinking about dying
c. Low energy levels, laziness, sleeping a lot, or hard to get out of bed in morning
d. No motivation, no hope for better future
e. self hate, feel ashamed, withdrawing from family and friends
f. High-stress levels and lots of worrying
g. Difficulty in focusing on job or other activities
h. Quickly changing mood, or having lots of anger
i. Increased alcohol drinking or not wanting to eat food
j. Hallucinations
k. Any other feelings you have:

3. Please explain how having these feelings has impacted your everyday living?

4. How do you think bad mental health contributes to bad physical health?

5. Do you think bad mental health leads to lower income/ effects your financial status? **Why?**

6. Do you think your community is less accepting / thinks bad about people with mental disorders? Does this prevent you for trying to get mental health help? **Why?**

7. What do you do when you need mental health care or help?

8. What barriers do you face when trying to access mental health services?

Recommendations for Improvements in Mental Health Care:

1. What is your definition of mental health care?

2. What is the biggest contributor to **improving your mental health**?

3. What are the **most valuable** mental health services that would help Chilika Lagoon? List all.

4. What **changes** in Chilika Lagoon can be made to help **access** mental health services?

5. What is your level of knowledge on mental health services available?
    a. Very educated about topic
    b. Fairly educated about topic
    c. Little educated about topic
    d. No education at all about topic

6. What is your level of knowledge on mental health policies?
    e. Very educated about topic
    f. Fairly educated about topic
    g. Little educated about topic
    h. No education at all about topic

7. **How can** the government help **increase** your knowledge on mental health services and policies? **Please explain:**

8. Do you feel the number of mental health services available and/or the government support needs to increase? **Please explain:**

9. What actions can the local government take to help with improving mental health of the community? **Please explain:**

10. What changes can be made to Chilika Lagoon to help increase **your happiness? Please explain:**

11. Do you feel an improvement in capture fisheries policies and/or protecting the fishers from environmental factors will help in improving mental health? **Please explain how:**

12. What benefits do you believe will come to the community from good, easy to access mental health care?

13. If there are any other thoughts about mental health or mental health services, please share.

The researcher will conclude by asking if there is anything else the participant would like to add to this questionnaire before ending this session. They will also sincerely thank them for their time and openness.

*Note to researcher: if you feel that the participant is in danger or facing a severe mental health issue, through their responses, i.e., may be facing intense and immediate suicidal thoughts, please get in touch with mental health medical professional, as soon as possible. It is not your duty to intervene or share this information with anyone else, except the medical professional. If help is needed in contacting a medical professional, please let the lead researcher know through mentioning the participants unique ID CODE. The participant should also be informed that you will share this information with a medical professional only. In extreme and immediate cases, please call 112.

Appendix B: Ethics Clearance

UNIVERSITY OF WATERLOO

Notification of Ethics Clearance to Conduct Research with Human Participants

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Principal Investigator: Prateep Nayak (School of Environment, Enterprise and Development)

Student investigator: Astha Priya (School of Environment, Enterprise and Development)

Research assistant: TBD (Vulnerability to Viability)

File #: 43757

Title: Improving Mental Health Policies in Small-Scale Fisheries

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The Human Research Ethics Board is pleased to inform you this study has been reviewed and given ethics clearance.

Initial Approval Date: 09/12/22 (m/d/y)

University of Waterloo Research Ethics Boards are composed in accordance with, and carry out their functions and operate in a manner consistent with, the institution's guidelines for research with human participants, the Tri-Council Policy Statement for the Ethical Conduct for Research Involving Humans (TCPS, 2nd edition), International Conference on Harmonization: Good Clinical Practice (ICH-GCP), the Ontario Personal Health Information Protection Act (PHIPA), the applicable laws and regulations of the province of Ontario. Both Boards are registered with the U.S. Department of Health and Human Services under the Federal Wide Assurance, FWA00021410, and IRB registration number IRB00002419 (HREB) and IRB00007409 (CREB).

This study is to be conducted in accordance with the submitted application and the most recently approved versions of all supporting materials.

Expiry Date: 09/13/23 (m/d/y)

Multi-year research must be renewed at least once every 12 months unless a more frequent review has otherwise been specified. Studies will only be renewed if the renewal report is received and approved before the expiry date. Failure to submit renewal reports will result in the investigators being notified ethics clearance has been suspended and Research Finance being notified the ethics clearance is no longer valid.

Level of review: Delegated Review

Signed on behalf of the Human Research Ethics Board

Karen Pieters

Karen Pieters, Manager, Research Ethics, karen.pieters@uwaterloo.ca, 519-888-4567, ext. 41495

This above named study is to be conducted in accordance with the submitted application and the most recently approved versions of all supporting materials.

Documents reviewed and received ethics clearance for use in the study and/or received for information:

file: Recruitment Script_Household Questionnaires_Version 2.docx

file: Recruitment Letter_Global Survey_Version 2.docx

file: Household Questionnaire Example_Chilika Lagoon_Version 2.1.docx

file: Global Survey Example_V2V Countries_Version 2.1.docx

file: Consent Letter_Household Questionnaires_Version 2.docx

file: Consent Form_Global Survey_Version 3.docx

file: Household Questionnaire Oral Consent Script_ Version 2.docx

file: ParticipantFeedback&AppreciationLetter_Version2.docx

Approved Protocol Version 4 in Research Ethics System

This is an official document. Retain for your files.

You are responsible for obtaining any additional institutional approvals that might be required to complete this study.