

Navigating vulnerability and viability with an intersectional lens: the case of small-scale fisheries of Chiloé, Chile

by

Nayadeth E. Arriagada Oyarzun

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Doctor of Philosophy

in

Social and Ecological Sustainability

Waterloo, Ontario, Canada, 2026

© Nayadeth E. Arriagada Oyarzun 2026

Examining Committee Membership

The following served on the Examining Committee for this thesis. The decision of the Examining Committee is by majority vote.

External Examiner	Dr. Abigail Bennet Department of Fisheries and Wildlife, Michigan State University
Supervisor(s)	Dr. Prateep Kumar Nayak, Professor, School of Environment, Enterprise and Development, University of Waterloo
Internal Member:	Dr. Derek Armitage, Professor, School of Environment, Resources and Sustainability, University of Waterloo
Internal Member:	Dr. Andrea Collins, Associate Professor, School of Environment, Resources and Sustainability, University of Waterloo
Internal-external Member	Dr. Jessica Blythe, Associate Professor, Environmental Sustainability Research Centre, Brock University

Author's Declaration

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Statement of Contributions

I am the sole author of Chapters 1 and 5 of this dissertation, which was written under the supervision of Dr. Prateep Kumar Nayak. Chapters 2, 3, and 4 are co-authored manuscripts, and I am the lead author of all three. Chapter 2 was co-authored with Dr. Andrea Collins, Dr. Jessica Blythe, Dr. Derek Armitage, and Dr. Prateep Kumar Nayak. It is currently under review. Chapter 3 and Chapter 4 were co-authored with Dr. Andrea Collins, Dr. Jessica Blythe, Dr. Derek Armitage, and Dr. Prateep Kumar Nayak, and both are currently under preparation for submission.

Chapter Two

Arriagada, N., Collins, A., Blythe, J., Armitage, D & Nayak, P.K. (2026) “From women's vulnerability to multidimensional gendered vulnerability in SSF: challenges and opportunities for a feminist approach”. Under review in *Coastal Studies and Society*.

Chapter Three

Arriagada, N., Collins, A., Blythe, J., Armitage, D & Nayak, P.K. (2026). “Men and women's differential experiences of vulnerability in SSF: A multidimensional case study from Chiloé, Chile”. (Under preparation for submission).

Chapter Four

Arriagada, N., et al. (to be determined). "We empower each other": Gendered agency and empowerment dynamics in female small-scale fisheries in Chiloé, Chile. (Under preparation for submission).

Abstract

This dissertation explores the multidimensional gendered dimensions of women's and men's vulnerability-viability experiences in small-scale fisheries (SSF) in Chiloé, Chile, through three specific objectives: 1) to critically assess how gender is conceptualized within the vulnerability literature on SSF, and to develop a more nuanced framework for understanding multidimensional vulnerability, 2) to empirically analyze the multidimensional gendered experiences of vulnerability among women and men in SSF in Chiloé, Chile, and 3) to explore agency and empowerment dynamics- both individual and collective- towards viability among women SSF in Chiloé, Chile.

To address these objectives, this dissertation combines a systematic scoping review with mixed-methods and qualitative empirical research. First, a systematic scoping review critically examined how gender has been conceptualized within the vulnerability literature on SSF and informed the development of a multidimensional framework for gendered vulnerability. Second, surveys (n=133), semi-structured interviews (n=33), and two participatory workshops were used to examine the multidimensional experiences of vulnerability among women and men involved in SSF in Chiloé. Finally, qualitative research with women in SSF explored the individual and collective processes of agency and empowerment that contribute to viability.

The scoping review demonstrates that research on gender and vulnerability in SSF has expanded primarily during the last decade, with most studies focusing on the Global South and on pre- and post-harvest activities. While multiple theoretical approaches have been used to conceptualize vulnerability—including social-ecological systems, resilience thinking, political ecology, livelihoods, well-being, and poverty-marginalization perspectives—only a limited number of studies engage in a comprehensive gender analysis. Subjective dimensions of vulnerability, intersectionality, power relations, agency, and gender norms remain largely overlooked. In response, this dissertation proposes a multidimensional framework that conceptualizes vulnerability as the interaction of material, relational, and subjective dimensions across well-being, resilience, and access to capital. Drawing on Feminist Political Ecology, the framework further recognizes vulnerability as dynamic, intersectional, and embedded in everyday identities, aspirations, emotional experiences, and power relations while simultaneously acknowledging people's capacity for agency.

Applying this framework to the empirical case of Chiloé demonstrates that women and men experience vulnerability in fundamentally different ways despite being exposed to many of the same environmental and socioeconomic stressors. Materially, men report greater negative impacts from ecological stressors, whereas women experience higher levels of food insecurity and health-related challenges. Women also display higher levels of adaptive capacity by diversifying livelihoods and actively seeking institutional support to respond to financial and personal difficulties. Relational dimensions reveal even more pronounced differences, as women's well-being is deeply shaped by caregiving responsibilities, household labor, and gendered divisions of work, while men rarely identify these responsibilities as sources of vulnerability. At the subjective level, women's experiences of vulnerability are closely intertwined with health, caregiving, grief, aspirations, and identities as both fishers and mothers. These subjective experiences influence how women navigate challenges, seek recognition, negotiate with institutions, and envision their futures. Together, these findings demonstrate that subjective dimensions constitute a critical component of gendered vulnerability in SSF yet remain insufficiently incorporated into dominant vulnerability frameworks.

The dissertation further explores how women navigate vulnerability through processes of agency and empowerment. Findings indicate that women actively pursue livelihoods in SSF as alternatives to more limited employment opportunities while simultaneously accommodating caregiving responsibilities.

Individual agency is expressed through occupational choices, livelihood diversification, and continuous negotiation with fisheries authorities, municipal institutions, and community organizations. Collective organization emerges as an especially significant source of empowerment. Women's organizations have generated both material outcomes—including shared productive assets and certifications—and non-material outcomes, such as expanded leadership opportunities, increased recognition, knowledge exchange, and stronger political participation. Most notably, participants identified their contribution to the enactment of Chile's Gender Equity Law in Fisheries (Law 21.370) as a major collective achievement. These findings suggest that collective empowerment reinforces individual agency, particularly through subjective dimensions of empowerment, strengthening women's capacity to influence decision-making and pursue more viable livelihoods.

This dissertation makes theoretical, empirical, and practical contributions to gender scholarship in SSF by demonstrating that vulnerability cannot be fully understood through material indicators alone. Instead, vulnerability emerges through the interaction of material, relational, and subjective dimensions that are shaped by gendered identities, responsibilities, power relations, and opportunities for agency. By integrating Feminist Political Ecology with the recent vulnerability-to-viability transitions research and emerging literature, this research proposes a multidimensional framework that offers a more comprehensive understanding of vulnerability while highlighting agency and empowerment as central processes in pathways toward viability. These findings contribute both theoretically and empirically to ongoing debates on gender, vulnerability, and well-being in small-scale fisheries and provide insights for policies and governance initiatives seeking to foster more equitable and viable fishing communities.

Acknowledgments

This journey would not have been possible without the support, encouragement, and care of so many people in Chile, Canada, and beyond.

First and foremost, I want to thank my husband, Miguel, and my son, Ignacio, who supported and encouraged me through every step of this journey, even during the moments when I did not believe in myself. Your love, patience, and unwavering support carried me through some of the most challenging moments of these five years. I could not have done this without you.

I am deeply grateful to my dear parents. Without your many forms of support, I would not have achieved this degree. Despite the distance, I always felt deeply connected to you and knew that you were there for us. I am especially grateful for how much you cared for our family during field trips and our many visits to Chiloé. Your love and support have meant more to me than I can express.

To my sisters, Evelyn and Valeria, my kindred spirits: thank you for encouraging me and supporting me through some of the most difficult moments of these five years. Thank you for caring so deeply for me, believing in me, and always reminding me that I could keep going. I am also grateful to my extended family, including my dear cousins and my in-laws, for their love and support throughout this journey.

I am deeply grateful to my supervisor, Dr. Prateep Nayak, for his guidance and support over the past five years and for helping me reach this milestone. This PhD journey was marked by many challenges, and I particularly appreciate the professional and financial support he provided during some of the most difficult periods of my degree. Thank you for helping me navigate this journey and for believing in the value of this work.

I am also very thankful to my committee members, Dr. Derek Armitage, Dr. Andrea Collins, and Dr. Jessica Blythe. Thank you for always being willing to listen, ask thoughtful questions, and provide timely feedback that tremendously strengthened this dissertation. It has been both a pleasure and an honour to work with such an enthusiastic, supportive, and encouraging committee.

I would also like to thank my fieldwork assistant, Nei Elmúdesi, who was instrumental to the success of our field seasons. Thank you for your dedication, willingness to work, persistence, and commitment in the field. I am equally grateful to Rodrigo Gallardo and Vladia Torres, who supported the survey process. Without your assistance, I would not have been able to achieve the goals we set for the survey data collection. Similarly, I want to thank Chiloé Profunda Foundation, and especially Barbara Elmúdesi and Manuela Véjar, as well as Isabel Yañez from Maritorias, for the help, co-creation, and co-realization of the participatory workshops.

I am grateful to my colleagues in the V2V Partnership, as well as those in the Fishbowl, SERS, and the broader Environment community. A special thank you to Navya Vikraman, Md. Ruyel Miah, Will Rauch-Davis, Lauren McElreoy, Fridah Salas, Elisha Okoth, Isabel Jorgensen, and Katie Pita for making classes, lab meetings, and office days so enjoyable. To my V2V friends who have come to feel more like family, Natasha Serrao and Deborah Padro: I am incredibly grateful for your friendship. Thank you for your encouragement, emotional and intellectual support, and guidance through both the highs and lows of this degree.

I am also grateful to my friends in Canada and Chile. Thank you to Kathy Toledo, Hugo Fuentes, Kanda Canales, Sebastián Gonzales, their beautiful families, and Valentina Castillo for being my Chilean family

in Waterloo. I am also deeply thankful to my friends in Chile and around the world for their tremendous support, care, and encouragement: Loreto Muñoz, Felipe Kuncar, María José Alvarado, Domingo Mosqueira, Andrea Gomez, Benjamin Idini, Paulina Rojas, Catalina Kutcher, Pablo del Rio, Constanza Figueroa, Barbara Elmúdesi, Valentina Saavedra, Manuela Véjar, María Inés Galecio, Patricia Fernández, Jorge Gallardo, and Carlos Gallardo. Your friendship made this journey lighter and reminded me that distance does not diminish the strength of meaningful relationships.

I am especially grateful to the people of Chiloé, and particularly to the interview, workshop, and survey participants who so generously shared their time, knowledge, experiences, and perspectives with me. This dissertation would not be what it is without their generosity and their insightful testimonies. I hope this work honours, in some small way, the trust they placed in me and contributes to the communities and livelihoods that inspired this research. At the same time, I am especially thankful for Carolina Barria and Ingrid Contreras, and Carlos Parra from Fisheries Office departments in Dalcáhué, Quinchao, and Chonchi, respectively, for their logistical support and their interest in this research.

Finally, I gratefully acknowledge the financial support that made this dissertation possible. This research was supported by the V2V Global Partnership, which is funded by the Social Sciences and Humanities Research Council (SSHRC) of Canada (Grant Number: [895-2020-1021](#)) under its Partnership Grants Program. In addition, the Social Sciences and Humanities Research Council of Canada (SSHRC) Doctoral Award (#752-2024-1336); the Ontario Graduate Scholarship (OGS); the Dean's Doctoral Initiative of the University of Waterloo; the President's Graduate Scholarship of the University of Waterloo; and the Advanced Human Capital Program of the National Agency for Research and Development (ANID), Becas Chile Program (#72220184).

To everyone who supported me in ways both big and small throughout these five years: thank you. This degree may bear my name, but it was made possible by a community of people who believed in me, supported me, and walked alongside me. I will carry that gratitude with me long after this journey ends.

Dedication

To my children Ignacio Salvador and Isabel Elena. Thank you for being my light in times of darkness, and the summer in my arms through all of life's winters. You are my greatest joy, my deepest love, and the reason I keep moving forward.

Table of Contents

Examining Committee Membership	ii
Author's Declaration.....	iii
Statement of Contributions	iv
Abstract.....	v
Acknowledgments.....	vii
Dedication	ix
List of Figures	xiii
List of Tables	xiv
Chapter 1 Introduction	1
1.1 A note from women SSF in Chiloé.....	1
1.2 Problematization	1
1.3 Research focus and objectives	3
1.4 Literature review	5
1.4.1 Small-scale Fisheries (SSF)	5
1.4.2 Social-ecological vulnerability	6
1.4.3 Gender and intersectionality	7
1.4.4 Agency and Empowerment.....	8
1.4.5. Viability in SSF.....	10
1.5 The case-study: Chiloé SSF, Chile	11
1.6 Methodology.....	14
1.6.1 Paradigms.....	14
1.6.2 Data collection approaches	14
1.6.3 Data analysis	19
1.6.4 Validity and reliability	19
1.6.5 Research Positionality.....	19
1.7 Ethics.....	21
1.8 Organization of the dissertation	21
Chapter 2 “From women's vulnerability to multidimensional gendered vulnerability in SSF: challenges and opportunities for a feminist approach”	23
2.1 Chapter Summary	23
2.2 Introduction.....	23
2.3 Theoretical Framework.....	24

2.3.1 Bounding vulnerability: historical development of vulnerability conceptualizations.....	24
2.3.2 Systems frameworks for vulnerability	25
2.3.3 Situating gender analysis and intersectionality for vulnerability research.....	26
2.3.4 Insights from new Feminist Political Ecology on vulnerability.....	27
2.4 Methods.....	29
2.5 Results.....	31
2.5.1 Sample overview.....	31
2.5.2 Geographic location and spatial scope.....	32
2.5.3 Spatial scale, type of fishery ecosystem and SSF activity	34
2.5.4. Vulnerability approaches in SSF research: different frameworks for similar research problems	34
2.5.5 Gender approaches in SSF vulnerability research: limited attention to gendered complex experiences.....	36
2.5.6 Patriarchy, poverty and the financial constraints' narrative: the vulnerability loop of women SSF	37
2.5.7 Agency, power dynamics, and subjective experiences: interrelated changing forces in gendered vulnerability in SSF	38
2.6 Discussion	40
2.7 Conclusions.....	43
Chapter 3 “Men and women's differential experiences of vulnerability in SSF: A multidimensional case study from Chiloé, Chile”	45
3.1 Chapter summary	45
3.2 Introduction.....	45
3.3 Theoretical framework.....	47
3.4 Research site	50
3.5 Methods.....	52
3.6 Results.....	54
3.6.1 Material Vulnerability.....	54
3.6.2 Relational vulnerability.....	60
3.6.3 Subjective Vulnerability	64
3.7 Discussion	69
3.8 Conclusions.....	71
Chapter 4 "We empower each other": Gendered agency and empowerment dynamics in female small- scale fisheries in Chiloé, Chile”	73
4.1 Chapter Summary	73
4.2 Introduction.....	73

4.3 Literature review	75
4.4 Theoretical framework.....	76
4.4.1 Gendered Agency.....	76
4.4.2 Empowerment	77
4.5 Research Site.....	79
4.6 Methods.....	80
4.7 Results.....	82
4.7.1 Resources	82
4.7.2 Agency	83
6.7.3 Achievements.....	86
4.8 Discussion	87
4.9 Conclusions.....	89
Chapter 5 Conclusions	91
5.1 Research purpose and objectives	91
5.2 Summary of major findings	91
5.3 Novel contributions.....	96
5.3.1 Theoretical contributions	96
5.3.2 Empirical and practical contributions	97
5.4 Limitations and future research.....	99
5.5 Personal concluding thoughts	99
References.....	101
Appendix: A Survey in Spanish.....	117
Appendix B – Survey in English.....	122
Appendix C – Interview Script	126
Appendix D – Participatory workshops outline.....	127
Appendix E – Consent form interviews Spanish	129
Appendix F – Consent form Interviews English.....	131
Appendix G – Consent form survey English	133
Appendix H – Consent form survey Spanish.....	135
Appendix I – Consent form participatory workshop Spanish.....	137
Appendix J – Consent form participatory workshops English.....	139

List of Figures

Figure 1.1: Conceptual framework	11
Figure 1.2: Map of Chiloé, Chile.	13
Figure 1.3: Fieldwork sites	16
Figure 2.1: Flow chart of the systematic scoping review process.....	30
Figure 2.2: Number of papers per year of publication	31
Figure 2.3: The methodology used throughout the final sample	32
Figure 2.4: Number of cases of study per country.....	33
Figure 2.5: Geographic location	33
Figure 2.6: Theoretical approaches to vulnerability and gender, and the topics explored among SSF	35
Figure 2.7: Multidimensional framework for gendered vulnerability in small-scale fisheries (SSF).....	42
Box 1: Researching Multidimensional Gendered Vulnerability in SSF in Chiloé, Chile.	43
Figure 3.1: Multidimensional framework for gendered vulnerability in small-scale fisheries (SSF).....	50
Figure 3.2: Map of Chiloé.....	52
Figure 3.3: Localities within three main research sites (cities).....	54
Figure 4.1: Theoretical framework for gendered agency and empowerment	78
Figure 4.2: Empowerment conceptualization	79
Figure 4.3: Map of Chiloé and research sites.....	80
Figure 4.4: Fieldwork research Sites.....	81
Figure 5.1: Key findings across chapters	95

List of Tables

Table 1.1: Summary of chapters, research objectives and research questions.....	4
Table 1.2: Core areas of literature.....	5
Table 1.3: Timeline of fieldwork activities.....	17
Table 1.4: Survey sample (count)	17
Table 1.5: Interview sample.....	18
Table 2.1: Different approaches to analyzing vulnerability and resource struggles.	29
Table 2.2: Search queries applied to SCOPUS and Web of Science in March 2024.....	30
Table 2.3: Characteristics of sample reviewed (spatial scale, fishery ecosystem and fishers' actors mentioned)	34
Table 2.4: How gender is included in the sample analyzed.....	37
Table 2.5: Different elements of in-depth gender analysis in Vulnerability and SSF research	39
Table 3.1: Survey sample overview	53
Table 3.2: Material stressors experienced by SSF in Chiloé, Chile.....	55
Table 3.3: Material stressors that have affected fishery related activities in Chiloé, Chile	55
Table 3.4: Material capitals of SSF in Chiloé, Chile	58
Table 3.5: Strategies employed by SSF in Chiloé, Chile to respond to material stressors (as a measure of resilience).....	58
Table 3.6: Relational responsibilities and stressors experienced by SSF in Chiloé, Chile	60
Table 3.7: Relational responsibilities and stressors that have affected fishery related activities in Chiloé, Chile.....	61
Table 3.8: Relational capitals of SSF in Chiloé, Chile	63
Table 3.9: Strategies employed by SSF in Chiloé, Chile to respond to relational responsibilities and stressors (as a measure of resilience)	64
Table 3.10: Personal stressors experienced by SSF in Chiloé, Chile (as a measure of subjective well-being)	64
Table 3.11: Personal stressors that have affected fisheries work in Chiloé, Chile	64
Table 3.12: Subjective struggles and aspirations	65
Table 3.13: Human Capital: Educational level	67
Table 4.1: Interview sample.....	82

Chapter 1 Introduction

1.1 A note from women SSF in Chiloé

Ana (pseudonym) wakes at 5 a.m. to the sound of rain striking the roof. It is a typical winter morning in Chiloé: dark, cold, and wet. Before her five children wake up, she spends two hours outside baiting hooks and preparing longlines for *reineta* catching, which she does beneath a small shelter her husband built to protect her from the rain. By seven o'clock, her hands are stiff from the cold and from the arthritis that has troubled her for years. The chronic pain in her lower back has worsened, yet she is still waiting for an appointment at the public hospital months after requesting one. The rest of the day unfolds around overlapping responsibilities. She prepares breakfast, gets her children ready for school, cleans the house, cooks lunch, and returns repeatedly to her fishing work whenever time allows. Her husband has been away at sea for weeks. As evening falls and the temperature drops, Ana lights a fire and a gas lamp and continues working outdoors until nine o'clock, just before her children go to bed.

Several islands away, in Caguach, Mariela (pseudonym), a 70-year-old algae gleaner, begins her day before sunrise. Despite advanced diabetes and deteriorating eyesight, she makes her way down to the beach before the tide rises. Every step is difficult, but stopping work is not an option. She supports her granddaughter, whom she has raised since the death of her daughter, and cares for her husband, who is nearing eighty and mostly confined to bed. Between harvesting algae, tending a vegetable garden, caring for animals, managing household responsibilities, and making lengthy boat trips to obtain medical care and supplies, such as her insulin, Mariela's days are shaped by a constant negotiation between livelihood, caregiving, health, and the practical realities of living on a remote island.

1.2 Problematization

I begin this thesis with the stories of Ana and Mariela because they illustrate many of the challenges, responsibilities, and uncertainties that shape women's everyday experiences in small-scale fisheries (SSF). Their daily routines reveal how fishing livelihoods are deeply intertwined with caregiving responsibilities, health challenges, environmental uncertainty, and the practical realities of sustaining households in often remote coastal communities. While these experiences emerge from the Chiloé Archipelago, they reflect broader dynamics that characterize small-scale fisheries globally, particularly the gendered realities that shape women's participation in the sector.

Despite their diversity, small-scale fisheries (SSF) play a critical role in supporting livelihoods, food security, local economies, and cultural identities worldwide (Harper et al., 2013; Nayak & Berkes, 2019). An estimated 113 million people participate in SSF, producing roughly 40% of the global catch and generating billions of dollars in economic value annually (FAO, 2023). Yet SSF are also widely recognized as vulnerable systems, shaped by interacting ecological, economic, social, and political pressures, including climate change, environmental degradation, market fluctuations, conflict, and marginalization (Nayak & Berkes, 2019; Dias et al., 2023; FAO, 2023). These vulnerabilities often intersect and reinforce one another, disproportionately affecting groups that already occupy marginalized positions within fisheries systems.

Women are one such group. Globally, women's participation in the fisheries value chain accounts for roughly 50% (Harper et al., 2013). In the SSF sector specifically, "at least 44.7 million women participate in SSF-related activities worldwide" (Harper et al., 2023: pp. 128). However, just as the experiences of Ana and Mariela illustrate, women in SSF are particularly vulnerable for various reasons. First, their

participation in SSF is often informal and unpaid, leading to income insecurity and limiting social benefits and protection (Harper et al., 2013; 2023). Second, informality reinforces their exclusion from official fisheries data collection and records, perpetuating systematic marginalization and exclusion from decision-making processes (Harper et al., 2023). Third, when their participation in SSF is paid, this is often underpaid and situated at the lower-paid end of the value chains, such as mending nets, algae gleaning and harvesting, cleaning fish, to name a few, which are characterized by seasonality and occasional labor (Alvarez et al., 2017; Frangoundes & Gerrard, 2019; Szymkowiak, 2020; Rice et al., 2024). Furthermore, these activities are often performed near shore due to childcare and household responsibilities, which reinforces a widely assumed perception (even held by women themselves) of women's contributions to SSF as an extension of their household tasks, such as food provisioning, rather than as part of a permanent job (Harper et al., 2013; Szymkowiak; Frangoundes & Gerrard, 2019, 2020). Finally, patriarchal social structures and unequal access to fisheries resources can expose women to various forms of abuse and exploitative power relations, including 'fish for sex' practices in some regions (Bene & Merten, 2013; Mangubhai et al., 2023; Okafor-Yarwood et al., 2022).

These problems are widely acknowledged in both academia and practice. Gender equality is defined as "equality between all genders, based on the principle that all humans are free to develop their personal abilities and make choices without being limited to stereotypes, prejudices, and rigid gender roles" (Frangoundes & Gerrard, 2019: p. 123), is a mainstream principle for better SSF governance (Gustavsson et al., 2021; Galappaththi et al., 2022; Lawless et al., 2021), and is included in international SSF policies such as the FAO SSF Voluntary Guidelines (FAO, 2015). However, while research on gender and SSF has grown in recent years (e.g., Harper et al., 2013; Kawarazuka et al., 2019; Szymkowiak, 2020; Azmi et al., 2021; Murunga et al., 2012; Lawless et al., 2019; Galappaththi et al., 2022), the gender data gap - the underrepresentation of gender analysis in SSF literature and in policy and management – remains (Harper et al., 2023). Some authors define the problem as "gender blindness" (Kleiber et al., 2015; Szymkowiak, 2020; Lau et al., 2021; Lawless et al., 2021) in the SSF sector, that is, "instruments that do not account for the different experiences, roles, responsibilities, rights, needs, obligations and power relations associated with being female and male and the dynamics between and among women and men, girls and boys" (Lawless et al., 2021: p. 4), perpetuating the historical attribution of SSF as a male-dominated, and biasing data collection methods in research and official records (Harper et al., 2023; Rice et al., 2024).

The consequences of gender blindness in SSF are substantial, in both scholarly research and practice. First, in practice, women's meaningful participation and inclusion in decision-making is limited: women fishers have fewer rights than their male counterparts, and sometimes they even lack entirely formal rights and political participation (Frangoundes & Gerrard, 2019), despite scholarly evidence of women's global contributions to a variety of formal and informal governance tasks and arrangements in SSF (Galappaththi et al., 2022). Second, the lack of a gender perspective in research and practice has led to reducing gender issues to women's issues as synonyms, and consequently, to their lack of inclusion in SSF records and decision-making as a numbers problem (e.g., participation quotas), ignoring power dynamics at household and community levels, the role of men, and expected gendered norms and roles (Lawless et al., 2021). Third, in scholarly research, while studies on vulnerability and SFF are abundant (see Béné & Merten, 2009; Nayak and Berkes, 2019; Bennett et al., 2020; Islam and Chuenpagdee, 2022; Dias et al., 2023), studies on gendered vulnerability in SFF are less so (notable exceptions include Azmi et al., 2021; Murunga et al., 2012; MacNaughton et al., 2016, Sreya et al., 2021; Appiah et al., 2021), often ignoring the differential vulnerable experiences between men and women and unequal patriarchal dynamics. This lack

of gendered vulnerability research in academia in SSF contrasts with SSF policies, as Lawless et al. (2021) point out, which have over-focused on women as vulnerable actors, leading to gendered targeted policies that have neglected women's agency. According to Lawless et al. (2021), this problem is an echo of decades of development initiatives and interventions that portray the so-called 'third-world women' (Mohanty, 1984) simply as 'more vulnerable' than men or even 'as victims' to environmental change, threats, and degradation, reinforcing the view of women as disconnected actors of their gendered social settings (Harris, 2006; Resurreccion, 2017; Lawless et al., 2021).

The challenges that women in SSF face outlined above, and the consequences of gender blindness in SSF in practice and academia, reinforce each other, and ultimately undermine prospects for viability¹ of SSF. This leads to contradictions between reality (women being more vulnerable than men in SSF), scholarly research (lack of research on gendered vulnerability in SSF), and practice (over-focus on women as victims, denying agency capacity and gendered contexts). In view of this, this research aims to contribute to addressing four specific knowledge gaps identified:

- 1) The limited research on gender and vulnerability SSF, which relies in part on the insufficient inclusion of meaningful gender approaches in SSF vulnerability research, and which tends to be anchored in resilience and social-ecological systems perspective (SES) (Kawarazuka et al., 2017). When gender is included, it is often a variable of analysis for data collection, reinforcing the problem which reduces gender nuances to women's issues, and ignores gendered roles and expectations, and power dynamics.
- 2) Within more dominant theoretical approaches (e.g. SES) to vulnerability in SSF, little is known about subjective experiences of vulnerability. Most research focuses on institutional and material (e.g., ecological, financial, and economic) dimensions, while subjective experiences are often overlooked.
- 3) Aligned with recent calls for advancing gender and fisheries research, sex-disaggregated data as a baseline and starting point are still insufficient in SSF research (Harper et al., 2023; Rice et al., 2024).
- 4) The over-focus on women as vulnerable subjects in SSF policies and overall, development initiatives, remains as a narrative that has permeated academic research, neglecting the role of gendered agency and empowerment as key elements to overcome vulnerability and move towards viability (Lawless et al., 2021). This gap aligns with calls made by gender and feminist scholars for nuanced gender approaches in gender-environment research and practice (Resurreccion, 2017; Arora-Jonson, 2011), as well as SDG goal number 5, "achieve gender equality and empower all women and girls" by 2030 (UN, 2026).

1.3 Research focus and objectives

As reflected in the knowledge gaps outlined above, gender equality is central to transitioning towards viable SSF (Frangoundes and Gerrard, 2019; Rice et al., 2024). That process requires moving beyond conventional approaches that have overlooked gender differences and instead exploring novel perspectives and methods that acknowledge the complex, gendered, and intersectional experiences of vulnerability, agency, and empowerment. Given these challenges, my research aims to explore the gendered dimensions of women's and men's vulnerability-viability experiences in the SSF in Chiloé, Chile. Specifically, I ask what is the role

¹ The definition of viability is found in section 1.4.5.

of gender and intersectionality in shaping how women and men navigate multidimensional vulnerability and viability in the SSF social-ecological system? Specific objectives are outlined as follows:

- 1) To critically assess how gender is conceptualized within the vulnerability literature on SSF, and to develop a more nuanced framework for understanding multidimensional gendered vulnerability (Chapter 2).
- 2) To empirically analyze the multidimensional gendered experiences of vulnerability among women and men in SSF in Chiloé, Chile (Chapter 3).
- 3) To explore agency and empowerment dynamics- both individual and collective- towards viability among women SSF in Chiloé, Chile (Chapter 4).

While each objective is presented in a standalone manuscript, the three specific objectives are interdependent and build on one another. The first research objective comprises a scoping literature review of gender and SSF research and proposes a novel SSF-tailored framework for analyzing multidimensional gendered vulnerability, informed by the review's findings, and a cross-fertilization of social-ecological systems perspectives on vulnerability and new Feminist Political Ecology (new FPE) approaches to vulnerability and resource struggles. The proposed framework in Chapter 2 guided the overall framing of Chapter 3, which employs a mixed-methods approach to men's and women's experiences in SSF in the Chiloé case study. Table 1.1 presents the guiding questions for each chapter (paper manuscripts) and their corresponding objectives.

Table 1.1: Summary of chapters, research objectives and research questions.

Chapter	Research Objective	Specific research questions
Chapter 2 (Manuscript 1): "From women's vulnerability to multidimensional gendered vulnerability in SSF: challenges and opportunities for a feminist approach"	To critically assess how gender is conceptualized within the vulnerability literature on SSF, and to develop a more nuanced framework for understanding multidimensional vulnerability	1) What is the current state of research on vulnerability and gender in small-scale fisheries? 2) How can different research on gender and vulnerability in SSF contribute to a more nuanced approach?
Chapter 3 (Manuscript 2): "Men and women's differential experiences of vulnerability in SSF: A multidimensional case study from Chiloé, Chile"	To empirically analyze the multidimensional gendered experiences of vulnerability among women and men in SSF in Chiloé, Chile	1) What stressors (material, relational, subjective) are affecting men's and women's well-being in SSF? 2) What are their capital and their resilience (measured as adaptive capacity) in the face of these stressors? 3) How are these processes affecting men and women in SSF differently?
Chapter 4 (Manuscript 3): "We empower each other": Gendered agency and empowerment dynamics in female small-scale fisheries in Chiloé, Chile	To explore agency and empowerment dynamics- both individual and collective- towards viability among women SSF in Chiloé, Chile	1) What are the resources and structures of opportunities for empowerment? 2) How is their agency expressed (both individually and collectively), as well as their 'sense of agency'? 3) What are the well-being achievements - empowerment outcomes- experienced?

1.4 Literature review

This dissertation draws from five main bodies of literature: vulnerability in social-ecological systems (SES), gender and intersectionality, vulnerability and resource struggles in Feminist Political Ecology (FPE), with both traditions guiding a cross-fertilization developed in Chapters 2 and 3, and small-scale fisheries (SSF). In addition, the concepts of agency and empowerment serve as the guiding theoretical foundation for Chapter 4. I also review the notion of viability in SSF in Chapter 5 and its connection to the vulnerability-viability continuum. The connections, advantages, and limitations of these traditions are analyzed in greater depth in each chapter. Further, all three chapters engage in gender analysis. Table 1.2 shows the main conceptual traditions from which each manuscript draws.

Table 1.2: Core areas of literature

Chapter	Focus	Core literature traditions/concepts
Chapter 2 (Manuscript 1)	Conceptual framework that integrates elements from FPE and SES vulnerability into a multidimensional gendered vulnerability specifically tailored for SSF	- SES vulnerability - Gender and intersectionality - Vulnerability and resource struggles in FPE - SSF
Chapter 3 (Manuscript 2)	To empirically analyze the proposed conceptual framework from Chapter 2 - multidimensional gendered experiences of vulnerability in SSF- among women and men in SSF in Chiloé, Chile	
Chapter 4 (Manuscript 3)	Gendered agency and empowerment dynamics- both individual and collective- towards viability among women SSF in Chiloé, Chile	- Agency and empowerment - Gender - SSF

1.4.1 Small-scale Fisheries (SSF)

No single definition captures the diversity and complexity of small-scale fisheries (SSF) (TBTI, 2023). However, small-scale fisheries possess some characteristics that identify them globally, such as low capital investment, the use of small-size vessels (if any), relatively low production for subsistence, local or commercial consumption, and often carrying out short fishing trips close to coasts (IPBES, 2019; FAO, 2023; UN, 2026).

The challenge with SSF definition, according to Smith & Basurto (2019) is that the definition is unclear in policies and in scholarly research. Moreover, SSF are often narrowly defined in terms of fishing technologies (e.g., fishing gear, boats and vessel sizes). The problem with technology-based definitions of SSF is that they risk essentializing SSF as a category fixed in material/technological characteristics and ignoring its social and cultural attributes and context. In addition, this so-called ‘technological determinism’ (idem) in defining SSF in scholarly research also has the dangers of rendering key roles of other activities besides harvesting or ‘fishing’ in the value chain invisible, such as pre- and post-harvest activities, most of

the time carried out by women, and therefore, ignoring gendered dimensions (idem). Therefore, any definition should also encompass the wide-ranging activities undertaken throughout the SSF value chain by both men and women, including harvesting from boats and on foot, as well as pre- and post-harvest activities on land (FAO, 2015; Smith & Basurto, 2019).

1.4.2 Social-ecological vulnerability

While vulnerability research varies across the fields of climate change, hazards and risk, and resilience, its definition is broadly agreed upon (Turner et al., 2003; Adger, 2006; Berkes, 2007). Thus, the vulnerability of a system, subsystem, or system's component is often defined as a function of the sensitivity (susceptibility to harm) exposure to stresses or hazardous conditions, while at the same time, the resilience or capacity of the system to adapt to the impacts of those conditions (Turner et al., 2003; Adger, 2006; Smit & Wandel, 2006; Bennett et al., 2016). Perturbations and pre-conditions are not enclosed to biophysical dimensions. Social, historical, political, and economic elements also play a crucial role in the system's vulnerability (Adger, 2006).

More recent vulnerability perspectives have focused on contextual vulnerability or 'as starting point,' as opposed to outcome vulnerability. This analytical distinction is used by several authors such as Smit and Wandel (2006), Adger (2006), O'Brien et al. (2004), Bennett et al. (2016), and Blythe et al. (2015). Contextual vulnerability approaches highlight the nature of vulnerability based on the system's attributes (Smit & Wandel, 2006), focusing on situated nature of individuals, households, communities, or regions to analyze the system's adaptive capacity to a changing environment (Blythe, 2015). Vulnerability as a 'starting point' is often associated with the SES perspective, which highlights the inextricable nature of coupled human-ecological processes (Adger, 2006). In addition, vulnerability is conceived as a dynamic with tempo-spatial variations and within the system's components: the vulnerability of a group can differ from that of individuals or communities (Turner et al., 2003; Smit & Wandel, 2006; Adger, 2006).

Many authors have proposed comprehensive frameworks for measuring vulnerability, with Turner et al. (2003) providing a foundational contribution to recent integrative approaches within the SES tradition. Their framework conceptualizes vulnerability through components such as exposure, sensitivity, and adaptive capacity, while emphasizing nested scales and cross-scale social and ecological interactions. These ideas strongly influenced subsequent frameworks, including those of Adger (2006) and Bennett et al. (2016), which similarly stress the importance of multiple interacting stressors, exposure beyond singular perturbations, restructuring after responses, and the role of spatial and temporal dynamics. Adger's (2006) contribution is particularly significant for synthesizing vulnerability approaches across different traditions and for advancing a broader understanding of social vulnerability in relation to climate and environmental change.

Nayak and Berkes (2019) further expand vulnerability research through a framework specifically focused on small-scale fisheries (SSF), based on two cases of Bay of Bengal, India. Their nuanced approach integrates well-being (a three-dimensional approach encompassing material, relational, and subjective dimensions), access to different forms of capital and resources, and resilience, understood in SES terms as the capacity to absorb disturbance and reorganize while maintaining system identity. Some of the resulting vulnerabilities they found based on their case of Chilika Lagoon are, at the material level, loss of primary income, pollution and other ecological changes, food insecurity, and increased indebtedness, to name a few. At the relational level, some of the resulting vulnerabilities are increased conflict (inter-village), migration, loss of political voice, etc. At the subjective level, the authors mention loss of customary skill sets and

knowledge, school dropout, adverse physical and mental health, disconnection from “mother Chilika”, among others.

In Chapters 2 and 3, I use the framework of Nayak and Berkes (2019) to further integrate a multidimensional gendered perspective for vulnerability in SSF taking elements from ‘new’ Feminist Political Ecology, as gender and other axes of power relations are often marginal within SES vulnerability frameworks (including Nayak and Berkes (2019), appearing more as variables in empirical analysis than as constitutive dimensions of vulnerability itself.

1.4.3 Gender and intersectionality

Gender and intersectionality are key elements guiding this research, anchored in Feminist Political Ecology perspectives (Rocheleau et al., 1996) that conceptualize the nature-gender nexus with a focus on power, control, and social justice. In this sense, gender and other axes of social power such as race, class, ethnicity, among others, shapes differentiated access to and control over natural resources, and at the same time, processes and struggles of environmental change and sustainable livelihoods (Rocheleau et al., 1996; Elmhirst, 2011; Sundberg, 2017). In so-called ‘new FPE’ - the new body of work since the 2000s in FPE (Elmhirst, 2011) - gender is understood as a process in which subjectivities are produced, reproduced, and contested through everyday performance (Nightingale, 2011), instead of being pre-given based on biological sex (Sundberg, 2017). Similarly, the focus on new FPE on multi-dimensional experiences in which race, caste, ethnicity, class, age, ability, and other social categories collapse with gender and operate as mutually constitutive phenomena that shape complex social inequalities is called intersectionality, often attributed to Crenshaw (1991) in academia, which FPE embraced and expanded.

However, intersectionality is considered a distinct ‘knowledge project’ and is used across disciplines, with three interdependent sets of concerns: intersectionality as a field of study rooted on racial formation studies, as an analytical framework with emphasis on social difference and power, and as a praxis (Collins, 2015). At the same time, scholars of intersectionality have advised caution regarding the boundaries and epistemological challenges of working under the umbrella of intersectionality within its own parameters, that is, how epistemic oppression might play a role in research practice (idem). In this sense, it was Crenshaw (1991) herself that stated that “intersectionality should not be taken as a new totalizing theory of identity” (pp. 1244). While identity has become a common theme in intersectionality literature (Collins, 2015), intersectionality was never meant to be a tool to fully account for all identities at any level (Cooper, 2015). Cooper (2015) argues for the importance of the analytical distinction: the framework never claimed to be a tool for an affirmative assertion about how subjectivity is constituted, but rather a claim on how some aspects of one’s identity are neglected (Cooper, 2015: pp. 8).

In this sense, it is essential to highlight how intersectionality scholars focus on structural categories that produce experiences of inequality, which marks a distance from posterior conceptualizations explored in the new FPE, including post-structural and performative approaches (Elmhirst, 2011; Resurreccion, 2017; Sundberg, 2017). Specifically, conceptualizations and dilemmas on intersectionality have been expanded in the current approaches in FPE and geography scholars, adding more layers of complexity, including contingent subjectivities related to ecological landscapes, which I will discuss in the next section.

In fisheries research, gender has become a growing area of interest, reflecting persistent gender inequalities rooted in patriarchal social relations that permeate the distribution of labour, access to and control over fisheries resources, rights and benefits, the recognition of women in fisheries records, and their meaningful

inclusion in decision-making processes (Harper et al., 2013; Kleiber et al., 2014; Frangoudes & Gerrard, 2019). On the other hand, intersectionality has been less explored. The work of Galappaththi et al. (2021) in this sense provides a key contribution to expanding the intersectional approach in SSF. The authors analyzed gender relations in dried fish value chains, drawing on examples from Bangladesh, Tanzania, and Sri Lanka, integrating intersectional and well-being perspectives, showing how gender intersects with other power systems, such as ethnicity, culture, religion, and caste, creating differential positions and gendered well-being outcomes (material, relational, subjective). The framework proposed by Galappaththi et al. (2021) provides key insights for this research, including the relational dimension of gender and its impact on well-being, as well as the crucial role of intersectionality and other social categories in shaping women's differential experiences in SSF.

In this dissertation, gender is a key concept throughout all three chapters (2, 3, 4), anchored in new FPE perspective that expands intersectionality and conceives subjectivities as multidimensional and gendered, situated in power dynamics and relations that not only limit access, use, and control of fisheries resources, but also the division of domestic labor, other social relations (community level), agency capacity, and even frames livelihoods and overall life decisions and future aspirations. I also take elements of new FPE, such as the importance of subjective experience in vulnerability struggles, which is discussed in detail in Chapter 2.

1.4.4 Agency and Empowerment

The notion of agency in social behavior is a standing debate in sociology and, recently, in scholarly gender discussions. While there is a consensus on its definition, different traditions have weighed the role of social structure and agency, usually as closely intertwined elements of social relations (Gammage et al., 2016). Early discussions on agency can be traced back to the work of Amartya Sen (1985) on freedom, agency, well-being, and capabilities. Sen proposes the 'capabilities approach,' which entails two elements. First, the moral importance of the freedom to pursue and achieve well-being, and second, that well-being is closely related to people's capabilities (Gammage et al., 2016; Robeyns & Morten, 2021).

In environmental studies, human agency is recognized as critical for adaptation to environmental change and stressors. However, most studies - especially quantitative approaches - have often focused on material dimensions and do not unpack the complexities of subjective and relational dimensions of agency (Brown & Westway, 2011). In this sense, a few scholars, such as Brown and Westway (2011) and McLaughlin and Dietz (2008), have theorized about vulnerability, adaptation, and agency, considering constructivist approaches to human agency that includes cultural and subjective elements and the reflexive capacity of the subjects. In this sense, McLaughlin and Dietz (2008) defined agency as "the capacity of individuals and corporate actors, with the diverse cultural meanings that they espouse, to play an independent causal role in history" (McLaughlin & Dietz, 2008: pp. 105).

While the role of human agency has been discussed since the 90s in gender and environment literature, it has been less theorized than structural constraints, remaining an understudied topic (Resurreccion, 2006; Rao et al., 2019). According to Jackson (1998), ecofeminism approaches in the late '70s and '80s provided more weight to historical and structural barriers posed to both women and nature, such as the patriarchal status quo and capitalism (Shiva, 1988), while the notion of agency was not considered relevant.

It was not until Feminist Political Ecology (FPE) was introduced in the 1990s with the landmark work of Rocheleau, Thomas-Slyter, and Wangari (1996) that the notion of agency in gendered landscapes took place

in gender debates. Before that, a similar dilemma that sociology historically confronted was present in gender literature discussions. As Jackson (1998) states, the challenge in gender analysis relied on "how do we deal with the tension between approaches to gender that emphasize the social structural constraints on women, what for convenience I will call here 'structural' approaches, and those that emphasize the agency of women as acting subjects" (Jackson, 1998: p. 313). In this sense, the author urged the necessity of advancing FPE approaches arguing for a further focus on agency, motivated by a criticism of the structuralist emphasis that "assumed the absence of choice and the presence of overwhelming constraint and implies therefore that women are helpless in the face of patriarchy" (Jackson, 1998: p. 313).

The new FPE (Elmhirst, 2011), also known as post-structural feminist approaches, deeply influenced by the work of Rocheleau et al. (1995) and Butler (1999), has also highlighted the role of agency in everyday embodied gendered experiences. As Resurreccion (2006) states, a perspective that departs from fixed/static notions of gender and other identity categories towards the instability of those categories and the idea that 'men' and 'women' are constructed through ongoing social processes is an agency perspective (Resurreccion, 2006). New FPE scholarship understands that environmental gendered struggles are not all tragic and women are not merely passive victims and highlights that women's agency plays a crucial role in their experiences, which is exercised in complex and contested ways (Mollet & Faria, 2013).

However, scholarly research on agency remains limited, with contemporary research conceptualizations frequently drawing on Naila Kabeer (1999) work. In the late 1990s, Kabeer developed influential theorizations of agency, gender, and empowerment that continue to inform contemporary scholarship (see Arora-Jonsson, 2009; Muñoz Boudet et al., 2013; Hanmer & Klugman, 2016; Gammage et al., 2016; Lawless et al., 2019; Kawarazuka et al., 2019; Rao et al., 2019; Mwaipopo et al., 2020). Their work emphasizes the centrality of empowerment and agency within institutionalized gendered power relations (Hanmer & Klugman, 2016; Gammage et al., 2016). More specifically, the author conceptualizes agency as a process through which choice becomes possible through access to resources. In this sense, agency refers to "the ability to define one's goals and act upon them. It is more than an observable action; it also encompasses meaning, motivation, and purpose which individuals bring to their sense of activity, 'sense of agency' or 'power within'" (Kabeer, 1999, p. 438). Agency is therefore not limited to decision-making alone, but may also take forms such as bargaining, negotiation, manipulation, deception, subversion, and resistance. It can be exercised both individually and collectively and may involve both positive and negative expressions of power (idem).

More recent conceptualizations, including those proposed by Muñoz Boudet et al. (2013), further develop the approaches advanced by Sen (1985) and Kabeer (1999), underscoring the importance of agency for gender equality and well-being. Within this perspective, agency is understood as both the capacity to act and the belief that action is possible through control over the resources that enable choice within existing opportunity structures.

Closely related, feminist scholars have argued that empowerment can be conceived as a byproduct of agency and a precondition for gender equality (Arora-Jonsson, 2014; Gammage et al., 2016). The work of Kabeer (1999) is a pioneer in conceptualizing empowerment in gender studies and has been widely used (see Gammage et al., 2016; Hanmer & Klugman, 2016; Freeman & Svendsen, 2022). The author defines empowerment as "the process by which those who have been denied the ability to make strategic life choices acquire such an ability" (Kabeer, 1999: p. 436). In this sense, the author highlights the notion of possibility and choice in critical aspects of life that allow people to live the lives they want (strategic life decision or

‘first order’). That includes choices about livelihood, marriage, and having children, etc. At the same time, empowerment includes three closely interrelated dimensions: resources (access to and future claims on material, human, and social assets); agency (including decision-making, negotiation, deception, bargaining, and manipulation); and achievements (well-being outcomes) (Kabeer, 1999). These three dimensions are understood as a continuum between preconditions, processes, and outcomes. In this sense, validity and reliability when measuring empowerment, acknowledged as very challenging, are anchored in the inclusion of these three dimensions.

Recent research on SSF and agency and empowerment (Lawless et al., 2019; Mwaipopo & Dauda, 2020; Kawarazuka et al., 2019) has shown that women experience and exercise agency and empowerment in complex ways, where material and individual incentives under neoliberal banners do not necessarily catalyze empowerment. Moreover, research suggest that subjective and relational elements, such as ‘sense of agency’, ‘ownership of processes’, and ‘domestic sphere negotiations’, may provide greater empowerment and gendered agency well-being outcomes (Lawless et al., 2019; Mwaipopo & Dauda, 2020; Kawarazuka et al., 2019). In Chapter 4, I build on this body of recent studies to empirically analyze agency and empowerment processes, both individual and collective, in women's SSF in Chiloe, Chile. In this chapter, I use the closely intertwined concepts of gendered agency and empowerment, based on Kabeer (1999), as well as a gender perspective rooted in new FPE principles of subjective, everyday, embodied experiences, as the theoretical guide.

1.4.5. Viability in SSF

While viability is not a central concept in the manuscripts that comprise this dissertation, it is a key component of the research question and overall guiding principle, and will be further developed in Chapter 5 (Conclusions). Discussions on vulnerability are embedded -implicitly or explicitly- in the notion of viability: research on vulnerability is inherently normative, as high levels of vulnerability are seen as not desirable. In environmental research, viability is often framed in terms of resilience when discussed in vulnerability landscapes. As Berkes argues: “vulnerability is the flip side of resilience” (Berkes, 2007: pp. 293). However, authors such as Turner et al. (2003), Adger (2006), and Smit and Wandel (2006) acknowledge that both concepts are not discrete opposites. However, there are more commonalities between resilience thinking and social-ecological vulnerability than differences. Critical elements to resilience, such as shocks and stresses and the complex linkages between them and systems components, the adaptive capacity of the system, and the focus on temporal-spatial complex dynamics are also key elements of ‘contextual vulnerability’ approaches in SES (Turner et al., 2003; Adger, 2006; Berkes, 2007).

In the context of SSF, a concept more often used when discussing vulnerability is viability, which has been analyzed in detail in the work of Berkes & Nayak (2018) and Nayak & Berkes (2019). According to the authors, viability (of communities) is a complex notion inextricably linked with vulnerability, which involves increasing or decreasing well-being, better or poorer access to capital, and building/losing resilience (Berkes & Nayak, 2018). Thus, the resulting framework the authors propose is a continuum composed of a vulnerability-health-viability construct for fisheries communities. In addition, the authors argue that power issues are at the core of making viable (fisheries) communities. Therefore, following Jentoft’s (2005) conceptualizations, empowerment in terms of co-management or community-based management emerges as a key element for the viability of maintaining and managing fisheries resources and reducing vulnerability (*idem*).

I situate my research on the vulnerability-viability continuum for SSF proposed by Berkes & Nayak (2018) and Nayak & Berkes (2019). However, the key argument and contribution of this dissertation is that, without a gendered perspective, this conceptualization is incomplete. I argue that the concepts of vulnerability, agency, empowerment, and viability are highly normative notions that have been discussed in development interventions, academia, and practice as key pathways towards achieving desirable societal concerns, such as gender equality in SSF (Galappaththi et al., 2022). Therefore, ignoring the nuances of the gendered implications of each of these concepts, which are inextricably interrelated, is the main gap this research aims to fill.

Figure 1.1 summarizes the conceptualizations of each chapter and the overall framework on which this dissertation is grounded. The implications of each element of this figure, their complex linkages, and novel contributions will be discussed in depth in Chapter 5 (conclusions).

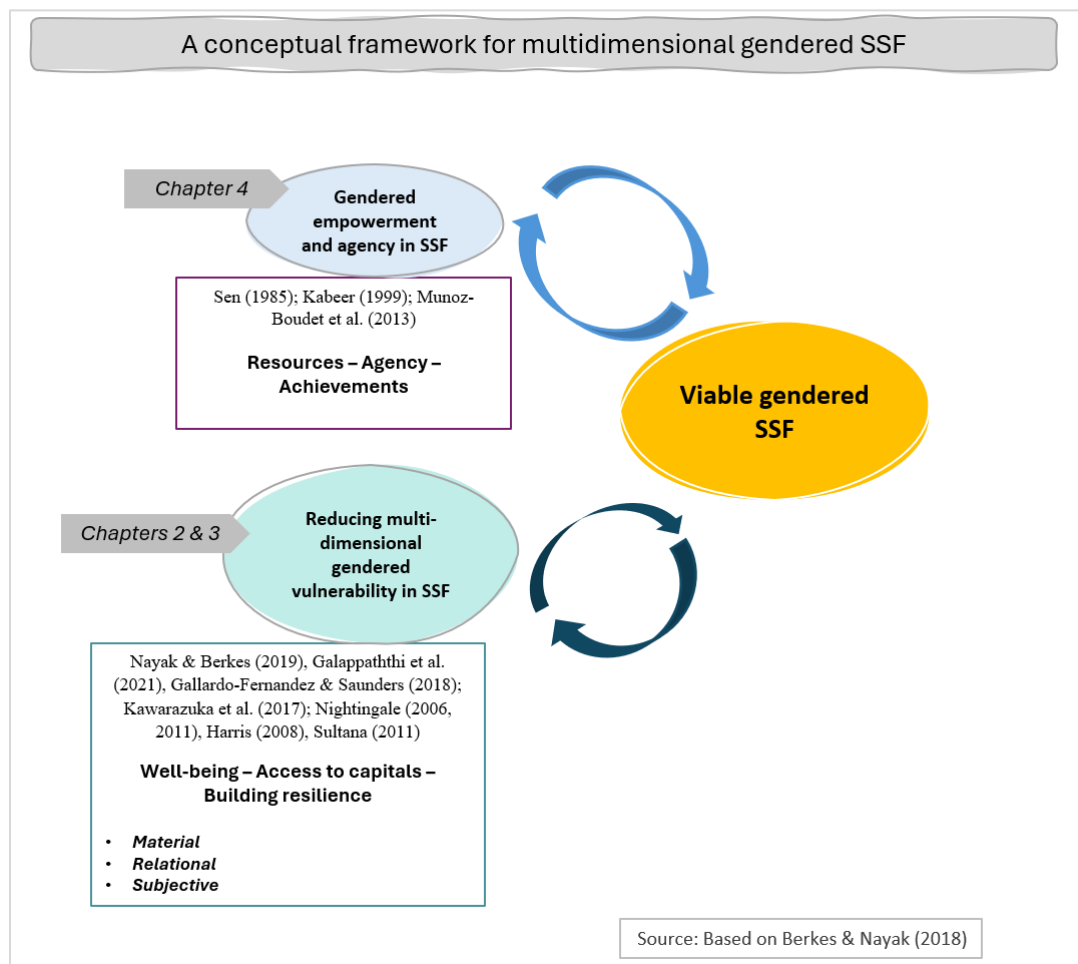


Figure 1.1: Conceptual framework

1.5 The case-study: Chiloé SSF, Chile

This research is situated in Chiloé, Chile (Figure 1.2), an archipelago in Los Lagos region, located 1,100 km South of Santiago, the Capital of Chile (DelaMaza et al., 2023). The archipelago, which includes the *Isla Grande* (Big Island) -the fourth biggest Island in South America- and 20 inhabited interior islands '*islas interiores*'. It has 10 municipalities and a population of 183,915 according to the 2024 census (INE, 2026).

Chiloé's economic development has been characterized by the strong presence of the aquaculture industry - salmon farming and mussels - since the early 1980s and 1990s, respectively, permeating livelihoods, which were characterized before that by artisanal fishing, agriculture, and livestock (Arriagada et al., 2025). Today, Chiloé is characterized by a hybrid economy with aquaculture industries, small-scale fisheries, small-scale agriculture and livestock, and employment in services, municipalities, and tourism (idem).

Since the 1980s, the salmon farming industry has established itself in several locations across the archipelago, experiencing explosive growth that peaked in 1994, when Chile became the second-largest exporter of farmed salmon after Norway (Pavez, 2016; Bustos, 2016). However, its trajectory has been marked by several sanitary crises, including the infectious salmon anemia (ISA) in 2007, which resulted in the closure of salmon farms and processing plants, and about 15,000 job losses (Bustos, 2016), as well as the 2016 sanitary crisis with records of high salmon mortality. Similarly, mussel mariculture has experienced a massive growth in Chiloé since the early 1990s, also focused as an export industry, despite experiencing several crises and multiple disturbances (microalgal food in 2009, larval supply in 2011-2013, as well as market price fluctuations) (Arriagada, 2019; San Martín, 2020).

The explosive growth of these industries, which marked Chile's incorporation into global markets beyond the export of minerals and agriculture, has nevertheless created a series of negative effects and paradoxes of sustainable development, such as environmental conflicts and precarious employment. These processes unfold within a context of strong rural cultural identity, isolation from the rest of the country, and limited attention from the State (Roman et al., 2016; Mascareño et al., 2018; Arriagada et al., 2025). Moreover, mussel and salmon farming industries have become closely linked to women's employment in Chiloé, particularly through seasonal and casual work in processing plants. While such employment has contributed to shifts in women's economic autonomy and gender roles, it has also reproduced conditions of labor vulnerability for many women (Alvarez et al., 2017).

In this context, small-scale fisheries (SSF) have persisted as a major source of livelihood despite ongoing conflicts with aquaculture, as evidenced by the 2016 social movement surrounding the salmon farming/red tide crisis (see Arriagada et al., 2025). What initially emerged as protests against the consequences of the worst red tide algal bloom in Chile's history, as well as against the dumping of 9,000 tons of dead salmon along the archipelago coast with the government's authorization, evolved into the most significant social movement in the region's history. For 17 days, the Island remained on strike, while demonstrations across the country sought to draw attention to the socioeconomic and environmental crisis affecting its inhabitants. Fisheries workers and actors throughout the value chain were among the groups most severely impacted by the massive mortality of marine species caused by the bloom and intensified by the salmon dumping.

Led primarily by artisanal fishers and divers, the conflict known as "*Mayo Chilote*" (Chilotean May) challenged not only the interests of the centralized government, but also broader environmental policies and governance frameworks concerning SSF, marine resources, and the livelihoods dependent upon them (Arriagada, 2019; DelaMaza et al., 2023; Arriagada et al., 2025). In this sense, reports from 2022 indicate that the Los Lagos region accounted for nearly 35.9% of 99,557 artisanal fisheries licenses (AFR) issued nationwide (Sernapesca, 2022). Interestingly, women represented almost 30% of participation at both the national and regional levels. Although women were historically excluded from official fishing licenses and related activities, since the early 2000s, they have increasingly entered what had long been a male-dominated sector (Gallardo-Fernández & Saunders, 2018). Within this process, seaweed harvesting and gathering—an ancestral practice—has been formalized and now constitutes the main area of women's

participation in SSF, both nationally and regionally (Gallardo-Fernández & Saunders, 2018; Alvarez et al., 2017).

In Chiloé specifically, women's incorporation into the formal registry increased significantly following the 2016 social movement. In response to disruptions in fishing activities, the State implemented compensation measures for affected fishers while also promoting the formalization of activities, particularly algae harvesting (Arriagada, 2019). Since then, women involved in SSF in Chiloé have become increasingly visible not only through their contributions across the SSF value chain but also through their participation in unions and organizations, where they have assumed recognized leadership roles and expanded their involvement in decision-making processes. Moreover, the approval of Law 20.370 in 2021, aimed at promoting gender equity in small-scale fisheries, represents a significant institutional development towards gendered governance in SSF in Chile, although its implications for women and men involved in SSF remain largely unknown.

Given this convergence of environmental, social, economic, and political processes, Chiloé emerges as a particularly relevant case for exploring the role of gender and intersectionality in shaping how women and men navigate multidimensional vulnerability and viability in SSF.

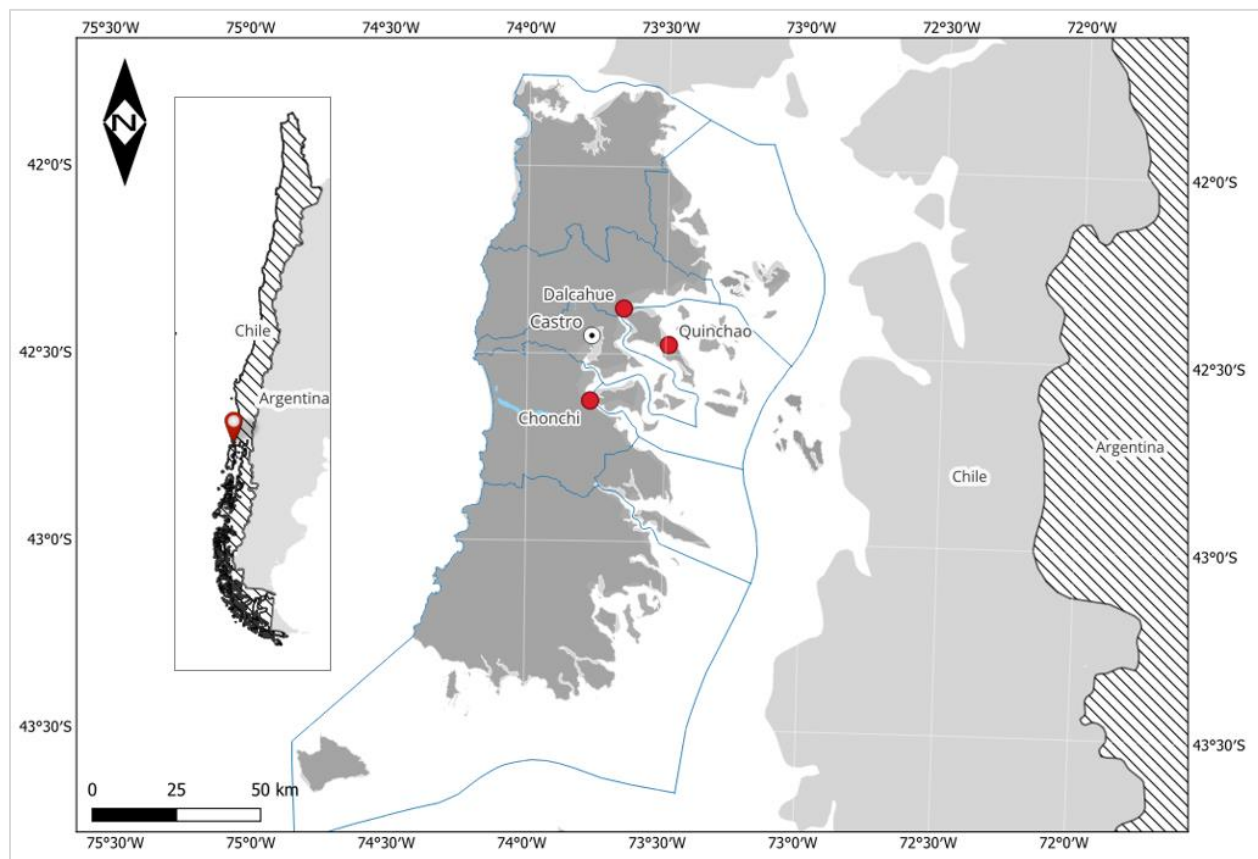


Figure 1.2: Map of Chiloé, Chile.

1.6 Methodology

1.6.1 Paradigms

My research takes an interdisciplinary approach, defined as work that seeks to transform knowledge by integrating ideas from two or more research traditions (Kragram et al., 2010). Although my work is grounded in the social sciences, the integration of interdisciplinary theoretical frameworks—Social-Ecological Systems (SES) and Feminist Political Ecology—positions it within an interdisciplinary research paradigm that bridges social science, gender and feminist studies, and ecological science.

From a philosophical standpoint, I followed an interpretative paradigm, that is, “the idea of conducting research in a natural setting with the researcher as the primary means for gathering and interpreting data” (Marshall et al., 2022: 258). Under this paradigm, philosophical and methodological assumptions are made about the nature of the reality under study (ontology), what counts as knowledge and how research knows reality (epistemology), and, consequently, the procedures used for research (methodology) (Cresswell & Poth, 2016). Within the interpretive umbrella, social constructivism² and post positivism can be both considered paradigms that have guided my research. First, in social constructivism, research looks for subjective meanings -negotiated socially and historically- people give to their experience, embedded in the cultural norms that operate in people's lives (Cresswell & Poth, 2016). Taking this into account, my research is guided by the following philosophical principle: I studied the experiences of vulnerability-viability among men and women in SSF. Guided by a gender-critical approach, I understand that these experiences are socially constructed. This is the main principle that guided qualitative data collection methods and analysis. On the other hand, post positivism, that is, the belief that cause-effect phenomenon (causality) in the scientific approach is probable, although not strict³ (Creswell, 2014), guided the quantitative portion of my research. In this sense, instruments, data collection, and data analysis were done with rigorous methods and the belief that results are a highly probable snapshot of the reality within a certain range of trust and error. That applies to both systematic scoping review using guidelines on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Chapter 2), and in-person quantitative survey data collection and analysis (Chapter 3).

1.6.2 Data collection approaches

The data collection approaches from which data collection methodologies emerged are two in this research: 1) case-study approach, 2) mixed-methods approach.

A case-study approach “refers to research that investigates a few cases, often just one, in considerable depth” (Gomm et al., 2009: pp. 3). Unlike experimental design research, where the investigator ‘creates’ the phenomena in question, the case study focuses on naturally occurring situations. While case study is often considered a method, some authors such as Gomm et al. (2009) discussed that it could also be considered a paradigm itself, posing an alternative to positivism or naturalistic paradigms, on the one hand, and constructivism paradigm on the other: causality and generalizations are not the primary purposes of

² Some authors -such as Denzin and Lincoln- consider social constructivist and interpretative paradigms as synonymous (Creswell, 2014). However, following Creswell (2014), I will consider the interpretative framework the main philosophical umbrella under which social constructivism and post-positivism fall.

³ A strict or deterministic point of view of causality in science is defined as positivistic rather than post-positivistic (Creswell, 2014).

case-study research⁴, neither is the generation of new interpretative theories. However, the descriptive uniqueness of the case study in question contributes to building general theories, as the authenticity of the case study is not synonymous with a singularity (idem). In other words, the advantage of case-study research is that it can provide critical insights to illuminate similar case studies in different settings while acknowledging differences and avoiding facile generalizations. In the case of my dissertation, case-study approach guided Chapters 3 and 4, which aims to understand the nuances of multidimensional gendered vulnerability of men and women in SSF in Chiloé, Chile.

In addition, given the uncertain nature of SSF as a social-ecological system, the objectives of this research regarding the gender-nature nexus require more than a single perspective to capture the complex dynamics involved. Therefore, the overall methodological approach of my dissertation is mixed-methods. The mixed-methods approach refers to “research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry” (Tashakkori & Creswell, 2007, p. 4). According to Hollstein (2014), studies are considered mixed methods if they satisfy three conditions:

- a) They must be based on both qualitative and quantitative data, either by collecting them or converting one type into another;
- b) They have to employ both quantitative and qualitative analytical strategies;
- c) Data or analytical strategies must be integrated at least in one stage of research, being data collection, data analysis, or data interpretation (Hollstein, 2014)

The advantages of using a mixed-method approach are many. First, it allows for maximizing the strengths of qualitative and quantitative methods while minimizing their weaknesses (DeCuir-Gunby & Schutz, 2018). For example, a mixed-method approach will allow me to combine the in-depth richness of interviews and focus group methods and the more precise and generalizable knowledge that results from a survey. Second, given the case-study approach in which this research situates and research objectives, a mixed-method approach is the best fit to combine both robustness (from quantitative methods) and complex emergent narratives (from qualitative methods).

In addition to these characteristics, scholarly feminist praxis has acknowledged the mixed-methods approach as a robust methodology, allowing exploring women’s voices and experiences, the complex nature of social reality, and understanding of differences in terms of race, class, gender, age, ethnicity, and other social categories (Hesse-Biber & Griffin, 2016).

The mixed-methods approach of this research was carried out in different stages, which will be described in detail in the next section.

1.6.2.1 Systematic scoping review

I synthesized the state of the literature on gender and vulnerability in SSF using a systematic scoping review (Chapter 2). I used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which include: 1) defining the research question and scope, 2) developing a research protocol, 3) conducting the database search, 4) screening articles based on title and abstract, 5) assessing full-text articles, and 6) extracting and coding the selected studies (Page et al., 2021; Galappaththi et al., 2022). I

⁴ This does not mean that it is incompatible: case-study research can focus on causality.

used SCOPUS and Web of Science to identify relevant scientific literature, as these databases best captured the key terms associated with our search query and aligned with my research question. The process was supported by the Covidence program (www.covidence.org), a tool specifically designed for systematic reviews. I initially screened 134 papers, and as the screening process progressed (title and abstract screening, removal of duplicates, and exclusion of non-relevant studies), the final sample comprised 21 studies for review. More details on the process, analysis, and results are provided in Chapter 2.

1.6.2.2 Empirical chapters: in-person surveys, interviews and participatory workshops

My research fieldwork was conducted in three municipalities of Chiloé: Dalcahue, Chonchi, and Quinchao (see Figure 3). These municipalities and their surrounding localities were selected based on a convenience criteria, as they are recognized for having a high number of legal small-scale fisheries (SSFs) and well-established Fisheries Departments within their municipal administrations.

Initial contacts were established through local researchers, NGOs, and the head of the Fisheries Department in Dalcahue, who subsequently recommended contacting their counterparts in Chonchi and Quinchao. Following these recommendations, I reached out to the respective department leaders to request their support during fieldwork, particularly for coordinating visits to smaller islands using municipal high-speed boats and facilitating connections with local SSF leaders. They agreed to collaborate, as both the doctoral research and its anticipated results—especially the quantitative data generated through this study—were considered valuable and relevant to their municipalities. Table 1.3 shows the timeline of the fieldwork process.

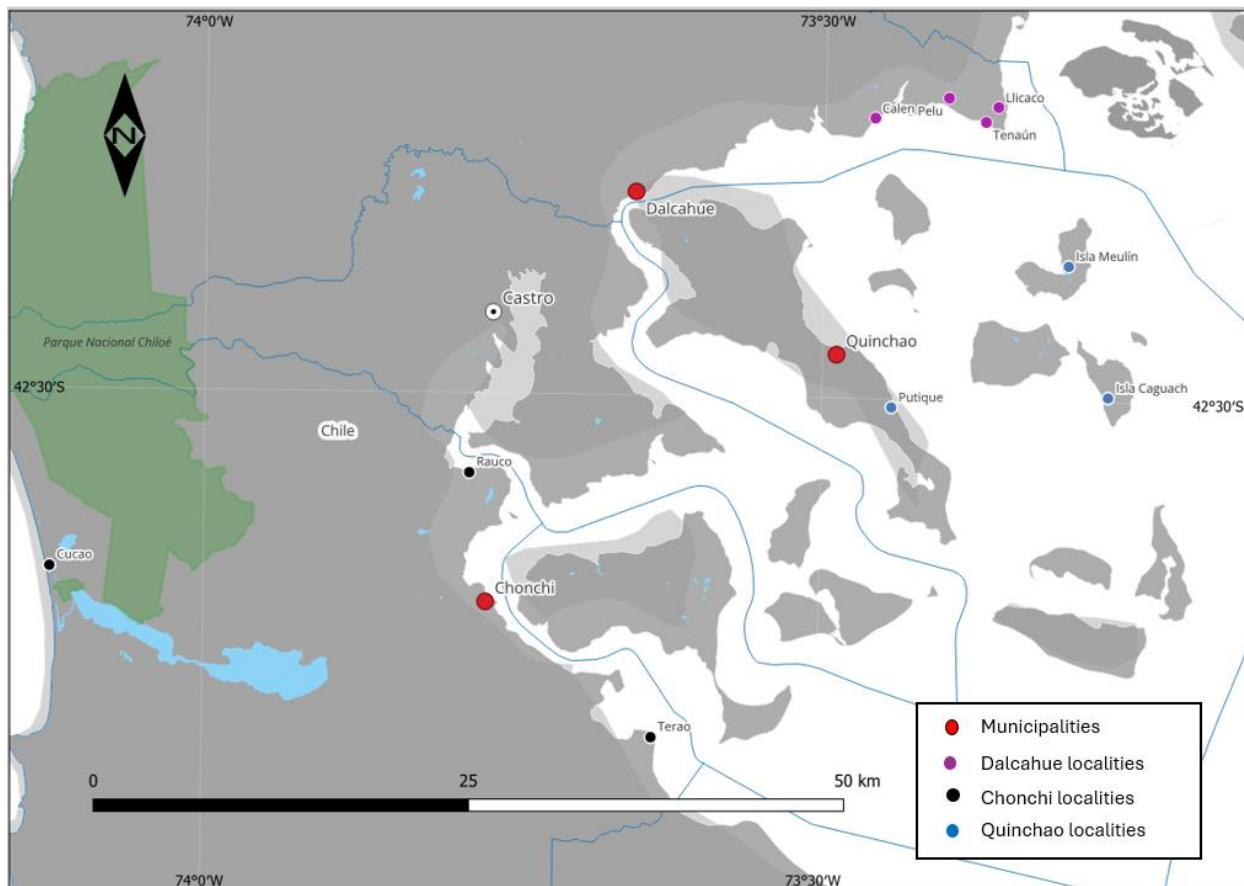


Figure 1.3: Fieldwork sites

Table 1.3: Timeline of fieldwork activities

	Nov 2023	Dec 2023	Jan 2024	Feb 2024	July 2024	August 2024
Initial meeting with local contacts and the head of the Municipal fisheries department	X					
Survey pilot (n=4)		X				
Interviews (first half)		X	X	X		
Survey			X	X		
Interviews (second half)					X	X
Participatory workshops						X

1.6.2.2.1 In-person surveys

Data were collected through 133 face-to-face (paper-and-pencil) surveys with men and women involved in SSF across the three municipalities mentioned above (Figure 3). Given the research objectives, the survey collected systematic sex-disaggregated data to explore vulnerability as a gendered multidimensional experience in SSF, with its material, relational, and subjective implications. Therefore, the purpose and scope of the survey are primarily descriptive (Chapter 3).

Due to the geographical challenges of accessing the rural coastal communities of the Chiloé Archipelago, as well as literacy differences, the surveys were conducted in Spanish and in-person by me and three fieldwork assistants, all local inhabitants of Chiloé associated with social science research, during December 2023-February 2024. The sample was purposive (non-probabilistic). Respondents had to meet the following criteria: 1) be involved in SSF value chain, 2) work and live in at least one of the three municipalities of the case of study, 3) be included in a 50-50 gender quota. The gender quota was not fully met; however, we reached 59% men (78 cases) and 41% women (55 cases). The median age in our survey is 49 years old, with 59.3% of women respondents aged 40-60 and 16.7% aged 60+. In the appendix section, the survey is included in both Spanish and English. Table 1.4 shows the survey sample⁵ and the universe.

To facilitate data analysis and ensure data reliability and verification, I personally digitized the paper-based surveys into a Qualtrics XM version. With that mechanism, transcription errors could be avoided, and an automatic database in different formats can be downloaded for analysis. The data collected by this technique is analyzed extensively in Chapter 3.

Table 1.4: Survey sample (count)

		Sample		Universe ^a	
		Male	Female	Male	Female
Main Fishery Activity	Boat owner	17	1	171	3
	Artisanal Fisher	46	5	810	3
	Shore Gleaner	26	51	2200	1445
	Diver	5	0	237	0
	Pre- and post-Harvest	1	10		
	Another	2	0		

^a Universe (by 2024) of total registered artisanal fisheries of the three municipalities, by sex

⁵ The categories of fishery activity are not mutually exclusive. People were allowed to mark more than one category on the survey.

1.6.2.2.2 In depth semi-structured interviews

I also conducted semi-structured interviews to gain a deeper understanding of the multidimensional experiences of vulnerability among men and women in SSF (Chapter 3), as well as to examine the role of gendered agency and empowerment in women's viability in SSF (Chapter 4). Agency and empowerment are particularly complex concepts to empirically measure, where issues of scale (individual, collective) confluence (Kabeer, 1999; Munoz-Boudet et al., 2013). Therefore, a comprehensive and flexible tool such as semi-structured interviews was appropriate for exploring these phenomena.

In total, 33 interviews were conducted with small-scale fishers (5 men and 28 women) across the municipalities of Dalcahue, Chonchi, and Quinchao between December 2023 and February 2024, and again during July–August 2025. Ages ranged from 45 to 75 years old. Most interviews were conducted by the first author with a research assistant, all in Spanish and audio-recorded for later transcription.

Participants were selected based on the following criteria: 1) active involvement in the SSF value chain as their primary livelihood, 2) a focus on female participants, and 3) residency within one of the three study localities. Interviewees were recruited via phone and email using purposive snowball sampling until saturation was reached. Initial contacts were identified through local collaborators and the corresponding Municipal Fisheries Departments, which resulted in many of the first interviewees being local SSF leaders. The appendix section contains the interview script applied. However, given the flexible nature of semi-structured interview data collection methods, this script was not always followed precisely. If any interesting topics emerged from the conversations, I dug deeper into them despite not being part of the script. Table 1.5 shows the interview sample.

Table 1.5: Interview sample

Main fishery activity		Men	Women
	Boat owner	2	
	Artisanal Fisher	3	
	Gleaner (Algae and Shellfish)		17
	Baiter (of hooks and longlines)		6
	Post-harvest processing		4
	Diver Assistant		1

1.6.2.2.3 Participatory workshops

Two participatory workshops were held for women-only SSF in Achao (Quinchao Municipality) and Dalcahue, on August 13th and 19th, 2024, respectively. Recruitment was done through snowball sampling, to contacts already interviewed, and through an open call to participate in workshops on social media and both Municipalities' social media accounts. In both workshops, 19 women participated in total, and they were held with the help of the Dalcahue and Quinchao Municipality Fisheries Departments, as well as the local Gender Equality NGO 'Chiloé Profunda', and the research/artistic group on Coastal women 'Maritorias'. Participatory workshops were held in Spanish, audio-recorded, and later transcribed by me. The data from these participatory workshops informed Chapter 3 and Chapter 4.

Some challenges were encountered with participatory workshops. The one held in Quinchao had low attendance (6 women), attributed to a storm and bad weather that day. It is important to note that Quinchao

Municipality comprises several interior islands, so traveling by boat to Achao (where the workshop was held) was severely hampered by the weather. Dalcahue, on the other hand, had higher attendance (13 women), which was considered sufficient to foster group dynamics and enriching discussions.

1.6.3 Data analysis

In alignment with the mixed-methods approach, I employed various data analysis techniques in this dissertation.

For the systematic scoping review, an extraction process was conducted via a Qualtrics XM survey, involving qualitative codification of the main variables and data of interest, in line with our research questions and paper objectives. In addition to descriptive variables, the codes included the main characteristics of the authors' gender approach and the vulnerability framework used (e.g., well-being, capitals approach, to name a few).

For the survey data, statistical analysis was performed in IBM SPSS Statistics version 30. Relationships between the categorical variable (gender) and the survey questions were examined using the Chi-square test of independence. The strength of association was estimated using Cramer's V. Statistical significance was set at $p < 0.05$.

Finally, for the interviews and participatory workshops data, a qualitative process of data analysis was conducted using NVivo (version 150) to open code each interview and participatory workshop, thereby identifying main theoretical guiding components (multidimensional vulnerability in SSF in Chapter 3) and agency and empowerment (Chapter 4) while leaving space for emergent themes. A second coding process in Excel enabled a more detailed, iterative review of the initial coding for validation purposes.

1.6.4 Validity and reliability

The question of validity and reliability is present in all scientific research. Reliability is broadly conceived as the consistency of a measurement scale. Validity is the extent to which the instrument measures the construct for which it is intended and not some other construct (or produces random noises) (Robins, 2015: pp. 109). To ensure both reliability and validity, a few measures were taken:

1. Mixed methods research (quantitative and qualitative): exploratory observations and interviews with local people informed the construction of the survey questionnaire. At the same time, the fullness of triangulation allows for combining the in-depth richness of interviews and the more precise and generalizable knowledge that results from a survey.
2. An initial meeting with SSF men and women (n=4) took place to review research objectives and questionnaire questions. This meeting was held on December 18th, 2024, in Dalcahue, and served as a small pilot to evaluate questions and the survey questionnaire's length.
3. A participatory meeting will be conducted (end of 2026) to present the results of this dissertation to the community involved in local SSF, to include their concerns, inputs, and to make an overall sense of the study results (community-based validation).

1.6.5 Research Positionality

According to Marshall and Rossman (2015), qualitative researchers should provide a clear and honest account of their identity, assumptions, and relationship to the research process. This principle is particularly

important in this thesis, as the questions that guided this research emerged not only from my academic interests but also from my lived experience. My positionality shaped my research questions, how I entered the field, the participants with whom I developed stronger connections, and ultimately the way I understood the stories shared throughout this study.

As a *chilota*, born and raised in Chiloé, and coming from a family whose ancestors have lived on the island for generations, I entered this research with a deep personal attachment to the communities and coastal livelihoods that form the focus of this dissertation. This familiarity facilitated access, trust-building, and a nuanced understanding of local realities that may have been difficult for an outsider to attain. I have researched Chiloé throughout my academic life: my undergraduate and master's theses, and now my PhD, all of which focus on the island. At the same time, I remained aware that my position was not straightforward. Years of higher education, including graduate studies abroad, have afforded me privileges and opportunities that differentiate my experience from that of many participants. Thus, throughout the research process, I sought to remain attentive to both my belonging and my distance, recognizing that I was simultaneously an insider and an outsider.

This insider/outsider status has always been somewhat uncomfortable for me and has become more pronounced over time. When I completed my undergraduate thesis, I was very comfortable with my position as a local. I felt deeply connected to the case study and fully immersed in it. However, this strong sense of belonging undoubtedly blinded me in some ways: my final product was a thesis grounded in a highly complex theoretical approach. When participants read it, it was largely beyond their understanding. After that experience, I promised myself that I would always try to ensure my research in Chiloé was also useful to participants and communities. This commitment is one of the main reasons why I pursued a Master's degree in Resources, Environment and Sustainability at UBC, focused on adaptive capacity building in Chiloé's coastal communities, and now a PhD in Social-Ecological Sustainability at the University of Waterloo, focused on gender and small-scale fisheries (SSF) in Chiloé as well, incorporating statistical analyses that key actors and community members themselves identified as needed in informal conversations before I began fieldwork.

Nevertheless, despite doing everything I could to make my research useful to participants and communities, I could not shake a persistent awareness of the privilege I carry. I am highly educated, trained at top universities, and have lived a comfortable life in Canada for more than ten years, far away from Chiloé. However, as fieldwork progressed, I found myself particularly drawn to the stories of women fishers. This connection emerged not only because of their central role in the fisheries and coastal economies of Chiloé, but also because many of their narratives resonated deeply with my own experiences as a mother.

During fieldwork, I repeatedly heard women describe their work in SSF as an occupation that enabled them to remain close to their children, care for their households, and balance productive and reproductive responsibilities. Many explained that their occupation in SSF offered a degree of flexibility unavailable in other forms of employment. Their accounts of organizing work around caregiving responsibilities felt remarkably familiar. In many ways, the motivations these women expressed for remaining in fisheries mirrored some of the reasons that led me to pursue a PhD. Like them, I was navigating the challenges of motherhood while trying to sustain a meaningful professional trajectory. The flexibility of academic work, despite its many demands and uncertainties, seemed to offer opportunities to combine intellectual aspirations with caregiving responsibilities, especially since my son was only 18 months old when I started my PhD during the COVID-19 pandemic.

Although our occupations, socioeconomic positions, and daily realities differed considerably, I recognized a shared experience of making life choices, especially livelihood aspirations, within structures that continue to place disproportionate caregiving expectations on women. This recognition fostered a profound sense of empathy that Bourdieu (1999) describes when attempting to reduce symbolic violence in research: "[...] to understand that if I were in her shoes (the interviewee), I would doubtless be and think just like her" (Bourdieu, 1999: 925). This empathy shaped many of the conversations that unfolded during fieldwork.

These shared experiences did not erase the differences between participants and me, nor did they provide direct access to their perspectives. Rather, they heightened my sensitivity to how gender, care work, family responsibilities, and livelihood decisions intersected in participants' lives. They also prompted me to ask different questions, to listen more carefully to stories that might otherwise have remained in the background, and to take seriously the forms of knowledge that emerge from everyday experiences of balancing work, family, and community obligations. At the same time, the persistent feeling of being an outsider kept me on my toes throughout the research process. I did not want to lose sight of the fact that part of me remained an outsider. As a visitor in a stranger's house, it was paramount to be respectful of participants' perceptions, narratives, and experiences.

The reasons for choosing Chiloé's small-scale fisheries communities as the focus of this research might be obvious at this point. What moves me as a researcher is the profound connection I feel to that island at the end of the world, to its communities, to its natural environment, and to any community that resembles it. However, the reasons behind my other decisions as a researcher might not be as clear. I initially chose to focus on gender, in part, because of my previous master's research. I felt I owed it to the many women involved in SSF whose experiences remain largely invisible. At the same time, my interest in agency and empowerment is guided by my knowledge of local realities and my observations of these women, who are far from helpless actors in the face of vulnerability. Research is needed to investigate this empirically and theoretically. In addition, my experience as a mother, my ethical commitment to understanding the challenges facing Chiloé's coastal communities, and my desire to produce knowledge that is useful to them all informed this research. Yet throughout the process, I sought to remain mindful that participants' experiences were their own, and that my responsibility as a researcher was not to speak for them, but to listen carefully, represent their perspectives respectfully, and create space for their voices to inform broader conversations about fisheries, social-environmental change, and gender equity.

1.7 Ethics

This research received approval from the University of Waterloo Research Ethics Board (REB #45734) on December 19th, 2024.

All participants provided written and verbal consent prior to participating in the research, during which they were informed about the very low risks of participation and the benefits. The participation was voluntary, and they had the freedom to withdraw at any time. The quotes included in this final thesis use only the initials of participants' first names to protect the interviewees' identities. See Appendix for the ethics approval documentation.

1.8 Organization of the dissertation

This thesis contains three papers written in manuscript format (Chapters 2, 3 and 4), as well as a conclusion section (Chapter 5). Each one of the papers addressed one specific objective outlined above in section 1.3,

in order, and was written as a separate piece for publication. Nevertheless, they build on each other to achieve the overarching main research objective of this dissertation. In view of this, some inevitable overlapping of concepts, methodological approaches, and empirical case study description exists among the manuscripts.

In Chapter 2, I conducted a systematic scoping review to examine how gender is addressed in the vulnerability literature related to SSF. At the same time, building on the review's findings and drawing on insights from Feminist Political Ecology (FPE), I propose a more nuanced framework for understanding vulnerability in SSF that incorporates multidimensional, subjective, and gendered perspectives. This manuscript is titled “From women's vulnerability to multidimensional gendered vulnerability in SSF: challenges and opportunities for a feminist approach”.

In Chapter 3, I applied the framework proposed in Chapter 2, that is, a multidimensional gendered approach to vulnerability in SSF, to the specific case study of Chiloé SSF, in Southern Chile. Through a mixed-methods approach using in-person surveys and in-depth, semi-structured, participatory workshops, I analyzed how vulnerability in SSF is an inherently gendered experience. This manuscript is titled “Men and women's differential experiences of vulnerability in SSF: A multidimensional case study from Chiloé, Chile”.

Chapter 4 explored the gendered agency and empowerment dynamics that women in SSF in Chiloé experience. Through a qualitative approach, the manuscript advances the scholarly understanding of how agency and empowerment are lived and how individual and collective expressions of both interact. The paper is titled "We empower each other": Gendered agency and empowerment dynamics in female small-scale fisheries in Chiloé, Chile.

Finally, Chapter 5 corresponds to the concluding remarks of this dissertation. It summarizes the key findings of each chapter and how each addressed its specific objective. In addition, the chapter highlights the novel contributions of this dissertation to advance knowledge, which are theoretical, empirical, and practical, as well as limitations and future research areas. All the papers cited throughout this thesis are referenced at the end, as well as the appendices.

Chapter 2 “From women's vulnerability to multidimensional gendered vulnerability in SSF: challenges and opportunities for a feminist approach”

2.1 Chapter Summary

Women play a crucial role in small-scale fisheries (SSF), yet their contributions and vulnerabilities are often overlooked in SSF research and policy. In particular, the complex and subjective aspects of gendered vulnerability have largely been neglected and remain poorly understood. In this study, we conducted a systematic scoping review to examine how gender is addressed in the vulnerability literature related to SSF. Our results show that in-depth gender analysis is scarce in research on SSF vulnerability, which is often anchored in a systems perspective that fails to account for the agency of individuals or social inequities and relations of power. Therefore, building on the review's findings and drawing on insights from Feminist Political Ecology (FPE), we propose a more nuanced framework for understanding vulnerability in SSF that incorporates multidimensional, subjective, and gendered perspectives. We argue that vulnerability research in SSF would benefit by incorporating core elements of new FPE, such as subjective dimensions of vulnerability, concerns over power dynamics, an intersectional approach, acknowledgment of agency capacity, and even embodied emotional struggles. The outcomes of this analysis can help reframe gender and vulnerability studies beyond the highly reproduced binary and essentialist narrative of women as victims or resilient actors, which has persisted in fisheries policy despite long-standing critiques. Instead, this analysis acknowledges the diverse voices and complexities of vulnerable experiences in SSF.

2.2 Introduction

Small-scale fisheries (SSF) -while disputed- are broadly defined as a wide range of activities undertaken by both men and women that occur along the continuum of the inland and marine fish capture value chain, from foot fishers to small and semi-industrial vessels, along pre- and post-harvest labor (Smith & Basurto, 2019; Smith et al., 2023). SSF employs approximately 60.2 million people across its value chain, supporting over 90% of the total number of people engaged in capturing fisheries globally, providing food security, nutrition, sustainable livelihoods, and economic value (FAO, 2023).

Women are integral to SSF, making up to 50% of the workforce (Harper et al., 2013; FAO, 2015; 2023). At the same time, women in SSF confront multiple challenges that put them in a particularly vulnerable place (Appiah et al., 2021; Gustavsson et al., 2021). For example, women's participation in SSF is often informal and unpaid, which limits their subsistence and income security, as well as their inclusion in official fisheries data and meaningful engagement in decision-making (Harper et al., 2013, 2023). Although women's paid participation in SSF has increased over time (Szymkowiak, 2017), they are still relegated to lower-paid and seasonal positions along the fisheries value chain, such as shellfish and seaweed harvesting near shore (Frangoundes & Gerrard, 2019), and post-harvest fish processing (Zhao et al., 2013). Examples from around the globe are consistent with this trend, such as Latin America (Alvarez et al., 2017; Gallardo-Fernández & Saunders, 2019), North America (Nadel-Klein, 2000; Szymkowiak, 2017), and the South Pacific (Rohe et al., 2018), among others. In addition, they are subject to exploitative gendered power dynamics along the SSF supply chain, often receiving fewer benefits from SSF than men (Mangubhai et al., 2023).

Overall, gender-based violence is pervasive in fisheries (Mangubhai et al., 2023) and illustrates the differentiated experiences of vulnerability confronted by men and women in SSF. Thus, despite their contributions, women and the gender-based vulnerability they experience are often overlooked and undervalued in SSF research and policy (Lawless et al., 2021), which makes them a 'hidden force' (Andrade et al., 2021; Harper et al., 2023; Smith et al., 2023). While in recent years, attention to the role of women in fisheries has increased (Kleiber et al., 2015; Barclay et al., 2022; Galappaththi et al., 2022), the multidimensional and subjective dimensions of gendered vulnerability in SSF have received insufficient attention to date. Many narratives, in both academia and development initiatives, tend to portray so-called "third-world women" (Mohanty, 1984) as more vulnerable than men to environmental degradation (Lawless et al., 2021; Resurreccion, 2017), denying nuanced gendered and intersectional dynamics and women's agency in the face of environmental change and risk (Harris, 2006). Understanding how fisheries management contributes to or addresses multidimensional gendered vulnerability is critical for realizing equitable and sustainable fisheries.

Given these challenges, our paper has two objectives. First, we aim to analyze gender approaches in the vulnerability literature of SSF. To achieve this, we conducted a systematic scoping review of refereed literature on vulnerability and gender in SSF under the guiding question: *What is the current state of research on vulnerability and gender in small-scale fisheries?* Second, we asked: *how can different research on gender and vulnerability in SSF contribute to a more nuanced approach?* We addressed this question by proposing a framework for social-ecological vulnerability in SSF that incorporates multidimensional gendered dimensions, drawing from new Feminist Political Ecology (new FPE) discussions of vulnerability (e.g., Arora Johnson, 2011; Nightingale, 2006, 2011; Harris, 2006; 2008; Sultana, 2011), and the evidence gathered from our systematic scoping review. We argue that new FPE approaches have focused on the subjective, gendered dimensions of vulnerability and have the potential to fill the gaps identified in our scoping literature review, as well as to inform the evolution of systems-based vulnerability approaches (Adger, 2006; Bennet et al., 2016; Nayak & Berkes, 2019) for studying gendered vulnerability in SSF, considering epistemological and methodological compatibilities.

The paper is structured in four sections. First, we synthesize the historical evolution of vulnerability conceptualizations, with an emphasis on social-ecological, gender, and environmental scholarships. Second, we describe the methods that guided our scoping review. Third, we outline the main results of our scoping review on gender and vulnerability research in SSF. Finally, we present a proposed gendered vulnerability framework for SSF and discuss its opportunities and limitations.

2.3 Theoretical Framework

2.3.1 Bounding vulnerability: historical development of vulnerability conceptualizations

Vulnerability research varies across the related fields of hazards and risk, climate change, and resilience, often defined as a function of 1) exposure to stresses or hazardous conditions, 2) sensitivity (susceptibility to harm), and 3) adaptive capacity or capacity of the system to adapt to the impacts of those conditions (Turner et al., 2003; Smit & Wandel, 2006; Adger, 2006; Bennet et al., 2016). While there are some differences, most authors agree on an inverse relationship between adaptive capacity and vulnerability, where the higher the adaptive capacity, the lower the system's vulnerability (Adger, 2006; Bennet et al., 2016).

Early vulnerability research emerged from risk-hazardous scholarship in the 1980s (Turner, 2003; Adger, 2006; Berkes, 2007; Bennet et al., 2016). Vulnerability in this literature is seen more as an outcome focusing on the susceptibility of individuals, communities, or systems to the impacts of natural events (e.g., earthquakes, floods, hurricanes, or droughts) (Bassett and Fogleman, 2013). Later, vulnerability discussions were linked to the 'pressure and release' (PAR) literature, broadening the scope to political economy dimensions. However, according to Turner et al. (2003), PAR research falls short of acknowledging systems' complex linkages and feedback. Overall, in both traditions, the focus on vulnerability is posed on the perturbations and stress to which the systems are exposed and the likelihood of hazards (Turner et al., 2003; Adger, 2006), and less on the complex relationships between dimensions or attributes.

Recent vulnerability approaches have focused on what several authors refer to as 'vulnerability as a context' or 'vulnerability as a starting point,' as opposed to vulnerability as an outcome (Bennett et al., 2016). This analytical distinction has been used by several authors such as Smit and Wandel (2006), Adger (2006), O'Brien et al. (2004), Bennet et al. (2016), and Blythe et al. (2015), to name a few; it is not, however, explicit in most research. Contextual vulnerability approaches emphasize the nature of vulnerability based on the system's attributes (Smit & Wandel, 2006). Specifically, research focuses on the situated nature of individuals, households, communities, or regions to analyze the system's adaptive capacity in a changing environment (Blythe, 2015, p. 276). According to these authors, vulnerability as a 'starting point' is often linked to the social-ecological systems perspective (SES), highlighting the inextricable nature of coupled human, social, political, and economic actions and ecological processes (Adger, 2006).

2.3.2 Systems frameworks for vulnerability

Many authors have proposed a comprehensive framework to measure vulnerability. The work of Turner et al. (2003) has been foundational for recent integrative frameworks in vulnerability research. The authors, situating themselves under the umbrella of SES, proposed a holistic framework that included components such as exposure, sensitivity, and adaptive capacity, considering nested scale boundaries and social and ecological cross-scale interactions (Turner et al., 2003; Blythe et al., 2014). These components are found in subsequent integrative frameworks by Adger et al. (2006) and Bennett et al. (2016), such as a) the role of multiple interacting stressors, b) exposure beyond specific perturbations, c) re-structuring after the responses, d) the role of nested spatial and temporal scales and dynamics.

Adger's (2006) work is considered significant in scholarly debates as it synthesizes the various approaches to vulnerability from different traditions. He also includes a generalized measure of social vulnerability related to climate and environmental change. According to Adger (2006), vulnerability needs to reflect material measures and the severity of its distribution. Additionally, he emphasizes the importance of the temporal dynamics of risk and its distribution across systems.

The work of Bennet et al. (2016) is also relevant, as it provides a framework for measuring vulnerability to multiple exposures within coastal systems. They acknowledged the importance of multiple stressors, indirect and interactive impacts, and nested spatial and scalar dynamics, in the same way that antecedent social-ecological vulnerability frameworks have pointed out (Turner et al., 2003; Adger, 2006; Smit & Wandel, 2006). The authors innovate by highlighting that exposure to stress and shocks can lead to positive outcomes.

Lastly, Nayak and Berkes (2019) proposed a comprehensive framework for studying vulnerability within SSF. The authors understand vulnerability as "multidimensional, complex, highly dynamic, and relative"

(pp. 207), comprising three major dimensions: well-being, capital and resources, and resilience. Well-being is understood, in a broader sense, as the possibility to enjoy the satisfaction and pursuit of one's own goals in life, and composed of material, relational, and subjective elements (*idem*). On the other hand, capitals include access to human, physical, social, natural, and financial assets. Moreover, resilience is understood as the tradition of SES, that is, the capacity of a system to absorb disturbance and reorganize in the face of change while retaining its identity (Nayak & Berkes, 2019). The authors also emphasize the importance of multilevel drivers that interact with all components of vulnerability, as well as how the absence of vulnerability is neither possible nor desirable. Uncertainty and change are inherent components of social-ecological systems. While a group or community, especially SSF communities, can build up resilience to better adapt to change, there is no state of zero vulnerability given the complexity of the many drivers of change at different levels and scales that SSF confront, such as local environmental hazards, and global market pressures, to name a few.

Commonalities between the frameworks reviewed are many and outweigh the differences, providing valuable contributions to vulnerability research. First, while some frameworks are specifically designed to measure vulnerability within a particular system or problem (e.g., climate change, coastal communities, SSF), they all fall under the SES approach, with epistemological, methodological, and analytical implications. That includes acknowledging complexity, change, uncertainty, multi-scalar interactions, and feedback as key properties of a system rather than 'undesirable' problems. In addition, aligned with SES tradition, all the frameworks emphasize the importance of resilience as part of a broader understanding of vulnerability to deal with change and uncertainty, and to absorb and respond to it. Thus, they have contributed to integrating both natural and human dimensions in vulnerability research and management. Third, all the frameworks explore an understanding of vulnerability as highly dynamic: the vulnerability of a system is not fixed or static over time (Adger, 2006).

Nonetheless, a common limitation in these theories is the lack of inclusion of gender and other forms of difference and power relations. When gender is included, as in the cases of Nayak and Berkes (2019) and Bennett et al. (2016), it is presented as a variable in the data analysis results section rather than as a key dimension of their vulnerability approach. A second limitation is how subjective experiential elements are either excluded from the analysis or relegated to a less relevant role under material (ecological, economic), relational, and institutional categories. This characteristic could be problematic when analyzing the role of gender and intersectionality in vulnerability. Adger (2006) and Nayak and Berkes (2019) emphasize that vulnerability is not synonymous with poverty, underscoring the need for a comprehensive understanding of well-being that extends beyond material dimensions.

2.3.3 Situating gender analysis and intersectionality for vulnerability research

The connection between gender and the environment has evolved into a scholarly debate over the past four decades, with critical insights from academia, practitioners, development institutions, and activists (Resurreccion, 2017). Critiques of ecofeminism and Women, Environment, and Development (WED) scholarship inspired the development of Feminist Political Ecology (FPE) (Sundberg, 2017; Resurreccion, 2017), which is centered on the essentialist framing of the feminine subject that naturalizes her nexus with nature. FPE scholars argued that the 'women-nature natural connection' narrative evolved into two interrelated facile assumptions: one which positions women as victims of environmental degradation, and the other where women are considered agents of ecological stewardship, adding more tasks to their long lists of obligations (Resurreccion, 2017).

Thus, during the mid-1990s, FPE emerged as a subfield of Political Ecology, sharing concerns over power, control, and social justice related to the natural environment, but now extending its scope to include gendered relations and social differences (Elmhirst, 2011; Resurreccion, 2017). According to Rocheleau et al. (1996), gender is a critical variable that interacts with class, culture, race, caste, and ethnicity in shaping the processes of access and control over resources, as well as the processes and struggles of environmental change and sustainable livelihoods (idem). The focus of FPE on multidimensional experiences where race, ethnicity, class, and other social categories collapse with gender is called intersectionality, often attributed to Crenshaw (1991) in academia. Crenshaw's analysis shows how the focus on either gender or race in white feminist agenda and antiracism revindications denied black women's experience of violence because it neglected the multiple ways in which racism and sexism converge (idem). Since then, intersectionality has expanded into various research (Collins, 2015).

The focus on structural categories that produce and reproduce experiences of inequality marks a departure from posterior FPE approaches (Elmhirst, 2011; Resurreccion, 2017; Sundberg, 2017). Thus, the so-called 'new FPE' refers to the new body of work in FPE since the 2000s, which establishes that gender—concerning class, race, and other relevant axes of power—shapes differentiated access to and control over natural resources (Elmhirst, 2011; Sundberg, 2017). Also called 'post-structuralist and performative approaches' (idem), new FPE has drawn from Butler's (1991) post-structural theory of gender, which argues that gendering practices are not based on biological sex differences but through everyday performance (Sundberg, 2017). According to new FPE scholars, gender is not pre-given; therefore, any gender analysis based on culturally defined male-female sex roles has the danger of falling into a reductionist analysis of the gender-environment relationship (Nightingale, 2006). In this sense, gender is understood as a process by which subjectivities are produced and contested through situated performance, which changes over time and space (idem).

Currently, gender research has also expanded into various fields beyond FPE. In fisheries research, gender has been widely recognized (Kawarazuka et al., 2017) and has become an important research topic (Kleiber et al., 2015; Lawless et al., 2019; Frangoundes & Gerrard, 2019; Galappaththi et al., 2022). However, some authors have highlighted that this engagement is primarily used as a variable of analysis to understand the gaps between men and women in access, roles, and decision-making rather than as a theoretical focus that enables critical analysis (Kawarazuka et al., 2017). Gender approaches go beyond the study of women to explore complex, intersectional experiences (Kleiber et al., 2015). Assessing how gender is included in SSF vulnerability studies is, therefore, necessary to move towards a gender-sensitive approach to SSF.

2.3.4 Insights from new Feminist Political Ecology on vulnerability

The underlying question of FPE—how to (re)conceptualize the nature-gender nexus—continues to expand under the 'new' FPE approach, where authors have explored the complexities of vulnerability landscapes related to natural resources (see Nightingale, 2006, 2011; Harris, 2006, 2008). One element of this expansion is how new FPE scholars have embraced the intersectionality framework (Sundberg, 2017; Elmhirst, 2011). For instance, Harris (2006, 2008) analyzes the intersection of gender poverty, ethnicity, and livelihoods in waterscape changes in Southeast Turkey. Her work understands the differentiated effects of water changes and interventions, where landless poor women experienced enhanced vulnerability (2008). Similarly, Nightingale (2006, 2011) problematizes how gender and other forms of differentiation become relevant in environmental disputes. Her work in rural Nepal examines how the intersectionality of gender,

caste, age, and ethnicity collapses with material and spatial practice in the normative restrictions imposed on men and women. Similarly, Sultana (2011) incorporates emotional geographies into her work on the arsenic-contaminated waterscapes in Bangladesh. The author analyzes how water access, use, control, ownership, and conflict are mediated through social relations of power and emotions that shape intersectional embodied subjectivities in everyday material practices of water collection (idem).

FPE approaches to vulnerability and climate change pose an interesting perspective. Most discussions around climate change vulnerability are built around the idea that pre-existing vulnerabilities and inequalities are thought to be exacerbated by climate change (Adger, 2006), such as the gap between rich and poor and gender inequality (Denton, 2002). Thus, gender has become a crucial dimension in climate change vulnerability analysis (Ravera et al., 2016). However, according to FPE scholars, this connection is often far from adequate gender analysis and relies on facile assumptions centered on the feminine subject as 'victims' (usually rural women of the Global South), who are more vulnerable to climate change than men (Arora-Jonsson, 2011; Ravera et al., 2016; Resurreccion, 2017).

The work of Arora-Jonsson (2011) is key in this critique. The author analyzes how the narrative of 'women as more vulnerable to climate change' is reproduced as a generalizable fact anchored in limited evidence and two inadequate ideas. First, women are the 'poorest of the poor,' and second, due to the high mortality rates of women in natural disasters. In addition to this 'feminization of poverty,' another counterproductive discourse is also reproduced based on essentialist views that resemble the ecofeminist and WED critiques mentioned earlier: women are closer to nature, and therefore, pro-environmental. Thus, the author argues that this insistence on the universal vulnerability or virtuousness of women is based on static understandings of women's roles, with adverse effects: it hinders gendered power relations and how vulnerability is reproduced, with different implications for both women and men. In addition, it denies their agency and capacity for collective action (Arora-Jonsson, 2011; Resurreccion, 2017).

In synthesis, new FPE offers key analytical tools for a more nuanced understanding of multidimensional, gendered vulnerabilities, demonstrating how resource struggles are complex and contested, thereby shaping multidimensional subjectivities in everyday practice. Moreover, while not all the work cited as new FPE necessarily focuses on vulnerability per se, the theoretical affinity is evident, providing an entry point to disentangle assumptions reproduced in vulnerability literature and development practice that restrict women to being 'vulnerable.' Instead, in new FPE, subjectivities are conceived as intersectional, where gendered hierarchies interact with other structures of power and social differentiation. At the same time, new FPE acknowledges the pivotal role of agency in the intersectional-environment nexus, which is conceptualized as a contested, emergent, and dynamic (Mollet & Faria, 2013).

On the other hand, FPE also has some practical challenges and limitations when analyzing vulnerability. As highlighted by Mollet and Faria (2013), when employing an intersectional approach, the researcher faces the practical challenge of incorporating an infinite number of categories of social differentiation or opting to prioritize gender as the central dimension. Additionally, it is crucial to examine the applicability of this critical framework in policy and governance practice. When reality is conceived as emergent and contested, designing policies presents additional challenges in translating them into practice. Table 2.1 summarizes the various approaches to vulnerability discussed, along with the analytical tools and perspectives, their respective contributions, and limitations.

Table 2.1: Different approaches to analyzing vulnerability and resource struggles.

Key papers	Theoretical traditions	Approach	Social/ ecological phenomena are seen as	Analytical elements					
				Dimensions of analysis	Unit of analysis	Subjective dimension	Agency	Power	Gender
Turner et al. (2003). Adger (2006), Bennet et al. (2016)	Social-Ecological Systems (SES)	Systemic	Complex, Dynamic, Systemic, (feedbacks), Scale dependant	Material Institutional Relational	Scale dependant (groups, community, local/ global)	Out of scope (only through knowledge and learning)	Yes	No, social differences are mostly given, contextual	No
Nayak & Berkes (2019)	Well-being, resilience	Systemic, critical	Complex, Dynamic, Relational, Relative, Scale dependant	Material Relational Subjective	Scale dependant (individual, groups, community, local/ global)	Yes (perceptual, knowledge, and learning)	Yes	Yes	No
Harris (2006, 2008), Nightingale (2006, 2011), Arora-Jonsson (2011), Sultana (2011)	Feminist Political Ecology (FPE)	Post-structuralist feminism, critical	Complex, Dynamic, Contingent, Contested, Situated,	Material Relational Symbolic Subjective Embodied Emotional	Individual Groups	Yes, including social identities and emotions	Yes	Yes	Yes

Source: Elaborated by the author, based on Kawarazuka et al. (2017).

2.4 Methods

Given the emergent understandings of vulnerability reviewed and our initial concern over the lack of dialogue between these different frameworks towards a more nuanced gendered approach in vulnerability research, we conducted a systematic scoping review to assess peer-reviewed publications on gender and vulnerability in SSF specifically. We decided to conduct a systematic scoping review due to its focus on identifying and analyzing knowledge gaps in the available evidence, which aligns with the critical approaches adopted by our synthesis (Munn et al., 2018). We followed the Systematic Reviews and Meta-Analyses guidelines (PRISMA), which include 1) formulation of research question and scope, 2) research protocol, 3) database search, 4) screening the papers resulting from the search based on title and abstract, 5) full-text assessment of papers, and 6) extraction and codification of the papers selected (Page et al., 2021; Galappaththi et al., 2022). We selected SCOPUS and Web of Science to search for relevant scientific literature that includes the key terms of our search query and better captures our research question: *What is the state of the art on vulnerability and gender research in SSF?*

Table 2.2 and Figure 2.1 summarize the search Boolean query for search and the PRISMA protocol followed, respectively. The process was supported using the Covidence program (www.covidence.org), a tool specially designed for systematic review. The first part of the search was restricted to the title and abstract resulting from the Boolean query search, which included only peer-reviewed publications from both databases in English. No restrictions were placed on the time of publication or geographical area. The database search yielded 134 studies in total (from SCOPUS and Web of Science), of which 23 were duplicated and therefore excluded. Later, 111 studies were screened (title, abstract, and keywords), resulting in 71 exclusions (irrelevant). The inclusion criteria were studies focusing on SSF, vulnerability approach studies, those with gender as a main topic (as a keyword), or women-targeted studies.

Table 2.2: Search queries applied to SCOPUS and Web of Science in March 2024.

Key term per question component	Search queries	
Gender	Gender* OR women* OR female*	AND
Small-scale fisheries	small-scale fish*OR small AND scale AND fish* OR artisanal*fish	
Vulnerability	vulnerability* OR vulnerable	

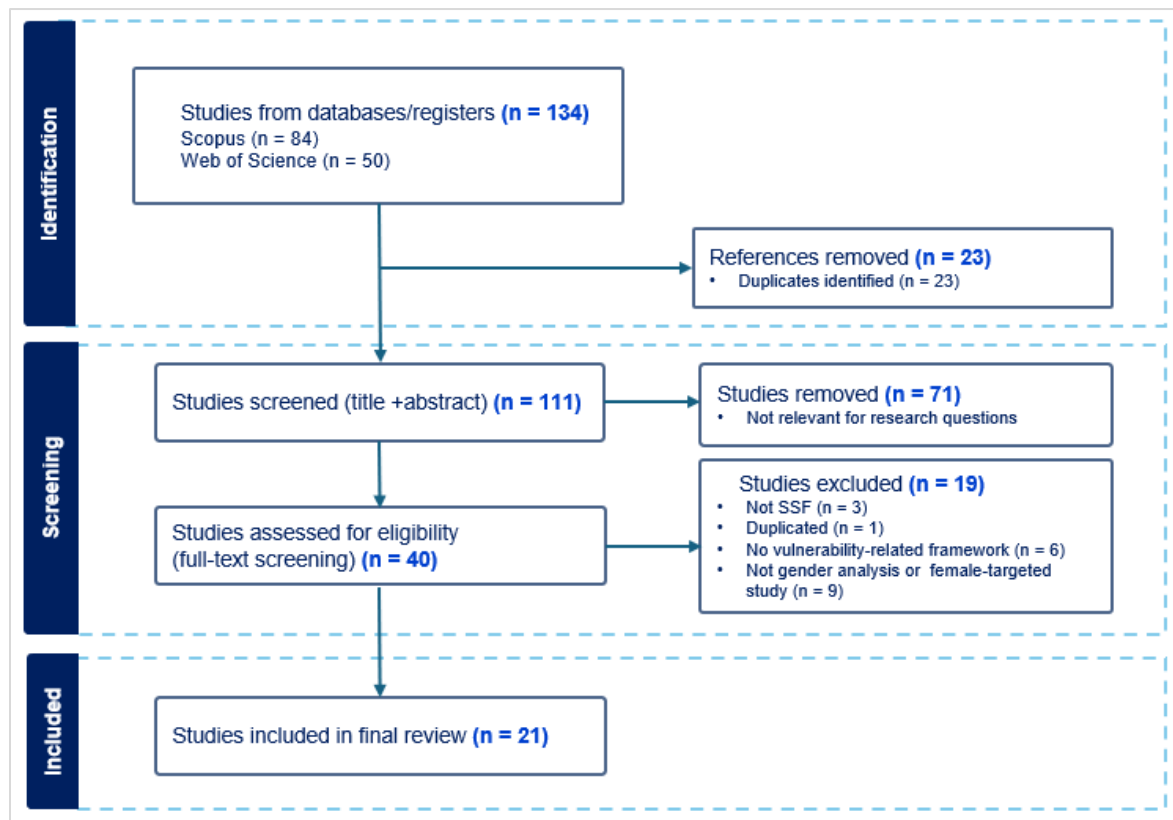


Figure 2.1: Flow chart of the systematic scoping review process.

After the screening, 40 full-text studies were assessed, from which 19 were excluded due to a lack of focus on gender or women's issues and a lack of vulnerability focus. Thus, 21 papers were included as the final sample for extraction and codification.

We acknowledge that the definitions of the main concepts in our inclusion criteria are complex; therefore, we included only papers that explicitly focused on SSF, vulnerability, gender, or women's targeted issues as a primary keyword/topic. Following Smith & Basurto (2019), we understand that the underlying definition of SSF is variable, with a focus on technological dimensions (e.g., boat length) rather than sociocultural aspects, and, as the authors demonstrated, often absent in one-quarter of the published articles they assessed. However, we are not critically analyzing the definition or characteristics of SSF per se. Instead, we assume that as long as the papers explicitly mention SSF as a unit of analysis, whether conceptualized or not, they refer to the same group of fisheries we defined in our introduction. A different situation involves the definitions and components of vulnerability and gender, which were analyzed more critically through the codification and extraction process.

Specifically, the extraction process involved a qualitative codification of the main variables and data of interest, in line with our research questions and paper objectives. In addition to descriptive variables, the codes included the main characteristics of the gender approach taken by the authors and the characteristics of the vulnerability framework (e.g., well-being, capitals approach, to name a few). Furthermore, based on our theoretical discussion in Section 2, we examined the final sample in terms of what we consider an in-depth gender analysis, as well as their individual contributions to a more nuanced proposed framework for gendered vulnerability in SSF.

2.5 Results

2.5.1 Sample overview

The selection criteria resulted in 21 papers published in peer-reviewed journals between 2008 and 2023. While no restrictions were introduced regarding the timeframe in our initial database search, the inclusion criteria self-limited to the last 16 years. The publication trend shows an increasing interest in vulnerability studies and gender in SSF, peaking in 2021 with five papers from that year (See Figure 2.2) (Amadu et al., 2021; Azmi et al., 2021; Mangubhai et al., 2021; Murunga, 2021; Sreya et al., 2021).

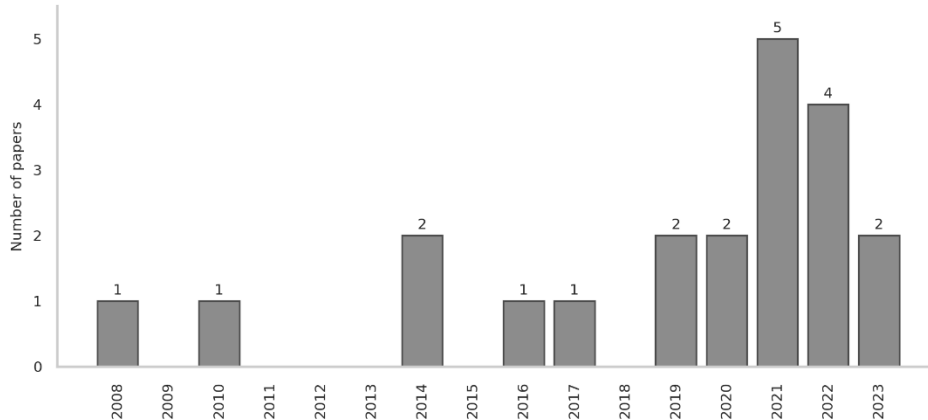


Figure 2.2: Number of papers per year of publication

The methods used in the selected papers varied, with predominantly qualitative approaches (7 cases) and systematic literature reviews (6 cases). Out of the papers with qualitative methodology; one used legal analysis as data collection technique (Auld & Feris, 2022), two used an ethnographic approach (Nolan, 2019; Azmi et al., 2021), and the remaining four used different types of interviews as a method of data collection: semi-structured interviews (Matsue et al., 2014), in-depth interviews (Coulthard et al., 2020); key informant interviews (Mangubhai et al., 2021), and qualitative surveys (Nagoli et al., 2010). This finding aligns with the approach advocated by some gender scholars for gendered research: qualitative methodology is the most effective tool for uncovering the nuances of gender dynamics (Kawarazuka et al., 2017). On the other hand, all the papers that employed mixed or quantitative methodologies used surveys as the primary data collection research technique, with one paper in particular incorporating participatory methods (Macnaughton et al., 2016). In addition, only one paper was a perspective paper (Weeratunge et al., 2014). See Figure 2.3.

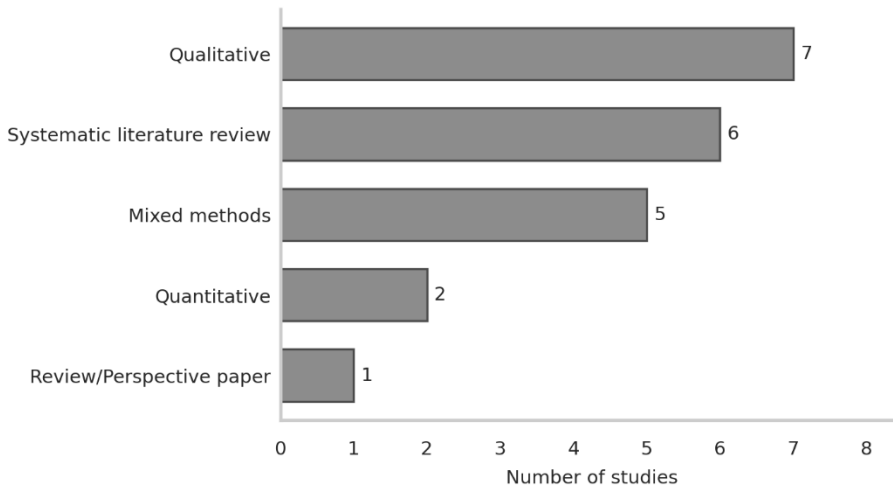


Figure 2.3: The methodology used throughout the final sample

2.5.2 Geographic location and spatial scope

Most of the papers included in the final sample focused on the Global South, except for three, which had a global scope (see Weeratunge et al., 2014; Calls and Sellers, 2019; de Carvalho et al., 2023). Most of the geographical regions studied are located in Africa and Asia, with the former accounting for 50% of the final sample and the latter for 27%. Only one paper was in South America, specifically on the Bolivian Amazon (Macnaughton et al., 2016). In addition, few papers have focused on multiple countries in their studies: Dias et al. (2023); Coulthard et al. (2020); Murunga, M. (2021); Mitra & Barua (2022); Okafor-Yarwood et al. (2022). In addition, the most frequent countries of study site on the selected final sample were India (6 cases), Ghana (5 cases), and Nigeria (3 cases). See Figure 2.4 and Figure 2.5.

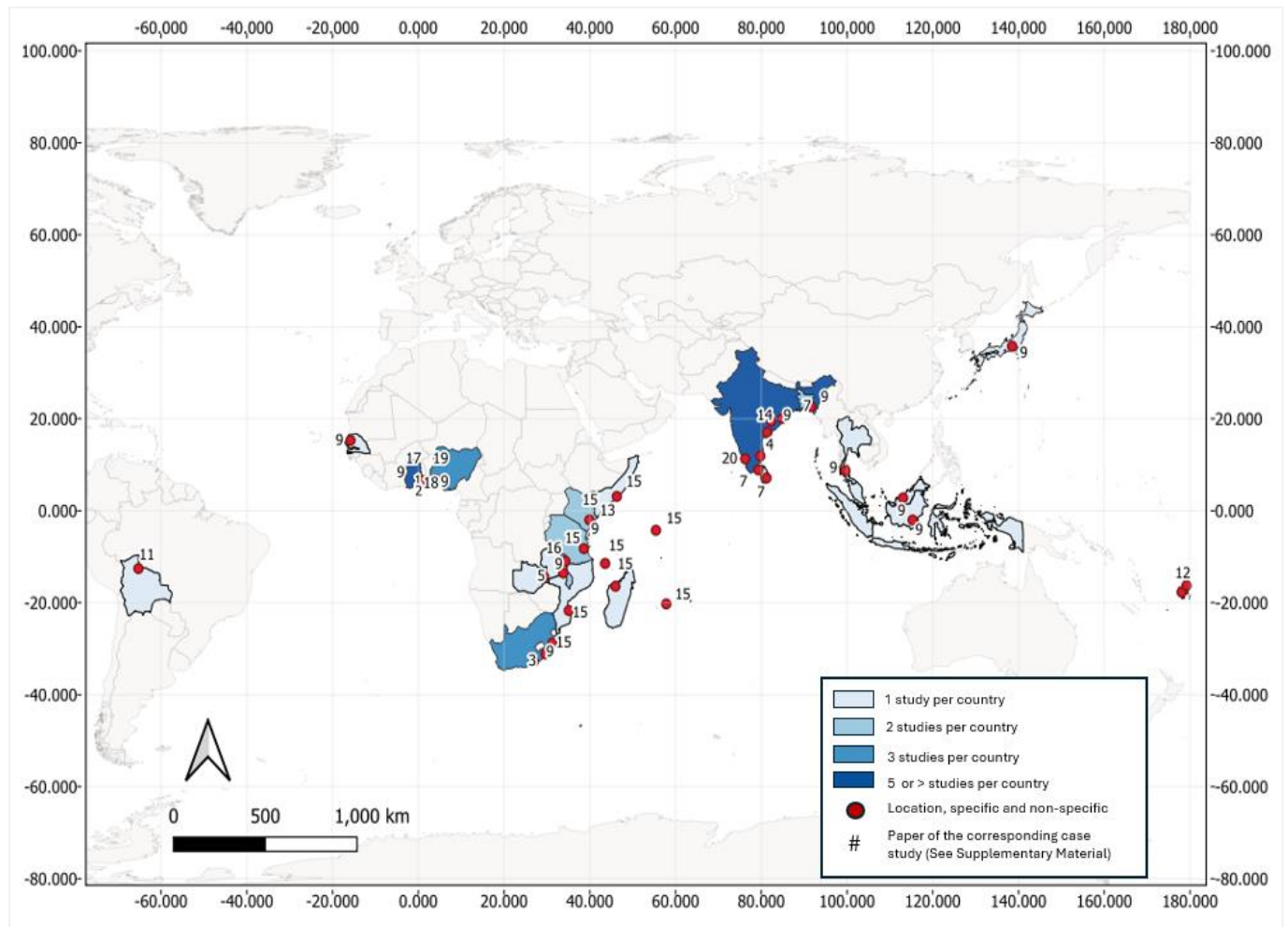


Figure 2.4: Number of cases of study per country.

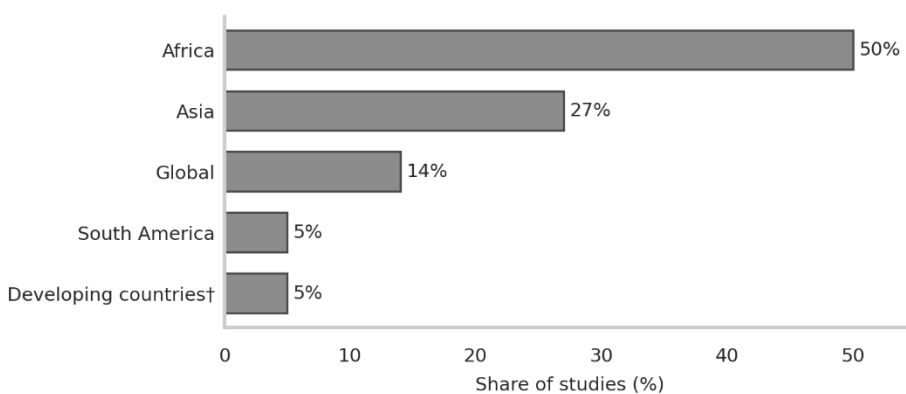


Figure 2.5: Geographic location | [†]The category of 'developing countries' as a geographic regional scope is taken from the original paper referenced (Kawarazuka et al., 2017) and is not a category constructed by the authors of the present paper.

2.5.3 Spatial scale, type of fishery ecosystem and SSF activity

The spatial scope (see Table 2.3) of analysis varied among the papers in the sample. Out of the total, six papers focused on the community level, followed by the regional level (5 cases), global level (4 cases), country level (3 cases), and two papers focused on the household level. Only one paper focused on the group level, which involved indigenous fishers (Macnaughton et al., 2016). Interestingly, most papers focused on coastal SSF (9 cases), two focused specifically on rivers inland SSF (Macnaughton et al., 2016; Oloko et al., 2022), and two focused on inland (lake) SSF (Mitra & Barua, 2022; Nagoli et al., 2010). It is worth noting that five papers did not specify the ecological system they focused on within SSF.

Table 2.3: Characteristics of sample reviewed (spatial scale, fishery ecosystem and fishers' actors mentioned)

Variable of analysis	Description	Codes	Number of cases
Spatial scale	Scope of analysis of the paper	Global level	4
		Regional level	5
		Country level	3
		Community level	6
		Groups	1
		Household-level	2
Fishery ecosystem within SSF	The paper mentions the type of SSF ecosystem (Yes/No)	Coastal and inland fisheries	2
		Coastal SSF	9
		Inland (lake) SSF	2
		Inland (river) SSF	2
		Non-specific	5
Fishers' actors mentioned	The paper mentions specific fishers' actors [†] (Yes/No)	Fishers (including boat owners and crew members)	9
		Fish processor	6
		Fish traders	3
		Fishmongers	2
		Fish vending and auctioning	1
		Indigenous fishers	1
		Non-specific fishing activity was described among SSF	4
		N/A	4

[†]The number of cases includes duplication, as some papers focus on multiple fishers' actors

The type of actor most mentioned among the papers of the sample were fishers (including boat owners and crew members). This category (fishers) included both men and women in the papers mentioned (e.g., Amadu et al., 2021). On the other hand, the papers that focused on other actors of the fisheries value chain: fish processors (mentioned in 6 cases), fish traders, fishmongers, and fish vendors mainly included women as the unit of analysis (e.g., Appiah et al. 2021; Matsue et al., 2014; Azmi et al., 2021). While most of the papers included in the final sample mentioned a specific type of fisher actor, four cases were non-specific, and the other four cases had no available information.

2.5.4. Vulnerability approaches in SSF research: different frameworks for similar research problems

In this section, we examine the characteristics of gendered vulnerability as explored in SSF research, taking into account the various emergent understandings of vulnerability presented in Section 2.3. Thus, our results show that the papers reviewed employ different approaches to vulnerability, which can be grouped into five clusters (in order of frequency): the Resilience and Social-Ecological Systems vulnerability framework (7 papers), the Poverty-marginalization approach (5 papers), and the Sustainable Livelihood framework. (4

papers), Well-being approach (3 cases), and Political Ecology (2 papers). It is worth noting that this categorization was derived from an inductive coding process and was not explicitly mentioned or outlined in all the reviewed papers. Therefore, we acknowledge that this categorization is an analytical decision made by the authors. In addition, while all the papers reviewed engage with vulnerability issues in different ways, this was not necessarily the main theoretical concept of each paper reviewed. Only three papers used the standard definition of vulnerability under what we call integrative or holistic vulnerability frameworks in SES (see Calls & Sellers, 2019; Mitra & Barua, 2022; Mangubhai et al., 2021), and the rest of the sample focused partially on vulnerability in terms of capitals (Allison & Ellis, 2001), poverty-marginalization, resilience, to name a few.

In addition, the selected papers explore the main topics of fisheries governance, climate change, livelihoods, transactional sex and HIV/AIDS risks, gender inequality, women's well-being, COVID-19 disruptions, and food security. Figure 2.6 summarizes the relationship between the categorization of approaches to vulnerability and the topics explored.

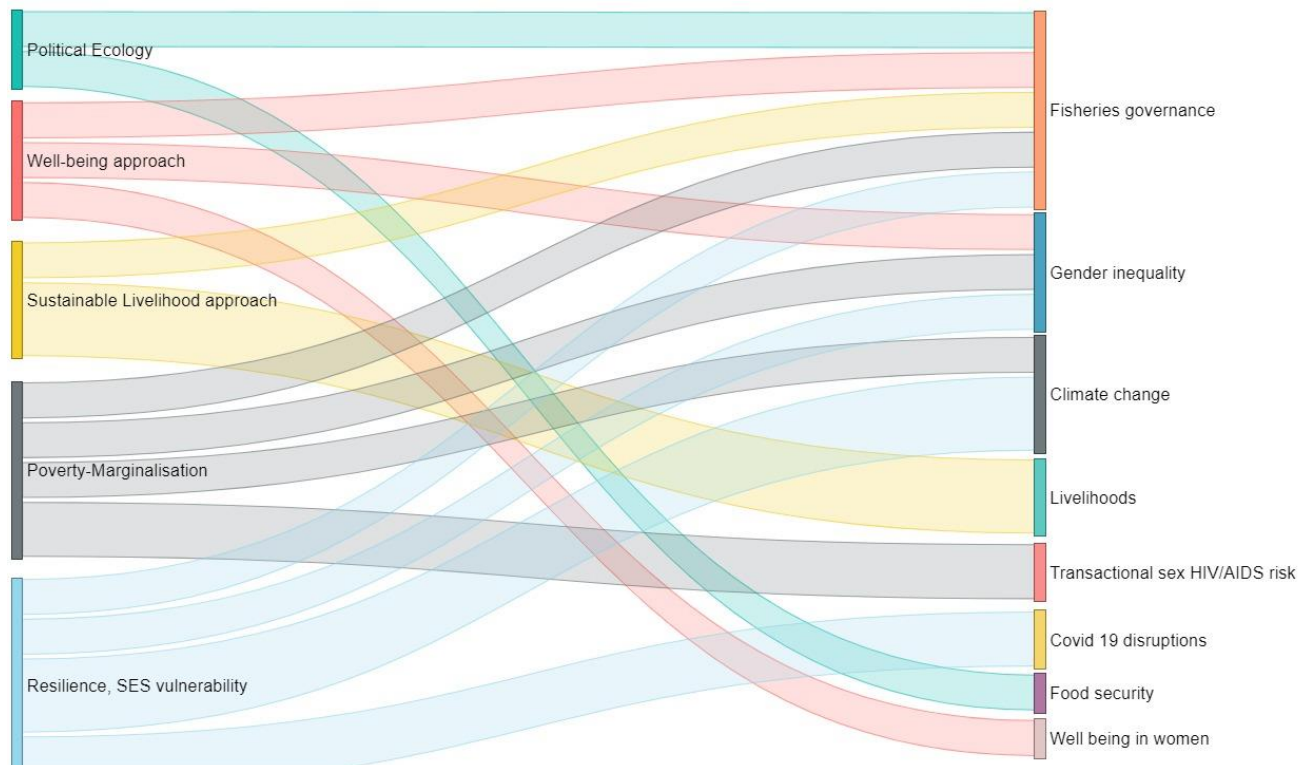


Figure 2.6: Theoretical approaches to vulnerability and gender, and the topics explored among SSF

Under the umbrella of Resilience and SES, vulnerability is often defined in terms of exposure, sensitivity, and adaptive capacity, with some variations among the sample. For instance, Call & Sellers (2019) broadly define vulnerability in terms of exposure and adaptive capacity, focusing on the gendered landscape of adopting sustainable interventions and policies in agriculture, forestry, and small-scale fisheries. In a different approach, Kawarazuka et al. (2017) analyze how gender has engaged with social-ecological resilience thinking in fisheries literature and define vulnerability under that specific framework, including elements of adaptive capacity to change and risk.

Under the Poverty-Marginalization category, vulnerability is primarily defined in terms of material and demographic dimensions, as well as the gendered differences involved in the specific topics explored in SSF within this framework. For example, some authors focused on the material dimensions of gendered vulnerability in the face of risk and stressors such as climate change (Sreya et al., 2021), HIV/AIDS and transactional sex (Nagoli et al., 2010), and non-material factors involved in AIDS/HIV risk and transactional sex, understanding agency and relational gendered dimensions (Béné & Merten, 2008).

The Sustainable Livelihood approach is also a framework used by several of the papers reviewed to explore vulnerability and gender in SSF. While there are some variations, livelihood is generally described as a combination of five capitals: financial, human, natural, physical, and social (Ellis, 2000). For example, some authors used the sustainable livelihood framework (SLF) -an index of the five capitals- to explore SSF livelihood vulnerability in Ghana, including a sex-disaggregated analysis between female and male fishers (Amadu et al., 2021) and SSF women-only (Appiah et al., 2021), both finding that female SSF score less in all the capitals assessed. In a different approach, Matsue et al. (2014) explored how the different capitals involved in the Sustainable livelihood framework influenced the bargaining power of "*mama karanga*" (Kenyan coast female fish processors).

The well-being framework is also used in three papers reviewed to explore SSF vulnerability and gender. Weeratunge et al. (2014) define well-being as an analytical lens that constitutes a broad-base outcome composed of three material and non-material dimensions (material, relational, and subjective). The papers reviewed follow this approach broadly, where subjective, material, and relational dimensions are key conceptual guides. For example, Azmi et al. (2021) focused on female household heads from a fishing community in India, examining how the intersection of class, caste, and gender affected their well-being and social mobility. Coulthard et al. (2020) focused on subjective well-being and the impact of alcoholism and domestic violence in fishing communities in India and Sri Lanka.

Finally, the papers that can be grouped under the Political Ecology framework, while different in their methods and conceptualization of vulnerability, share a common focus on power dynamics, intersectionality, and gender inequality in SSF vulnerability. Macnaughton et al. (2016) conducted a participatory case study in rural Bolivia, utilizing a Gender Transformative Approach, and highlighted how power dynamics derived from intersectional identities —specifically, being female, indigenous, and poorer fishers— augmented their vulnerability in family finances and dependence on male partners. In a similar quest, Nolan (2019) showed, through eight months of ethnography in Coastal Ghana, how the expansion of capitalism in ‘commodity frontiers’ in SSF, primarily due to overfishing by foreign vessels, disproportionately impacted poorer women’s access not only to fisheries but also to fishing gear and financial capital.

2.5.5 Gender approaches in SSF vulnerability research: limited attention to gendered complex experiences

During the extraction process, in addition to assessing each paper's vulnerability approach and the topics explored among SSF, we also examined how gender was represented in the sample, guided by the new FPE insights discussed in section 2.3.4. Due to sample variability in approaches to vulnerability in SSF, as well as in methods and contextual settings, research findings cannot be easily summarized across the sample without oversimplification. Nevertheless, some research findings can be critically highlighted under the analytical clusters identified above, as well as considering the FPE insights on gender and vulnerability.

Overall, our analysis showed three categories in which the papers reviewed engaged with gender and/or women's studies (see Table 2.4): as a theoretical framework guiding the paper, as a women-targeted study, or as a variable of analysis only (sex-disaggregated data), from which only eight in total engaged in in-depth gender analysis in very different ways. At the same time, none of the studies that included gender as a variable of analysis had a deeper engagement with gender nuances in SSF vulnerability. Thus, while gender is a growing field in SSF (Kleiber et al., 2015; Frangoundes & Gerrard, 2019; Lawless et al., 2019), our review showed that many of the papers analyzed lacked meaningful engagements with gender complexities, aligned with our initial argument that most dominant comprehensive approaches to vulnerability in SES are gender blind (Harper et al., 2023). The dimensions we looked for were at least three of six of the following (see Table 2.5): a) subjective dimensions of gendered experiences, b) intersectional approach, c) power dynamics, d) elements of agency and/or empowerment y/o exercise of choice in processes of struggle/response/coping/adaptation to vulnerability, e) theoretical framework on gender/feminist literature, f) gender norms, roles, y/o expectations (based on Rocheleau et al., 1996; Kabeer, 1999; Munoz et al., 2013; Kawarazuka et al., 2017; Lawless et al., 2019). Exploring each element in our sample will provide a clearer picture of how to rethink gendered vulnerability in SSF and the pathways for a more multidimensional and nuanced approach.

Table 2.4: How gender is included in the sample analyzed

Gender included as:	In-depth gender analysis		
	No	Yes	Total
Theoretical framework/analysis	4	5	9
Variable only (sex-disaggregate data)	6		6
Women/female-targeted study	3	3	6
Total	12	8	21

2.5.6 Patriarchy, poverty and the financial constraints' narrative: the vulnerability loop of women SSF

According to our examination, some studies show that women SSF are in fact more vulnerable than men in certain domains, such as climate change, sustainable livelihoods, and gender-based violence, due to a lack of financial capital access and poverty given patriarchal social relations. For example, Oloko et al. (2022) studied women SSF in Nigeria and concluded that institutional constraints, such as lack of financial assistance, lack of formal education and institutional support, as well as cultural constraints such as polygamy and patriarchal relations, put SSF women in a more vulnerable position and challenge the sustainability of their livelihoods. This narrative aligns with the papers focused on HIV/AIDS and transactional sex vulnerability, which acknowledge that female SSF are more vulnerable to fish-for-sex practice and consequently, HIV/AIDS (Nagoli et al., 2010). While Béné & Merten (2008) challenged the widely held assumption that women are more at risk of this practice due to a 'survival strategy' resulting from their poverty and instead, weight the role of socio-institutional culture and sexual norms of SubSaharan countries, the authors acknowledge the reality of the increased vulnerability of female fish traders to this practice and the violence they are exposed to due to “no sex, no fish” coercion, while at the same time, highlighting the nuances of this vulnerability, including their agency capacity to negotiate beyond structural constraints.

Fewer studies have looked at the gendered climate change vulnerability among SSF, so the evidence is somewhat mixed in the sample, and some tend to reproduce Arora-Jonsson's (2011) critique in the climate

change literature, where women are found to be "more vulnerable" than men due to poverty. For example, Sreya et al. (2021) found that female-headed households in the Thrissur fishing community of Kerala, India, were more economically vulnerable to extreme climatic events than male-headed households and presented less adaptive capacity. On the other hand, while systematic literature reviews on the same topic also conclude that women SSF are in fact more vulnerable to climate change (Call and Sellers, 2019; Mitra & Barua, 2022), they highlight other co-occurring phenomena such as a lack of participation in governance arrangements such as MPA, and the less likelihood to adopt adaptation interventions targeted to buffer climate change effects (Call and Sellers, 2019). However, following Arora-Jonsson (2011) caution over simplistic narratives, authors such as de Carvalho et al. (2023) also draw from their systematic literature review the argument that the evidence is not sufficient, and theoretical approaches do not necessarily capture the complexities of gender differences between men and women when it comes to climate change vulnerability in SSF.

2.5.7 Agency, power dynamics, and subjective experiences: interrelated changing forces in gendered vulnerability in SSF

A significant portion of our sample undertook a more complex analysis of the gendered dimensions of vulnerability in SSF, broadening the picture of women's experiences beyond material and/or institutional constraints by acknowledging power dynamics, agency, and subjective narratives as co-constitutive of their vulnerability. Gendered power dynamics -defined as in terms of an act with a relational and symbolic nature and grounded on shared values and norms- can take many forms (individual, collective, over, power to, from within, power with) in SSF, and create differential constraints and opportunities for women and men (Murunga, 2021). The 'power over' or as coercion through traditional gender roles and the positional power of husbands has been well documented as a vulnerability factor in female SSF that negatively impacts their ability to access to fish and therefore, secure food for their families, extra income and reduce economic dependence (Mcnaughton et al., 2016; Murunga, 2021), and increase their likelihood of experiencing domestic violence and abuse (Coulthard, 2020). In this sense, fewer papers examined the role of intersectionality in power dynamics that augment women's vulnerability in SSF. For instance, in rural Bolivia, indigenous poor female fishers have higher vulnerability due to spouse economic dependence and gender-based abuse (Mcnaughton et al., 2016). Similarly, Azmi et al. (2021) showed that while the intersection of gender, class, caste and motherhood plays a role in the positional marginalization and vulnerability of women fish auctioneers and trades in Cuddalore District, India, their agency and well-being are a changing force that mediates power relations and allows them to strategize and respond to their families and own needs, access to network and aspire to social mobility.

The role of agency and empowerment has been well documented in our sample. As shown in Table 2.5, the papers that included an in-depth gender perspective in their analysis of vulnerability in SSF all incorporated elements of agency and/or empowerment. Interestingly, this is closely related to the fact that all four papers that employed a gender-theoretical perspective or feminist literature used Kabeer's (1999) conceptualization of gender empowerment and the exercise of choice. Thus, similar to the case of female fish auctioneers and traders in India and their agency capacity in the face of augmented intersectional vulnerability (Azmi et al., 2021), evidence shows that in Coastal Kenya female fish traders' have shown bargaining power despite their marginalized status: the so-called 'mama karanga' draw on a wide range of capitals, such as financial through informal loans, and social (via collective bargaining), to secure their fish access and negotiate price in their favor (Matsue et al., 2014). Similarly, Okafor Yarkwood et al. (2022) also found that women exhibit some resilience in the face of adversity (COVID-19) in their research of female fishers in the Gulf of

Guinea, by seeking livelihood diversification. At the same time, the authors advise caution, as the resilience concept imposes expectations on women who must manage even more roles to their already long list of responsibilities. As Kwarazuka et al. (2017) argue, gender needs to be methodologically and theoretically rigorous to enrich resilience approaches in SSF, which is currently scarce in the literature.

Table 2.5: Different elements of in-depth gender analysis in Vulnerability and SSF research

Examples	Dimensions of in-depth gender analysis					
	Subjective dimensions of gendered experiences/relations	Intersectional approach	Power dynamics	Elements of agency and/or empowerment and/or exercise of choice in processes of vulnerability	Theoretical framework on gender/feminist literature	Gender norms, roles, y/o expectations
Azmi et al. (2021)	■	■	■	■		■
Béné & Merten (2008)			■	■		■
Coulthard et al. (2020)			■	■	■	■
Kwarazuka et al. (2017)			■	■	■	■
Macnaughton et al. (2016)		■	■	■	■	
Matsue et al. (2014)			■	■		■
Murunga, M. (2021)			■	■		■
Weeratunge et al. (2014)	■			■	■	■

Source: Elaborated by the authors. Based on Rocheleau et al, 1996; Kabeer, 1999; Munoz et al., 2013; Kwarazuka et al., 2017; Lawless et al., 2019.

Lastly, subjective gendered experiences of SSF vulnerabilities have been less explored in the literature we reviewed; however, their importance has been stated: how women feel and think about the life they have and can achieve is a key piece of their well-being along material and relational dimensions (Azmi et al., 2021; Weeratunge et al., 2014; Coulthard et al., 2023). Weeratunge et al. (2014) define subjective dimensions of well-being as “spans of notions of self, individual and shared hopes, fears and aspirations, expressed levels of satisfaction or dissatisfaction, trust and confidence among other things” (pp. 257). Thus, the question of women’s identities as fisherwomen, traders, or processors, and the desire that accompanies these identities within their communities, including the symbolic contributions made by these SSF women, is at the center of the subjective question (Weeratunge et al., 2014; MacNaughton et al., 2016). The co-occurrence of many roles (wife, mothers) and the caring responsibilities that comes with them has also been seen to play a role in low levels of self-identification with fisher’s category. Instead, seeing their activities as an extension of women’s supporting roles negatively impacted their empowerment and capacity to display agency (MacNaughton et al., 2016). Conversely, authors have also shown that a strong sense of social identity as fishers in their communities enables women to respond to precarities and display strategic actions towards mobility (Azmi et al., 2021).

Overall, our results show that despite the significant contributions of the examples cited to each complex and intertwined dimension of gendered vulnerability in SSF, aligned with the findings of Kawarazuka et al. (2017), we support the argument that gender complexities are insufficiently informed in vulnerability studies in SSF. While elements such as agency, empowerment, power dynamics, gender roles, norms, and expectations are explored in a few papers, their inclusion remains limited, especially considering our initial sample (111 papers screened). Furthermore, there is a notable gap in the incorporation of subjective dimensions of gendered experiences of vulnerability and intersectional approaches.

2.6 Discussion

The results of the systematic scoping review showed that, while scarce, gender vulnerability in SSF is a growing field of research over the last 16 years, with the majority of studies reviewed focusing on the Global South. While the actors in the fishery are varied, a significant proportion focused on female harvesters and pre- and post-processors in the SSF value chain. The frameworks used to explore SSF gender vulnerability are few, including SES, Sustainable Livelihood Approach, Well-being, and Political Ecology. However, the results highlight the lesser extent of gender nuances in studies on SSF vulnerability, regardless of the main theoretical approach employed. While some papers engaged in more in-depth gender analysis, as defined based on our discussion in Section 2.4, our results support the need to build over the contributions of the cited literature in aspects of meaningful gender analysis that have been less explored in SSF vulnerability research, such as the acknowledgment of power dynamics, an intersectional approach, and the subjective dimensions of gendered experiences.

To address this gap, we argue that vulnerability studies must move beyond the traditional overemphasis on material, structural, and institutional dimensions and include a comprehensive theorization that considers all elements of an in-depth gender perspective. In this sense, the new FPE offers key elements to move forward on that path and contribute to a more nuanced understanding of vulnerability and gender in SSF.

New FPE shows how environmental vulnerability narratives about gender are complex and contested. In addition, this body of literature conceives subjectivities as intersectional and performative; gender is not the only differentiated category in terms of power, but it intersects with other social categories of differentiation, (re) producing dynamic identities that are not pre-given. Instead, they are (re)negotiated in everyday practices, with different implications for women and men. This understanding departs from homogenous assumptions of women's environmental vulnerability based on gender/sex roles. In a similar sense, drawing on the work of Sultana (2011) and Nightingale (2011), FPE incorporates the importance of embodied emotional geographies and struggles as co-constitutive of vulnerable experiences. Scarcity and suffering narratives are thus vital elements that shape subjectivities and the relationship with nature. A third contribution of the new FPE to more nuanced vulnerability analysis is its understanding of materiality. The environment, in terms of space, material, and resources, becomes a contingent-emergent process that collapses with intersectional identities and social relations of power. This understanding de-centers the historical material-structural focus on vulnerability research in previous decades. Lastly, another contribution of FPE discussions to vulnerability analysis is the role of the agency in the gender-environment nexus. By conceiving intersectional subjectivities as dynamic, agency plays an important role in the relationship with the environment and social power relations. In this sense, according to Resurreccion (2017), FPE takes distance from WED narratives that frame women as 'resilient agents' that have the role of protecting the environment. This aligns with the critique highlighted by Arora-Jonsson (2011) regarding women's virtuousness as pro-environmental, stating that a portion of climate change and disaster research

inadequately focuses on the flipside coin of women's vulnerability with a similar static, the essentializing and fixed narrative of their natural closeness with the environment, adding more burdens to their already long list of everyday tasks (Arora-Jonsson, 2011; Resurreccion, 2017; Ravera et al., 2016).

Thus, we argue that there is space to integrate critical elements of new FPE into vulnerability approaches in SSF, such as subjective dimensions, intersectional approach, agency capacity, and even embodied emotional struggles. As our results show, vulnerability research on gender and SSF is scarce, while in contrast, as Lawless et al. (2021) point out, fisheries policies have over-focused on women as vulnerable actors. Thus, we build on the work of Kawarazuka et al. (2017) in their quest to integrate gender analysis into SES resilience in SSF, acknowledging the contribution of their synthesis but narrowing the scope to vulnerability only.

We acknowledged that the approaches reviewed in our study build on different traditions that fundamentally differ in their understanding of vulnerability. However, we are not advocating for a meta-integrative framework for vulnerability. Instead, we situate the cross-fertilization within Nayak & Berkes's (2019) framework based on epistemological affinities. First, the authors understand vulnerability as dynamic, complex, multidimensional, and relative (Nayak & Berkes, 2019), a perspective similar to FPE approaches, which also view the human-nature nexus as complex, dynamic, contingent, and contested. Second, based on well-being theorizations, the authors incorporate subjective elements into their framework, allowing for the inclusion of embodied emotional geographies, as well as elements of agency.

Thus, the emerging framework (see Figure 2.7), drawn from the evidence we gathered and based on Nayak & Berkes, (2019); Kawarazuka et al., (2017), Weeratunge et al., (2014); Nightingale, (2006), (2011); Harris, (2008); Sultana (2011), shows that vulnerability is an inherently intersectional experience with different implications for women and men in SSF in each dimension: absence of well-being, loss of resilience, and lack of access to capital. Further, we propose that the interaction between dimensions is also dynamic and complex: subjective dimensions such as emotional struggles of vulnerability are embedded in material/ecological elements as well as relational realities. This nuanced understanding of vulnerability seeks to engage with meaningful and intersectional discussions beyond homogenizing narratives of women as victims. Instead, the framework acknowledges the subject's capacity for agency across dimensions (material, relational, and subjective).

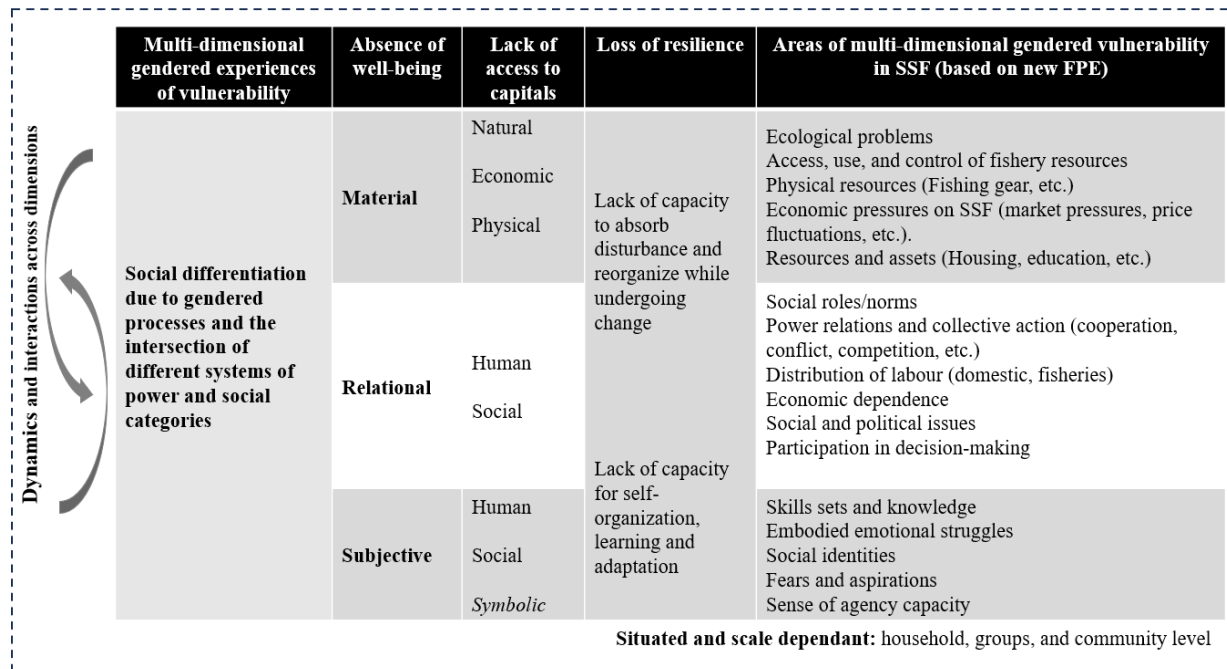


Figure 2.7: Multidimensional framework for gendered vulnerability in small-scale fisheries (SSF)

Source: Elaborated by the authors. Based on Nayak & Berkes (2019); Kawarazuka et al. (2017), Weeratunge et al. (2014), Nightingale (2006, 2011), Harris (2008), Sultana (2011), Galappaththi et al. (2021).

This framework offers an alternative to widely used approaches that evaluate vulnerability in terms of sensitivity, exposure, and adaptive capacity, and invites further exploration of how non-material expressions of vulnerability also contribute to the differential experiences of men and women in SSF. An illuminating example of the importance of the interrelated dimensions of well-being in gender in SSF can be found in the work of Weeratunge et al. (2014), where the authors argue, for example, that identity, as a notion embedded in relational and subjective dimensions, is a central debate in gender and SSF. The self-identification with a specific category (e.g., fisher, processor), the symbolic status that emerges from it, and the future hopes associated with their identity can reveal a series of critical elements in how women navigate well-being, and as we argue, their own vulnerability. Weeratunge et al. (2014) work, as well as others that focused on well-being and gender in SSF (e.g., Galappaththi et al., 2021), provide a first significant insight into how to apply our proposed framework, and set the path for interesting guiding questions for a thicker and gender-sensitive approach to vulnerability in any context-dependent case study of SSF (See Box 1 for an empirical ongoing example).

Box 1: Researching Multidimensional Gendered Vulnerability in SSF in Chiloé, Chile.



Photo of a participatory workshop held in August 2024 in Quinchao Island, Chiloé.

Chiloé is an Archipelago in southern Chile that comprises 10 municipalities and 20 inhabited Islands, including the Largest Island, “Isla Grande”. In 2023-2024, fieldwork was deployed to investigate how women navigate vulnerability and viability in SSF in three municipalities: Chonchi, Quinchao and Dalcahue, under a University of Waterloo, Canada, Doctoral Research Project, and as a part of V2V Global Partnership, with SSHRC funding, and the ethical approval from the Behavioural Research Ethics Office from University of Waterloo (Certificate #45734)

Historically, Chiloé’s primary livelihoods had been associated with SSF, agriculture, and livestock, and since the early 80s, salmon and mussel farming industry. To this day, SSF remains a vital activity, providing a source of livelihood, contributing to food

security and nutrition, and fostering local identity (Arriagada et al., 2025). There, women in SSF, mostly harvesters and pre- and post-processors, play an important role in the SSF value chain. They have advocated through collective organization for a gender-inclusive legislation that provides visibility to their role, social security, and participation in decision-making beyond quota policies.

Based on our proposed framework, multidimensional gendered experiences of vulnerability have been explored through face-to-face surveys of men and women involved in SSF, in-depth interviews, and two participatory workshops to unveil differences and nuances of both men's and women's experiences. The mixed-methods design, which incorporates quantitative, qualitative, and participatory data collection techniques, is considered a key element in evaluating the effectiveness of our proposed framework in capturing the nuances of the differential gendered experiences of the actors involved in SSF.

Preliminary results show that females SSF evaluate differently some aspects of vulnerability than their male counterparts, such as caring roles and household responsibilities, which, on the one hand, negatively impacts their ability to work on SSF, while on the other, makes them feel empower to seek specific roles along the SSF value chain, in order to precisely, have the freedom to perform their many caring roles. As such, they demonstrate a sense of freedom and agency in choosing specific SSF activities (such as mending and baiting hooks) due to expected gendered roles, such as caring for children and elders. Thus, narratives of ‘self-identification’ and ‘self-worth’ and pride associated with their fish-related activity, such baiting and mending hooks and fishing longlines, shore harvesting, and post-processors are abundant in participants testimonies. At the same time, women SSF also present higher levels of adaptive capacity through collective organization, participation in decision-making and bargaining with institutional agents and representatives than their male counterparts in the face of environmental and material vulnerability.

A critical challenge associated with this approach is its methodology, which is grounded in epistemological differences. As we analyzed in the results section, methodology and theoretical differences among the sample analyzed are multiple and varied, regardless of whether they all focus on gender and SSF vulnerability, leading to mixed results even when analyzing the same topics (e.g., climate change, governance). At the same time, vulnerability research anchored in SES has traditionally employed more causal explanations and quantitative modeling techniques in empirical research (Kawarazuka et al., 2017), while FPE and intersectionality perspectives have their own methodologies and techniques, often characterized by qualitative and bottom-up approaches (Sundberg, 2017). These methodological challenges should be explored in any further attempt to complement both perspectives on vulnerability. As Kawarazuka et al. (2017) argue, methodological rigorously is a key element for genuine gender analysis in SES research in SSF, which includes observational data collection and narrative analysis to gain a critical perspective on gendered social differentiation (Kawarazuka et al., 2017).

2.7 Conclusions

The purpose of this paper was, first, to assess the current state of research on gender and vulnerability approaches in SSF and, second, to propose a targeted, nuanced framework for gendered vulnerability research in SSF, building on the contributions of the work we analyzed in our scoping review, as well as through a cross-fertilization between new FPE and systems-based vulnerability frameworks.

Our findings from the systematic scoping review suggest that gendered vulnerability in SSF is a recent and growing field of research over the last 16 years, with a greater focus on the Global South. While research on gender and SSF in the Global North has primarily focused on paid work (e.g., Nadel-Klein, 2000; Szymkowiak, 2020), there is an evident lack of research on vulnerability, specifically, and gender in SSF in this geographic region, which warrants further exploration. We believe that the nuances of those vulnerability experiences can be very enlightening regarding paid activities in SSF value chains.

In addition, we found that vulnerability research in SSF varies depending on the theoretical approaches to vulnerability, including SES and resilience thinking, Political Ecology, Livelihoods approaches, Well-being theory, and poverty-marginalization approach. The results are also mixed in terms of how research has incorporated gender into the selected studies, with only a small proportion of the sample engaging in what we consider in-depth gender analysis. Given this gap, and building on gendered vulnerability in SSF studies we analyzed, we propose a bridge with new FPE literature, where intersectionality, subjective dimensions, power dynamics, agency capacity, and embodied emotional experiences are key to describing vulnerability experiences. This results in our proposed framework for multidimensional gendered vulnerabilities in SSF, which aims to contribute to several efforts.

First, it contributes to the feminist quest to reframe gender and vulnerability analysis beyond the binary, homogeneous, and essentialist understanding of women as victims or resilient actors that has persisted in fisheries policy despite decades of critiques (Lawless et al., 2021). Second, it contributes to the effort already undertaken by recent gender and SSF scholarly work and expert consensus (Harper et al., 2023; Rice et al., 2024), which highlights the necessity of overcoming gender-blindness in SSF fisheries research, official data, and policy and practice.

Aligned with Rice et al. (2024), our proposed framework validates the authors' agenda for the need for researching gender disaggregated data as a starting point in SSF, which is still lacking (Harper et al., 2023), as well as the importance of adopting an intersectional approach, which despite increasing in scholarly work, the authors recognized the “research that treats all individual within a gender category as homogenous remains dominant” (Rice et al., 2024: 405). Finally, future efforts should focus on empirically testing this proposed framework with a strong emphasis on both theoretical innovation and methodological rigor. Such efforts should aim to refine and validate the framework in diverse SSF contexts using mixed and participatory methods that prioritize local voices and experiences, which have been acknowledged as a key principle for gender research in SSF (Rice et al., 2024) as well as vulnerability research in SSF (Dias et al., 2023).

By incorporating this critical gendered approach, future research can benefit from an alternative perspective beyond conventional analyses of SSF vulnerability and contribute to a more conceptually robust discussion in academia that is, at the same time, applicable to the real-world challenges faced by SSF communities and translated into more inclusive and effective policies.

Chapter 3 “Men and women's differential experiences of vulnerability in SSF: A multidimensional case study from Chiloé, Chile”.

3.1 Chapter summary

The purpose of this chapter is to characterize the multidimensional gendered experiences of vulnerability among women and men in SSF in Chiloé, Chile, using the framework proposed in Chapter 2. Drawing on a mixed-methods approach that combines surveys, in-depth semi-structured interviews, and a participatory workshop, this research reveals the markedly different ways in which women and men experience vulnerability, even when exposed to the same stressors. These findings suggest that vulnerability constitutes a distinct phenomenon for each group, shaped by gendered caring roles, gendered social relations, and mostly, very different subjective experiences. In addition, women SSF, fueled by the interactive nature of well-being, embedded in their material vulnerabilities, as well as their identities as mothers and female SSF, present more levels of adaptive capacity to respond to material stressors. In doing so, the chapter demonstrates how the proposed framework helps uncover the nuanced gendered dynamics of vulnerability, addressing a persistent gap in empirical vulnerability research in SSF, which treats SSF as a homogeneous group and assesses vulnerability without gendered complexities.

3.2 Introduction

Small Scale Fisheries (SSF) support over 90% of 120 million people engaged in capturing fisheries globally (FAO, 2023; Dias et al., 2023). SSF provide not only economic value, with an approximate 77 USD billion revenue from the first sale to SSF catch⁶ (FAO et al., 2023), but also nutrition, food security, culture and sustainable livelihoods (FAO, 2023). While there is no global definition of SSF, they are typically characterized by a range of activities undertaken by men and women along inland and marine fish capture value chain (including pre- and post-harvest labor), from on foot fishers to small and semi-industrial vessels (Smith & Basurto, 2019; Smith et al., 2023), the use of limited technology, and low-capital methods of processing and marketing (Dias et al., 2023).

Despite their undisputable contributions, SSF remain vulnerable to a broad range of ecological and social stressors, from climate change and extreme weather and environmental degradation (FAO, 2023; Islam and Chuenpagdee, 2022), to economic and market pressures, social conflict, and political marginalization (Nayak and Berkes, 2019; Dias et al., 2023; Prado et al., 2025). These multiple stressors usually interact with one another regardless of their nature and scale, exacerbating vulnerabilities (Bennet et al., 2016). For example, Nayak and Berkes (2019) analyzed how global drivers of change (e.g. market pressures) interact in a two-way process with local drivers of change (e.g., the disintegration of Chilika Lagoon' SSF) in SSF in the Bay of Bengal, India, exacerbating vulnerabilities simultaneously, from global to local, but also local to global.

The consensus of SSF as vulnerable has grown in academia and in international guidelines (FAO 2015; 2023). While some elements remain context-specific, Islam and Chuenpagdee (2022) recently showed, on a global scale, that SSF vulnerability can be associated with 5 main factors (i.e., biophysical, social, economic, technological, and governance), indicating that SSF vulnerability is a shared state with similar

⁶ Numbers calculated from case studies included in the report (2013-2017), Hidden Harvest, 2023.

characteristics globally. More recently, the COVID-19 pandemic further exacerbated challenges and became a critical driver of vulnerability for SSF around the globe (Dias et al., 2023; Bennett et al., 2020), which resulted not only in reduced sales, temporary closures that increased poverty and unemployment, but also threatened food security and amplified existing injustices towards vulnerable groups, such as gender inequality, which affects women in SSF globally (Islam and Chuenpagdee, 2022; Mangubhai et al., 2021; Okafor-Yarwood et al., 2022).

Women are considered critical to SSF, comprising up to 50% of the global workforce (Harper et al., 2013; FAO, 2015), translating to at least 44.7 million women participating in SSF activities worldwide (Harper et al., 2023). Their contributions are multiple along the SSF value chain, including food nutrition and security, local economies and local ecological knowledge (Harper et al., 2013; Kleiber et al., 2015). However, research indicates that women in SSF are particularly vulnerable to multiple interacting stressors (Appiah et al., 2021; Gustavsson et al., 2021). For instance, their participation is often informal and unpaid, leading to income insecurity and exclusion from official fisheries records (Harper et al., 2013). When paid, women's participation in SSF is often situated at the lower-paid end of fisheries value chains, such as processing, mending nets, gleaning, harvesting, and post-harvest activities (Szymkowiak, 2017; Frangoundes & Gerrard, 2019). Most of these roles are characterized by seasonality and limited access to fisheries, which can be subject to exploitative and abusive power dynamics (e.g., transactional sex) (Bene & Merten, 2013; Mangubhai et al., 2023; Okafor-Yarwood et al., 2022) and to unequal distributions of benefits relative to their male counterparts (Frangoundes et al., 2019).

While SSF vulnerability research has grown in recent years, including the work on gender (Kawarazuka et al., 2019; Azmi et al., 2021; Murunga et al., 2012; MacNaughton et al., 2016; Sreya et al., 2021; Appiah et al., 2021), measures of gender differences have historically been overlooked in SSF (Harper et al., 2013; Kleiber et al., 2015). The gender data gap refers to the underrepresentation of gender analysis in SSF literature and in policy and management (Harper et al., 2023). Authors have pointed out the gender data gap regarding several aspects of research, such as in the appropriation of marine ecological knowledge (Weeratunge et al., 2010); in the systems and official fisheries registry underrepresenting the role of gender in food nutrition and local economies (Harper et al., 2013); women's fishing practices and their impact on ecological ecosystems (Kleiber et al., 2015), and their contribution to SSF governance (Gallappaththi et al., 2022). While gender research goes beyond the study of women, sex-disaggregated data should be the minimum in fisheries research to enable comparisons and serve as a baseline for comprehensive analysis (Kleiber et al., 2015; Harper et al., 2023; Rice et al., 2024).

Unfortunately, despite international guidelines that emphasize the need for gender equality efforts in development strategies, such as SDG 5 (UN Sustainable Development Goals), and, specifically for SSF, the most recent Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (FAO, 2023), the gender data gap persists to this day in SSF research and management (Rice et al., 2024; Harper et al., 2023). Recent research indicates that persistent gender data gaps are due to cycles of gender-blindness, a sexist phenomenon where the majority of the information gathered by fisheries agencies and related institutions refers to the activity as male-dominated, creating biased sampling methods, and underrepresenting gender differences and women's contributions to several aspects of SSF systems (Rice et al., 2024; Harper et al., 2023).

The gender gap in SSF research has pervasive consequences for management and policy, affecting opportunities and challenges for sustainable fisheries and the well-being of all actors involved, perpetuating obstacles rooted in stereotypes, prejudices, and rigid gender roles (Harper et al., 2023; Frangoundes and Gerrard, 2019). While SSF are widely recognized as vulnerable, and women within SSF often framed as particularly so, this framing has led to an overemphasis on women as a homogenous vulnerable group in policy and practice. As Lawless et al. (2021) point out, such approaches risk obscuring the differentiated experiences, rights, agency, and power-related dynamics shaping vulnerability. As a result, a critical gap persists in the insufficient analysis of gendered and intersectional experiences of vulnerability, which this paper seeks to address. Understanding the nuances of gender-differentiated vulnerability experiences is key to gender-inclusive research in SSF, beyond the misleading narrative that women are helpless in the face of environmental degradation (Harris, 2006; Resurreccion, 2017), and to making SSF more sustainable and to better management and governance (Kleiber et al., 2015).

Given these challenges, this paper aims to characterize the multidimensional gendered experiences of vulnerability among women and men in SSF in Chiloé, Chile (Figure 3.2). We focus on Chiloé, Chile as the case offers a compelling empirical example of high dependency of SSF, with high participation of women (Sernapesca, 2017), while at the same time, a history of multiple drivers of change that put Chiloé SSF as a complex social-ecological system: 40 years of intensive salmon farming industry -including a few crises, high social organization, and climate change (Arriagada et al., 2025). More specifically, we investigate three questions: 1) what stressors (material, relational, subjective) are affecting men's and women's well-being in SSF?, 2) what are their capital and their resilience (measured as adaptive capacity) in the face of these stressors?, and 3) how are these processes affecting men and women in SSF differently?

We operationalize vulnerability through the three-dimensional vulnerability framework for SSF (Nayak & Berkes, 2019) that includes well-being, different capital, and resilience. We build on this work by incorporating gender and intersectional elements from 'new Feminist Political Ecology' (new FPE), which includes subjective and symbolic dimensions of the vulnerability experience (e.g., Arora Johnson, 2011; Nightingale, 2006, 2011; Harris, 2006; 2008; Sultana, 2011). This adds a novel dimension to the framework, enabling a more intersectional and multidimensional perspective of vulnerability. The paper proceeds as follows: first, we introduce the theoretical framework. Next, we describe the research site and methods. We then present our main results. Finally, the paper ends with a discussion and conclusion, highlighting the contributions of our paper and guidelines for future research.

3.3 Theoretical framework

While perspectives on vulnerability vary across the related fields of climate change, hazards and risk, and resilience scholarship, it is often defined as a function of three elements: 1) exposure to stresses or hazardous conditions, 2) susceptibility to harm or sensitivity, and 3) the adaptive capacity of the system to respond to the impacts of those conditions (Turner et al., 2003; Smit & Wandel, 2006; Adger, 2006; Bennett et al., 2016).

Recent vulnerability approaches have focused on what several authors refer to as 'vulnerability as a context' (Bennett et al., 2016). These approaches are distinct from 'vulnerability as an outcome' framings (Turner et al., 2003), which focus on the susceptibility of individuals, communities, or systems to the impacts of

natural events. Contextual vulnerability approaches emphasize the situated nature of individuals, households, communities, or regions to analyze the adaptive capacity of systems in a changing environment. In this sense, contextual conditions are understood to influence the exposure, as well as responses, of a particular group or place (Blythe, 2015), and it is often linked to the social-ecological systems perspective (SES), highlighting the inextricable nature of coupled human, social, political, and economic actions and ecological processes (Adger, 2006).

For SSF specifically, Nayak and Berkes (2019) proposed a framework tailored to SSF vulnerability. The authors understand vulnerability as "multidimensional, complex, highly dynamic, and relative" (p. 207), thereby situating their framework within contextual vulnerability tradition. From this perspective, vulnerability is composed by three major dimensions: 1) well-being, 2) capital and resources, and 3) resilience. Well-being is understood as the possibility to enjoy the satisfaction and pursuit of one's own goals in life, and is composed of material, relational, and subjective elements (Nayak and Berkes, 2019), which are interconnected. This three-dimensional approach for well-being is based on the theoretical work of McGregor (2008) and Weeratunge et al. (2014). Capital is understood as access to different types of resources, including the human, physical, social, natural, and financial assets required to live a dignified life. Finally, resilience is defined, following SES thinking, as the capacity of a system to absorb disturbances and reorganize in the face of change while retaining its identity (Nayak & Berkes, 2019).

Based on two empirical cases of Bay of Bengal, India, Nayak and Berkes (2019) outline indicators of vulnerability within SSF for each dimension of the framework. At the material level, the authors identify ecological problems, the economic crisis (e.g., loss of fishery-based income, food insecurity, and related problems), and biophysical changes (e.g., fisheries declines, loss of access to fishery grounds). At the relational level, encompassing human and social capital, the authors identify indicators such as increased conflict associated with aquaculture, economic dependence, political power, and rights (e.g., the collapse of SSF cooperatives and organizations and the loss of fishery access rights). Finally, at the subjective level, the authors mention the loss of local knowledge and a decline in education, as well as a loss of connection to Chilika, which impacts their identity, among other factors. The authors also emphasize the importance of multilevel and multidirectional drivers that interact with all components of vulnerability; therefore, a state of zero vulnerability is neither possible nor desirable. Uncertainty and change are inherent components of SES, including SSF. While a group or community can enhance resilience to change, given the complexity of the many drivers of change across different levels and scales that SSF confront (e.g., local environmental hazards, global market pressures), a complete elimination of vulnerability is unattainable.

A key dimension of the proposed framework of Nayak & Berkes (2019) is the emphasis on the subjective dimension of vulnerability, a common limitation of the widely used definition of vulnerability (as a measure of sensitivity, exposure, and adaptive capacity) in SES approaches in SSF (Weeratunge et al., 2014). In this sense, the notion of well-being is crucial for addressing this gap, by integrating subjective aspects such as aspirations, individual and shared fears, hopes, and motivations that play a role in how people experience vulnerability in SSF, in how they perceive risk, and their capacity to adapt. According to Weeratunge et al. (2014), the concept of identity links relational and subjective dimensions of well-being and warrants further analysis in SSF, particularly with respect to gender differences and roles. Nayak and Berkes' (2019) conceptualization, however, while it includes sex-disaggregated data and gender equality as desirable

efforts toward viability, does not explore in depth the gendered dimensions or experiences of vulnerability, a common limitation in more widely used vulnerability approaches.

Given this challenge, we created a cross-fertilization between Nayak and Berkes (2019) framework with new Feminist Political Ecology (new FPE) scholarship. This conceptualization was expanded in detail in Chapter 2, based on a systematic scoping review of the state of art of vulnerability and gender in SSF scholarship. In that chapter, we concluded that, while gender and vulnerability research has increased over the past decade, in-depth gender analysis remains scarce in research on SSF vulnerability, which is often anchored in a systems perspective that fails to account for individual agency, social inequities, and power relations. To fill this gap, we argue that vulnerability research in SSF would benefit from incorporating core elements of new FPE, such as subjective dimensions of vulnerability, concerns about power dynamics, an intersectional approach, acknowledgment of agency capacity, and embodied emotional struggles.

The question behind FPE— how to (re)conceptualize the nature-gender nexus considering concerns over power, control and social justice —was expanded by the 'new' FPE approach, where authors have explored the complexities of vulnerability landscapes related to natural resources (see Nightingale, 2006, 2011; Harris, 2006, 2008; Sundberg, 2017). New FPE scholars have embraced the intersectionality framework (Elmhirst, 2011), where gender is decentered as a critical variable, and interacts with class, culture, race, caste, and ethnicity in shaping the access and control over resources, as well as the struggles of environmental change and sustainable livelihoods (Rocheleau et al., 1996). In addition, new FPE conceives subjectivities as performative; the intersection of social categories of differentiation (re) produced dynamic identities that are not pre-given. Instead, they are (re)negotiated in everyday practices, with different implications for women and men (Nightingale, 2006). This understanding departs from homogenous assumptions of women's environmental vulnerability based on gender/sex roles. In a similar vein, drawing on the work of Sultana (2011) and Nightingale (2011) on waterscape struggles, new FPE emphasizes the importance of embodied emotional geographies as co-constitutive of vulnerable experiences, such as scarcity and suffering narratives that shape subjectivities and the gendered nexus with nature. Lastly, another contribution of FPE discussions to vulnerability analysis concerns the agency's role in the gender-environment connection. As Arora-Jonson (2011) discusses, research on women in the face of environmental risk is often portrayed as a binary: either 'virtuous pro-environmental' or 'helpless victims', inadequately essentializing their relationship with nature as static while denying their agency.

Figure 3.1 presents the Framework proposed in Chapter 2, which guides the empirical research in this paper. This framework further deepens the initial theorizations of Nayak and Berkes (2019) and offers an alternative to widely used approaches that evaluate vulnerability in terms of sensitivity, exposure, and adaptive capacity, highlighting that non-material expressions of vulnerability that also contribute to the differential experiences of men and women in SSF.

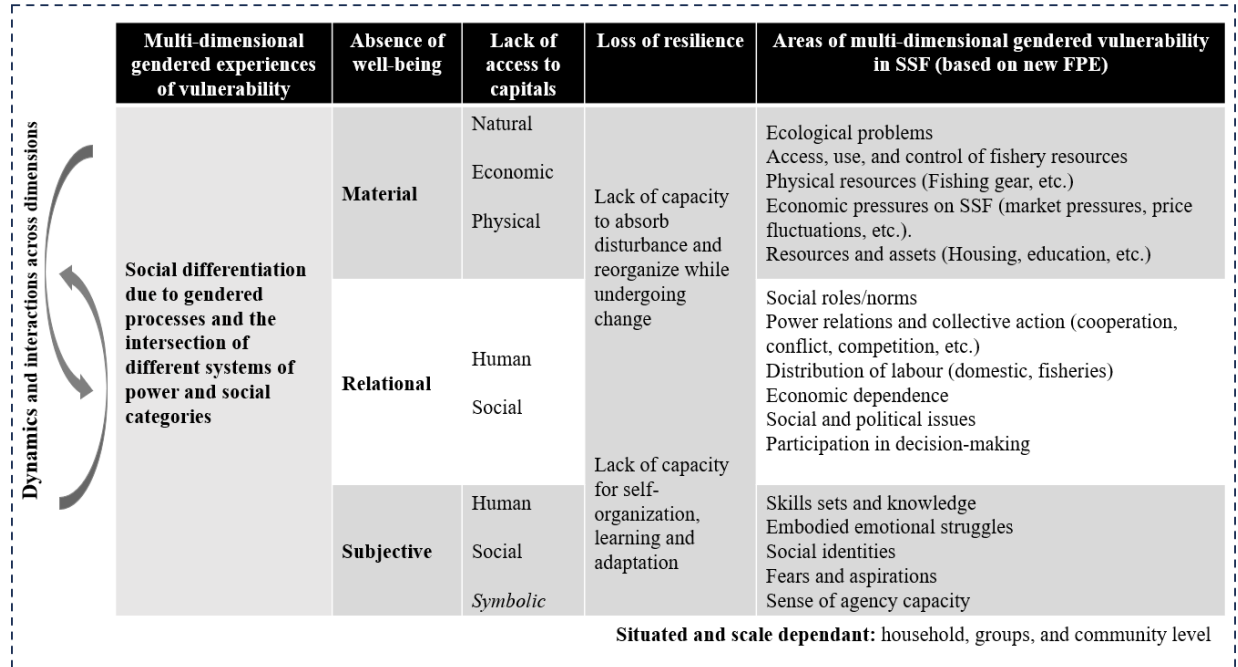


Figure 3.1: Multidimensional framework for gendered vulnerability in small-scale fisheries (SSF)

Source: Chapter 2. Elaborated by authors, based on Nayak & Berkes (2019); Kawarazuka et al. (2017), Weeratunge et al. (2014), Nightingale (2006, 2011), Harris (2008), Sultana (2011); Galappaththi et al. (2021).

In this framework, vulnerability is conceptualized as an inherently intersectional experience, producing differentiated implications for women and men in SSF across its key dimensions: the absence of well-being, the erosion of resilience, and limited access to different forms of capital. Material, Relational, and Subjective dimensions serve as an analytical guiding model on which this paper's analysis is based. Moreover, the interaction among these dimensions is dynamic and complex. Subjective experiences of vulnerability, such as emotional distress and identity, are deeply embedded in material and ecological conditions, as well as in relational structures. This nuanced perspective advances intersectional analyses that move beyond homogenizing portrayals of women as passive victims. Instead, the framework recognizes individuals' capacity for agency across material, relational, and subjective domains.

The three-dimensional model for vulnerability (Material, Relational, Subjective) with its three components (Well-being, Capital, Resilience -as means of adaptive capacity-), to which the dimensions permeate too, was used to structure data collection instruments and analysis, and therefore, will be used as a guide to present results and discussion.

3.4 Research site

Chiloé is an archipelago located in the Los Lagos region (see Figure 2), southern Chile, with 10 municipalities and 20 inhabited islands, including *Isla Grande* (Big Island), with a total population of 168,185 people according to the 2017 census (Arriagada et al., 2025). In the last 40 years, Chiloé has undergone dramatic economic, environmental, and cultural changes, driven by the presence of the salmon farming industry since the early 1980s, which was poised to become the second-largest exporter of farmed

salmon in the world after Norway by 1994, with a production of 640 thousand tons annually, equivalent to US\$2,400 million. However, in 2007, the ISA (infectious salmon anemia) virus crisis led to the closure of marine concessions and processing plants, resulting in about 15,000 job losses (Bustos, 2016). Chile's mussel mariculture has also been in the inner sea of Chiloé since the 1990s, with a massive growing rate - a record year in 2017 exceeding 300,000 tons of production- (San Martin et al. 2020). However, similar to the salmon industry, mussel aquaculture has also experienced various crises due to microalgal feed (2009–2010), larval supply (2011–2013), and other disturbances (e.g., fluctuations in market prices) (San Martin et al., 2020; Arriagada et al., 2025).

Chiloé's high dependence on SSF and the conflict with aquaculture were demonstrated during the 2016 social movement. What began as protests against the consequences of the worst red tide algal bloom in Chile's history and the dumping of 9,000 tons of dead salmon along the coast ended as the most significant social movement in the region's history. For 17 days, the Island was on strike, while at the national level other protests sought to draw attention to the socioeconomic and environmental disaster affecting the Island's inhabitants. Fisheries workers and their value chain were particularly severely affected by the bloom-induced record levels of marine species mortality, which were exacerbated by the salmon dumping. The conflict led by artisanal fishers and divers, denominated "Chilotean May" (*Mayo Chilote*), challenged not only the centralized government and political elite's interest but primarily environmental policy and governance towards SSF, the marine resources, and the livelihoods that depend on it (Arriagada, 2019; Arriagada et al., 2025; DelaMaza et al., 2023).

In 2022, Sernapesca registered 99,557 artisanal fisheries (AFR) licenses nationwide (AFR Artisanal Fisheries Registration), of which 35,744 are in the Los Lagos region. At the same time, women are well represented in SSF, accounting for almost 30% of national and regional participation in all (registered) artisanal fisheries activities (Sernapesca, 2022). Moreover, even though by 2017 women represented 29,700 of the total AFR licenses in the region, they were not considered in the official records of the national fisheries administration until May 2016, when a significant percentage was operating illegally (Arriagada, 2019).

While studies suggest that the official registration of women in fisheries, specifically among seaweed harvesters, is a relatively recent phenomenon in Chile (Gallardo-Fernández & Saunders, 2018), gendered governance has progressed in recent years. Specifically, in 2021, Law 20.370, which promotes Gender Equity in SSF, was approved, with yet unknown implications for men and women involved in SSF. Given these confluences of elements, Chiloé emerges as an interesting case of study to explore the role of gender and intersectionality in how women and men navigate multidimensional vulnerability in SSF.

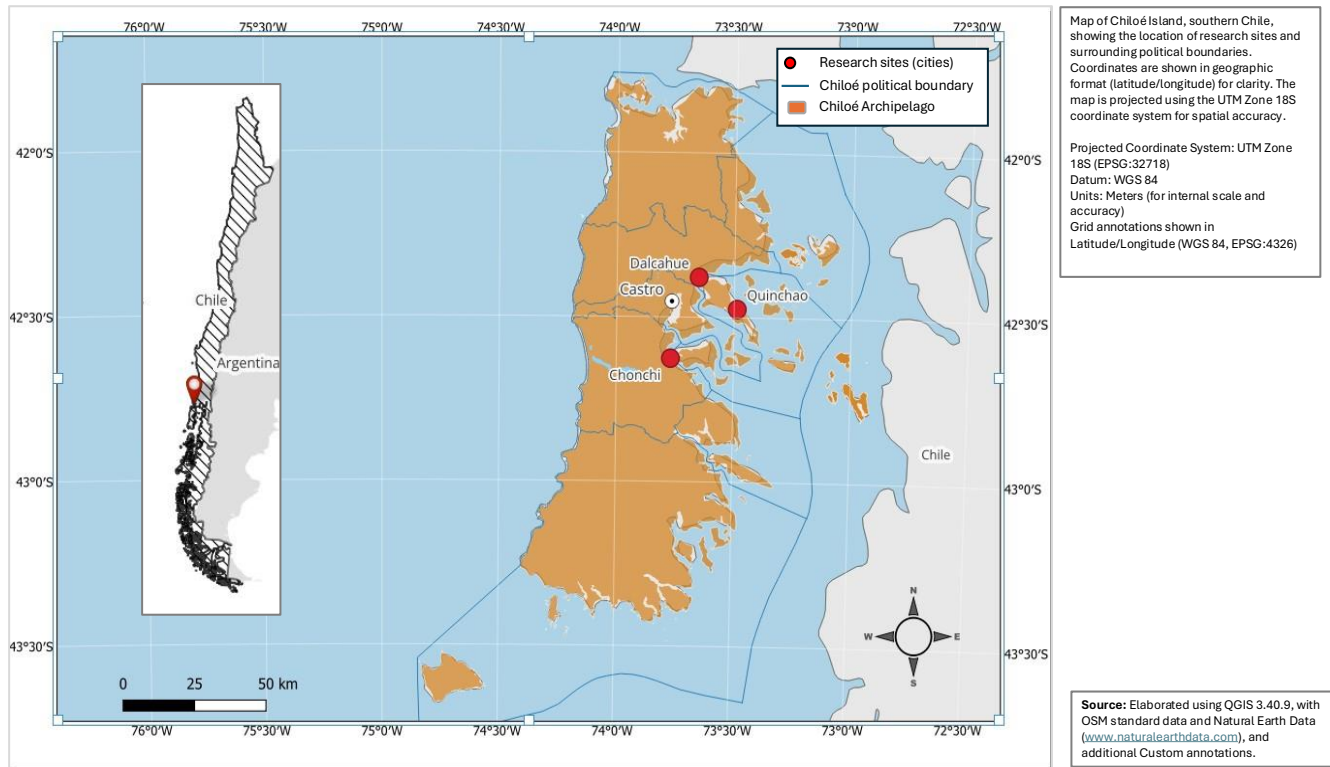


Figure 3.2: Map of Chiloé

3.5 Methods

Data was collected⁷ through 133 face-to-face surveys interviews (paper and pencil) with men and women involved in SSF, in different locations of three municipalities of Chiloé Archipelago: Chonchi, Dalcahue, and Quinchao (Figure 3). Survey interviews were conducted in Spanish by the first author⁸ and three fieldwork assistants, all local inhabitants of Chiloé associated with social science research, during December 2023-February 2024. The sample was purposive (non-probabilistic) sampling, with the following quota criteria: 1) To be involved in SSF value chain, 2) work and live in at least one of the three municipalities of the case of study, 3) a 50-50 gender quota for men and women. The gender quota was not fully met; however, we reached 59% men (78 cases) and 41% women (55 cases). See table 3.1 for details about sample and universe⁹. Statistical analysis was performed in IBM SPSS Statistics version 30. Relationships between categorical variables were examined using the Chi-square test of independence. The strength of association was estimated using Cramer's V. Statistical significance was set at $p < 0.05$.

In addition, semi-structured interviews were conducted to collect qualitative data with 33 small-scale fishers (5 men and 28 women) in the same localities (Dalcahue, Chonchi, and Quinchao municipality) during

⁷ This research has the ethical approval from the Behavioural Research Ethics Office from University of Waterloo (Certificate #45734).

⁸ It is important to mention that the principal investigator (N.A.) is a native of Chiloé, born and raised in Castro city, which facilitated rapport and initial contacts with key stakeholders.

⁹ Data on the Universe specifically for the three municipalities of Chiloé Island in 2024, was obtained through Subpesca (Fisheries and Aquaculture National Undersecretary institution) communications and principal investigator request, available upon formal request according to the Data Transparency Law in Chile.

December 2023-February 2024 and July-August 2025. Semi-structured interviews were conducted mostly by the first author and one research assistant, all in Spanish, with voice recordings for further transcription. Interviewees' selection criteria were: 1) being involved in SSF value chain as the main livelihood, 2) mostly females, 3) to live in one of the three localities. Interviewees were recruited by phone and e-mail, using a snowball method of purposive sampling until saturation was reached, with initial leads from local contacts and the corresponding Municipality Fisheries Department. As a consequence, the initial interviewees were mostly local SSF leaders. In addition, two participatory workshops were held for women-only SSF in Achao (Quinchao Municipality) and Dalcahue, on August 13th and 19th, 2024, respectively. In both workshops, 19 women participated in total, and they were held with the help of the Dalcahue and Quinchao Municipality Fisheries Departments, as well as the local Gender Equality NGO 'Chiloé Profunda', and the research/artistic group on Coastal women 'Maritorias'.

Audio recordings were transcribed and analyzed in NVivo (version 15) to open code each interview, thereby identifying components of SSF multidimensional vulnerability while leaving space for emergent themes. A second coding process in Excel allowed a more detailed iterative review of the initial coding process for validation purposes.

The use of a mixed-methods approach for data collection and analysis aligns with recent studies on gender approaches in fisheries (Haper et al., 2023; Rice et al., 2024), which have emphasized the need for such an approach to conduct meaningful gender studies in fisheries research. The advantage relies on the fullness of triangulation, which allows for combining the in-depth richness of interviews and the more precise and generalizable knowledge that results from a survey. At the same time, there is a particular advantage that guided our decision to use mixed methods (quantitative and qualitative) in terms of validity and the applicability of these results at the local practice level, such as serving as a baseline for municipal policies and informing future research on the same case study.

Table 3.1: Survey sample overview

		Sample		Universe ^a	
		Male	Female	Male	Female
		Count	Count	Count	Count
Main Fishery Activity	Boat owner	17	1	171	3
	Artisanal Fisher	46	5	810	3
	Shore Gleaner	26	51	2200	1445
	Diver	5	0	237	0
	Pre- and post-Harvest	1	10		
	Another	2	0		

^a Universe (by 2024) of total registered artisanal fisheries of the three municipalities, by sex.

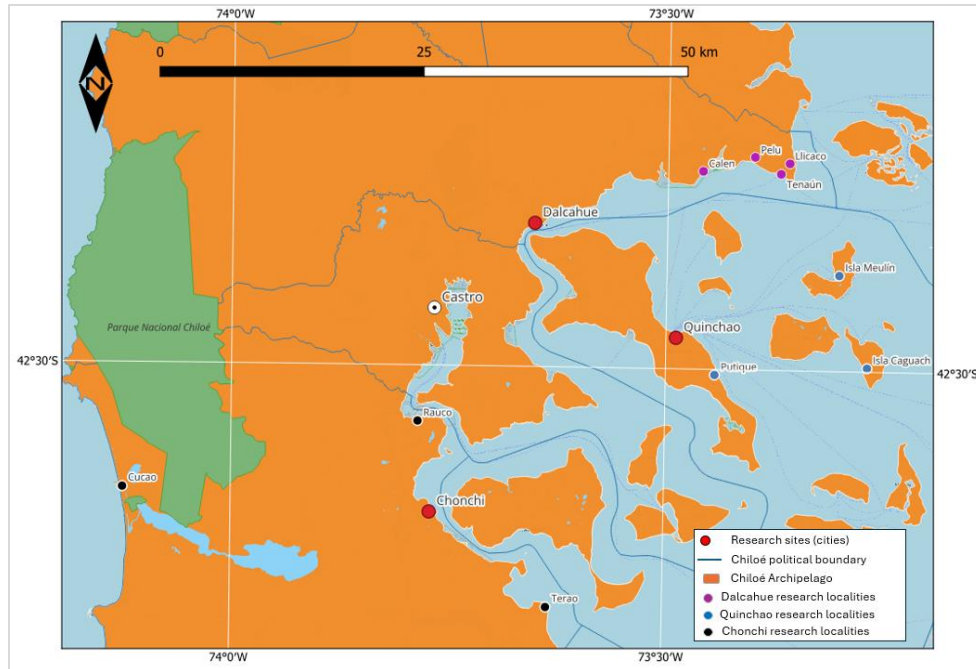


Figure 3.3: Localities within three main research sites (cities)

3.6 Results

Our results section is divided into three main sections (material, relational, and subjective dimensions of vulnerability) and two subsections per dimension (well-being and capitals, plus adaptive capacity). See Figure 3.1 for guidance.

3.6.1 Material Vulnerability

3.6.1.1 Material Well-being

Results showed that men and women SSF experienced different arrays of material stressors, including ecological, related to fishery resources, physical, and economic, that challenge their well-being (Table 3.2 and Table 3.3). On the ecological dimension, severe storms were the most frequently mentioned ecological stressor for both men and women SSF (80.1% and 89.1%, respectively, Table 2), affecting their fishery-related activity (Table 3.3), with positive responses of 75.6% for men SSF and 81.8% for women SSF. These findings resonate with participants' comments from interviews, where the majority describe not only being affected by a "changing weather", but directly by climate change. Participants narratives describe how weather has changed over the last decades making their work more uncertain: *"This year has been very bad; we can notice climate change. So many severe storms. I am starting to see that we will be like Mexico, with hurricanes and everything... because the severity of things we have seen"* (M, female baiter and gleaner).

Table 3.2: Material stressors experienced by SSF in Chiloé, Chile

Stressors experienced during the last 12 months									
	Variable	Men		Women		χ^2	(df)	p-value	Cramer's V
		Count	%	Count	%				
Ecological	Flood	14	17.9%	13	23.6%	0.645 ^a	1	0.422	0.070
	Drought	28	35.9%	20	36.40%	0.003 ^a	1	0.956	0.005
	Severe storm	63	80.1%	49	89.1%	1.68 ^a	1	0.195	0.112
	Algal Blooms	20	25.6%	12	22%	0.258 ^a	1	0.612	0.044
	Coastal and Marine pollution	56	71.8%	27	49.1%	7.087^a	1	0.008*	0.231
Fishery Resource	Catching fewer resources	67	85.9%	46	83.6%	0.129 ^a	1	0.719	0.031
	Decline in resource availability	60	76.9%	48	87.3%	2.264 ^a	1	0.132	0.130
	Increase in fishing gear price	70	89.7%	30	54.5%	21.421^a	1	0.000*	0.401
	Damage to fishing gear	62	79.5%	28	50.9%	12.041^a	1	0.0001*	0.301
	Theft of fishing gear	26	33.3%	17	30.9%	0.087 ^a	1	0.768	0.026
	Problems with Industrial fishing and/or aquaculture	43	55.1%	23	41.8%	2.286 ^a	1	0.131	0.131
Physical	Accident	14	17.9%	5	9.1%	2.067 ^a	1	0.151	0.125
	Disease	15	19.2%	22	40.0%	6.929^a	1	0.008*	0.228
Economic	Food insecurity	5	6.4%	12	21.8%	6.869^a	1	0.009*	0.227
	Theft or home unsafe	9	11.5%	8	14.5%	0.262 ^a	1	0.609	0.044
	Lend money to a family member	33	42.3%	16	29.1%	2.422 ^a	1	0.120	0.135
	Household insecurity (Housing problems, troubles paying bills or rent)	21	26.9%	14	25.5%	0.036 ^a	1	0.850	0.016
^a . 0 cells (0.0%) have expected count less than 5.									
* Statistical significance at $p < 0.05$.									

Table 3.3: Material stressors that have affected fishery related activities in Chiloé, Chile

Stressors that have affected fishery related activities									
	Variable	Men		Women		χ^2	(df)	p-value	Cramer's V
		Count	%	Count	%				
Ecological	Flood	10	12.8%	7	12.7%	.000 ^a	1	0.987	0.001
	Drought	10	12.8%	11	20.0%	1.250 ^a	1	0.263	0.097
	Severe storm	59	75.6%	45	81.8%	.722 ^a	1	0.396	0.074
	Algal Blooms	14	17.9%	12	21.8%	.307 ^a	1	0.579	0.048
	Coastal and Marine pollution	34	43.6%	17	30.9%	2.194 ^a	1	0.139	0.128
Fishery Resource	Catching fewer resources	61	78.2%	45	81.8%	.260 ^a	1	0.610	0.044
	Decline in resource availability	57	73.1%	44	80.0%	.846 ^a	1	0.358	0.080
	Increase in fishing gear price	57	73.1%	20	36.4%	17.835^a	1	0.000*	0.366
	Damage to fishing gear	55	71.4%	22	40.0%	13.038^a	1	0.000*	0.314
	Theft of fishing gear	24	30.8%	15	27.3%	.190 ^a	1	0.663	0.038
	Problems with Industrial fishing and/or aquaculture	42	53.8%	20	36.4%	3.962 ^a	1	0.047	0.173
Physical	Accident	14	17.9%	5	9.1%	2.067 ^a	1	0.151	0.125
	Disease	12	15.4%	21	38.2%	0.003	1	0.003*	0.260
Economic	Food insecurity	3	3.8%	6	10.9%	2.550 ^a	1	0.110	0.138
	Theft or home unsafe	3	3.8%	2	3.6%	.004 ^a	1	0.950	0.005
	Lend money to a family member	8	10.3%	6	10.9%	.015 ^a	1	0.904	0.010
	Household insecurity (Housing problems, troubles paying bills or rent)	11	14.1%	6	10.9%	.295 ^a	1	0.587	0.047
^a . 0 cells (0.0%) have expected count less than 5.									
* Statistical significance at $p < 0.05$.									

In addition, coastal and marine pollution is also an ecological stressor to which participants mentioned being exposed, with statistically significant differences between men (71.8%) and women SSF (49.1%).

These numbers dropped when participants were asked whether pollution affected their fishing (men: 43.6% and women: 30.9%). However, pollution is also present in their narratives about the difficulties of their livelihoods, but while men blame industrial fishing and salmon farming for coastal and marine pollution, women critically acknowledge the responsibility of SSF and their role in creating and managing pollution: *"It's too much pollution, and it is not just salmon farming's responsibility. We all have played a role in that...the tide brings all kinds of garbage. So, we all need to become more conscious about what we are doing wrong, not just aquaculture, but also artisanal fisheries"* (C, female diver).

In the same sense, when it comes to stressors related to fishery resources, male interviewees expressed conflicts with industrial fishing and aquaculture, not only regarding pollution but mostly as a cause of fishery and marine species' lack of access and even fisheries decline: *"If things [quotas] were better distributed, but they aren't. The fishing industry takes the bigger piece of the cake, and the artisanal sector is relegated to two or three species throughout the year; we have to survive with that, and that's it. It's unsustainable"* (A, male SSF and union leader). This resonates with survey results, as 53.8% of male SSF reported being affected in their fishery-related activities by problems with industrial fishing and aquaculture in the region, unlike their female counterparts.

In addition, men and women both experienced fisheries decline and catching fewer resources in the last 12 months, but reported being highly affected by both issues (Table 3.3): 78.2% men and 81.8% women report catching fewer resources, and 73.1% men and 80% women mentioned a decline in resource availability. Additionally, men reported being affected by the increasingly high cost of fishing gear and damage to their fishing gear (73.1% and 71.4%, respectively), unlike female SSF, with these differences being statistically significant.

Struggles with the high cost of fishing gear resonate with the financial and economic troubles both men and women SSF confront constantly. Narratives about how market pressures over the pricing of marine resources and the global economic crisis affected their revenues are present throughout interviews. Participants reported being significantly affected by lower market prices for the resources they catch, especially algal resources (*pelillo*, *luga*), alongside an overall reduction in sales, which has impacted their income. It is worth noting that artisanal fisheries have stated they are selling their products for export, which further affects their prices due to global market fluctuations, and that intermediaries are buying at very low prices:

"Buyers are the ones that export. There was a time that they even told us that the Chinese had discovered how to replace 'pelillo' in their products, such as shampoo and soap, so they weren't interested in buying. Apparently, that was a rumor only. Similar with Luga, one year the price was 2 mil pesos (\$2 US dollar) per kg. Now is like 500 pesos (0.57 US dollar). The prices fluctuate so much" (M, female gleaner).

The impacts of these economic struggles on their everyday life can be seen in survey responses. While a low percentage of survey respondents expressed having experienced household insecurity, actions such as lending money to a family member are relatively high in men's SSF (42.3%). In addition, 21.8% of female SSF survey respondents reported experiencing food insecurity in the past 12 months, compared with 6.4%

of their male counterparts, reflecting differences in how economic challenges affect men and women in SSF.

Finally, a major difference between how men and women experience material well-being challenges is in health-related stressors. Female survey respondents reported experiencing disease over the past year (40%), and 38.2% reported being negatively impacted in their fishery-related activities by this, which is statistically significantly higher than male SSF survey respondents. This resonates with in-depth interviews. Struggles over health problems are a core element in women's SSF discourses, as a main source of stress affecting their overall physical and even subjective well-being. Descriptions of physical pain in their backs, hands and knees while harvesting on the shore and mending nets, baiting hooks and longlines, and UTIs and cystitis problems due to long hours of harvesting in the cold or even assisting in boats without access to washrooms, are constant in their narratives, worsened by a lack of access to medical care and insurance given the seasonal and informal nature of their work:

"The diseases we see in women SSF are vaginal prolapse, cystitis, rheumatism, arthrosis, arthritis, depression, and alcoholism. In women baiting hooks and longlines, we see other types of diseases, even accidents, and a risk of tetanus from rusty hooks. And while they have access to the public medical system, with a low co-payment, they still have to get a bunch of tests and things that sometimes are not possible short-term through the public system" (C, female SSF union leader).

"My father's boat doesn't have a washroom. So, when we go out, I go to the washroom at 9 am before we leave, and the next opportunity is once I am back at home at 6 pm. I know it's bad to hold it, but what else can I do? I already have kidney and bladder problems because of it" (C, female SSF, assistant diver and union leader).

These problems are exacerbated by age. The median age in our survey is 49 years old, with 59.3% of women respondents aged 40-60 and 16.7% aged 60+. Interview participants acknowledge age related issues as a part of their vulnerability experienced, referring to artisanal fisheries as an activity of "old people", which also suffers the danger of low generational replacement: *"Young people don't want to become fishers due to many reasons, including mismanagement in quota and species assignments. This is an activity of old people, with the danger of getting lost in time" (A, male SSF and union leader).*

3.6.1.2 Material Capitals and Resilience

The multidimensional model for SSF vulnerability we proposed includes capitals (or lack of) and resilience (or loss of) measured through adaptive capacity, as key components of the framework. When it comes to material vulnerability, physical, economic, and natural capital were measured through survey responses and interviews (Table 3.4). Adaptive capacity was measured in surveys by asking participants which strategy they deployed for each stressor analyzed in the previous section (Table 3.5).

Table 3.4: Material capitals of SSF in Chiloé, Chile

Do you have the following:									
Capital	Variable	Men		Women		χ^2	(df)	p-value	Cramer's V
		n	%	n	%				
Physical	Boat	28	35.9%	10	18.5%	4.701 ^a	1	0.03*	0.189
	Small motor boat	16	20.5%	2	3.7%	7.656 ^a	1	0.006*	0.241
	Medium motor boat	9	11.5%	0	0	6.687 ^a	1	0.01*	0.225
	Big motor boat	3	3.8%	0	0	2.125 ^a	1	0.145	0.127
	Fishing gear	52	66.7%	32	59.3%	.757 ^a	1	0.384	0.076
	House	58	74.4%	45	81.8%	1.027 ^a	1	0.311	0.088
	Cellphone	78	100.0%	55	100.0%				
	Car	50	64.1%	29	52.7%	1.731 ^a	1	0.188	0.114
Natural	Piece of land	50	64.1%	36	65.5%	.026 ^a	1	0.872	0.014
	Livestock	24	30.8%	34	61.8%	12.645 ^a	1	0.00*	0.308
Financial	Savings	57	73.1%	34	61.8%	1.892 ^a	1	0.169	0.119
	Access to banking services	59	75.6%	41	74.5%	.021 ^a	1	0.885	0.012
^a . 0 cells (0.0%) have expected count less than 5.									
* Statistical significance at $p < 0.05$.									

When it comes to material capitals, a high percentage of men and women SSF survey respondents seem to have access to financial capital (savings, banking services), as well as physical capitals regarding such as housing (74.4% men and 81.8% women), a piece of land, and possessions such as a car and cellphone (100% for both men and women). Major differences are observed between men and women in the possession of different types of boats, which largely reflect the nature of their work: most females self-identify as shore harvesters or gleaners, whereas males identify as fishers.

Table 3.5: Strategies employed by SSF in Chiloé, Chile to respond to material stressors (as a measure of resilience)

Adaptive capacity									
	Variable	Men		Women		χ^2	(df)	p-value	Cramer's V
		n	%	n	%				
Ecological	Looking for new sources of information and knowledge on how to deal with these issues	27	38.0%	15	28.3%	1.282 ^a	1	0.258	0.102
	Anticipating and preparing beforehand	47	66.2%	25	47.2%	4.512 ^a	1	0.034*	0.191
	Seeking external help (Municipality, Local Fishing Agency, etc.)	16	22.9%	14	26.4%	.207 ^a	1	0.649	0.041
	I organize with neighbours and/or the community to face these problems	45	63.4%	18	34.0%	10.508 ^a	1	0.001*	0.291
	Not much, just improvise when they occur	51	71.8%	39	73.6%	.047 ^a	1	0.829	0.019
Fishery Resource	Extra work in fishery related activity (intensify extraction, diversify to another resources or extraction method, etc.).	42	53.8%	22	40.7%	2.194 ^a	1	0.139	0.129
	Looking for new sources of income outside fishery-related activities (e.g. agriculture, aquaculture seasonal jobs, micro-entrepreneurship, etc)	56	71.8%	48	88.9%	5.579 ^a	1	0.018*	0.206
	Selling fishing gear	15	19.2%	2	3.8%	6.676 ^a	1	0.01*	0.226

	Ask for a loan (family, friends, bank)	27	34.6%	21	39.6%	.341 ^a	1	0.559	0.051
	Using savings	60	77.9%	33	61.1%	4.356^a	1	0.037*	0.182
	Ask for help and/or organize with SSF union or similar organization	22	28.2%	11	20.4%	1.045 ^a	1	0.307	0.089
	Not much, just improvise when they occur	48	61.5%	42	77.8%	3.879 ^a	1	0.049	0.171
Physical and economical/financial	Seek help within a support network or close relationships	31	60.8%	25	59.5%	.015 ^a	1	0.902	0.013
	Not doing much, just keep going without asking for help	33	64.7%	26	63.4%	.016 ^a	1	0.898	0.013
	Seek help outside support network or close relationships (Municipality, State Social Agencies, etc.)	7	13.7%	17	40.5%	8.608^a	1	0.003*	0.304
^a . 0 cells (0.0%) have expected count less than 5.									
* Statistical significance at $p < 0.05$.									

When asked how they deal with the ecological stressors mentioned, respondents reported improvising and reacting as their main responses to such events (71.8% of men SSF and 73.6% of female SSF). Interestingly, we see a statistically significant difference between men and women: 66.2% of men do try to anticipate and prepare before (vs. 47.2% female counterparts), while 63.4% declared organizing with the community in the face of these stressors, which contrasts with 34% of women SSF who declare to take the same action. These responses align with what interviews discourses show: women's SSF narratives about climate change and weather changing are present, but often accompanied with a sense of 'fatal end' and feelings of resignation:

"It's not the same [the work]. First, climate change. I told 5 years ago to the other girls' lets start to focusing on something else besides baiting hooks and longlines, try to apply to micro-entrepreneurship projects, because these livelihood is not forever'. They were super skeptical 'we don't believe you, it will stay the same'. And it didn't. We used to have 50 boxes of longlines and hooks per week. Now we barely have 50 per month" (M, woman SSF, 'baiter').

While women recognize the need to improvise more in response to weather and climatic issues than their male counterparts do, they do acknowledge diversification outside SSF as their main strategy for responding to fishery-related stressors such as resource and catch declines. Specifically, 88.9% of female SSF respondents report seeking new sources of income outside fishery-related activities (e.g., agriculture, aquaculture, seasonal jobs, micro-entrepreneurship), which statistically contrasts with male respondents. In interviews, many women report working seasonally in the aquaculture industry, which is highly prevalent on the Island. Most notably, interview results show that the most prevalent strategy among female SSF is low-scale farming and livestock, which is reinforced by survey results (table 5): 61.8% of women report having livestock, a statistically significant contrast with male SSF (30.8%). A common strategy seen in female SSF, especially gleaners, is harvesting algae during the summer and the rest of the year, complementing income with low-scale agriculture and produce derived from also low-scale livestock such as chickens, sheep, and pigs. As an interviewee explains: *"My two livelihoods are algae harvesting and the farm. Agriculture always, besides selling eggs, lambs, raising and selling pigs and chickens. We try to do a little bit of everything". (C, Algae gleaner).*

While both men and women acknowledge also to improvise a lot when face with low catches (77.8% female respondents and 61.5% male respondents), unlike women whom diversify into agriculture, men do seem to use more reacting strategies to deal such stressors, such as using their savings (77.9%), ask for a loan (34.6%), and even selling their fishing gear (19.2%), with the first and the third being statistically significant different from female SSF.

Finally, both men and women SSF indicate the cope with financial and physical stressors by seeking help within their support network or close relationships (family, friends) (60.8% men and 59.5%), they also acknowledge that they improvise when facing those issues without asking for help (64.7% men and 63.4% women). However, we see statistically significant differences when it comes to asking for help outside family members or close networks: 40.5% of women SSF reported seeking help through the Municipality and local Government Social programs. Interestingly, women often mention in interviews and in workshops stories on how they "fought for their rights" despite bureaucratic obstacles with local authorities and municipal agents, especially regarding access to health services:

"I fought a lot to get psychological help. But it is hard in the minor islands. And you fight, but still find doors being closed. Its awful but it is true. Especially regarding the health system. But we have rights. For example, my mom has always lived in Caguach [interior Island], and why does she have to move to another city to have an oxygen machine at home? And I've seen improvements in water provision and electricity, but if authorities are expanding those services, they need to include the capacity for an oxygen machine, I mean... it's the minimum. And then you are known as a person who complains to the authorities. But fighting for your rights is never a bad thing" (J, algae gleaner).

3.6.2 Relational vulnerability

3.6.2.1 Relational well-being

Relational well-being was measured in the survey by asking participants about their relational responsibilities and challenges in the past 12 months (Table 3.6), and whether those responsibilities and stressors had affected their work in fishery-related activities (Table 3.7).

Table 3.6: Relational responsibilities and stressors experienced by SSF in Chiloé, Chile

Have you experienced these stressors in the past 12 months								
Variable	Men		Women		χ^2	(df)	p-value	Cramer's V
	n	%	n	%				
Caring roles (children, elders, etc.)	22	28.2%	34	61.8%	14.950 ^a	1	0.000*	0.335
Lack of cooperation in domestic/ household work	4	5.1%	20	36.4%	21.280 ^a	1	0.000*	0.400
Lack of support network	16	20.5%	15	27.3%	.825 ^a	1	0.364	0.079
Exclusion in decision-making in fishery organization	9	11.5%	10	18.2%	1.163 ^a	1	0.281	0.093
Exclusion in household decision-making	8	10.3%	5	9.1%	.050 ^a	1	0.824	0.019
^a . 0 cells (0.0%) have expected count less than 5.								
* Statistical significance at $p < 0.05$.								

Table 3.7: Relational responsibilities and stressors that have affected fishery related activities in Chiloé, Chile

If stressors have affected their fishery-related activity								
Variable	Men		Women		χ^2	(df)	p-value	Cramer's V
	n	%	n	%				
Caring roles (children, elders, etc.)	11	14.1%	24	43.6%	14.510 ^a	1	0.000*	0.330
Lack of cooperation in domestic/ household work	0	0.0%	12	21.8%	18.706 ^a	1	0.000*	0.375
Lack of support network	7	9.0%	11	20.0%	3.351 ^a	1	0.067	0.159
Exclusion in decision-making in fishery organization	1	1.3%	5	9.1%	4.566 ^a	1	0.033*	0.185
Exclusion in household decision-making	1	1.3%	1	1.8%	.063 ^a	1	0.802	0.022
^a . 0 cells (0.0%) have expected count less than 5.								
* Statistical significance at $p < 0.05$.								

Caring roles are at the core of women's discourses about wellbeing. Struggles with how to reconcile work and caring for their own children, and even grandchildren, and elders such as their mothers, aunts, husbands, and even elder neighbours, are constant throughout each of the interviews held with women SSF. Many describe this as a burden they reconcile by taking the children with them to work, regardless of the weather or their own physical health. Anecdotes of shore harvesting while watching their toddlers, or putting their babies in small cribs, are often present, and now, with age, repeating the same with grandchildren. This resonates with survey responses: 61.8% of women SSF report having caring roles, and 43.6% report that those caring roles have affected their work in SSF, which is statistically higher than men's responses. The story is similar when it comes to domestic and household chores and responsibilities: differences between men and women are statistically significant: 0% of male respondents report being affected in their fishing activity by this, which contrasts with 21,8% of female participants.

Interestingly, their caring responsibilities have not diminished, even though most interviewees now have older children; caring for elders is also a common element in their narratives. Many of them define their lives as a continuum of caring for someone else:

"I took care of my father, my mother. Both died in my arms. Then I took under my care my mother-in-law. Then my husband who had a cerebral stroke. I also took care of my cousin, who also died later, then my sister, who also died, and now a neighbour, she is very old and lonely. But I never thought I could get sick too; I didn't think about myself during those times. I never had time to think, just time to care for those people. I am in my 70s now, and I am still working, still taking care of others, and working on the farm or at shore harvesting. My age is not a difficulty to keep working" (C., Alage gleaner).

Struggles over the unequal distribution of their household responsibilities are also expressed by women in interviews. Women SSF express that men have the freedom to dedicate themselves solely to their fishing work, while they must juggle everything at once:

"Where is that men that could say "you go, I stay". Women go out for days on their boats and some days they are at home resting. But when women get to rest? Even when we tried to get together with the women's SSF association, we all get together after 5 because we

need to get everything done at home first, lunch, cleaning, pick up kids from school, so nobody can say "you didn't do this at home". But that should've be like that, we also need out time off" (D, women SSF and organization leader).

Often these discourses come with some sense of contradiction: while sometimes they feel these inequalities as part of gender discrimination, or '*machismo*', they recognize that they themselves make the decision to stay at home, prioritizing children's well-being over their own, which resonates with the 9.1% of women feeling excluded from household decisions. Moreover, many of them acknowledge initiating their work as an algae gleaner or by baiting hooks to have the freedom to stay with their own children: shore harvesting is only in the summers, and baiting hooks and longlines are activities they can perform in their own homes:

"The first time I saw women baiting hooks, I asked if I could learn it, and she taught me, and like a snowball, we started to teach among women. Because I realized that this was an opportunity to be with my children, wake them up, dress them, take them to school. So, we started to find women who wanted the same opportunity: to work while taking care of their children without having to ask someone else. Because that is the biggest fear, finding a stranger to take care of your kids and not knowing how they will be" (M., algae gleaner and baiter).

In a similar sense, the question of support networks arises in interviews. Most women acknowledge having a strong overall network, usually their mothers and close relatives, to help them when in need, especially in their caring roles. It is not the husbands or male partners; it is women helping other women. The lack of a support network is a stressor itself. Interestingly, when asked in our survey, percentages are not very high, both for those who experienced it in the past year (20.5% of men and 27.3% of women) and for those who report it as a stressor that has affected their work (9% of men and 20% of women). Interestingly, there are no statistically significant differences between the two groups. This is reinforced by the results shown in Table 3.8 under Support Network Index, which indicate that both male and female SSF have high scores (0.8 and 0.7, respectively), with no statistically significant differences.

Finally, participants report low levels of exclusion in their SSF organizations (associations, syndicates, and unions); only 11.5% of men report experiencing exclusion in the last year, compared with 18.2% of women. These percentages are lower when respondents are asked whether this stressor has affected their work in fisheries: 1.3% and 9.1%, respectively, with no statistically significant difference between the two groups. In interviews, participants echo these results: while some women again mentioned *machismo* in their organizations, the board of directors of SSF unions needs a gender quota by law; therefore, many of them not only participate but also hold, or have in the past held, leadership roles in their organizations.

Furthermore, women-led SSF associations are known in the region for their influence in SSF governance, their bargaining power with authorities and lawmakers. They have led protests for social and quota rights in SSF, conflicts with the salmon industry and industrial fishing, have had audiences in Congress to make SSF more sustainable, and were behind the new Law 21.370, which includes modifications to the existing Fishing and Aquaculture law '*Ley de Equidad de Genero en Pesca*', officially published in 2021. This law contemplates not only the elimination of any type of discrimination based on gender, but also the incorporation of pre- and post- harvest activities '*actividades conexas*' as legally recognized as fundamental

for the SSF value chain, with all the social benefits that include. The law also reinforces the need to diminish the gender gap in the National Registry of SSF and restates the requirement of a gender quota in SSF syndicates and unions.

3.6.2.2 Relational Capitals and Resilience

Relational capital pertains to social and human capital, which were measured through different questions on the survey, summarized in Table 3.8. Human Capital included access to education for their families and medical support. Social Capital was measured using a proxy of: 1) respondents report having a spouse or partner and 2) the Support System Index, created by 8 questions about having support for different specific needs, replicated from the National Socioeconomic Characterization Survey in Chile, the largest and most legitimized survey to measure multidimensional poverty by the National Institute of Statistics (Chile).

Table 3.8: Relational capitals of SSF in Chiloé, Chile

Capital	Variable	Men		Women		χ^2	(df)	p-value	Cramer's V
		n	%	n	%				
Human	Access to school for children	73	93.6%	53	96.4%	.498 ^a	1	0.480	0.061
	Access to medical services	61	78.2%	54	98.2%	11.000 ^a	1	0.001*	0.288
Social	Spouse or partner	50	64.9%	32	62.7%				
	Do you have someone who:								
	i. Can help you in case of sickness	62	79.5%	42	76.4%	-			
	ii. Can facilitate a motor vehicle	74	94.9%	50	90.9%	-			
	iii. Lend you money in case of need	66	84.6%	46	84.6%	-			
	iv. Can help you with legal advice or to resolve financial questions	53	67.9%	40	72.7%	-			
	v. Can help you in the use of technology	69	88.5%	50	90.9%	-			
	vi. Can help you to make home repairs	53	67.9%	38	69.1%	-			
	vii. Can help you to get a job for you or family member (reference letter, contact)	57	73.1%	33	60.0%	-			
	viii. Can give you life advice when facing personal problems	63	80.8%	48	87.3%	-			
	Support Network Index (SNI) SNI= (i+ii+iii+iv+v+vi+vii+viii/8)	Men n	Men Mean	Women n	Women Mean	t-test 2-sided p-value			
		76	0.8092	55	0.7886	0.583 ^b			
^a . 0 cells (0.0%) have expected count less than 5.									
^b . Equal variances assumed									
* Statistical significance at $p < 0.05$.									

Survey respondents report overall high levels across the different capitals asked about. Statistically significant differences are observed in access to doctors or medical services, with 98.2% of women reporting higher levels, compared with 78.2% of their male counterparts.

Resilience was measured by asking participants which strategies they use when confronted with the previously listed relational stressors. While the results do not show statistically significant differences between men and women (Table 3.9), we can see that, for both groups, the majority of respondents report taking little action when confronted with these issues (70% of men and 66.7% of women). In accordance with previous results, female SSF seem to seek more help from their support networks than their

counterparts (55.6% vs 45%). Only 46.7% of women report confronting the situation (whether at home or in their organizations) and seeking the cooperation they need.

Table 3.9: Strategies employed by SSF in Chiloé, Chile to respond to relational responsibilities and stressors (as a measure of resilience)

Variable	Men		Women		χ^2	(df)	p-value	Cramer's V
	n	%	n	%				
Not much, I try to avoid conflict, keep going the way I am used to and try to manage as best as I can	28	70.0%	30	66.7%	.109 ^a	1	0.742	0.036
Seek help in inner circle or support network	18	45.0%	25	55.6%	.944 ^a	1	0.331	0.105
I confront the situation and demand the cooperation I need	25	62.5%	21	46.7%	2.138 ^a	1	0.144	0.159

^a. 0 cells (0.0%) have expected count less than 5.
^{*} Statistical significance at $p < 0.05$.

3.6.3 Subjective Vulnerability

3.6.3.1 Subjective Well-being

Subjective dimension of well-being refers to "the spans of notions of self, individual and shared hopes, fears and aspirations, expressed levels of satisfaction or dissatisfaction, trust and confidence among other things" (Weeratunge et al., 2013: 257). Subjective well-being was measured in the survey by asking participants if they had experienced and been affected by some personal stressors, such as addiction and the loss of a family member. In addition, we asked whether the combined stressors in the survey placed an emotional burden on participants (Table 3.12). Interviews, however, are the primary source for accessing participants' perceptions of subjective well-being through expressions of their aspirations, emotional struggles, identity, and recognition.

Table 3.10: Personal stressors experienced by SSF in Chiloé, Chile (as a measure of subjective well-being)

Have you experienced these stressors in the past 12 months								
	Men		Women		χ^2	(df)	p-value	Cramer's V
	n	%	n	%				
Addictions	8	10.3%	0	0.0%	6.002 ^a	1	0.014*	0.212
Death of a family member	16	20.5%	24	43.6%	8.201 ^a	1	0.004*	0.248

^a. 0 cells (0.0%) have expected count less than 5.
^{*} Statistical significance at $p < 0.05$.

Table 3.11: Personal stressors that have affected fisheries work in Chiloé, Chile

If stressors have affected their fishery-related activity								
	Men		Women		χ^2	(df)	p-value	Cramer's V
	n	%	n	%				
Addictions	3	3.8%	0	0.0%	2.164 ^a	1	0.141	0.128
Death of a family member	10	12.8%	15	27.3%	4.414 ^a	1	0.036*	0.182

^a. 0 cells (0.0%) have expected count less than 5.
^{*} Statistical significance at $p < 0.05$.

Results show that some personal stressors such as addiction (10.3% men vs 0%) is experienced statistically differently among the two groups. Alcoholism is often mentioned in interviews as a common "men's problem" with cascading effects for entire families, especially in the interior Island of Chiloé Archipelago:

"Yesterday I talked to someone and they told me 'the city where most people die due to alcoholism is this one [Quinchao] [...]. Just in our Island with a population of no more than 300 people, last year 7 people died due to alcoholism. This year is February, and already we have 2 deaths related to alcohol" (B, gleaner and union leader).

The loss of a family member also has a gendered component: 46.6% of women reported experiencing this in the past 12 months, versus 20.5% of men. In addition, 27.3% of women report that the experience of losing a family member has even affected their work, which resonates with interview discourses: the emotional struggle of grief often repeats among participants:

"I haven't participated much because my mother died in July this year, and in February my dad. So I have been...just now started to go to syndicate meetings again. My husband had to leave his job because I couldn't, as a mom, work; it has been something very hard to live with" (J, gleaner).

Further, almost half of the participants, 56% of men and 52.7% of women, acknowledge the emotional burden of the different ecological, resource-related, personal, financial, and relational stressors they experience, making it sometimes difficult to work on their fisheries-related activity (table 3.12), which, despite not showing statistical differences among two groups, shows the dynamic and interactive nature of vulnerability itself: each dimension is connected with another.

Table 3.12: Subjective struggles and aspirations

	Men		Women		χ^2	(df)	p-value	Cramer's V
	n	%	n	%				
"Experiencing the problems listed creates an emotional burden and a level of preoccupation that difficult my work"	42	56.0%	29	52.7%	.137 ^a	1	0.711	0.032
Would you like your children to dedicate to SSF in the future?	28	36.4%	23	43.4%	.651 ^a	1	0.420	0.071
^a . 0 cells (0.0%) have expected count less than 5.								
* Statistical significance at $p < 0.05$.								

In interviews, the emotional struggles participants expressed are much more complex and varied than just grieving. Women's interviewees often mentioned experiences and feelings of discrimination due to being a woman, and mostly, for being a fisher, which is often associated with a life of poverty and sacrifice. The narrative of sacrifice itself seems to be experienced with ambivalent emotions: while many recognize that being a fisher entails sacrifice and endurance, tainted by moments of physical and emotional pain, they also reflect on it as an element of pride.

"I have always heard "fisher men and women are so dirty, the smell of fishing". I say "if they knew we carry so much cash in our pockets". When a women discriminate me at school

because she said in front of all the parents that "baiting hooks it would be the last thing she would do". I cried and I thought "God doesn't punish but he is fair". Later on, I heard she had started baiting hooks, despite being an accountant. I have my own house, a loving husband, healthy children, I have a job. Many people can envy that" (M, baiter and gleaner).

Pride as a notion of self-association with being a fisher seems to be a building block of their identity. In this sense, women's SSF identity associated with their livelihoods is something strong that they themselves highlight in most interviews. Despite the sacrifices, identifying as a fisher is not only a source of pride but also of belonging: most fishers come from families with a tradition of artisanal fishing. Continuing their activity, despite all the difficulties, triggers a sense of responsibility and legacy embedded in their idea of self, and reproduced in everyday practice beyond their work: when talking to their children, socializing with their neighbours, even when bargaining with institutional representatives.

Motherhood is a key element among female interviewees. Being present for their children and providing for their families is integral to their fish-related activity. As previously mentioned, that is why many of them continued with family tradition or even learned to bait hooks and mend nets. In this sense, it is not only identity seems to be associated with motherhood, but aspirations seem to be framed by motherhood and their gender role expectations:

"It is always so complex for us, we have so many roles and expectations to fulfill. I wish I could have my own boat, embark, and leave for days, but it is almost impossible that women make that decisions because of the children, household responsibilities. So we don't have much option besides taking these jobs that allow us to work with the sea and fisheries, but mostly from home or close home" (D, gleaner and union leader)

Interestingly, uncertainty is also often present when asked about their own aspirations, always embedded with the experience of being a mother and fisher, gleaner, diver or 'baiter', all together and combined, as these different roles were inextricably connected. Participants express concern about how uncertain their livelihood has become, and the likelihood that their children will have a good life from small-scale fisheries elicits mixed responses among interviewees.

"Artisanal fishing is dying, because future generations don't want to work on this. We also have 'vedas', red tide, or whatever contamination, and artisanal fisheries have to stop. So, future generations... our kids don't see that with good eyes; they even prefer to work in salmon farming, aquaculture, and go out of the Island. It's sad to see because I would love that small-scale fisheries could live forever" (C, diver and union leader).

While many participants acknowledge pride in their children learning their livelihood, survey respondents do not report being so keen on their children following their footsteps (table 3.12): 43.4% of women SSF declared they would like their children to dedicate themselves to SSF in the future, while this percentage decreases to 36.4% for men.

Finally, while 80% of female survey respondents self-identify as Indigenous, which statistically contrasts with their male counterparts (53.8%), indigeneity is a category that never came up in interviews as

concerning their identities. Furthermore, most participants, men and women, refer to 'indigenous communities' as an '*outside other*', in contrast with their 'fisheries associations, unions, and syndicates', which is often assumed as a "we" in their discourses.

3.6.3.2 Subjective capitals and resilience

Subjective capital concerns mostly human capital in terms of knowledge and education¹⁰, measured through survey, as well as symbolic capital through interviews.

Table 3.13: Human Capital: Educational level

Level of Education	Men		Women	
	Count	%	Count	%
No formal education	1	1.3%	0	0.0%
Incomplete elementary	14	17.9%	16	29.1%
Elementary complete	25	32.1%	13	23.6%
Secondary complete	12	15.4%	5	9.1%
Secondary incomplete	18	23.1%	12	21.8%
Superior or technical	4	5.1%	4	7.3%
Professional education incomplete	3	3.8%	3	5.5%
Professional complete	1	1.3%	2	3.6%
Total	78	100.0%	55	100.0%

Some differences can be observed in the two groups: men being slightly more educated than women. Women often commented in interviews, especially older participants, how they did not have access to education while their brothers or male family member in contrast, did have the opportunity:

"I remember I was making bread while crying, because I didn't know what was I supposed to do. My mother told me "you need to work so your brother can study because he is a man". That's how life used to be, and I couldn't even keep a cent because everything was sent to my brother. So technically I help him to study, and once he finished I was able to leave home" (C., gleaner).

While education as an asset varies by numbers, women and men report in interviews that women SSF are the ones who consistently seek opportunities to study with SSF knowledge or in a related field. They are the main users of any government-led initiative to educate SSF on paperwork, project creation and application, cooking, and post-catch fisheries processing, etc. Further, some interviewees highlight the value of traditional knowledge, passed down to them by their mothers and elders, which they hope to preserve, not only for their livelihoods but also for the traditional gastronomy for which Chiloé is known in Chile. In this sense, the word "visibility" often emerges in interviews with both men and women, not only regarding their traditional knowledge but also regarding the importance of their work. Recognition within the 'self', peers, and policymakers is a recurrent topic in interviews, emerging not only as a form of 'symbolic capital' but also as a mobilizing force within their identities, motivating them to organize more collectively and demand more rights and benefits.

¹⁰ While education is also considered a material capital, we decided to include subjective vulnerability as knowledge skills and information is considered an indicator in our model of subjective capital.

"Just imagine, we were like 'invisible'. We do such an important job, but it is like we don't exist. Because if there are no women mending nets or baiting hooks and longlines, men can't go out and fish, without a 'hook with bait', how can they extract 'reineta'? which is a main resource, even get exported. They can't, so we are the most important piece of the chain (V, baiter).

"Women were invisible for policy, regardless they have always been part of artisanal fishing. They are the ones baiting hooks, but always have been invisible, do the main goal today is they can be seen and counted so they can have access for more resources and benefits to do their job, which is so important" (A, male fisher).

Interestingly, while women SSF interviewees' symbolic capital relates more to visibility and recognition across different aspects (self, peers, community, and policy), men interviewees seem to anchor their pride and symbolic capital more in the self-employed and 'independent' nature of SSF.

"Artisanal fishers have never been workers of someone: it has a history of independence, freedom, and self-employment, which we hope to maintain" (A, male fisher).

Recognition and the seeking of new forms of knowledge are not only forms of capital but also forms of subjective adaptive capacity. Seeking recognition and visibility for policies and policymakers requires collective action and organization, which is evident not only in participants' discourses but also in tangible aspects of different participant observation encounters. As mentioned before, many of the women interviewed are not only local leaders in their SSF organizations but also have experience dealing with local and national authorities and have sought visibility in important spaces such as the FAO SSF global conference in Rome.

Sense of agency, in this note, is an additional key indicator of subjective adaptive capacity, observed in interviews and participants' discourses. Having the sense means they feel they can make important, strategic decisions in their lives and regarding their livelihoods, which is a constant in their narratives, especially among women in SSF.

"Everything has been the product of effort, because in other parts, the State just comes with things. But in our case, it's just 'neque' [effort]. And that makes me so proud to see we have the capacity to do so, accompanied by the opportunity to keep studying, which has opened our minds. And when you are a local leader, you need to teach people that you can't wait for things to happen you have to make them happen, and that includes not limiting yourself. That you can dream big, even without resources, just creativity and motivation" (R, female gleaner and union leader).

The sense of agency to make their lives in SSF better comes not only from core elements of their identity, such as motherhood in the case of women, or high sense of self-identification with their work, which is observed in both men and women SSF, but also from a deep attachment to their occupation: women often share in interviews the passion for their livelihood.

"I just love the sea. I started when I was 9 years old. Is part of me, I always have love the ocean. For me is relaxing, despite de cold. When they tell me that the tide is Good and tomorrow we will extract 'machas', I get excited. I feel that the sea heals me. For me being stuck at home is what makes me sick, especially my mental health" (P, female mollusk gleaner).

"When people ask me, I continue saying: I love my work. Embark in a boat and to navigate. I feel I left my problems on the shore, I don't take them to the sea" (C, female diver).

3.7 Discussion

While vulnerability studies in SSF are a growing field (Blythe et al., 2015; Nayak & Berkes, 2019; Dias et al., 2023; Islam and Chuenpagdee, 2022), a common approach in empirical vulnerability research is to treat SSF as a homogenous group and assess vulnerability without gendered nuances. To address this gap, this research has explored the differentiated vulnerability experiences of men and women in SSF in three municipalities on Chiloé Island, Chile, with a hybrid framework which mixed SES vulnerability and elements from new FPE. Our results show that vulnerability in SSF is indeed a multidimensional gendered process: women experience material, relational, and subjective vulnerability very differently from their male counterparts, making it almost a totally different experience regardless of being exposed and affected by the same stressors.

When it comes to material well-being, while men fishers seem to be more affected by ecological stressors such as weather changes and contamination, as well as fishery-related problems and the high cost of fishing gear, women are more affected by food insecurity and health problems. Responses to these stressors affecting their well-being are also different: men seem to have higher levels of adaptive capacity to confront ecological problems by organizing with community or fishery associations; however, they tend to improvise more by selling their gear or using savings when confronted with personal, fishery-related, or financial problems. Women, on the contrary, seem to have higher levels of adaptive capacity: they use strategies such as diversification when responding to declines in resource capture or other resource-related stressors. In addition, women seek more help outside their networks to confront financial and personal problems, such as advocating for their health, by contacting the Municipality's social office or similar government agencies.

Diversification is something that has been reported in other studies on gendered fisheries in Salomon Island (Cohen et al., 2016; Lawless et al., 2019): women are diversifying their livelihoods more over time, which has been considered an indicator for better adaptive capacity in the face of social and environmental change (Cinner and Bodin, 2010). However, this does not necessarily translate into higher well-being, as Lawless et al. (2019) found, since it adds more tasks to their already long list of responsibilities.

At the relational level, differences are more striking: women's well-being is affected by caring roles and household responsibilities, and unlike material vulnerability, they seem to respond to these stressors by coping and asking for support from their close relationships, usually other women as well. The burden of the long list of tasks and additional workloads that female fishers face due to the unequal distribution of power, expected gender roles, and unequal distribution of household work has been described in the literature (Resurreccion, 2006; Lawless et al., 2021; Frangoundes & Gerrard, 2019). Human and social

capital in this dimension do not vary much across groups; however, women report greater access to medical assistance, which seems to be anchored in their capacity to demand help and to assert basic health rights, unlike their male counterparts. At the same time, while gender discrimination and '*machismo*' are also mentioned among their SSF organizations, in accordance with what has been extensively documented in the literature about decision-making exclusion in fisheries (Resurreccion, 2006; Frangoundes & Gerrard, 2019), female participants' narratives and actions demonstrate higher levels of empowerment and collective organization with other women to confront this stressor. While there is not much literature on capitals and collective action with a gendered perspective in fisheries, Matsue et al. (2014) reported similar insights on female fishers processors 'mama karanga', where collective action seemed to play a key role in their empowerment and bargaining power with fish vendors.

Finally, the subjective dimension of vulnerability appears to be a key element in distinguishing between men and women in SSF, often overlooked in more widely used models of contextual vulnerability and research. This dimension of our framework was deeply influenced by new FPE scholarship, especially regarding how vulnerability experiences shape gendered aspirations, identities, fears and emotional struggles (Arora Johnson, 2011; Nightingale, 2006, 2011; Harris, 2006; 2008; Sultana, 2011). Subjective dimensions of vulnerability, and specifically, well-being, seems to be embedded in their material and relational vulnerability: emotional struggles in women are related to their struggles with health problems, losing a family member, and their caring roles. These issues also seem to frame their identity: being a fisher requires mental and physical sacrifice, as well as motherhood, but it is not only attachment to these livelihoods but also a notion of 'self' centered in being a female fisher and mother that triggers elements of pride, self-recognition, and adaptive capacity. Mothers SSF seem to find a mobilizing force in their identity that, at the same time, can limit some work aspirations (e.g., get a fishery job away from home), but simultaneously pushes them to seek and demand external help, recognition, and benefits - usually bargaining and negotiating with local authorities and policy makers. Thus, their sense of agency (both individual and collective) seems higher than that of their male counterparts. This finding seems to be particularly interesting in our research and a counter-narrative of what is often present in gender and fisheries literature: women instead of self-recognizing themselves as fishers, see their fisheries activities as an extension of their household activities, reinforcing their invisibility (Frangoundes & Gerrard, 2019; Harper et al., 2023).

Our research shows that gender roles and expectations can be pervasive to women and men, reinforcing vulnerability experiences: financial pressures on men, while caring roles in women, with both reporting lower levels of adaptive capacity for these problems, and instead, just coping as they are 'expected' to do so. However, women SSF, fueled by the interactive nature of well-being, embedded in their material vulnerabilities, as well as their identities as mothers and female SSF as a mobilizing force, present more levels of adaptive capacity to respond to these stressors. By organizing collectively, diversify in fisheries and outside fisheries to have an extra income, acquiring new and different types of knowledge, and by seeking -and demanding- external help and rights from policy makers, government, state, and local institutions, women SSF prepare, plan, and strategize more effectively their responses to their multiple vulnerabilities.

The dynamics regarding the subjective dimension of vulnerability, particularly, echo research on well-being and female SSF, such as Weeratunge et al. (2014) and Azmi et al. (2021). Weeratunge et al. (2014) highlight

the role of identity as a key element in female SSF, which not only represents a collective ethos of the fishery but also carries symbolic implications for their status and aspirations, including their freedom to choose not to be fishers. The authors acknowledge that this appears to be a strategic decision. Similarly, Azmi et al. (2021) analyzed women's SSF well-being to address vulnerability (in a broad sense), finding that women fish vendors and actioners exhibit higher levels of well-being pursuit embedded within their contextual vulnerabilities (lack of financial assets, social marginalization, environmental insecurity). While mothers are more vulnerable, the authors highlight that these women exercise active agency to meet family needs, which fuels their pursuit of individual and collective well-being.

While our research results are enclosed in a completely different geographical, political and cultural context of the research of Weeraunge et al (2014) and Azmi et al. (2021), they do echo their findings, contributing to a feminist quest in SSF research that emphasizes differential gendered experiences between men and women SSF anchored not only in differences in the stressors experienced, but in their identities and how that connects with the strategies and responses they employ when confronted with different dimensions of vulnerability.

3.8 Conclusions

This research aimed to assess multidimensional vulnerability among SSF men and women in Chiloé Island, Chile. Overall, our results show that SSF vulnerability is a gendered experience with many nuances: men and women's multidimensional experiences of vulnerability are very different, even when exposed to the same stressors, making the experiences for both groups almost distinct phenomena.

In this sense, by using our proposed framework, which includes not only gendered and intersectional nuances in vulnerability but also the three-dimensional nature of well-being, these complexities in the experiences of men and women SSF can be unveiled. More specifically, subjective experiences seem to play a key role in connecting material and relational vulnerabilities, as new Feminist Political Ecology and well-being scholars have emphasized. Thus, our approach and results contribute to a growing field in vulnerability research (Nayak and Berkes, 2019; Dias et al., 2023) that seeks to decenter historical overfocus on material vulnerability, acknowledging vulnerability as a much more complex phenomenon, with dynamics and interactions among dimensions beyond poverty or material scarcity narratives.

In addition, as Rice et al (2024) and Harper et al. (2023) advocate, sex-disaggregated data as a minimum in SSF research is evident in our research: researching the vulnerability of SSF as a homogenous ethos would have reinforced gender-blind bias, with the risk of hindering the complex reality behind SSF vulnerability. At the same time, our research demonstrates the importance of using mixed methods for data richness and as a protocol for gender-inclusive research in SSF (Kawarazuka et al., 2017; Rice et al., 2024; Harper et al., 2023). In this sense, this research contributes to feminist SSF scholars' quest that raises caution when studying fisheries as a homogeneous ethos, and instead, encourages using sex disaggregated data as a minimum, mixed methods, and intersectionality, to unveil hidden differential dynamics often studied as a similar whole between men and women in SSF.

Moreover, our results show that women report higher levels of adaptive capacity than their male SSF counterparts. While these results are context-specific to the reality of the Chiloé SSF, they contribute to a

broader academic pursuit on gender to reframe analyses of gender and vulnerability beyond the essentialist understanding of women as helpless victims of environmental change, which has persisted in fisheries policy despite decades of critique (Lawless et al., 2021).

This research provides a much-needed starting point for uncovering gendered differences in vulnerability within SSF and helps establish a baseline for future policy-aligned international guidelines on gender equity in SSF. Future research should build on these findings by examining the dynamics and nuances that may help diminish vulnerability and enhance viability: agency and empowerment among women in SSF. In particular, greater attention should be given to the elements beyond material incentives, such as the roles of motherhood, collective action, and self-recognition as a fisher as potential mobilizing forces towards viability in SSF.

Chapter 4 "We empower each other": Gendered agency and empowerment dynamics in female small-scale fisheries in Chiloé, Chile"

4.1 Chapter Summary

Women in SSF are known to face serious challenges compared to their male counterparts worldwide. However, reducing their experiences to vulnerability alone hinders recognition of their adaptive capacity, agency, and empowerment. Thus, the purpose of this chapter is to characterize the nuances of agency and empowerment dynamics- both individual and collective- among female SSF in the Chiloé Archipelago, Southern Chile. Using a qualitative approach with semi-structured interviews and participatory workshops, the results indicate that women in SSF in Chiloé have achieved high levels of empowerment. More specifically, the findings showed that women participants exercise agency by actively seeking better livelihoods within SSF, diversifying, and by actively participating, negotiating, and even bargaining with authorities and decision-making actors. In addition, the findings suggest that collective, non-material well-being outcomes -or empowerment achievements- carry greater weight than material and individual ones and have positively permeated their sense of agency and sense of empowerment. Overall, this research contributes to a body of research that has explored the weight of non-material processes as key for building empowerment, which contrasts with development approaches that have focused for decades on women as 'victims', as well as individual and entrepreneurial incentives and interventions for agency (Mwaipopo & Dauda, 2020).

4.2 Introduction

Small Scale Fisheries (SSF) supports over 90% of 120 million people engaged in capturing fisheries globally (FAO, 2023; Dias et al., 2023), providing food security, sustainable livelihoods, and economic value, with an approximate 77 USD billion revenue from the first sale to SSF catch¹¹ (FAO et al., 2023). Women make up almost 50% of the global workforce in SSF; that is, at least 44.7 million women participate throughout the SSF value chain globally, including pre-harvesting, commercial and subsistence harvesting, and post-harvest activities (Harper et al., 2013; 2023; FAO, 2015). As a result, their role is considered critical in SSF, contributing to food security and nutrition, as well as to local economies and sustainable livelihoods (Harper et al., 2013; Kleiber et al., 2015).

SSF are a particularly vulnerable system globally (FAO 2023), confronting a series of stressors, from social conflict and political, economic, and market pressures to biophysical and climatic changes (Nayak and Berkes, 2019; Dias et al., 2023). Women are recognized as particularly vulnerable within SSF for various reasons. First, their participation in SSF is often informal and unpaid, leading to income insecurity and limiting social benefits and protection (Harper et al., 2013; 2023). Furthermore, informality reinforces their exclusion from official fisheries data collection and records, perpetuating systematic marginalization and exclusion from decision-making processes (Harper et al., 2023). Third, when their participation in SSF is paid, this is often situated at the lower-paid end of the value chains, such as processing, mending nets, gleaning and harvesting, and post-harvest activities, which are characterized by seasonality and occasional labor (Szymkowiak, 2017; Frangoundes & Gerrard, 2019). Moreover, women's contributions to these activities are often seen (even by women in SSF themselves) as an extension of their household

¹¹ Numbers calculated from case studies included in the report (2013-2017), Hidden Harvest, 2023.

responsibilities rather than as part of a permanent job (Frangoundes & Gerrard, 2019; Harper et al., 2013). Finally, patriarchal relations and limited access to fisheries also subject women to abuse and exploitative power dynamics (Mangubhai et al., 2023; Okafor-Yarwood et al., 2022)

While women in SSF face serious challenges compared to their male counterparts worldwide, reducing their experiences to vulnerability alone hinders recognition of their adaptive capacity, agency, and empowerment. As Lawless et al. (2021) point out, SSF policies have an over-focus on women as vulnerable actors, leading to gendered targeted policies and instruments that have neglected women's and men's differential experiences, rights, agency, and power-related dynamics (Lawless et al., 2021).

This limitation is not only in studies of SSF. Discussions on Gender, Environment, and Development have often reproduced the notion that women are more vulnerable to environmental change and stress and, therefore, helpless victims in the face of risk (Cornwall & Rivas, 2015; Resurreccion, 2017). However, feminist scholars have criticized that notion as simplistic and have highlighted the role of women's individual and collective agency in their relationship with the environment. Similarly, and closely connected with agency, gender and development studies have included empowerment and participation as a banner in their gender equity agenda since the 80s. An example of this is SDG 5 which aims to "achieve gender equality and empower all women and girls" by 2030 (UN, 2026).

According to gender scholars, however, severe shortcomings in the framing of Gender and Development scholarship have placed the accent on neoliberal narratives of individual capacity and material resources, sidestepping patriarchal gendered power relations (Resurreccion, 2006; Arora-Jonsson, 2009). Despite these criticisms, and even though agency is increasingly getting acknowledged as crucial for adaptation and resilience (McLaughlin & Dietz, 2008; Brown & Westway, 2011), research on the subject remains scarce (Rao et al., 2019).

This paper examines agency and empowerment beyond the overfocus on material resources and individual incentives, and instead explores the role of subjective dimensions such as the 'sense of agency' and 'ownership of processes' (Muñoz Boudet et al., 2013; Mwaipopo & Dauda, 2020). Thus, our objective is to characterize the nuances of agency and empowerment dynamics- both individual and collective- among female SSF in the Chiloé Archipelago, Southern Chile. More specifically, we ask: 1) What are the resources and structures of opportunities for empowerment? 2) How is their agency expressed (both individually and collectively), as well as their 'sense of agency'? 3) What are the well-being achievements -empowerment outcomes- experienced?

We focus on Chiloé, Chile (Figure 4.2), as this case offers a strong empirical example of heavy reliance on SSF, with notable participation of women (Sernapesca, 2022). At the same time, Chiloé's SSF illustrates a complex social-ecological system shaped by multiple, interacting drivers of change: four decades of intensive salmon farming—including several crises—combined with high levels of social organization and the pressures of climate change (Arriagada et al., 2025). The remainder of the paper is structured as follows: we begin by outlining the theoretical framework, followed by a description of the research site and methodology. Next, we present the main findings. The paper concludes with a discussion of the results, the study's limitations, and its key contributions.

4.3 Literature review

Research on gendered agency and SSF (Cohen et al., 2016; Gallardo-Fernandez & Saunders, 2018; Kawarazuka et al., 2019; Lawless et al., 2019) and closely related, empowerment (Freeman & Svendsen, 2022; Labayo, 2024; Adam et al., 2024) is a growing area of interest. Research on gendered agency in SSF shows that women exercise agency and strategize decisions for their own and their family's well-being, despite their vulnerable positions. For example, Azmi et al (2021) focused on female household heads from a fishing community in Cuddalore District, India, and showed that while the intersection of gender, class, caste and motherhood plays a role in the positional marginalization of women fish auctioneers and traders, their agency and well-being are a changing force that mediates power relations and allows them to strategize and respond to their families and own needs, access to network and aspire to social mobility. Similarly, Kawarazuka et al. (2019) explored how women exercised 'creative agency' (innovative ways to respond to social constraints) in bargaining with patriarchy through practices such as food provisioning, child-rearing, budget allocations, and networking, which were strategically deployed and allocated within gendered power relations and negotiations inside their households and with their communities. According to the authors, what from the outside could be seen as passive acceptance of gender roles or a coping mechanism (for example, prioritizing the husband's meals) was, in fact, strategically allocated to support overall food provisioning and security.

The question of how agency and empowerment processes are achieved, and which incentives and interventions can enhance them, is often central to research on the topic and to development initiatives. However, these have been criticized by feminist scholars because of the commonly held notion in development studies that better economic conditions and household income will spill over to increase women's agency and empowerment (Frangoudes & Gerrard, 2019; Hanmer & Klugman, 2016). Studies in SSF specifically have demystified this assumption of linearity between economic incentives and well-being outcomes in gendered agency, and shown that agency -and empowerment- are far more complex processes. For example, Mwaipopo & Dauda (2020) and Lawless et al. (2019) studied SSF related activities in Tanzania and the Solomon Islands coastal communities, respectively, finding that incentives for livelihoods diversification –in terms of securing subsistence through income and food- (Lawless et al., 2019), as well as micro-credits access (Mwaipopo & Dauda, 2020), were not enough to act as a catalyst for gendered agency and therefore, empowerment in female SSF. Instead, the subjective experience involved in the process, including domestic negotiations and a 'sense of agency,' was more crucial for exercising choice and improving well-being. Similarly, Freeman & Svendsen (2022) explore the impact of Fisheries Local Action Groups (FLAGs) on the visibility and empowerment of women involved in fisheries activities in the EU. The study hypothesizes that interventional public-funded programs can enhance women's empowerment via supporting the emergence of entrepreneurial activities. While the study showed that FLAGs supported access to resources and agency for women's empowerment, their impact on well-being achievements -empowerment outcomes- is less clear and varies across areas, so caution is advised against assuming a linear relationship between them.

In Chile specifically, Gallardo-Fernandez & Saunders (2018) studied gendered relations and power structures – including agency and empowerment- in the inclusion of female SSF into the territorial use rights in fisheries (TURF) by the formation of an all-women union of seaweed gatherers in Coliumbo, VIII region. The authors highlighted how women were empowered by the process of forming the TURF itself,

despite the struggles, enhancing their agency and advocacy for their interests in the community, decision-making, and even within their families.

4.4 Theoretical framework

We use the conceptualizations of Naila Kabeer on agency and empowerment (1999), which is widely used in gender and environmental studies (see Arora-Jonsson, 2009; Muñoz Boudet et al, 2013; Weeratunge et al., 2014; Hanmer & Klugman, 2016; Gammage et al., 2016; Gallardo-Fernandez & Saunders, 2018; Lawless et al., 2019; Kawarazuka et al., 2019; Rao et al., 2019; Mwaipopo & Dauda, 2020), while at the same time, complemented with the theorizations of Muñoz Boudet et al. (2013). This is explained in more detail in the sections below.

4.4.1 Gendered Agency

While the role of human agency has been discussed since the 1990s in gender and environment literature, it has been less theorized than structural constraints, remaining an understudied topic (Resurreccion, 2006; Rao et al., 2019). Given this gap, research on gendered agency is often anchored in Naila Kabeer's (1999) contribution, which builds on Amartya Sen's (1985) work. Kabeer theorized the notion of agency, gender, and empowerment, which remains widely used even in recent studies (Hanmer & Klugman, 2016; Gammage et al., 2016; Lawless et al., 2019; Kawarazuka et al., 2019; Mwaipopo & Dauda, 2020). Kabeer (1999), aligned with post-structuralist feminist views, highlights the importance of empowerment and agency related to institutionalized gender power structures and relations (Hanmer & Klugman, 2016; Gammage et al., 2016). In her definition of agency as a process, the author operationalizes the notion of choice enabled by resources (idem). Thus, agency is "the ability to define one's goals and act upon them. It is more than an observable action; it also encompasses meaning, motivation, and purpose which individuals bring to their sense of activity, 'sense of agency' or 'power within'" (Kabeer, 1999: pp. 438). She also acknowledges that while the agency is often defined as decision-making, it can take many forms such as manipulation, bargaining, negotiation, deception, subversion, and resistance, as well as less observable forms, such as critical processes of cognitive reflection and analysis. At the same time, it can be exercised by individuals and collectivities and has negative and positive meanings related to power (idem).

This element, which links agency to power with both negative and positive connotations, is explicitly acknowledged by the author as derived from Amartya Sen's (1985) notions of positive and negative freedom. Positive agency is related to 'power to', that is, a person's capacity to define their own goals and pursue them. On the contrary, negative agency is related to 'power over', that is, the capacity of an agent to override other's agency (via violence, coercion, or threat) (Kabeer, 1999: pp. 438). This point is key in Kabeer's theory with implications for empirical research measuring agency: the primary difference between agency and 'well-being freedom' is that any action related to one's agency has the potential to decrease the actor's well-being. Ergo, agency does not necessarily translate into well-being outcomes.

More recent conceptualizations on agency, such as the work of Muñoz Boudet et al. (2013), deepen Sen's (1985) and Kabeer's (1999) theorizations, highlighting the importance of agency for gender equality and well-being. Thus, the authors argue that gender equality is, in fact, the combination of three elements: endowments, economic opportunities, and agency (Muñoz Boudet et al., 2013). In this sense, agency is defined in terms of three dimensions: "as the ability to act, the self-efficacy or the belief that acting is possible, and the ability to control the resources to make a choice possible, all within opportunity structures"

(Muñoz Boudet et al., 2013: pp. 14). The authors define opportunity structures as "resources, institutions, established processes (traditions, moral codes, gender norms), and other enabling factors" (Muñoz et al., 2013: pp. 13).

Research on agency has acknowledged the complexities and the importance of studying agency within gender norms and structures. When development initiatives are 'gender blind' (Lawless et al., 2019) and do not consider how gender inequalities affect women's individual and collective agency, there is a risk that interventions would be detrimental to their well-being (idem). As Kabeer (1999) and Sen (1985) specifically distinguish, agency does not equal well-being outcomes, so maintaining that distinction is key for a gender-sensitive approach in empirical research.

Moreover, Kabeer (1999) noted that other scholars have acknowledged that measuring agency is inherently difficult; therefore, a multidimensional perspective that includes subjective elements and gendered structures is imperative (Hanmer & Klugman, 2016). The importance of gendered opportunity structures lies in the notion of 'choice', a core element of agency and a main challenge in measuring agency (Kabeer, 1999; Muñoz Boudet et al., 2013). Specifically, Kabeer (1999) argues that the ability to choose means that, at the base, there is always an alternative. This idea aligns with the subjective dimension of the concept, that is, what the author calls 'sense of agency': the actor's consciousness of the ability to choose between alternatives, and, at the same time, with the material factors that enable that capacity. Thus, according to Kabeer (1999) and Muñoz Boudet et al. (2013), agency without material structures and access to resources is merely a meaningless and passive capacity (Muñoz Boudet et al., 2013). This characteristic of agency marks a difference and a measurement challenge when it comes to evaluating whether 'choosing not to choose' or exercising agency through practices that reinforce the status quo can also be understood as agency.

4.4.2 Empowerment

The practical challenges of measuring agency are, to some extent, weighed in the conceptualization of empowerment. In feminist literature, scholars have defined empowerment differently from development institutions, which often associate empowerment with specific indicators (e.g., child marriage, children's health and well-being, economic mobility) (Frangoudes & Gerrard, 2019). Specifically, feminist scholars have argued that empowerment can be conceived as a byproduct of agency and a precondition for gender equality (Arora-Jonsson, 2009; Cornall & Rivas, 2015; Gammage et al., 2016). In other words, individual and collective agency processes can lead to empowerment in women "when it exercises questions, challenges, or changes regressive norms and institutions that perpetuate the subordination of women" (Hanmer and Klugman, 2016: p. 238).

The work of Naila Kabeer (1999) is a pioneer in understanding – and operationalizing- empowerment and has been widely used in empirical approaches (Gammage et al., 2016; Hanmer & Klugman, 2016; Freeman & Svendsen, 2022). Kabeer (1999) defines empowerment as "the process by which those who have been denied the ability to make strategic life choices acquire such an ability" (Kabeer, 1999: p. 436). In this sense, the author highlights the notions of possibility and choice and distinguishes between two types of decisions: 'first-order,' also referred to as 'strategic life decisions,' and 'second-order.' The former refers to critical aspects of life that allow people to live the lives they want. That includes choices about livelihood, whether to marry and whom to marry, having children, etc. The latter refers to less crucial aspects of life. In addition, the author emphasized that the first-order decision helps to frame the second-order ones (Kabeer, 1999).

According to the author, empowerment includes three closely interrelated dimensions: resources (access to and future claims to material, human, and social assets); agency (including decision-making, negotiation, deception, bargaining, and manipulation); and achievements (well-being outcomes) (idem). These three dimensions can also be understood as a continuum between preconditions, processes, and outcomes. Thus, the author analyses the empirical measurement of empowerment, historically driven by development agencies, and establishes that the indicator's complexity and validity should be grounded in the inclusion of the three indivisible dimensions she proposes (Idem).

Figures 4.1 and 4.2 summarize the main concepts that guided our research, along with our own definitions based on the authors' theorizations.

Concept	Definition	Dimensions	Definitions	Indicators (examples)
Empowerment	A precondition for gender equity. It is the three-dimensional process of change, by which those who have been denied the ability to make strategic life choices -first order- acquire such an ability. It can be collective and/or individual. (Kabeer, 1999)	Resources –or structures of opportunities	Access to enabling factors such as material assets and relational and human assets -traditions, gender roles and norms- (Based on Kabeer, 1999; Muñoz Boudet et al., 2013).	• Livelihoods • Access to housing, education, etc. • Caring roles and domestic labour • Expected gender roles • Social capital
		Agency	The ability to define one's goals and act upon them. It is an observable action with meaning, motivation, and purpose which individuals bring to their sense of activity -'sense of agency'- or 'power within. It can take the form of decision-making, as well as negotiation, deception, bargaining, and manipulation. (Based on Kabeer, 1999; Muñoz Boudet et al., 2013).	• Capacity to choose on actual livelihoods alternatives and strategies • Capacity to choose on personal strategic life choices (marriage, children) • Capacity to organize collectively • Sense of agency –individual and collective-
		Achievements	Well-being outcomes, from functioning achievements (mortality, marriage, financial independence, children wellbeing), to more complex subjective dimensions of their realisation of their choices-'sense of'-of transformatory significance (Based on Kabeer, 1999; Freeman & Svets, 2022).	• Functioning achievements such as education (personal and children) • Financial independence • Outcomes and/or influence in decision-making • Sense of achievement towards equity (individual or collective)

Figure 4.1: Theoretical framework for gendered agency and empowerment

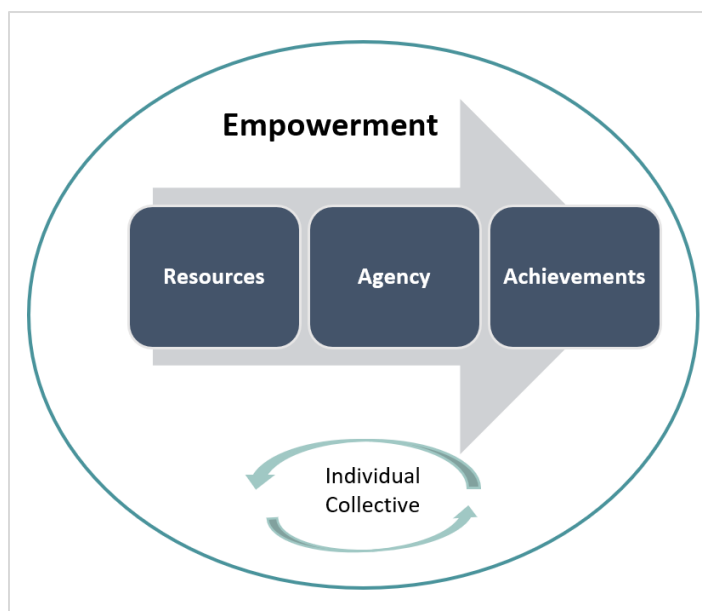


Figure 4.2: Empowerment conceptualization | Empowerment is a process made of three interlinked dimensions. The arrows indicate the relationships among dimensions, as explained in the theoretical framework.

4.5 Research Site

Chiloé is an archipelago in Southern Chile, located in the Los Lagos region, composed of 10 municipalities and 20 inhabited islands called '*islas interiores*', besides the Isla Grande (Big Island) (Figure 4.3). It is the fourth biggest island in South America, with a total population of 183.915 according to the 2024 census (INE, 2026).

Chiloé's economic development -and livelihoods- have been characterized by the strong presence of the salmon farming industry since the early 80s, one of Chile's major exports, and by 1994, racing to become the second-largest exporter of farmed salmon in the world after Norway during that time (Bustos, 2016). However, subsequent sanitary crises -most notably the spread of Infectious Salmon Anemia (ISA)- severely affected the industry and halted that progress. Besides salmon farming, mussel aquaculture is also well-established on the island, with a similar trajectory (San Martín et al., 2020; Arriagada et al., 2025). These industries have been strongly associated with women's employment on the island, through jobs in processing plants -mostly seasonal and casual-, which, on the one hand, have generated a shift in women's economic independence and gender roles, on the other, they have continued to place many women in conditions of labor vulnerability (Alvarez et al., 2017).

In this context, SSF has survived as a major source of livelihood, despite conflicts with aquaculture, as demonstrated in the 2016 social movement regarding salmon farming/red tide crisis (see Arriagada et al., 2025). More specifically, reports from 2022 show that the Los Lagos region concentrates almost 35,9% of the artisanal fisheries licenses (AFR) issued by the authority nationwide, which rose to 99,557 (Sernapesca, 2022), of which women represent almost 30% of the national and regional participation. Women have been historically excluded from official fishing licenses and related activities, but since the early 2000s they have been entering the fishery, which was male-dominated until then (Gallardo-Fernández & Saunders, 2018). In this context, seaweed harvesting and gathering, specifically -a long ancestral practice- has become

formalized and has encapsulated most of the women's participation in SSF nationally and regionally (Gallardo-Fernández & Saunders, 2018; Alvarez et al., 2017).

In the case of Chiloé, a significant increase in women entering the formal registry occurred following the 2016 social movement. In response to disruptions in fishing activities, the State introduced compensation measures for affected fishers and created incentives to formalize activities, particularly algae harvesting (Arriagada, 2019). Since then, women in SSF in Chiloé have emerged as a significant force, not only through their contributions to the SSF value chain but also as active members of unions and organizations, assuming recognized leadership roles and advancing decision-making processes.

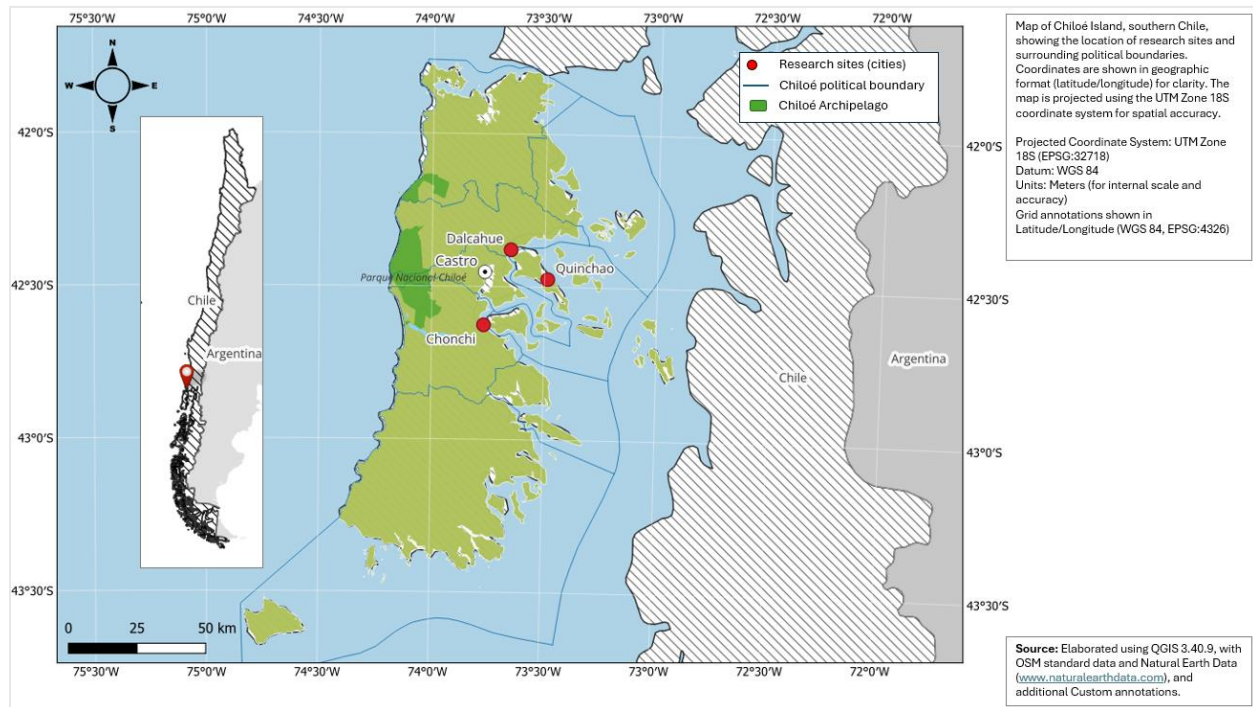


Figure 4.3: Map of Chiloé and research sites

4.6 Methods

A qualitative approach was employed to characterize women's gendered agency and empowerment processes and dynamics in SSF. Data were collected through semi-structured interviews with 28 women and 5 men (See Table 4.1) involved in SSF across three municipalities -due to convenience- in Chiloé: Chonchi, Dalcahue, and Quinchao (See Figure 4.4). Ages ranged from 45 to 75 years old. Interviews were conducted by the first author and one research assistant, all of them in Spanish. Fieldwork was conducted during November 2023-February 2024 and July-August 2025. Interview participants were recruited¹² by phone and e-mail, using a snowball method of purposive sampling until saturation was reached, with initial leads from local contacts and the corresponding Municipality Fisheries Department. Therefore, the initial interviewees were mostly local SSF leaders.

¹² This research has the ethical approval from the Behavioural Research Ethics Office from University of Waterloo (Certificate #45734).

The interview script included questions about their beginnings and family history as SSF, whether they pursue SSF activities and related livelihoods, and the advantages and disadvantages of their livelihoods. Furthermore, questions explored their experiences in their union and women-only associations, their perceptions of caring roles, and decision-making processes in their organizations, among others.

In addition, two participatory workshops were held with women involved in SSF in Achao (Quinchao Municipality) and Dalcahue, on August 13th and 19th, 2024, respectively. Recruitment was done through snowball, to contacts already interviewed, and through an open call to participate in workshops on social media and both Municipalities' social media accounts. In both workshops, 19 women participated in total, and they were held with the help of the Dalcahue and Quinchao Municipality Fisheries Departments, as well as the local Gender Equality NGO 'Chiloé Profunda', and the research/artistic group on Coastal women 'Maritorias'. For the workshops, some limitations were encountered, especially at the one held in Quinchao, due to low attendance, attributed to a storm and bad weather that day.

Inclusion criteria for interviewees and workshops included: 1) being females involved in the SSF value chain as the main livelihood, 2) to live in one of the three municipalities (Achao, Dalcahue and Chonchi).

Audio recordings were transcribed and analyzed in NVivo (version 15) to open-code each interview, thereby identifying components of agency and empowerment as an a priori guide (indicators in Figure 4.1) while leaving space for emergent themes. A second (axial) coding process in Excel enabled a more detailed, iterative review of the initial coding for validation purposes.



Figure 4.4: Fieldwork research Sites

Table 4.1: Interview sample

Main fishery activity	Men	Women
Boat owner	2	
Artisanal Fisher	3	
Gleaner (Algae and Shellfish)		17
Baiter (of hooks and longlines)		6
Post-harvest processing		4
Diver Assistant		1

4.7 Results

Our results section is divided into three main sections based on the dimensions (resources, agency, and achievements) of the empowerment conceptualization used, which are explained in detail in Figures 4.1 and 4.2.

4.7.1 Resources

Women participants' narratives about the importance of having their own independent income were consistent throughout interviews, not only as a material necessity but also as a 'common sense'; staying at home exclusively was not an option for them. In this sense, most of them acknowledge that their main available opportunities in the past were to work at aquaculture processing plants, as they do not have post-secondary education. However, this option experienced by many came with a sense of discomfort due to labor conditions, seasonality, and complex and strict schedules that made their household work, and mostly caring for children, very difficult:

When my kids were little I used to work at a processing plant. I started at 8 am and finished at 6 pm, picking up kids from school. [...] And then some night shift at the processing plant, and I was worried about them all the time, for them being alone, so I never liked that job (V., female baiter).

In this sense, livelihood opportunities for women in the past were limited to working in processing plants, which participants acknowledge have changed in the last decades. While most of them come from SSF families and had the knowledge and practice of shore gleaning and algae harvesting, they used to do it for their own subsistence and consumption: *"Our grandmothers and mothers used to be gleaners and even baiters, but most of them still saw themselves as wife and mothers only" (M, female baiter).*

In the last few decades and mostly in the last few years, enabled by the entrance of female algae gleaning into the official registry and pre- and post- harvesting activities getting more attention, women were able to dedicate themselves to SSF activities in a more professional manner, without needing to resort to employment in the aquaculture industry. This switch was pursued and enabled by one main necessity: being at home for their household work and caring roles, especially motherhood:

"Working as a baiter changed my life because now, I can do it from home and be there with my family, and not have to ask anyone to take care of my kids. So it is great, I get to have my own money from home" (N., female algae gleaner and baiter).

While most female interviewees feel and believe that this advantage of dedicating themselves more to their SSF activities is their major win, two women question the unequal distribution of their caring roles and see

this as a burden for being females, noticing the 'unfairness' of their expected gendered roles that their male counterparts do not have to experience:

"Just because our gender...because we are women, we must stay at home, with the kids, preparing food, helping the husband, doing laundry, helping kids with school work. And in between, you do your SSF activity...either baiting or gleaning at dusk. But they do it within their 'female role', what society expects us to do. Once you finish your expected responsibilities, you can go out and make your income. So, according to my view, it makes it an even harder activity." (D., women SSF and organization leader).

Another positive element acknowledged by participants when professionalizing their work as SSF, whether as algae gleaners, baiting hooks, post-processing, or diver assistants, was the possibility of organizing themselves with other SSF women, not only with women on their own unions, but also the SSF women's groups and associations that have been created, which can be seen not only as an increase in their social capital, but also as a satisfactory assets that has been gained:

"Before we did things separately. We knew each other, but never talked or shared a 'mate'. Now we have meetings and share a lot, we drink 'mate' together, share meals, and have constant conversations. It has been a big change" (R., female algae gleaner and SSF leader).

Working collectively as a group outside their mixed-gender unions and associations has given them various satisfactions, but mostly material and non-material achievements, that will be explored in the next sections.

4.7.2 Agency

As discussed in the theoretical framework, the question underlying the challenge of measuring agency concerns the real possibility of choice in strategic life decisions within a structure of opportunities (Kabeer, 1999). At the individual level, our results shows that SSF women interviewed could choose their livelihood within a limited number of options -by their level of formal education, traditional knowledge, and gendered roles. However, the capacity for choice is evident: they avoided paid employment in services and aquaculture processing plants and instead opted for independent work as SSF, mostly algae gleaning, baiting hooks and longlines, and post-harvest processing. It seems that the capacity of choosing 'not to choose' paid work is at the core of their decision:

"I chose to work as a baiter because I saw an opportunity...to be able to take care of my children. Because before this, you went to a farmed salmon processing plant, you have a schedule, and no employer gives you flexibility. So, you have to meet working hours for months. And that only lasts a season...your contract, no security for the next one. So, the first time I saw a women baiting I said "I need to learn how to do that". And I asked around, only a few did it back then...did you know Fishermen used to send their boxes of hooks to Calbuco? [outside Chiloé]. And a lady taught me. And here we are...hundreds of us now" (M., female baiter and algae gleaner).

In this sense, most of the women interviewees are very explicit about how they transformed this livelihood into a more professional SSF activity that gave them the independence to earn income while also meeting their household responsibilities and caregiving roles.

Another indicator of agency at the individual level, acknowledged by the literature, is livelihood diversification, though with some caution. Among rural algae and shellfish gleaners, participants reported diversifying into small-scale agriculture and livestock. This opportunity is enabled by two elements: their ownership of a small piece of land, and the seasonal nature of their work on SSF. Gleaning is an activity that develops during the late spring, late summer/early fall. Therefore, the rest of the year, they have the opportunity to seek a different source of income: *"We are like the seagull waiting for the tide. The rest of the time we dedicate ourselves to the farm"* (N., female algae gleaner and algae processor). In the case of more urban female SSF (Dalcabue city), where the highest population of *encarnadoras* -'baiters' for hooks and longlines- for *Reineta* catching, known in English as Southern panfret (*brama australis*), diversification is less present as their activity runs mostly for the year-long. Only a few 'baiters' acknowledge diversifying into summer algae-gleaning or assisting their husbands with fishing and diving, especially when the entire family dedicates itself to SSF and has its own boat. A couple of interviewees said they began exploring more innovative ways to diversify in the summer, either through tourism or traditional gastronomy. Chiloé is known as a tourist destination, so seeking such an opportunity is also a real possibility during the summer months, according to participants.

While what can be acknowledged as a 'second-order' life decision in the terms of Kabeer (1999), strategies for household spending and income allocation also seem to be in the hands of many of the women interviewed. In this sense, their independent income usually goes to groceries and children's clothing, acknowledging that very little is invested in themselves:

"The money I make, which is not much, usually goes to clothing. Good winter jackets for the kids, for example, are what I will buy soon. That's usually expensive. But that's the priority. I won't spend the money on myself, let alone on paying for a post-secondary degree. First priority is kids' food provision, clothing, and so on" (M., female post-harvest processing and seller)

What is most evident in the women's responses is their bargaining capacity and negotiation with local and fisheries authorities, municipal social departments, and their own fisheries organizations. This capacity seems to be individual and collective. Participants expressed interest in seeking support from local fisheries and social organizations' offices in their municipalities for their individual and collective projects. The type of support they asked for is usually not strictly monetary, or as they say in their own words, *"it's not charity"*; they present their projects, ask to what source of public funding they can apply, and when they need to, ask for help with technology, access to computers, and paperwork:

"I have learned by experience. If you go to [the authority or public service], ask for something, you have to go with concrete numbers, the project already formed, cost, quantity, and the data. It can be the municipality or regional authority, I don't care. I see many people get behind because they don't know how to approach public services and ask for help. And they get used to people doing everything for them. And then if they don't win with their projects, they get mad. But people are way too comfortable and don't seek their own opportunities" (M., female baiter and algae gleaner).

"We usually went as an organization to talk to the City Mayor. But we never asked for money. We went with specific projects or specific items we needed support for under a bigger project. And what we usually did was apply for public funding for our projects. Last year, I won

individual funding for my seafood truck. I was able to buy a stainless-steel table and a dough machine" (P., female razor clam harvester).

This capacity to plan and seek help is also known as a virtue by male counterparts of their SSF unions and syndicates, where many women also perform key roles. *"I never see the girls knocking on doors and asking for charity. They are very strategic" (S., male SSF leader).* They also acknowledge their capacity to influence major decision-making within their own organizations, making themselves heard, as a male SSF said: *"You can get in trouble if you do not listen to these women" (R., male SSF leader).*

Collective agency capacity can also be seen in their female collective organizations. While all of the interviews participated in mixed-gender SSF unions and syndicates, they have formed their own 'women-only SSF groups and associations', where they do not only organize collective projects such as food-trucks, specializing courses (food processing, manipulating seafood, handmade handicraft, and even gender equity courses), but also they have engaged in 'contentious collective action'¹³ when necessary. This was the case with the 2016 social movement in Chiloé, which received national and international coverage. This conflict was led by SSF organizations and leaders, and triggered by the worst red tide in history and the dumping of 9,000 tons of salmon mortality near shore (see Arriagada et al., 2025). Female participants acknowledge a key role in the protest and barricades:

"When the 'Chilotean May' started, we called each other and said 'ok tomorrow we'll go and cut the road.' We arrived at 8 am, many of us having no idea how to protest or how to make a barricade. And we women were at the front, even with an 82-year-old 'abuela', and the men were behind. And the police fired tear gas canisters at us, but we caught them and threw them back. After that, we laughed at what we were doing, for the first time. And we spent many days like that, men did get that involved on the road protest, we were the leaders" (P., female razor clam harvester).

This element relates to their 'sense of agency': women interviewed acknowledge that they have the capacity to influence decision-making at whatever cost, via convincing peers at their unions, through negotiation or bargaining with authorities, or even by protesting:

"We women have a special capacity to convince that men do not have. They [male SSF] think they are very "macho" but they are not very strategic, even a little bit 'dumb' if you forgive my language. They are not very diplomatic... they lack tact; they don't know how to 'butter up' counterparts to persuade them. If they get a "no" they say "ok". We [women] don't. We can turn things up, make a mess if necessary, and look for other ways to reach our goals. Until we get them, even partially" (C., female SSF leader and diver assistant).

As the quote shows, women's self-awareness of their capacity to influence decision-making, achieve goals, negotiate, and even bargain is quite developed, showing that their subjective sense of agency is attuned with their actual capacity.

¹³ Contentious collective action is defined as "when ordinary people organize themselves with allies and confronts elites or authorities over contested claims, using different action repertoires" (Arriagada et al., 2025: 4).

6.7.3 Achievements

Women's narratives about their individual material well-being outcomes center on their livelihood achievements, as well as their own and their children's educational achievements. Women SSF reflect on how getting their first SSF project (e.g., fishing gear, processing room for shellfish and algae, food truck and/or related equipment) was the starting point for them to keep searching for opportunities and advocate for themselves:

"The first time I decided to include my social number on an internet page for a project, and I was selected, it was for funding for fishing gear I remember...since then, I haven't stopped. Everything I have is due to my own effort and sacrifice" (M., female baiter and algae gleaner).

"I was able to get my own processing room for my products. That's why I always say 'you have to set yourself goals'. Nobody is going to come and tell you, 'you have to get better'. You have to be a visionary and constantly keep looking where you can make improvements and get better" (M., female shellfish processor and seller).

Closely related to this, many interviewees reported that, thanks to their livelihoods and insatiable thirst for improvement, they have been able to achieve personal educational milestones, such as completing secondary education, earning certifications in their specific skills and livelihoods, and even pursuing post-secondary education. In addition, at the time of the fieldwork, some interviewees were doing a six-month course on "gender equity and gender violence prevention", a weekly course dictated by the Ministry of Women and Gender Equity.

"I am a certified diver assistant. It wasn't easy to get the certification; I had to study a lot. Diving can be very dangerous due to pressure, so you need to be very well prepared to assist with that. Thank goodness I passed...I am talking about 12 years ago. And to this day I am the only woman who has that certification and works embarked with a diver; among hundreds and hundreds of men" (C., female SSF leader and diver assistant).

More common are women's discourses that acknowledge their children's education as their primary material achievement. Most interviewees stated that through their work, they were able to send their children to post-secondary education, including university, and many of them became the first university-educated people in their families. Sentiments of pride regarding these educational achievements flood their narratives, conceived as personal accomplishments.

"My children are grown people, and I was able to educate them through selling artisanal handicrafts and algae and shellfish gleaning. None of them wanted to become fishers, though. I have a teacher, a special educator, a social worker, a police man, a nurse, and an engineer". (P., female algae and shellfish gleaner).

When it comes to collective achievements, women interviewed declared that through the women-only organizations, they have accomplished many outcomes and goals, from material (e.g., a collectively owned food-truck, certifications, and fishing gear), to non-material, such as talks on certain topics of interest, traveling to other regions to see the work of other female SSF. The participants also perceived their highly influential roles within their organizations as significant accomplishments. However, they noted that occupying positions such as "president" or serving as leaders of SSF mixed-gender unions had become

customary for them over time. As a result, these roles were no longer regarded as exceptional achievements but rather as the norm or a matter of "common sense."

"You will find that most of SSF unions are composed by women, or women are mostly the leaders. Because we are the ones that speak up and get results. We have had meeting with many syndicates of Chiloé and it is mostly female presidents" (C., female algae gleaner).

Most notably, participants agree that their major milestone was the approval of the *'Ley de Equidad de Genero en Pesca'* (Gender Equity law) 21.370, which includes modifications to the existing Fishing and Aquaculture law, officially published in 2021. Many women interviewed had been behind this law for many years before its promulgation, addressing the National Congress (Parliament), meeting with lawmakers, and discussing the lack of a gender perspective in the current Fisheries Law. They recognized it was a collective effort, not only regional but also with national implications, involving women SSF from other regions. The law, besides promoting gender equity and eliminating all forms of gender discrimination, recognizes the role of women in SSF value chains by legalizing pre- and post-harvests activities such as baiting *'encarnado'*, among six others, under the category *'actividades conexas'*, which are considered vital to SSF value chains. This legal recognition opens a series of benefits for them, including access to social benefits, the possibility to apply for additional projects and funding for equipment, certifications, and educational opportunities, and the subjective achievement of becoming 'visible' and 'recognized' as fundamental to the SSF value chain. The promulgation of this law is considered a major triumph among participants, with two interviewees at the core of its creation and subsequent negotiations leading to approval in Congress. A process that took many years and culminated in the FAO SSF Submission in Rome in 2024, where two interviewees -local SSF female leaders- went, making Chile the first country to have a law on gender equity in SSF.

"While at the beginning, men thought that we [women SSF] were fighting to reduce their resource quotas, because they thought that the quotas we talked about were about resources, not gender quotas in our organizations. But it is so important for women to participate in organizations and make our work visible, especially to the State. If only male fishers are leaders in organizations, our reality will remain invisible, especially our role in the SSF value chain, and our caring roles, which are a huge issue. For us, it was such an achievement when the law was approved" (D., female SSF).

4.8 Discussion

The results presented above show that women in SSF experience empowerment as defined by our guiding framework: the acquired ability to make strategic life decisions. The following sections unpack the three analytical dimensions that guided this analysis, and the concept of empowerment itself. Specifically, they examine the preconditions, or resources, that enable empowerment; how women experience and exercise agency; and the achievements, or well-being outcomes, that emerge from these processes.

First, regarding resources, our results show that livelihood opportunities and the capacity to choose are actual possibilities for these women, but within structures of opportunity framed by educational level, family tradition in SSF, and caring roles. While for most participants, motherhood is the motor of their strategic decisions and life goals (agency capacity), with a few questioning this as a gendered expected role in a patriarchal system. In other words, as the theory of agency holds, agency is a dimension of power (Kabeer et al., 1999), and the agency of these women occurs within expected gendered roles such as

motherhood. This finding is consistent with what Lawless et al. (2019) concluded from livelihoods and agency in SSF women in Solomon Islands: "capacity to exercise choice in livelihoods is correlated with the dynamic interactions that govern individual choices between community and household settings" (Lawless et al., 2019: 357). In a similar sense, while Lawless et al. (2019) also warned that livelihood diversification -especially when introduced/encouraged by policies under the banner of agency- can actually have a negative effect as it has the risk in increase women's existing workloads and responsibilities, we found that diversification in our case of study is not seen as a burden, as it does not overlap with SSF related activities. Instead, it is a tool they explore due to the seasonality of algae gleaning, especially among rural SSF female participants. In addition, women's positive perception of diversifying their income sources year-round supports this idea.

When it comes to agency per se, scholarship discussed in detail the challenge behind measuring agency as the distinction between an actual capacity of agency, and what can be called "simulacrum of choice" (Nusbaum, 2006), that is, the illusion of choice when there is not one, can become blurry (Sen, 1985; Kabeer, 1999; Muñoz Boudet et al., 2013). In this sense, our results show that participants strategically pursued their current livelihoods within their gendered structures, aiming for independence and flexibility rather than paid labor as an employee. That element, considered a strategic life choice, together with their explicit capacity to bargain and negotiate—both individually and collectively—with local authorities, policymakers, municipal agents, and SSF union peers to improve their working conditions through projects, demonstrates that the women interviewed possess genuine agency. Rather than exhibiting a mere simulacrum of agency or passively accepting the status quo, they have the capacity to exercise real agency, even if this may also involve what Nussbaum (2006) and Gammage et al. (2016) describe as "adaptive preferences". These women actively set goals -individual and collective- and act upon them. Most notably, their capacity to influence and participate in decision-making, and even to engage in contentious forms of collective action, reinforces what other authors have acknowledged: grassroots activism and contentious collective action are direct expressions of collective agency by challenging gendered constraints (Arora-Johsson, 2009; Gammage et al., 2016).

Further, non-material well-being outcomes appear to have a greater influence on women's overall well-being and on their 'sense of agency' and 'sense of empowerment' than material and individual achievements. Although women report important material gains, including their own and their children's educational accomplishments, these seem to play a comparatively smaller role. This is the case with the Gender Equity law in fisheries 21.370, where participants not only felt empowered by the outcomes but also by the bottom-up process itself. In this sense, our results show that collective agency and collective achievements -especially non-material- are a major source of empowerment that positively permeates individual processes of agency and empowerment. This is consistent with Mwaipopo & Dauda's (2020) findings in a village community in Tanzania: what most impacted the agency in VICOBA (a women's self-organized bank facility) was the sense of ownership over the process, rather than the economic benefits of poverty reduction and household income constraints. Similarly, it echoes Gallardo-Fernandez & Saunders (2018) research, where the authors showed higher empowerment resulting from the process of forming SSF women-only unions in the VIII region of Chile. In addition, it aligns with gender scholars' critiques of development initiatives as 'gender blind' for focusing on individual and material incentives as straightforward catalysts for agency and empowerment (Lawless et al., 2019).

The literature shows that the dynamics between individual and collective agency and empowerment are complex and very often non-linear in gendered landscapes, and even in some cases, gaining agency

(collective) can be a source of conflict and detrimental for agency at the household level due to defying patriarchal structures (Arora-Johnson, 2009; Gammage et al., 2016). However, our results support the idea that collective agency and, overall, collective empowerment seem to increase agency and empowerment at the individual level, at least at the subjective level in terms of 'sense of', which is explicitly recognized by women interviewed:

"There are so many women who still have not empowered themselves. They have a hard time making decisions. The other day, a new girl joined our group, and she was shocked, "You ladies are experts". But I said to her that everybody starts somewhere, and we collectively learn and empower each other" (L., female gleaner).

4.9 Conclusions

The purpose of this paper was to characterize the nuances of individual and collective agency and empowerment among women in SSF in the Chiloé Archipelago, southern Chile. To do so, we examined the three dimensions that compose empowerment: resources, agency, and achievements. When it comes to the opportunity structures that enabled empowerment processes, our findings suggest that these were anchored in women's capacity to pursue their livelihoods as SSF—that is, to exercise agency—and were shaped by educational attainment, family tradition in SSF, and motherhood. Second, women's influence over decision-making, together with their capacity to negotiate and bargain, indicates high levels of agency, including a subjective sense of agency, or consciousness of this capacity, at both the individual and collective levels. Finally, our third research question examined the well-being achievements, or empowerment outcomes, experienced by women in SSF. The findings suggest that collective, non-material outcomes carry greater weight than material and individual ones.

Overall, consistent patterns across the findings indicate that women in SSF in Chiloé have acquired high levels of empowerment. Their livelihoods have undergone a transformation, consistent with broader processes of professionalization and the growing recognition of women's role in SSF in Chile (Alvarez et al., 2017). Alongside these changes, women have also transformed their agency and empowerment within inherently gendered opportunity structures. Our findings suggest that these dynamics are driven by collective processes of agency related to decision-making, whose resulting well-being outcomes permeate individual experiences of agency and empowerment. Although this research did not examine the conflicts and potential negative consequences associated with gaining agency and empowerment in one sphere of life, this should not be interpreted as suggesting that these processes are free of tension, particularly within the household. Future research, especially using an ethnographic approach, is needed to further explore these dynamics, as previous studies have also suggested (e.g., Gallardo-Fernandez & Saunders, 2018).

Several authors (Kabeer, 1999; Muñoz Boudet et al., 2013; Hanmer & Klugman, 2016; Lawless et al., 2019), to name a few, coincide in the empirical challenge to measure agency with a gender perspective, where research is limited and historically has focused on material enablers for agency, often times confusing such material proxies with agency itself. In this sense, our research reinforces the importance of a qualitative approach when measuring agency and empowerment, which can untangle complex dynamics, such as subjective experiences and the 'sense of' as Kabeer (1999) states, as well as the reinforcing mechanisms between the individual and collective spheres.

Our research contributes to an emerging body of research that has explored the weight of non-material processes as key for building empowerment, which contrasts with development approaches that have

focused for decades on individual and entrepreneurial incentives and interventions for agency (Mwaipopo & Dauda, 2020). However, research on agency and empowerment in SSF with a gendered perspective is still scarce, and more so are approaches that consider complex dynamics and nuances given gendered and patriarchal structures. We believe that the roles of agency and empowerment are critical not only for achieving gender equality, as scholarship strongly suggests (Kabeer, 1999; Muñoz Boudet et al., 2013), but also as key dimensions that can bridge the pathway from vulnerability to viability in SSF with a gender-sensitive perspective.

Chapter 5 Conclusions

This chapter aims to synthesize the main findings from the empirical Chapters 2, 3, and 4, and to expand on the overall contribution of this dissertation to multidimensional gendered vulnerability and SSF knowledge in scholarly debates. To achieve this, the chapter revisits the research purpose and objectives, as well as the theoretical, empirical, and practical contributions. I also explore the study's limitations, identify several future research directions, and offer some personal reflections on the research process.

5.1 Research purpose and objectives

The purpose of this dissertation was to explore the multidimensional gendered dimensions of women's and men's vulnerability-viability experiences in the SSF in Chiloé, Chile. To achieve this purpose, this research has the following specific objectives:

- 1) To critically assess how gender is conceptualized within the vulnerability literature on SSF, and to develop a more nuanced framework for understanding multidimensional vulnerability (Chapter 2).
- 2) To empirically analyze the multidimensional gendered experiences of vulnerability among women and men in SSF in Chiloé, Chile (Chapter 3).
- 3) To explore agency and empowerment dynamics- both individual and collective- towards viability among women SSF in Chiloé, Chile (Chapter 4).

I addressed these objectives by developing a systematic scoping review, proposing an SSF-tailored framework for multidimensional gendered vulnerability (Objective 1), and employing an empirical mixed-methods approach to measure gendered vulnerabilities in the Chiloé SSF (Objective 2), as well as a qualitative approach with women in the SSF in Chiloé (Objective 3). These objectives collectively respond to the main research purpose of this dissertation and advance the knowledge gap identified in the introductory chapter on gender and SSF research and vulnerability-viability continuum. The details of the major findings per objective and chapter are outlined below.

5.2 Summary of major findings

The major findings of this dissertation are presented in detail in Chapters 2, 3, and 4, which were developed as standalone, independent yet closely interlinked manuscripts.

In Chapter 2 (objective 1), I examined the state of the art in the literature on gender and vulnerability in SSF, with a final sample of $n=21$ papers, finding that research on the topic is mostly limited to the last decade and that the majority focuses on the Global South and on pre- and post-harvest activities. In addition, I found that vulnerability research in SSF varies depending on the theoretical approaches to vulnerability, including SES and resilience thinking, political ecology, livelihoods approaches, well-being theory, and the poverty-marginalization approach. However, drawing on Feminist Political Ecology theorizations that guided my definition of an in-depth gender analysis, the results showed that only a small portion of the sample engaged with the complexity of gender analysis by addressing at least three of the six elements identified in this study: (1) subjective dimensions, (2) an intersectional approach, (3) power dynamics, (4) elements of agency, empowerment, and/or the exercise of choice, (5) a gender or feminist theoretical framework, and/or (6) gender norms, roles, and/or expectations. More specifically, the results showed that subjective dimensions of vulnerability in the literature reviewed were largely overlooked. This finding seems to be contrary to the crucial role that gender scholars and feminist approaches (FPE) have accorded

to gendered subjective experiences in the face of environmental risk, degradation, or lack of access to natural resources (e.g., Arora Johnson, 2011; Nightingale, 2006, 2011; Harris, 2006; 2008; Sultana, 2011),

In view of this, I proposed a novel framework to analyze multidimensional gender vulnerability in SSF informed by key contributions of the sample analyzed (e.g. Azmi et al., 2021; Kawarazuka et al., 2017; Weeratunge et al., 2014) and, in addition, a cross-fertilization between elements of ‘new’ Feminist Political Ecology research on vulnerability and resource scarcity (Nightingale, 2006, 2011; Harris, 2008; Sultana, 2011), and comprehensive frameworks for vulnerability in SSF (Nayak and Berkes, 2019). Thus, the emerging framework proposes that vulnerability is an inherently intersectional experience with different implications for women and men in SSF in each dimension: absence of well-being, loss of resilience, and lack of access to capital. Further, the interaction between dimensions is dynamic and complex: subjective dimensions, such as the emotional struggles of vulnerability, are embedded in material/ecological elements as well as relational realities, nuances often ignored in dominant approaches (e.g. SES approaches) to vulnerability in SSF. This complex understanding of vulnerability seeks to engage with meaningful gender discussions beyond homogenizing narratives of women as victims, often present in gender-environment interventions, and instead, acknowledges the subject's capacity for agency across dimensions (material, relational, and subjective).

In Chapter 3, my aim was to empirically analyze the multidimensional gendered experiences of vulnerability among women and men in SSF in Chiloé, Chile (Objective 2), by using the framework proposed in Chapter 2. With a mixed-methods approach (surveys, interviews, and participatory workshops data collection techniques), results showed that vulnerability in SSF is a multidimensional gendered process in the case study: women experience material, relational, and subjective vulnerability very differently from their male counterparts, making it almost a totally different experience regardless of being exposed and affected by the same stressors. On the material dimension, while men seem to be more affected by ecological stressors, women declare to be more affected by food insecurity and disease. In dealing with those problems, men appear to improvise more by selling their gear or using their savings, while women present higher levels of adaptive capacity, women use strategies such as diversification when responding to declines in resource capture or other resource-related stressors, which aligns with pre-existing findings in the literature in different SSF context (Cohen et al., 2016; Lawless et al., 2019). In addition, women seek more help outside their networks to confront financial and personal problems, such as advocating for their health, by contacting the Municipality's social office or similar government agencies.

When it comes to relational responsibilities and stressors, differences are even more striking: women's SSF well-being is highly affected by caring roles (childcaring, caring for elders) and household labour, to which they seem to be coping instead of adapting: improvising and asking for help from their support system. On the contrary, men in SSF do not declare themselves to be affected by these responsibilities. The burden of patriarchal gender role division of labour has been described by scholars of gender literature (Resurreccion et al., 2006; Lawless et al., 2021; Frangoundes & Gerrard, 2019).

Additionally, women also report low levels of gender discrimination among their unions and syndicates. However, unlike the literature on decision-making exclusion in fisheries (Resurreccion, 2006; Frangoundes & Gerrard, 2019), female participants' narratives and actions demonstrate higher levels of empowerment and collective organization with other women to influence decision-making and, therefore, confront this stressor.

Finally, at the subjective level of vulnerability experiences, differences between men and women are evident: emotional struggles of women SSF seemed to be embedded in their material and relational vulnerabilities, that is, related to their health issues, caring roles, and losing a family member. At the same time, motherhood and caring roles seem to frame their identity and aspirations: getting a job in fisheries close to home is a goal set by themselves. A notion of ‘self’ as a fisher and mother triggers elements of pride, self-recognition, and adaptive capacity; it pushes them to seek external help, visible recognition, and benefits, usually through bargaining and negotiation with local authorities and policymakers. Thus, the subjective dimension of vulnerability appears to be a key element in distinguishing between men and women in SSF yet is often overlooked in more widely used models of contextual vulnerability and in research. This dimension of our framework was deeply influenced by new FPE scholarship, particularly regarding how experiences of vulnerability gendered aspirations, identities, fears, and emotional struggles (Arora Johnson, 2011; Nightingale, 2006, 2011; Harris, 2006, 2008; Sultana, 2011).

Overall, by using this framework (see Chapter 2, Figure 2.7), which includes not only gendered and intersectional nuances in vulnerability but also the three-dimensional nature of well-being, the complexities of the vulnerability experiences of men and women SSF can be unveiled, showing that, in the Chiloé case study, the experiences of both groups are almost distinct phenomena.

In Chapter 4, my aim was to explore agency and empowerment dynamics- both individual and collective- towards viability among women SSF in Chiloé, Chile. Consistent with Chapter 3 findings, which show that women SSF exhibit higher levels of ‘sense of’ agency than their male counterparts, the purpose of this manuscript was to delve deeper into these dynamics and into the empowerment process (Kabeer, 1999), by characterizing the resources that enable these processes, how their agency is expressed, and the well-being outcomes they experience.

Thus, when it comes to resources or structures of opportunities (Kabeer, 1999; Muñoz Boudet et al., 2013), results showed that participants actively sought their current livelihoods in SSF as baiters, age gleaners, and diver assistants, as a real alternative to their limited opportunities, mostly enclosed to working on aquaculture processing plants, which historically has employed women in the region (Alvarez et al., 2017). This pursuit was enabled mostly by one main necessity: being at home to handle household work and caregiving roles, especially motherhood, and was framed by their educational level and family tradition in SSF. Closely related, their individual agency is expressed as they opt in to independent work as SSF, an actively pursued goal. In addition, livelihood diversification seems to also be present in the participants' experiences, which is considered another agency indicator by the literature (Cohen et al, 2016). Specifically, among rural algae and shellfish gleaners, participants reported diversifying into small-scale agriculture and livestock. This opportunity is enabled by two elements: their ownership of a small piece of land, and the seasonal nature of their work on SSF, such as gleaning in late spring, summer/early fall.

Nevertheless, what is most evident in the women's agency capacity, individual and collective, is their bargaining capacity and negotiation with local and fisheries authorities, municipal social departments, and their own fisheries organizations, and even engaging in contentious politics if necessary. This conscious capacity – ‘sense of’ – aligns with various of their collective well-being achievements: through the women-only organizations, they have accomplished material outcomes (e.g., a collectively owned food-truck, certifications, and fishing gear), to non-material, such as talks on certain topics of interest, traveling to other regions to see the work of other female SSF. But mostly, their major milestone was the approval of the *Ley*

de Equidad de Genero en Pesca' (Gender Equity law) 21.370, which includes modifications to the existing Fishing and Aquaculture law, officially published in 2021.

Overall, the results in Chapter 4 showed that non-material well-being outcomes seem to have a greater impact on women's SSF well-being, positively permeating individual processes of agency and empowerment. While the impact of non-material collective processes in increasing empowerment outcomes has been described in the literature (Gallardo-Fernandez & Saunders, 2018; Mwaipopo & Dauda's, 2020), as well as the negative impacts of those processes (e.g. conflicts at the household level due to patriarchal structures) (Arora-Johnson, 2009; Gammage et al., 2016), the dynamics between individual and collective levels have been less explored. Thus, Chapter 4's results support the idea that collective agency and, overall, collective empowerment seem to increase agency and empowerment at the individual level, at least at the subjective level in terms of 'sense of'.

Overall, the findings across the resulting chapters (2, 3, and 4) contribute to a more nuanced understanding of how multidimensional gendered dynamics of vulnerability and viability are experienced by men and women in SSF, which is the main purpose of this dissertation. Chapters 2 and 3 contribute to the specific understanding of vulnerability experiences between men and women, which, according to the research results, are inherently multidimensional and gendered. Chapter 4 contributes to understanding the dynamics of agency and empowerment, which I argue seems to hinder a crucial process towards viability in SSF.

As it was mentioned in Chapter 1, the notion of viability in SSF follows Berkes & Nayak's (2018) argument based on Jentoft's (2005) writings that "viable fishing communities need viable fishing stocks, and at the same time, viable fishing stocks require viable fishing communities" (p. 242), and their extensive discussion on power asymmetries and sources of social differentiation in fisheries communities. In simple terms, according to the authors, a viability model is composed by three processes: reducing vulnerabilities (3-dimensional well-being, capitals, and building resilience), sharing power and enhancing empowerment (through co-management or self-management), and the image of an SSF community that is able to maintain the fishery resource through multi-level governance with community-based management, following Ostrom (1990) principles for commons governance.

However, I argue, based on the theoretical approach and evidence gathered across the three resulting chapters of this dissertation, that without an in-depth gender perspective, the notion of viability in SSF is incomplete (Figure 5.1). Specifically, as it was shown in Chapters 2 and 3, vulnerability is a multidimensional, gendered process with different implications for men and women in SSF. Empowerment, on the other hand, should also be considered in terms of gender, as Chapter 4 characterizes it, taking distance from what Berkes & Nayak (2018) propose in terms of empowerment as co-management. Sharing power through co-management is just one element of power dynamics within broader intersectional and gendered patriarchal structures, which, if not addressed, will likely not contribute to a community's viability in SSF. Chapters 3 and 4 also shine a light on governance arrangements: in addition to multi-level and community-based governance, the empirical findings describe how women fought for a Gender Equity Law in SSF governance, with positive cascading effects at every dimension of their vulnerability experience, as well as triggering agency and empowerment processes. Therefore, gender equity as a governance meta-order (Kooiman et al., 2005), with meaningful gender participation in decision-making, also seems crucial for viability.

Figure 5.1 shows the resulting simplified model of the vulnerability-viability continuum with a gender perspective, already mentioned in Chapter 1, and now summarizes in more detail the main findings from each chapter and proposes a gendered alternative to Berkes & Nayak's (2018) initial model.

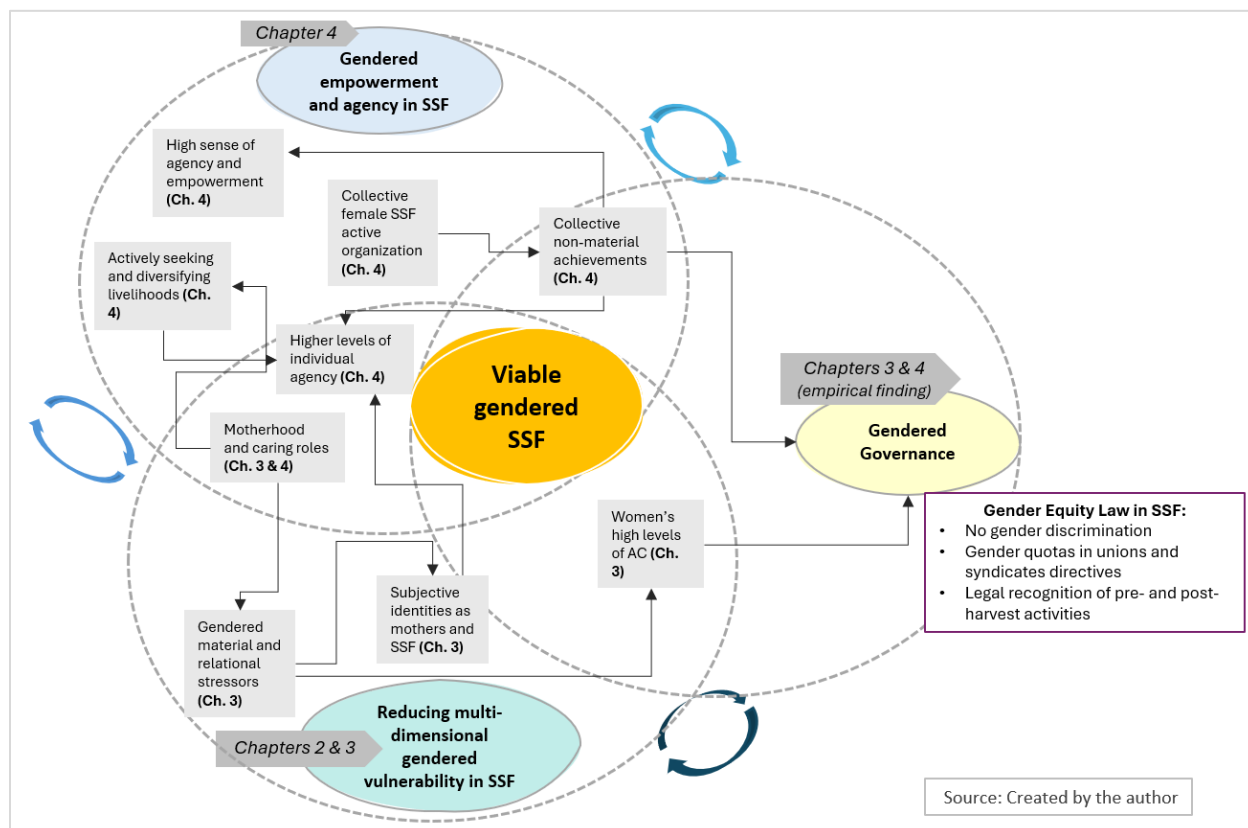


Figure 5.1: Key findings across chapters

A first point of connection across these findings and contributions is the reduction of **multidimensional gendered vulnerability in SSF**, which is the central focus of Chapters 2 and 3. Chapter 3 demonstrates that the material and relational stressors constituting key dimensions of SSF vulnerability are experienced in gendered ways, with differentiated levels of adaptive capacity also emerging across participants. At the same time, Chapter 2 identifies subjective identities as a key dimension of gender analysis in understanding vulnerability in SSF. This dimension is empirically reflected in Chapter 3 through the embedded identities of participants as both mothers and “fishers,” demonstrating how these identities shape experiences of vulnerability and adaptive capacity.

A second thread connecting the findings is **gendered empowerment and agency among women in SSF**, which both contributes to reducing multidimensional gendered vulnerability and points towards the viability of SSF. Motherhood and caring roles emerge as important connecting themes across Chapters 3 and 4. While these roles can contribute to gendered vulnerabilities, they can also become sources from which agency emerges, including through the pursuit of diverse livelihood strategies. Chapter 4 further demonstrates how participants’ sense of empowerment and agency materialized through collective action and organization, contributing to collective well-being outcomes. A particularly significant outcome was

the development of the Gender Equity Law in SSF, illustrating how individual and collective forms of agency can contribute to broader institutional change.

This finding, developed empirically across Chapters 3 and 4, also constitutes a key theoretical contribution to understanding **gendered governance and the viability of gender-equitable SSF**. The findings highlight the importance of governance arrangements that address gender discrimination, provide legal recognition to women's contributions across pre- and post-harvest activities, and establish gender equity as a broader governance principle. Together, these elements represent a novel contribution to the understanding of gender-equitable SSF governance and position Chile as a pioneer in advancing gender equity within SSF governance.

5.3 Novel contributions

The results highlighted above and the theoretical framework that guided the dissertation addressed significant gaps (theoretical and empirical) in gender and vulnerability research in SSF, as well as understudied phenomena (in scholarly research and practice) such as agency and empowerment in fostering SSF viability. In doing so, this dissertation advances knowledge with several novel contributions, which will be detailed in the next sections.

5.3.1 Theoretical contributions

This dissertation, particularly Chapters 2 and 3, contributes to understanding an understudied phenomenon in scholarly research, namely the nuances of multidimensional gendered vulnerability in SSF. As it was described in Chapter 1, this knowledge gap identified - and empirically confirmed in Chapter 2 through a systematic scoping review - relies in part on the widespread use of conventional vulnerability approaches anchored in SES (e.g. (Turner et al., 2003; Smit & Wandel, 2006; Adger, 2006; Bennett et al., 2016), which do not include a gender and a feminist perspective as a core element. Thus, Chapter 2 proposes a novel cross-fertilization between vulnerability in SSF (Nayak & Berkes, 2019), anchored in SES tradition, and the so-called 'new' Feminist Political Ecology (FPE) (Harris, 2006, 2008; Nightingale, 2006, 2011; Arora-Jonsson, 2011; Sultana, 2011), and including elements of the gender and SSF literature sampled in that Chapter (e.g., Azmi et al., 2021; Weeratunge et al., 2014; Kawarazuka et al., 2017). The resulting framework offers an integrative approach to comprehensively understanding multidimensional gendered vulnerabilities in SSF, advancing scholar knowledge in two main ways. First, the framework includes elements of 'new' FPE that disentangle both men's and women's complex vulnerable experiences, such as embracing an intersectional approach, the importance of gendered roles and expectations, power dynamics, agency and empowerment processes, and the crucial role of the subjective dimension, which are often overlooked in conventional approaches. The integration of power dynamics, closely related to the intersectional approach, as well as gendered roles and expectations within a patriarchal gendered system, is a novel contribution that has been systematically overlooked in conventional approaches. A common limitation in vulnerability theories anchored in SES is the lack of inclusion of gender and other forms of differentiation based on power relations. When gender is included, as in Nayak and Berkes (2019) and Bennett et al. (2016), it is presented as a variable in the data analysis results section rather than as a key dimension of their vulnerability approach. This limitation is consistent with Kawarazuka et al. (2017) argument on how social-ecological resilience approaches often exclude gender. When integrated, it is usually a variable via 'mainstreaming gender' to enhance data collection and analytical purposes.

Second, the importance of the subjective element is also a novel theoretical contribution of this dissertation, analyzed in detail in Chapter 2, and empirically in Chapter 3. As new FPE scholarly debates highlight, and

emergent research on gender and SSF shows, how women feel and think about the life they have and can achieve is a key piece of their material and relational well-being (Azmi et al., 2021; Weeratunge et al., 2014; Coulthard et al., 2023). However, the subjective dimension is often overlooked in SES approaches to vulnerability, where relational (e.g., governance arrangements, institutional settings, social capital, and networks) and material elements (e.g., economic, financial, ecological) seem to have a more dominant role. This element is explored empirically in depth in Chapter 3: subjectivities, such as identities, emotional struggles, and aspirations, not only seemed to be affected dynamically by relational and material vulnerabilities but were also inherently gendered, as men and women experienced them in very different ways. Thus, the elements and analytical linkages of the proposed framework yielded a deeper analysis of how men and women experience vulnerability in the case study, as shown in Chapter 3.

A novel theoretical contribution in Chapter 4 arises from a deeper exploration of the role of gendered agency and empowerment for women in SSF in two main ways. First, gendered agency and empowerment research can serve as a counternarrative to the very established idea in gender and development practice that women are helpless victims in the face of environmental change (Cornwall & Rivas, 2015; Resurreccion, 2017). By unveiling the dynamics of both interlinked processes, the chapter helped to illustrate the complexities and the broader gendered embodied contexts of women's lives that in part explained their differential vulnerability experiences (Chapter 3), yet far from fitting as a 'helpless victims' category.

Second, the manuscript advances the knowledge (with empirical evidence) of two closely related elements that are undertheorized in agency scholarly debates: the weight of material and non-material (subjective) dimensions. Several authors (Kabeer, 1999; Muñoz Boudet et al., 2013; Hanmer & Klugman, 2016; Lawless et al., 2019) to name a few, coincide in the empirical challenge to measure agency with a gender perspective, where research is limited and historically has focused on material enablers for agency and opportunity structures, often time confusing such material proxies with agency itself. In addition, less attention has been paid to other elements, such as the subjective 'sense of agency'. Chapter 4 thus contributes to theorizations of agency and empowerment by giving important space to the "subjective sense of agency" and non-material enablers, aligning with FPE debates. While at the same time, it cautiously distinguishes between the actual capacity for choice and what authors have called 'simulacrum of agency' (Nussbaum, 1996), or the passive acceptance of gendered roles and norms, by acknowledging well-being processes involved in agency and empowerment dynamics, which are not always correlated (Sen, 1985).

Finally, the findings across chapters and the overall theorizations on the vulnerability-viability continuum in SSF, as proposed in this dissertation, also offer a novel alternative to a more conventional approach to viability in SSF, based on resource sustainability, co-management arrangements and multilevel governance (Berkes and Nayak, 2018). Instead, this research posits an alternative that advances a gender-sensitive approach to viable SSF communities, disentangling gender and intersectional power dynamics and patriarchal relations towards gender equity in SSF.

5.3.2 Empirical and practical contributions

The empirical contributions of this dissertation were primarily presented in Chapters 3 and 4, with the case study of men and women in SSF in Chiloé, Chile. However, it is important to note that Chapter 2, through a scoping systematic review, also makes empirical contributions (via secondary data) to advancing knowledge on gender in SSF. In this sense, Chapter 2 lays the foundation for future research on vulnerability and gender in SSF by providing a global assessment of the state of the art and proposing a nuanced approach to gender-sensitive research in SSF.

Chapters 3 and 4 make a novel empirical contribution by using primary data from an understudied case study. Research on gender and SSF in Chile remains limited. Although several studies have examined women, gender, and SSF in Chile, particularly in the XIII and X regions (Gallardo-Fernandez & Saunders, 2018; Alvarez, 2017), research focusing specifically on the Chiloé archipelago is scarce. This dissertation therefore contributes new empirical evidence to the broader literature on gender and fisheries while advancing understanding of the Chiloé case. Beyond its relevance to Chile, the findings provide a foundation for future comparisons across regions within the country and for cross-country analyses, particularly within the South American context.

Chapter 3 also contributes to recent calls on gender and fisheries research (Harper et al., 2023; Rice, 2024) on the importance of collecting sex-disaggregated data as a baseline in fisheries studies. Treating SSF vulnerability as a homogeneous phenomenon would have reproduced gender-blind assumptions and obscured the complex and differentiated realities that shape vulnerability within SSF. Under the same recommendations, the findings from Chapter 3 also highlight the value of mixed methods for generating richer data and advancing gender-inclusive research protocols in SSF (Kawarazuka et al., 2017; Rice et al., 2024; Harper et al., 2023). In doing so, this dissertation aligns with feminist SSF scholarship that cautions against examining fisheries as a uniform social context. Instead, it supports the use of sex-disaggregated data, mixed methods, and an intersectional lens to reveal the often-overlooked dynamics that differentiate the experiences of women and men in SSF.

In addition, Chapter 4 makes a novel empirical contribution by examining understudied dimensions of gendered agency and empowerment among women in SSF in Chiloé. Both concepts are widely recognised as empirically challenging to study (Kabeer, 1999), given their complexity and context-specific nature. Yet, research and practice have often reduced agency and empowerment to material and individual enablers, overlooking the gendered, intersectional, and collective processes through which they are negotiated and exercised. Chapter 4 addresses this gap by providing empirical insights into the role of non-material factors and the interplay between individual and collective dynamics in shaping gendered agency and empowerment. These findings also respond to a gap identified in policy and practice, where women in SSF continue to be predominantly framed as vulnerable subjects. This dominant narrative, which has also permeated academic research, tends to overlook gendered agency and empowerment as critical processes through which vulnerability can be challenged and transformed (Lawless et al., 2021). In this sense, the chapter aligns with broader calls from gender and feminist scholars for more nuanced approaches to gender in environment and development research and practice (Resurreccion, 2017; Arora-Jonsson, 2011), while also contributing to the ambitions of Sustainable Development Goal 5 “to achieve gender equality and empower all women and girls by 2030”.

Finally, the findings of this dissertation make an important practical contribution to policy and practice. They provide robust empirical evidence to support gender-sensitive policymaking and decision-making, not only in Chile but also in informing regional efforts to advance gender equity in SSF. Moreover, the preliminary findings on the implementation of the pioneering Gender Equity Law in Aquaculture and Fisheries—developed through a bottom-up process largely led by women leaders in SSF—offer valuable insights for designing more gender-sensitive governance arrangements and policy interventions. In this sense, the Chilean experience has the potential to inform similar initiatives at regional and global levels.

5.4 Limitations and future research

There are two main limitations associated with this research. First, while the framework that guided this entire research, and especially the proposed framework applied in Chapter 3, focused on intersectionality, in practice, not many intersecting identities were identified. This is most notable in the survey. While I asked questions about indigeneity, with 80% of female survey respondents self-identifying as Indigenous, which statistically contrasts with their male counterparts (53.8%), no statistically significant difference was identified in the sample. In addition, indigeneity, as an intersecting identity, was never a category that came up in interviews. On the contrary, most participants, men and women, refer to 'indigenous communities' as an '*outside other*', in contrast with their 'fisheries associations, unions, and syndicates', which is often assumed as a "we" in their discourses.

In this sense, although the proposed framework is inherently intersectional, this dissertation focused primarily on gendered differences, as the data did not allow for a more in-depth exploration of other intersecting social categories. Overall, the women and men interviewed and surveyed were relatively homogeneous in terms of characteristics such as class, religion, age, and race. Future research, particularly with larger, probabilistic samples, is therefore needed to capture more nuanced intersectional differences and to better understand how multiple social identities shape experiences within SSF.

Second, another limitation of this dissertation is the lack of deeper insights into intra-household conflicts, particularly regarding the findings presented in Chapter 4. As the literature suggests, when women gain agency and empowerment through collective action and participation in associations, tensions may emerge within the household as existing patriarchal structures are challenged (Arora-Jonsson, 2009; Gammage et al., 2016). A practical challenge in exploring these dynamics is the time and rapport required to build trust with participants, as discussing conflicts with partners or husbands is often highly sensitive. Future research could therefore examine these dimensions in greater depth through an ethnographic approach, which would be better suited to capturing these complex and often hidden household dynamics.

Future research should empirically examine the governance arrangements and implementation dynamics of the newly enacted Gender Equity Law in Aquaculture and Fisheries. This represents a particularly promising avenue for research, given the law's novelty and its potential to reshape gender relations and governance in SSF. Building on the framework proposed by Galappaththi et al. (2022), such research could further develop and apply a gender-sensitive governance framework that integrates insights from Feminist Political Ecology (FPE) and Interactive Governance (Kooiman et al., 2005). This was initially envisaged as a fourth manuscript within this dissertation. However, due to time and feasibility constraints, it was beyond the scope of the research. As implementation of the law progresses, future studies will be well positioned to examine how this governance process unfolds in practice and the extent to which it contributes to more gender-sensitive governance arrangements in SSF.

5.5 Personal concluding thoughts

It has been almost five years since I began this PhD journey, and two years since I completed my fieldwork. Looking back, I can now see that the greatest challenges I faced throughout this process were, interestingly, more closely aligned with the experiences of the women whose stories are imprinted in these pages than with methodological or research-related challenges themselves.

That said, conducting the in-person survey was undoubtedly one of the greatest research challenges I undertook. At times, I even questioned whether it was a feasible endeavor. In-person surveys are time-consuming, costly, and filled with uncertainty, particularly when there is no guarantee that the data will yield meaningful insights that honour participants' contributions and justify the time and trust they invested in sharing their stories. Now, at the end of this journey, I feel deeply proud of having taken on such a demanding task. Although I had previously participated in several survey projects throughout my professional career—and knew well how stressful they could be—being responsible for the entire process was a completely different experience. I remain profoundly grateful to the research participants and research assistants who carried out much of the demanding fieldwork, knocking on doors across the localities we visited, many of them remote and difficult to access.

Nevertheless, the major challenge of this PhD journey lies in my very own caring responsibilities. As I write the final pages of this dissertation, I find myself juggling household responsibilities, the middle of a not-so-smooth pregnancy, my six-year-old constantly revolving around me with endless questions—even about my thesis—and my husband working through yet another online meeting. Throughout these moments, I keep returning to the stories of the women who participated in this research and to their own experiences of negotiating gendered roles and responsibilities.

Having the flexibility of working many days from home has, for the most part, been a privilege. It has allowed me to be the present mother I have always wanted to be and, as an immigrant in the country I now call home, it has also been a necessity, given that our support network is virtually non-existent. Yet there have also been days when balancing these responsibilities has felt overwhelming: when my son was sick, when we visited the E.R. several times, when deadlines piled up, or when my husband had to work late. On those days, I often found myself trying to fulfill every role at once, carrying a heavier mental and emotional load than my male partner. It became difficult not to reflect on the very questions at the heart of this dissertation and to recognize how, even within a progressive relationship, gendered expectations, household responsibilities, and caring roles continue to weigh more heavily on women.

I often think about the women I met through this research. Although my work is physically very different from theirs, I recognize in their stories the constant negotiation of decisions around motherhood, childcare, and care more broadly. Their experiences resonated with my own in ways I had not anticipated, reminding me that gendered responsibilities are lived across very different social and economic contexts.

While these reflections are explored in greater detail in the positionality statement in Chapter 1, they have remained a constant thread throughout this research journey. They have also been a source of motivation during moments of exhaustion. The stories of these women deserve to be told. The weight of their everyday experiences deserves to be made visible. Equally important is telling the story of their capacity to anticipate, to pursue their aspirations, and to act upon them—their agency and empowerment. In many ways, their stories echo aspects of my own, while also speaking to the often-invisible experiences of millions of women whose lives, struggles, and aspirations are indirectly reflected throughout these pages.

References

- Adam, R., Lam, R. D., Lozano Lazo, D. P., McDougall, C., Rajaratnam, S., Ouko, K., Pasani, C., Forsythe, L., & Rossignoli, C. M. (2024). Using a sustainable food systems framework to examine gender equality and women's empowerment in aquatic food systems. *Frontiers in Sustainable Food Systems*, 8. <https://doi.org/10.3389/fsufs.2024.1327798>
- Adger, W. N. (2006). Vulnerability. *Global Environmental Change, Resilience, Vulnerability, and Adaptation: A Cross-Cutting Theme of the International Human Dimensions Programme on Global Environmental Change*, 16(3), 268–281. <https://doi.org/10.1016/j.gloenvcha.2006.02.006>
- Álvarez Burgos, M. C., & Álvarez Burgos, M. C. (2020). “No queremos ser pesca acompañante, sino pesca objetivo”. Interfaces socioestatales sobre enfoque de género en la pesca artesanal en Chile. *Runa*, 41(2), 67–85. <https://doi.org/10.34096/runa.v41i2.8691>
- Álvarez, M. C., Stuardo Ruiz, G., Collao Navia, D., Gajardo Cortes, C., Álvarez, M. C., Stuardo Ruiz, G., Collao Navia, D., & Gajardo Cortes, C. (2017). La visualización femenina en la pesca artesanal: Transformaciones culturales en el sur de Chile. *Polis (Santiago)*, 16(46), 175–191. <https://doi.org/10.4067/S0718-65682017000100175>
- Amadu, I., Armah, F. A., & Aheto, D. W. (2021). Assessing livelihood resilience of artisanal fisherfolk to the decline in small-scale fisheries in Ghana. *Sustainability (Switzerland)*, 13(18). <https://doi.org/10.3390/su131810404>
- Andrade, M. M. de, Xavier, L. Y., Grilli, N. de M., Oliveira, C. C. de, Andrade, D. A. de, Barreto, G. C., Hellebrandt, L., Galvão, M. C., Silva, S. T. da, Mont'Alverne, T. C. F., & Gonçalves, L. R. (2021). Gender and small-scale fisheries in Brazil: Insights for a sustainable development agenda. *Ocean and Coastal Research*, 69. <http://www.scielo.br/j/ocr/a/yYqY64NRb6NMhNw6QBHnsjg/?lang=en>
- Appiah, S., Antwi-Asare, T. O., Agyire-Tettey, F. K., Abbey, E., Kuwornu, J. K. M., Cole, S., & Chimatiro, S. K. (2021). Livelihood Vulnerabilities Among Women in Small-Scale Fisheries in Ghana. *The European Journal of Development Research*, 33(6), 1596–1624. <https://doi.org/10.1057/s41287-020-00307-7>

- Arora-Jonsson, S. (2009). Discordant Connections: Discourses on Gender and Grassroots Activism in Two Forest Communities in India and Sweden: Winner of the 2009 Catharine Stimpson Prize. *Signs*, 35(1), 213–240. <https://doi.org/10.1086/599259>
- Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender and climate change. *Global Environmental Change*, 21(2), 744–751. <https://doi.org/10.1016/j.gloenvcha.2011.01.005>
- Arriagada, N. (2019). *Adaptive capacity in social-environmental crisis: The case of the red tide/salmon farming conflict in Chiloé (Chile)* [University of British Columbia]. <https://doi.org/10.14288/1.0380286>
- Arriagada, N., Satterfield, T., & Boyd, D. R. (2025). Social-ecological uncertainty and the (in)capacity to adapt: Stakeholders' perceptions post-red tide/salmon farming crisis in Chiloé Island (Chile). *Ecology and Society*, 30(4). <https://doi.org/10.5751/ES-16604-300412>
- Auld, K., & Feris, L. (2022). Addressing vulnerability and exclusion in the South African small-scale fisheries sector: Does the current regulatory framework measure up? *Maritime Studies*, 21(4), 533–552. <https://doi.org/10.1007/s40152-022-00288-9>
- Azmi, F., Lund, R., Rao, N., & Manimohan, R. (2021). Well-being and mobility of female-heads of households in a fishing village in South India. *Gender, Place and Culture : A Journal of Feminist Geography*, 28(5), 627–648. <https://doi.org/10.1080/0966369X.2020.1739003>
- Barclay, K. M., Satapornvanit, A. N., Syddall, V. M., & Williams, M. J. (2022). Tuna is women's business too: Applying a gender lens to four cases in the Western and Central Pacific. *Fish and Fisheries*, 23(3), 584–600. <https://doi.org/10.1111/faf.12634>
- Bassett, T. J., & Fogelman, C. (2013). Déjà vu or something new? The adaptation concept in the climate change literature. *Geoforum*, 48, 42–53. <https://doi.org/10.1016/j.geoforum.2013.04.010>
- Béné, C. (2003). When Fishery Rhymes with Poverty: A First Step Beyond the Old Paradigm on Poverty in Small-Scale Fisheries. *World Development*, 31(6), 949–975. [https://doi.org/10.1016/S0305-750X\(03\)00045-7](https://doi.org/10.1016/S0305-750X(03)00045-7)
- Béné, C., & Merten, S. (2008). Women and Fish-for-Sex: Transactional Sex, HIV/AIDS and Gender in African Fisheries. *World Development*, 36(5), 875–899. <https://doi.org/10.1016/j.worlddev.2007.05.010>

- Bennett, N. J., Blythe, J., Tyler, S., & Ban, N. C. (2016). Communities and change in the anthropocene: Understanding social-ecological vulnerability and planning adaptations to multiple interacting exposures. *Regional Environmental Change*, 16(4), 907–926. <https://doi.org/10.1007/s10113-015-0839-5>
- Bennett, N. J., Finkbeiner, E. M., Ban, N. C., Belhabib, D., Jupiter, S. D., Kittinger, J. N., Mangubhai, S., Scholtens, J., Gill, D., & Christie, P. (2020). The COVID-19 Pandemic, Small-Scale Fisheries and Coastal Fishing Communities. *Coastal Management*, 48(4), 336–347. <https://doi.org/10.1080/08920753.2020.1766937>
- Berkes, F., & Nayak, P. K. (2018). Role of communities in fisheries management: “One would first need to imagine it.” *Maritime Studies*, 17(3), 241–251. <https://doi.org/10.1007/s40152-018-0120-x>
- Berkes. (2007). Understanding uncertainty and reducing vulnerability: lessons from resilience thinking. *Natural Hazards (Dordrecht)*, 41(2), 283–295. <https://doi.org/10.1007/s11069-006-9036-7>
- Blythe, J., Flaherty, M., & Murray, G. (2015). Vulnerability of coastal livelihoods to shrimp farming: Insights from Mozambique. *AMBIO*, 44(4), 275–284. <https://doi.org/10.1007/s13280-014-0574-z>
- Brown, K., & Westaway, E. (2011). Agency, Capacity, and Resilience to Environmental Change: Lessons from Human Development, Well-Being, and Disasters. *Annual Review of Environment and Resources*, 36(1), 321–342. <https://doi.org/10.1146/annurev-environ-052610-092905>
- Bustos, Beatriz (2016): ¿Síndrome de Estocolmo? Comunidad, industria y desarrollo tras la crisis del virus ISA en Chiloé. In Román, A., Barton, J., Bustos, B., Salazar, A. (2016): Revolución Salmonera, paradojas y transformaciones territoriales en Chiloé. RIL editores, Santiago.
- Burns, D., Howard, J., & M.Ospina, S. (n.d.). *Sage Research Methods—The SAGE Handbook of Participatory Research and Inquiry*. Retrieved June 11, 2026, from <https://methods.sagepub.com/hnbk/edvol/the-sage-handbook-of-participatory-research-and-inquiry/toc>
- Bustos, B., & Román, Á. (2019). A Sea Uprooted: Islandness and Political Identity on Chiloé Island, Chile. *Island Studies Journal*, 14(2), 97–114. <https://doi.org/10.24043/isj.91>
- Butler, J. (1999). *Gender Trouble: Tenth Anniversary Edition* (2nd ed.). Routledge. <https://doi.org/10.4324/9780203902752>

- Butler, J. (2010). PERFORMATIVE AGENCY. *Journal of Cultural Economy*, 3(2), 147–161.
<https://doi.org/10.1080/17530350.2010.494117>
- Call, M., & Sellers, S. (2019). How does gendered vulnerability shape the adoption and impact of sustainable livelihood interventions in an era of global climate change? *Environmental Research Letters*, 14(8), 083005. <https://doi.org/10.1088/1748-9326/ab2f57>
- Cinner, J. E., & Bodin, Ö. (2010). Livelihood Diversification in Tropical Coastal Communities: A Network-Based Approach to Analyzing ‘Livelihood Landscapes.’ *PLoS ONE*, 5(8).
<https://doi.org/10.1371/journal.pone.0011999>
- Cohen, P. J., Lawless, S., Dyer, M., Morgan, M., Saeni, E., Teioli, H., & Kantor, P. (2016). Understanding adaptive capacity and capacity to innovate in social–ecological systems: Applying a gender lens. *Ambio*, 45(S3), 309–321. <https://doi.org/10.1007/s13280-016-0831-4>
- Collins, P. H. (2015). Intersectionality’s Definitional Dilemmas. *Annual Review of Sociology*, 41(1), 1–20.
<https://doi.org/10.1146/annurev-soc-073014-112142>
- Cooper, B. (2015). *Intersectionality* (L. Disch & M. Hawkesworth, Eds.; Vol. 1). Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199328581.013.20>
- Cornwall, A., & Rivas, A.-M. (2015). From ‘gender equality and ‘women’s empowerment’ to global justice: Reclaiming a transformative agenda for gender and development. *Third World Quarterly*, 36(2), 396–415.
<https://doi.org/10.1080/01436597.2015.1013341>
- Coulthard, S., White, C., Paranamana, N., Sandaruwan, K. P. G. L., Manimohan, R., & Maya, R. (2020). Tackling alcoholism and domestic violence in fisheries—A new opportunity to improve well-being for the most vulnerable people in global fisheries. *Fish and Fisheries*, 21(2), 223–236.
<https://doi.org/10.1111/faf.12426>
- Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*, 43, 1241. <https://doi.org/10.2307/1229039>
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Thousand Oaks, CA: Sage.

- Creswell, J. W., & Poth, C. N. (2016). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. SAGE Publications.
- de Carvalho, D. A., Amaral, S., & Alves, L. M. (2023). Climate change adaptation frameworks in fishing communities: A systematic review. *Ocean & Coastal Management*, 243, 106754.
<https://doi.org/10.1016/j.ocecoaman.2023.106754>
- de, J. (n.d.). *Medición de la Pobreza Multidimensional en Chile, Encuesta Casen 2022*.
- DeCuir-Gunby, J. T., & Schutz, P. A. (2017). *Developing a Mixed Methods Proposal: A Practical Guide for Beginning Researchers*. SAGE Publications, Inc. <https://doi.org/10.4135/9781483399980>
- Denton, F. (2002). Climate change vulnerability, impacts, and adaptation: Why does gender matter? *Gender & Development*, 10(2), 10–20. <https://doi.org/10.1080/13552070215903>
- Dias, A. C. E., Armitage, D., Nayak, P. K., Akintola, S. L., Arizi, E. K., Chuenpagdee, R., Kumar Das, B., Diba, S. A., Ghosh, R., Isaacs, M., Islam, G. M. N., Kane, A., Li, Y., Manase, M. M., Mbaye, A. A., Onyango, P., Pattanaik, S., Sall, A., Susilowati, I., ... Singh, S. (2023). From vulnerability to viability: A situational analysis of small-scale fisheries in Asia and Africa. *Marine Policy*, 155(Complete).
<https://doi.org/10.1016/j.marpol.2023.105731>
- Ellis, Frank. (2000). *Rural livelihoods and diversity in developing countries*. OUP Catalogue. Oxford: Oxford University Press.
- Elmhirst, R. (2011). Introducing new feminist political ecologies. *Geoforum*, 42(2), 129–132.
<https://doi.org/10.1016/j.geoforum.2011.01.006>
- DelaMaza, G. E., Arriagada, E., & Cortez, M. (2023). Tide and movements: When accumulation of territorial conflicts achieves limited political results. The case of Chiloé, Chile. *Apuntes*, 50(93), 181–211. Scopus.
<https://doi.org/10.21678/apuntes.93.1655>
- FAO (Ed.). (2015). *Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication*.

- FAO, Duke University, & WorldFish. (2023). *Illuminating Hidden Harvests. The contributions of small-scale fisheries to sustainable development*. FAO; Duke University; WorldFish.
<https://doi.org/10.4060/cc4576en>
- Flick, U. (n.d.). *Sage Research Methods—Doing Triangulation and Mixed Methods*. Retrieved June 11, 2026, from <https://methods.sagepub.com/book/mono/doing-triangulation-and-mixed-methods/toc>
- Flick, U. (2018). *The SAGE Handbook of Qualitative Data Collection*. SAGE Publications Ltd.
<https://doi.org/10.4135/9781526416070>
- Frangoudes, K., & Gerrard, S. (2019). Gender Perspective in Fisheries: Examples from the South and the North. In R. Chuenpagdee & S. Jentoft (Eds.), *Transdisciplinarity for Small-Scale Fisheries Governance: Analysis and Practice* (pp. 119–140). Springer International Publishing. https://doi.org/10.1007/978-3-319-94938-3_7
- Frangoudes, K., Gerrard, S., & Kleiber, D. (2019). Situated transformations of women and gender relations in small-scale fisheries and communities in a globalized world. *Maritime Studies*, 18(3), 241–248.
<https://doi.org/10.1007/s40152-019-00159-w>
- Freeman, R., & Svells, K. (2022). Women’s empowerment in small-scale fisheries: The impact of Fisheries Local Action Groups. *Marine Policy*, 136. Scopus. <https://doi.org/10.1016/j.marpol.2021.104907>
- Galappaththi, M., Armitage, D., & Collins, A. M. (2022). Women’s experiences in influencing and shaping small-scale fisheries governance. *Fish and Fisheries*, n/a(n/a). <https://doi.org/10.1111/faf.12672>
- Galappaththi, M., Collins, A. M., Armitage, D., & Nayak, P. K. (2021). Linking social wellbeing and intersectionality to understand gender relations in dried fish value chains. *Maritime Studies*, 20(4), 355–370. <https://doi.org/10.1007/s40152-021-00232-3>
- Gallardo-Fernández, G. L., & Saunders, F. (2018). “Before we asked for permission, now we only give notice”: Women’s entrance into artisanal fisheries in Chile. *Maritime Studies*, 17(2), 177–188.
<https://doi.org/10.1007/s40152-018-0110-z>
- Gammage, S., Kabeer, N., & van der Meulen Rodgers, Y. (2016). Voice and Agency: Where Are We Now? *Feminist Economics*, 22(1), 1–29. <https://doi.org/10.1080/13545701.2015.1101308>

Goal 5 | *Department of Economic and Social Affairs*. (n.d.). Retrieved May 13, 2026, from

<https://sdgs.un.org/goals/goal5>

Gomm, R., Hammersley, M., & Foster, P. (2009). *Case Study Method*. SAGE Publications Ltd.

<https://doi.org/10.4135/9780857024367>

Gustavsson, M., Frangoudes, K., Lindström, L., Álvarez, M. C., & de la Torre Castro, M. (2021). Gender and Blue Justice in small-scale fisheries governance. *Marine Policy*, 133, 104743.

<https://doi.org/10.1016/j.marpol.2021.104743>

Hanmer, L., & Klugman, J. (2016). Exploring Women's Agency and Empowerment in Developing Countries: Where do we stand? *Feminist Economics*, 22(1), 237–263.

<https://doi.org/10.1080/13545701.2015.1091087>

Harper, S., Kleiber, D., Appiah, S., Atkins, M., Bradford, K., Choudhury, A., Cohen, P.J., de la Puente, S., de la Torre-Castro, M., Duffy-Tumas, A., Fakoya, K., Fent, A., Frocklin, S., Gopal, N., Gough, C., Gustavsson, M., Hapke, H.M., Hellebrandt, L., Ferrer, A.J., Johnson, J.L., Kusakabe, K., Lawless, S., Macho, G., Mangubhai, S., Manyungwa-Pasani, C., McDougall, C., Ojea, E., Oloko, A., Pedroza, C., Randrianjafimanana, T., Rasoloniriana, R., Robson, L., Romeo, C., Salgueiro-Otero, D., Snyder, H., Soejima, K. 2023. Towards gender inclusivity and equality in small-scale fisheries. In: FAO, Duke University & WorldFish. 2023. *Illuminating Hidden Harvests: the contributions of small-scale fisheries to sustainable development*. Rome, FAO; Durham, USA, Duke University; Penang, Malaysia, WorldFish.

Harper, S. J., Williams, M., Kleiber, D., Axelrod, M., Mangubhai, S., Torell, E., Macho, G., Fakoya, K., Gopal, N., Ojea, E., Lawless, S., Franz, N., de la Torre-Castro, M., Deeg, C., Gustavsson, M., Oloko, A., Atkins, M., Basurto, X., Soejima, K., ... McDougall, C. (2026). Designing gender-inclusive data systems in small-scale fisheries. *Ambio*, 55(2), 245–259. <https://doi.org/10.1007/s13280-025-02250-5>

Harper, S., Zeller, D., Hauzer, M., Pauly, D., & Sumaila, U. R. (2013). Women and fisheries: Contribution to food security and local economies. *Marine Policy*, 39, 56–63.

<https://doi.org/10.1016/j.marpol.2012.10.018>

- Harris, L. M. (2008). Water Rich, Resource Poor: Intersections of Gender, Poverty, and Vulnerability in Newly Irrigated Areas of Southeastern Turkey. *World Development*, 36(12), 2643–2662.
<https://doi.org/10.1016/j.worlddev.2008.03.004>
- Hesse-Biber, S. N., & Johnson, R. B. (Eds.). (2015a). *The Oxford Handbook of Multimethod and Mixed Methods Research Inquiry* (1st ed.). Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199933624.001.0001>
- Hollstein, B. 2014. Mixed methods social network research: an introduction. In (eds) S. Dominguez & B. Hollstein, *Mixed-Methods Social Network Research*. New York: Cambridge University Press.
doi:10.1017/cbo9781139227193.003
- Nagoli, J., Holvoet, K., Remme, M. (2010). HIV and AIDS vulnerability in fishing communities in Mangochi district, Malawi. *African Journal of AIDS Research*, 9(1), 71–80.
<https://doi.org/10.2989/16085906.2010.484575>
- Illuminating Hidden Harvests*. (2023). FAO; Duke University; WorldFish ; <https://doi.org/10.4060/cc4576en>
- IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, J. Settele, E. S. Brondízio, H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages. <https://doi.org/10.5281/zenodo.3553579>
- Islam, M. M., & Chuenpagdee, R. (2022). Towards a classification of vulnerability of small-scale fisheries. *Environmental Science & Policy*, 134, 1–12. <https://doi.org/10.1016/j.envsci.2022.03.023>
- Jackson, C. (n.d.). *Gender, irrigation, and environment: Arguing for agency*. 12.
- Jupp, V. (2006). *The SAGE Dictionary of Social Research Methods*. SAGE Publications, Ltd.
<https://doi.org/10.4135/9780857020116>

- Kabeer, N. (1999). Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment. *Development and Change*, 30(3), 435–464. <https://doi.org/10.1111/1467-7660.00125>
- Kawarazuka, N., Locke, C., McDougall, C., Kantor, P., & Morgan, M. (2017). Bringing analysis of gender and social–ecological resilience together in small-scale fisheries research: Challenges and opportunities. *Ambio*, 46(2), 201–213.
- Kawarazuka, N., Locke, C., & Seeley, J. (2019). Women bargaining with patriarchy in coastal Kenya: Contradictions, creative agency and food provisioning. *Gender, Place & Culture*, 26(3), 384–404. <https://doi.org/10.1080/0966369X.2018.1552559>
- Khagram, S., Nicholas, K. A., Bever, D. M., Warren, J., Richards, E. H., Oleson, K., Kitzes, J., Katz, R., Hwang, R., Goldman, R., Funk, J., & Brauman, K. A. (2010). Thinking about knowing: Conceptual foundations for interdisciplinary environmental research. *Environmental Conservation*, 37(4), 388–397. <https://doi.org/10.1017/S0376892910000809>
- Kleiber, D., Harris, L. M., & Vincent, A. C. J. (2015). Gender and small-scale fisheries: A case for counting women and beyond. *Fish and Fisheries*, 16(4), 547–562. <https://doi.org/10.1111/faf.12075>
- Kooiman, J., Selwyn, M. B., Jentoft, S., & Pullin, P. (Eds.). (2005). *Fish for Life. Interactive Governance for Fisheries*. Amsterdam University Press.
- Labayo, C. P. (2024). The state of women's empowerment in fisheries in rural Bicol, the Philippines. *Development in Practice*, 34(1), 37–48. <https://doi.org/10.1080/09614524.2023.2248423>
- Lach, D. (2014). Challenges of Interdisciplinary Research: Reconciling Qualitative and Quantitative Methods for Understanding Human–Landscape Systems. *Environmental Management*, 53(1), 88–93. <https://doi.org/10.1007/s00267-013-0115-8>
- Lau, J. D., Kleiber, D., Lawless, S., & Cohen, P. J. (2021). Gender equality in climate policy and practice hindered by assumptions. *Nature Climate Change*, 11(3), 186–192. <https://doi.org/10.1038/s41558-021-00999-7>

- Lawless, S., Cohen, P. J., Mangubhai, S., Kleiber, D., & Morrison, T. H. (2021). Gender equality is diluted in commitments made to small-scale fisheries. *World Development*, 140, 105348. <https://doi.org/10.1016/j.worlddev.2020.105348>
- Lawless, S., Cohen, P. J., McDougall, C., Mangubhai, S., Song, A. M., & Morrison, T. H. (2022). Tinker, tailor or transform: Gender equality amidst social-ecological change. *Global Environmental Change*, 72, 102434. <https://doi.org/10.1016/j.gloenvcha.2021.102434>
- Lawless, S., Cohen, P., McDougall, C., Oirirana, G., Siota, F., & Doyle, K. (2019). Gender norms and relations: Implications for agency in coastal livelihoods. *Maritime Studies*, 18(3), 347–358. <https://doi.org/10.1007/s40152-019-00147-0>
- Macnaughton, A. E., Rainville, T. K., Méndez, C. I. C., Ward, E. M., Wojciechowski, J. M., & Carolsfeld, J. (2016). Gender transformative approaches with socially and environmentally vulnerable groups: Indigenous fishers of the Bolivian Amazon. In *Transforming Gender and Food Security in the Global South* (pp. 241–264). Routledge. <https://doi.org/10.4324/9781315564111-20>
- McGregor, J. A. 2008. Wellbeing, poverty and conflict. WeD Policy Briefing 01/08.
- MacGregor, S. (Ed.). (2017). *Routledge Handbook of Gender and Environment*. Routledge. <https://doi.org/10.4324/9781315886572>
- Mangubhai, S., Barclay, K. M., Lawless, S., & Makhoul, N. (2023). Gender-based violence: Relevance for fisheries practitioners. *Fish and Fisheries*, 24(4), 582–594. <https://doi.org/10.1111/faf.12747>
- Mangubhai, S., Nand, Y., Reddy, C., & Jagadish, A. (2021). Politics of vulnerability: Impacts of COVID-19 and Cyclone Harold on Indo-Fijians engaged in small-scale fisheries. *Environmental Science & Policy*, 120(Complete), 195–203. <https://doi.org/10.1016/j.envsci.2021.03.003>
- Marshall, Catherine and Gretchen Rossman (2015). *Designing Qualitative Research*, 6th Edition. Thousand Oaks: SAGE.
- Marshall, C., Rossman, G. B., & Blanco, G. L. (2021). *Designing Qualitative Research*. SAGE Publications.

- Mascareño, A., Cordero, R., Azócar, G., Billi, M., Henríquez, P. A., & Ruz, G. A. (2018). Controversies in social-ecological systems: Lessons from a major red tide crisis on Chiloe Island, Chile. *Ecology and Society*, 23(4). <https://www.jstor.org/stable/26796862>
- Matsue, N., Daw, T., & Garrett, L. (2014). Women Fish Traders on the Kenyan Coast: Livelihoods, Bargaining Power, and Participation in Management. *Coastal Management*, 42(6), 531–554. <https://doi.org/10.1080/08920753.2014.964819>
- Mitra, A., & Barua, P. (2022). Coping Practices of Women Fisherfolk in Responses to Climate Change at UNESCO Declared World Heritage Site of Sundarbans. In U. Chatterjee, A. O. Akanwa, S. Kumar, S. K. Singh, & A. Dutta Roy (Eds.), *Ecological Footprints of Climate Change: Adaptive Approaches and Sustainability* (pp. 701–729). Springer International Publishing. https://doi.org/10.1007/978-3-031-15501-7_28
- Mohanty, C. T. (1984). Under Western Eyes: Feminist Scholarship and Colonial Discourses. *Boundary* 2, 12/13, 333–358. <https://doi.org/10.2307/302821>
- Mollett, S., & Faria, C. (2013). Messing with gender in feminist political ecology. *Geoforum*, 45, 116–125. <https://doi.org/10.1016/j.geoforum.2012.10.009>
- Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), 143. <https://doi.org/10.1186/s12874-018-0611-x>
- Muñoz Boudet, A. M. (2013). *On norms and agency: Conversations about gender equality with women and men in 20 countries*. World Bank.
- Murunga, M. (2021). Towards a better understanding of gendered power in small scale fisheries of the Western Indian Ocean. *Global Environmental Change*, 67, 102242. <https://doi.org/10.1016/j.gloenvcha.2021.102242>
- Mwaipopo, R., & Dauda, M. (2020). Feminism, Women's Agency, and Subjective Well-Being: Women's Experiences of Village Community Banks in Tanzania. *Tanzania Journal of Development Studies*, 17(2), Article 2. <http://196.44.162.39/index.php/tjds/article/view/3424>

- Nacional, B. del C. (2021, August 25). *Biblioteca del Congreso Nacional | Ley Chile*. www.bcn.cl/leychile.
<https://www.bcn.cl/leychile>
- Nadel-Klein, J. (2000). Granny baited the lines: Perpetual crisis and the changing role of women in scottish fishing communities. *Women's Studies International Forum*, 23(3), 363–372.
[https://doi.org/10.1016/S0277-5395\(00\)00094-7](https://doi.org/10.1016/S0277-5395(00)00094-7)
- Nayak, P. K., & Berkes, F. (2019). Interplay Between Local and Global: Change Processes and Small-Scale Fisheries. In R. Chuenpagdee & S. Jentoft (Eds.), *Transdisciplinarity for Small-Scale Fisheries Governance: Analysis and Practice* (pp. 203–220). Springer International Publishing.
https://doi.org/10.1007/978-3-319-94938-3_11
- Nightingale, A. (2006). The Nature of Gender: Work, Gender, and Environment. *Environment and Planning D: Society and Space*, 24(2), 165–185. <https://doi.org/10.1068/d01k>
- Nightingale, A. J. (2011). Bounding difference: Intersectionality and the material production of gender, caste, class and environment in Nepal. *Geoforum*, 42(2), 153–162.
<https://doi.org/10.1016/j.geoforum.2010.03.004>
- Nolan, C. (2019). Power and access issues in Ghana's coastal fisheries: A political ecology of a closing commodity frontier. *Marine Policy*, 108(Complete). <https://doi.org/10.1016/j.marpol.2019.103621>
- O'Brien KL, Leichenko R, Kelkar U et al (2004). Mapping vulnerability to multiple stressors: climate change and globalization in India. *Glob Environ Change* 14:303–313.
<https://doi.org/10.1016/j.gloenvcha.2004.01.001>
- Okafor-Yarwood, I. M., van den Berg, S., Collins, Y. A., & Sefa-Nyarko, C. (2022). “Ocean Optimism” and Resilience: Learning From Women's Responses to Disruptions Caused by COVID-19 to Small-Scale Fisheries in the Gulf of Guinea. *Frontiers in Marine Science*, 9.
<https://doi.org/10.3389/fmars.2022.862780>
- Oloko, A., Fakoya, K., Ferse, S., Breckwoldt, A., & Harper, S. (2022). The Challenges and Prospects of Women Fisherfolk in Makoko, Lagos State, Nigeria. *Coastal Management*, 50(2), 124–141.
<https://doi.org/10.1080/08920753.2022.2022969>

- Pavez, Camila. 2016. Salmonicultura y los nuevos pesacadores. Relaciones de conflicto y cooperación. In Román, A., Barton, J., Bustos, B., Salazar, A. (2016) (Eds): Revolución Salmonera, paradojas y transformaciones territoriales en Chiloé. RIL editores, Santiago.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71.
<https://doi.org/10.1136/bmj.n71>
- Petticrew, M., & Roberts, H. (2005). *Systematic Reviews in the Social Sciences: A Practical Guide*. John Wiley & Sons, Incorporated. <http://ebookcentral.proquest.com/lib/waterloo/detail.action?docID=239885>
- Porter, M. (1985). “She Was Skipper of the Shore-Crew:” Notes on the History of the Sexual Division of Labour in Newfoundland. *Labour (Halifax)*, 15, 105–123. <https://doi.org/10.2307/25140555>
- Prado, D., Armitage, D., Nayak, P., Arriagada, N., Castillo, T., de la Lama, R. L., Trimble, M., & Epstein, G. (2026). Threats and prospects for the viability of small-scale fishing communities in Latin America: A systematic review of conflicts and blue injustices. *Ocean & Coastal Management*, 271, 107934.
<https://doi.org/10.1016/j.ocecoaman.2025.107934>
- Ravera, F., Iniesta-Arandia, I., Martín-López, B., Pascual, U., & Bose, P. (2016). Gender perspectives in resilience, vulnerability and adaptation to global environmental change. *Ambio*, 45(S3), 235–247.
<https://doi.org/10.1007/s13280-016-0842-1>
- Rao, N., Mishra, A., Prakash, A., Singh, C., Qaisrani, A., Poonacha, P., Vincent, K., & Bedelian, C. (2019). A qualitative comparative analysis of women’s agency and adaptive capacity in climate change hotspots in Asia and Africa. *Nature Climate Change*, 9(12), 964–971. <https://doi.org/10.1038/s41558-019-0638-y>
- Resurreccion, B. P. (2006). Gender, Identity and Agency in Philippine Upland Development. *Development and Change*, 37(2), 375–400. <https://doi.org/10.1111/j.0012-155X.2006.00482.x>

- Resurrección, B. P. (2017). From 'women, environment, and development' to feminist political ecology. In MacGregor, S. (Ed.). (2017). *Routledge Handbook of Gender and Environment*. <https://doi.org/10.4324/9781315886572> pp. 71-85.
- Resurrección, B. P., & Elmhirst, R. (2020). We build the power in empowerment: Feminist activism at the forefront of environment and climate change arenas. In *Negotiating Gender Expertise in Environment and Development*. Routledge.
- Rice, E. D., Gondwe, E., Bennett, A. E., Okanga, P. A., Osho-Abdulgafar, N. F., Fakoya, K., Oloko, A., Harper, S., Kawaye, P. C., Chuku, E. O., & Smith, H. (2024). The future of gender research in small-scale fisheries: Priorities and pathways for advancing gender equity. *Fish and Fisheries*, 25(3), 401–408. <https://doi.org/10.1111/faf.12814>
- Román, A., Barton, J., Bustos, B., Salazar, A. (2016): Revolución Salmonera, paradojas y transformaciones territoriales en Chiloé. RIL editores, Santiago.
- Rocheleau, D. E. (1995). Gender and Biodiversity: A Feminist Political Ecology Perspective. *IDS Bulletin*, 26(1), 9–16. <https://doi.org/10.1111/j.1759-5436.1995.mp26001002.x>
- Robeyns, Ingrid and Morten Fibieger Byskov, "The Capability Approach," *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition), Edward N. Zalta (ed.)
- Rohe, J., Schlüter, A., & Ferse, S. C. A. (2018). A gender lens on women's harvesting activities and interactions with local marine governance in a South Pacific fishing community. *Maritime Studies*, 17(2), 155–162. <https://doi.org/10.1007/s40152-018-0106-8>
- San Martin, V. A., Vasquez Lavín, F., Ponce Oliva, R. D., Lerdón, X. P., Rivera, A., Serramalera, L., & Gelcich, S. (2020). Exploring the adaptive capacity of the mussel mariculture industry in Chile. *Aquaculture*, 519, 734856. <https://doi.org/10.1016/j.aquaculture.2019.734856>
- Sen, A. (1985). Well-Being, Agency and Freedom: The Dewey Lectures 1984. *The Journal of Philosophy*, 82(4), 169–221. <https://doi.org/10.2307/2026184>
- Sen, A., Agarwal, B., Humphries, J., & Robeyns, I. (2003). CONTINUING THE CONVERSATION. *Feminist Economics*, 9(2–3), 319–332. <https://doi.org/10.1080/1354570032000089788>

- Shiva, V. (1988). *Staying alive: Women, ecology, and survival in India* (Vol. 84): Kali for Women New Delhi.
- Silva, M. R. O., Silva, A. B., Barbosa, J. C., Amaral, C., & Lopes, P. F. M. (2022). Empowering fisherwomen leaders helped reduce the effects of the COVID-19 pandemic on fishing communities: Insights from Brazil. *Marine Policy*, 135, 104842. <https://doi.org/10.1016/j.marpol.2021.104842>
- Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, 16(3), 282–292. <https://doi.org/10.1016/j.gloenvcha.2006.03.008>
- Smith, H., & Basurto, X. (2019). Defining Small-Scale Fisheries and Examining the Role of Science in Shaping Perceptions of Who and What Counts: A Systematic Review. *Frontiers in Marine Science*, 6. <https://doi.org/10.3389/fmars.2019.00236>
- Smith, H., Basurto, X., & St Martin, K. (2023). Enacting food system transformation through the Small-Scale Fisheries Guidelines. *Maritime Studies*, 23(1), 2. <https://doi.org/10.1007/s40152-023-00339-9>
- Sreya, P. S., Parayil, C., Aswathy, N., Bonny, B. P., Aiswarya, T. P., & Nameer, P. O. (2021). Economic vulnerability of small-scale coastal households to extreme weather events in Southern India. *Marine Policy*, 131, 104608. <https://doi.org/10.1016/j.marpol.2021.104608>
- Sultana, F. (2011). Suffering for water, suffering from water: Emotional geographies of resource access, control and conflict. *Geoforum*, 42(2), 163–172. <https://doi.org/10.1016/j.geoforum.2010.12.002>
- Sundberg, J. (2017). Feminist Political Ecology. In *International Encyclopedia of Geography* (pp. 1–12). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118786352.wbieg0804>
- Szymkowiak, M. (2020). Genderizing fisheries: Assessing over thirty years of women’s participation in Alaska fisheries. *Marine Policy*, 115, 103846. <https://doi.org/10.1016/j.marpol.2020.103846>
- Too Big To Ignore (2026). <http://toobigtoignore.net/> [Last visited May 28, 2026]
- Turner, B. L., Kasperson, R. E., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L., Eckley, N., Kasperson, J. X., Luers, A., Martello, M. L., Polsky, C., Pulsipher, A., & Schiller, A. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences*, 100(14), 8074–8079. <https://doi.org/10.1073/pnas.1231335100>

United Nations. (2026). *The third world ocean assessment: State of the marine environment*. United Nations.

<https://woa.un.org/>

Weeratunge, N., Béné, C., Siriwardane, R., Charles, A., Johnson, D., Allison, E. H., Nayak, P. K., & Badjeck,

M.-C. (2014). Small-scale fisheries through the wellbeing lens. *Fish and Fisheries*, 15(2), 255–279.

<https://doi.org/10.1111/faf.12016>

Weeratunge, N., Snyder, K. A., & Sze, C. P. (2010). Gleaner, fisher, trader, processor: Understanding gendered

employment in fisheries and aquaculture. *Fish and Fisheries*, 11(4), 405–420.

<https://doi.org/10.1111/j.1467-2979.2010.00368.x>

Zhao, M., Tyzack, M., Anderson, R., & Onoakpovike, E. (2013). Women as visible and invisible workers in

fisheries: A case study of Northern England. *Marine Policy*, 37, 69–76.

<https://doi.org/10.1016/j.marpol.2012.04.013>

Appendix: A Survey in Spanish

Encuesta sobre Pesca Artesanal en Chiloé 2024

Gracias por su tiempo para responder esta encuesta. La encuesta toma aproximadamente 15 minutos. Tus respuestas serán completamente confidenciales, así que por favor responda con honestidad. Su participación es voluntaria por lo que puede desistir de responder y/o participar en cualquier momento. A su vez, puede no responder preguntas si estas le generan incomodidad.

DESDE YA MUCHAS GRACIAS POR RESPONDER.

DATOS PARA EL SUPERVISOR	
Fecha:	Encuestador:
Encuesta número #	Duración:
Donde fue tomada la encuesta:	Teléfono contacto:

Información General sobre ocupación. Marque con una X donde corresponda			
P1. ¿Con cuantas personas vive en su hogar? Marque con una X	0	P5. [SOLO PARA ACTIVIDADES CONEXAS]: ¿Qué tipo de actividad conexas realiza?	Encarnadores
	1		Charqueadores
	2		Ahumadores
	3		Tejedor (a)
	4		Fileteador (a)
	5		Carapacheros
	6 o mas		Desconchador (a)
			Otro
P2. ¿Es usted uno de los principales proveedores de su familia? Marque con una X	Si	P6. ¿Tiene usted registro pesquero artesanal (RPA) o Registro de Actividades Conexas (RAC)? Marque con una X	Si
	No		No
P3. ¿Cuántas personas en su familia Ud. apoya financieramente? Marque con una X	0	P7. ¿Pertenece a una agrupación, sindicato, asociación o federación de pesca? Marque con una X	Si
	1		No
	2		
	3		
	4 o mas		
P4. ¿Cuál es su principal actividad asociada a la pesca artesanal? Marque con una X	Armador (a)	P8. [Solo si responde SI en P7] ¿Qué tipo de agrupación, sindicato, asociación o federación pertenece? Marque con una X	Solo hombres
	Pescador artesanal		Mixto
	Recolector de orilla		
	Buzo		
	Actividades conexas		Solo mujeres
	Otro:		

A continuación, le leeré una serie de problemas ambientales. POR FAVOR RESPONDA SI O NO, SI HA EXPERIMENTADO LOS SIGUIENTES PROBLEMAS	P9.1 EN LOS ULTIMOS 12 MESES		P10.1 LE HA DIFICULTADO O IMPEDIDO REALIZAR SU TRABAJO EN PESCA	
a) Inundación	Si	No	Si	No
b) Sequia/escasez de agua	Si	No	Si	No
c) Temporal o tormenta severa	Si	No	Si	No

d) Bloom de algas (marea roja, marea café)	Si	No	Si	No
e) Contaminación en el mar y borde costero	Si	No	Si	No
f) Otro _____	Si	No	Si	No

[SOLO SI RESPONDE SI EN ALGUNA DE LAS OPCIONES DE P9.1. Si responde NO en todas, saltar a P9.2]

P11.1 ¿COMO MANEJA LOS PROBLEMAS AMBIENTALES MENCIONADOS ANTERIORMENTE?

Marque con una X donde corresponda

a) Buscando nuevas fuentes de información sobre cómo lidiar con esos problemas	Si	No
b) Preparándome con anticipación para esos eventos	Si	No
c) Buscando ayuda externa (Municipalidad, Apoyo Institucional, del Estado, Organismo Pesquero, etc.)	Si	No
d) Me organizo con la comunidad, colegas y/o vecinos para lidiar con estos problemas	Si	No
e) No mucho, improviso en caso de que ocurra	Si	No
f) Otro. ¿Cual?	Si	No

A continuación, le leeré una serie de problemas relacionados con el <u>recurso pesquero</u>. POR FAVOR RESPONDA SI O NO, SI HA EXPERIMENTADO LOS SIGUIENTES PROBLEMAS	P9.2 EN LOS ULTIMOS 12 MESES		P10.2 LE HA DIFICULTADO O IMPEDIDO REALIZAR SU TRABAJO EN PESCA	
g) Capturar menos recurso pesquero	Si	No	Si	No
h) Disminución del recurso pesquero	Si	No	Si	No
i) Aumento del costo del equipo de trabajo de pesca/marisca	Si	No	Si	No
j) Daño en el equipo y/o material de pesca	Si	No	Si	No
k) Robo del material o equipo de pesca	Si	No	Si	No
l) Problemas con pesca industrial y/o acuicultura	Si	No	Si	No
m) Falta de acceso al recurso pesquero	Si	No	Si	No
n) Otro _____	Si	No	Si	No

[SOLO SI RESPONDE SI EN ALGUNA DE LAS OPCIONES DE P9.2. Si responde NO en todas, saltar a P9.3]

P11.2 ¿COMO MANEJA LOS PROBLEMAS DEL RECURSO PESQUERO MENCIONADOS ANTERIORMENTE? Marque con una X

g) Trabajo extra en el tema pesquero (extraer más recurso, diversificar recurso y/o método de extracción, etc.).	Si	No
h) Buscando nuevas fuentes de ingreso económico <u>fuera</u> del rubro pesquero artesanal (por ejemplo, actividades complementarias, microemprendimientos, operadores de centros acuícolas, etc.)	Si	No
i) Venta del equipo y/o material de pesca y/o recolección	Si	No
j) Pedir un préstamo (familia, amigos, banco, etc.).	Si	No
k) Usar los ahorros	Si	No
l) Pido ayuda y/o me organizo con mi sindicato y/o organización asociada a la pesca artesanal	Si	No
m) No mucho, improviso en caso de que ocurra	Si	No
n) Pido ayuda y/o apoyo en instituciones (Municipalidad, Estado, etc.)	Si	No
o) ¿Otro? Por favor explique	Si	No

A continuación, le leeré una serie de <u>problemas personales</u>. POR FAVOR RESPONDA SI O NO, SI HA EXPERIMENTADO LOS SIGUIENTES PROBLEMAS....	P9.3 EN LOS ULTIMOS 12 MESES		P10.3 LE HA DIFICULTADO O IMPEDIDO REALIZAR SU TRABAJO EN PESCA	
o) Accidente	Si	No	Si	No
p) Falta de alimento/inseguridad alimentaria	Si	No	Si	No

q) Enfermedad	Si	No	Si	No
r) Adicciones	Si	No	Si	No
s) Muerte de un miembro de la familia	Si	No	Si	No
t) Robo/inseguridad en el hogar	Si	No	Si	No
u) Prestar dinero a un familiar	Si	No	Si	No
v) Problemas de vivienda (falta de vivienda, falta de acceso a servicios básicos y/o pago de arriendo, etc).	Si	No	Si	No
[SOLO SI RESPONDE SI EN ALGUNA DE LAS OPCIONES DE P9.3. Si responde NO en todas, saltar a P9.4]				
P11.3 ¿COMO MANEJA LOS PROBLEMAS PERSONALES MENCIONADOS ANTERIORMENTE? [Marque con una X donde corresponda]				
p) Buscar ayuda en mi círculo cercano o en mis redes de apoyo				Si No
q) Trato de evitar problemas o confrontación y continúo haciendo todo de la misma forma				Si No
r) Busco ayuda fuera de mi círculo cercano y/o de apoyo (municipalidad, entidades del Estado, etc.)				Si No
s) Otro. Explique				Si No

A continuación, le leeré una serie de problemas en torno a relaciones sociales, redes de apoyo y cuidados, etc.	P9.4 EN LOS ULTIMOS 12 MESES		P10.4 LE HA DIFICULTADO O IMPEDIDO REALIZAR SU TRABAJO EN PESCA	
POR FAVOR RESPONDA SI O NO, SI HA EXPERIMENTADO LOS SIGUIENTES PROBLEMAS....				
w) Actividades de cuidado (de hijos, adulto mayor, etc.)	Si	No	Si	No
x) Falta de cooperación en el trabajo doméstico o labores del hogar	Si	No	Si	No
y) Falta de redes de apoyo	Si	No	Si	No
z) Exclusión en la toma de decisiones de la organización de pesca en que participa	Si	No	Si	No
aa) Exclusión en la toma de decisiones del hogar	Si	No	Si	No
bb) Otro _____	Si	No	Si	No

[SOLO SI RESPONDE SI EN ALGUNA DE LAS OPCIONES DE P9.4. Si responde NO en todas, saltar a P12.]				
P11.4 ¿COMO MANEJA LOS PROBLEMAS EN TORNO A RELACIONES SOCIALES Y DE CUIDADO MENCIONADOS ANTERIORMENTE? Marque con una X donde corresponda				
t) Trato de evitar problemas o confrontación y continúo haciendo todo de la misma forma				Si No
u) Buscar ayuda en mi círculo o redes de apoyo				Si No
v) Confronto la situación y busco la cooperación y/o ayuda que necesito				Si No
w) Otro. Explique.				Si No

P12. Señale su nivel de acuerdo respecto a la siguiente afirmación: “Experimentar los problemas o factores de stress mencionados arriba generan una carga emocional y/o preocupación que dificulta realizar mi trabajo”	Muy de acuerdo
	De acuerdo
	En desacuerdo
	Muy en desacuerdo

DIMENSIONES RELACIONALES Y SUBJETIVAS		
P13. ¿Le gustaría que su hijo (a)/hijos (as) se dedique a la pesca artesanal en el futuro?	Si	No

P14. Tiene ud. a alguien que lo pueda ayudar en las siguientes situaciones:		
[Marque con una X en todas las que corresponda]		
1. Pueda ayudar en el cuidado en caso de enfermedad de algún miembro del hogar	Si	No
2. Pueda facilitar un vehículo si el hogar lo necesita	Si	No
3. Pueda prestar dinero al hogar en caso de emergencia	Si	No
4. Pueda ayudar al hogar a resolver consultas o realizar trámites legales o financieros	Si	No
5. Pueda ayudar al hogar en el uso de tecnologías (computador, internet, etc.)	Si	No
6. Pueda ayudar con reparaciones del hogar (gasfitería, mecánica, albañilería, etc.)	Si	No
7. Pueda ayudar a conseguir un trabajo a un miembro del hogar (servir de referencias, información o contratar).	Si	No
8. Pueda aconsejar a los miembros del hogar en caso de problemas personales o familiares	Si	No
P15. En los últimos 12 meses, ha tenido que dejar de trabajar debido a alguno de las siguientes responsabilidades: Marque con una X todas las que corresponda		
a) Cuidado de hijos	Si	No
b) Cuidado de un adulto mayor	Si	No
c) Cuidado de un familiar con discapacidad y/o enfermedad	Si	No
d) Debido a labores del hogar	Si	No

Información general						
P16. Género	Femenino	P22. Ud. ¿Se identifica como indígena?	Si	No	No sabe	
	Masculino					
	Otro					
P17. Ciudad de residencia		P23. [Solo si responde sí en P22] ¿Pertenece Ud. a alguna agrupación indígena?	Si			
			No			
			No sabe			
P18. Edad (años)		P24. [Solo si responde sí en P23] En la agrupación indígena a la que Ud. pertenece, ¿son parte o han solicitado una ECMPO?	Si			
P19. ¿Nació ud. en Chiloé?	Si		No			
	No		No sabe			
	No sabe					
P20. Nivel educacional	Sin educación formal	Bote	Si	No		
	Básica incompleta	Lancha menor	Si	No		
	Básica completa	Lancha media	Si	No		
	Media incompleta	Lancha mayor	Si	No		
	Media completa	Equipo de pesca o actividades afines	Si	No		
	Ed. Superior/ técnica incompleta	Vivienda	Si	No		
	Ed. Superior/técnica completa	Sitio o parcela	Si	No		
	Educación Profesional incompleta	Ganado	Si	No		
	Educación Profesional completa	Celular	Si	No		
	Magister/Doctorado	Auto	Si	No		
	P21. Estado civil	Casado (a)	Acceso a Escuela para sus hijos (as)	Si	No	
		Soltero (a)	Acceso a médico o ayuda medica	Si	No	

	Viviendo con pareja	Ahorro	Si	No
	Viudo o viuda	Acceso a servicios Bancarios	Si	No

Fin del cuestionario.

¡Gracias!

Appendix B – Survey in English

SSF survey questionnaire

Thank you for taking the time to answer this questionnaire. The survey takes approximately 20 minutes to answer. Your responses will be completely anonymous, so please reply with confidence and honesty. You are entitled to withdraw from answering the survey at any time. Thank you!

Date (day, month, year):	Interviewer:
Survey #	Gender of respondent:
Location of survey was taken:	Duration:

General information about the occupation			
P1. How many family members do you have (that live with you)? Mark with an X	1	P7. What is your artisanal fishery main activity? Mark with an X	Gleaner/ harvester (<i>recolector</i>)
	2		Boat owner (<i>armador</i>)
	3		Diver (<i>buzo</i>)
	4		Artisanal fisher
	5 or more		Other:
P2. Are you the primary earner of your family? Mark with an X	Yes	P8. Do you belong to a Union, Syndicate, or fishery association? Mark with an X	Yes
	No	P9. IF YES in P8. What kind of syndicate do you belong to? Mark with an X	No
			Mixed-gender
			Male-only
		Women-only	
P3. How many people in your family do you support financially?	1	P10. Do you have an artisanal fishery license (RPA)? Mark with an X	Yes
	2		No
	3		
	4 or more		
P4. What is your primary occupation?		P.11 Since when do you have RPA? (Month, year)	
P5. What is the primary source of income of your family?		P.12 What are the main species you catch?	

Please answer YES or No if you have experienced the following environmental stressors	P9.1 In the last 12 months		P10.1 (If Yes in P9) If they had made your work difficult in SSF		
cc) Flood	Yes	No	Yes	No	
dd) Drought/water scarcity	Yes	No	Yes	No	
ee) Storm or severe weather	Yes	No	Yes	No	
ff) Algal blooms	Yes	No	Yes	No	
gg) Ocean and coastal pollution	Yes	No	Yes	No	
hh) Other	Yes	No	Yes	No	
[ONLY IF YES IN P9.1. IF NO, jump to P9.2]					
P11.1 How do you deal with the environmental problems mentioned? Mark with an X					
x) Seeking new sources of information on how to deal with these problems				Yes	No
y) Preparing myself beforehand				Yes	No
z) Seeking external institutional help (Municipality, Fisheries Department, etc.)				Yes	No

aa) Collective organizations with syndicate or neighbours	Yes	No
bb) Not much, I improvise as they occur	Yes	No
cc) Other?	Yes	No

Please answer YES or No if you have experienced the following PROBLEMS RELATED WITH THE FISHERY RESOURCE	P9.2 In the last 12 months		P10.2 (If Yes in P9.2) If they had made your work difficult in SSF	
ii) Catch less resource	Yes	No	Yes	No
jj) Decrease in fishery resource	Yes	No	Yes	No
kk) Increase in fishing gear	Yes	No	Yes	No
ll) Damage in fishing gear	Yes	No	Yes	No
mm) Robbery of the fishing gear	Yes	No	Yes	No
nn) Problems with industrial Fisheries or aquaculture	Yes	No	Yes	No
oo) Lack of Access to fishery resource	Yes	No	Yes	No
pp) Other	Yes	No	Yes	No

[Only if Yes in P9.2. If NO, jump to P9.3]

P11.2 ¿How do you deal with the fishery resource problems mentioned? MARK WITH AN X

dd) I work more in the SSF activity (more extraction, diversification of resources or methods, etc.)	Yes	No
ee) Seeking new sources of income outside SSF	Yes	No
ff) Selling fishing gear or related material	Yes	No
gg) Ask for a loan (bank, friends, family, etc.)	Yes	No
hh) Use savings	Yes	No
ii) Ask for help to ssf syndicate or organization	Yes	No
jj) Not much, I improvise when they occur	Yes	No
kk) Ask for help and support from institutions (Municipality, state, etc.)	Yes	No
ll) Other	Yes	No

Please answer YES or No if you have experienced the following PERSONAL PROBLEMS	P9.3 In the last 12 months		P10.3 (If Yes in 9.3) If they had made your work difficult in SSF	
qq) Accident	Yes	No	Yes	No
rr) Food insecurity	Yes	No	Yes	No
ss) Disease or illness	Yes	No	Yes	No
tt) Adicctions	Yes	No	Yes	No
uu) Death of a family member	Yes	No	Yes	No
vv) Robbery/home insecurity	Yes	No	Yes	No
ww) Lend money to a family member	Yes	No	Yes	No
xx) Housing problems	Yes	No	Yes	No

[Only if YES in P9.3. If NO, jump to P9.4]

P11.3 ¿How do you deal with the personal problems mentioned? MARK WITH AN X

mm) Seek help and support in my support system/inner circle (friends, family)	Yes	No
nn) Try to avoid any confrontation and keep going the same way	Yes	No
oo) Seek help and support outside my support system (municipality, State, etc.)	Yes	No
pp) Other	Yes	No

Next, I will read you a series of questions about social relationships, support networks, caregiving, and related issues. PLEASE ANSWER YES OR NO IF YOU HAVE EXPERIENCED ANY OF THE FOLLOWING PROBLEMS....	P9.4 In the last 12 months		P10.4 If they had made your work difficult in SSF	
yy) Caring roles (children, elders, etc.)	Yes	No	Yes	No
zz) Lack of cooperation in domestic labour and caring responsibilities	Yes	No	Yes	No
aaa) Lack of support system	Yes	No	Yes	No
bbb) Exclusion from decision-making in the SSF organization	Yes	No	Yes	No
ccc) Exclusion from decision-making in the household	Yes	No	Yes	No
ddd) Other _____	Yes	No	Yes	No

Only if YES in P9.4. If NO, jump to P12.]

P11.4 ¿How do you deal with the social problems mentioned? MARK WITH AN X

qq) Try to avoid any confrontation and keep going the same way	Yes	No
rr) Seek help and support in my support system/inner circle (friends, family)	Yes	No
ss) I confront the situation and seek for the help and support I need	Yes	No
tt) Other _____	Yes	No

P12. Please indicate your level of agreement with the following sentence:

Experiencing the problems or stressors mentioned above creates an emotional burden and/or worry that makes it difficult for me to carry out my work.

Strongly agree

Agree

Disagree

Strongly Disagree

RELATIONAL AND SUBECTIVE DIMENSIONS		
P13. “Would you like your child/children to pursue artisanal fishing in the future?”	YES	No
P14. Tiene ud. a alguien que lo pueda ayudar en las siguientes situaciones:		
[Marque con una X en todas las que corresponda]		
9. Be able to help with caregiving in the event that a household member becomes ill	Yes	No
10. Be able to provide a vehicle if the household needs one	Yes	No
11. Be able to lend money to the household in case of an emergency	Yes	No
12. Be able to lend money to the household in case of an emergency	Yes	No
13. Be able to help the household resolve questions or complete legal or financial procedures	Yes	No
14. Be able to help household members use technology (computer, internet, etc.)	Yes	No
15. Be able to help with household repairs (plumbing, mechanical repairs, masonry, etc.)	Yes	No
16. Be able to help a household member find a job (by providing references or information, or by hiring them)	Yes	No
17. Be able to provide advice to household members in the event of personal or family problems	Yes	No

P15. In the past 12 months, have you had to stop working due to any of the following responsibilities? Please check (✓) all that apply.		
e) Childcare	Yes	No
e) Caregiving for an older adult	Yes	No
f) Caregiving for a family member with a disability and/or illness	Yes	No
g) Due to household responsibilities	Yes	No

General information					
P16. Self-identified gender	Female	P21.a Do you self-identify as indigenous or with indigenous ancestry?	Yes	No	I don't know
	Male				
	Bon-binary	P21. b If Yes in p21.b Please specify.			
	Other				
P17. Town/area of residence		P.22 Where you born in Chiloé?	Yes	No	
P18. Age (years)		P23. Do you own the following:	Yes	No	
P19. Level of education	No formal education	Bote			
	Elementary incomplete	Lancha menor			
	Elementary complete	Lancha media			
	High School incomplete	Lancha mayor			
	High School complete	Fishing net/equipment			
	Post-secondary (non-college) studies incomplete	House			
	Post-secondary (non-college) studies complete	Piece of land			
	College degree/university level incomplete	Livestock			
	College degree/university level complete	Cellphone			
	Graduate	Car			
P20. Marital status	Married	Access to school for children			
	Single	Access to a doctor			
	Living with couple (not married)	Savings			
	Widow/widower	Access to a banking service			

End of the questionnaire. Thank you!

Appendix C – Interview Script

1. Please tell me a little bit about yourself. Your name, where you are from, what type of SSF activity you do, etc.
2. How did you start in fishery-related activities?
3. Do you belong to a union, syndicate, or fishery organization? Tell me about it (the history of the union, since when is part of it, etc.).
4. What advantages do you perceive from the fishery activity do you perform?
5. What obstacles can you identify in SSF these days, particularly in your main activity? Please explain. How does it make you feel?
6. When you are confronting personal, environmental, or any stressors that make your fishery activity difficult, how do you deal with them? What resources or toolbox can you identify to overcome those obstacles?
7. What role does the union play in your fishery activity? What advantages do you have to belonging to an organization? What disadvantages do they bring?
8. What is your perception of Fishery authority and related institutional arrangements, including the RPA, fisheries regulations, etc.? Do you feel supported?
9. Do you perceive gender differences in the fisheries-related activities? What about decision-making in your union? And your personal life? Please elaborate.
10. Let's reflect on your life for a minute. Do you feel that you can make important decisions in your life? What about your household and family? Please explain.
11. Similarly, do you think you have the capacity to be heard and make important decisions regarding your fishery-related organization? Please explain.
12. How influential has been being a fisher in your personal life? What advantages and disadvantages have brought over time?
13. How do you see SSF in 20 years? Would you like your children to dedicate themselves to SSF? Please elaborate.

Appendix D – Participatory workshops outline

Governance and Gender Equity in Small-Scale Fisheries

Chile is the only country in the world with a Gender Equity Law for fisheries (Law 21.370). This law was driven by women small-scale fishers. It recognizes related fishing activities, which are generally feminized forms of work. There is a National Registry of Related Fishing Activities, which now officially recognizes these activities as fundamental to small-scale fisheries. However, there is still a lack of clarity regarding the practical benefits of registering in this registry.

Objectives

1. Raise awareness of Law 21.370 and provide participants with related informational materials.
2. Explore the implications of Law 21.370 – What does this law mean in practical terms for your life?
 - a. Practical implications b. Symbolic implications i. Recognition ii. Meanings iii. Agency (for example, deciding not to register in the National Registry of Related Fishing Activities because it is strategically disadvantageous demonstrates women's capacity for agency)
3. Social participation

Workshop Plan

1. Introduction

- a. Introductions in a circle
 - Who are you?
 - Why are you here today?
- b. Presentation of the project
 - Why have we invited you?
 - What do we want to learn?
 - How can this project contribute?

2. Gender Equity in Your Work

Objective: To understand women's perceptions and experiences of gender inequalities in their work within their local communities.

Method: Participants engage in a facilitated discussion circle guided by a series of prompting questions.

Discussion questions:

- What does it mean to be a woman shore gatherer today in Dalcáhué/Quinchao?
- What situations do you perceive as unequal between women and men?
- In which social or community organizations do you participate?
- How do you balance work, private life, and social participation?

3. Talking about the Fisheries Gender Equity Law

Objective: To introduce participants to a legal instrument designed to reduce the inequalities they have experienced—and continue to experience.

Method: Using excerpts from Law 21.370, participants discuss the law and its implications.

Selected excerpts from the law:

- “To promote equal rights and opportunities for women and men within the sector.”
- "To eliminate all forms of gender-based discrimination."
- "To promote the full participation of women in cultural, political, economic, and social spheres, as well as the exercise of their human rights and fundamental freedoms."
- "Recognition of related fishing activities through the National Registry of Related Fishing Activities."

Discussion questions:

- What do you think about Law 21.370?
- What benefits do you see in it?
- What challenges or limitations do you see?
- What position has your union (or unions) taken regarding the law?
- Have you registered in the National Registry of Related Fishing Activities? Why or why not?

4. Utopias

Objective: To imagine what participants' working lives would look like in the absence of gender discrimination and gender inequalities.

Method: Participants co-create an “exquisite corpse” poem using utopian statements that emerge from their own responses. As the discussion unfolds, the facilitation team writes participants' answers on pre-cut strips of coloured paper. These individual phrases are then combined into a collective poem.

Prompting questions:

- How do you imagine your work if gender inequalities no longer existed?
- What would your relationships with others working in your sector look like?
- Where and under what circumstances would you carry out your work?
- Would you like your daughters to continue this occupation?
- What would participation in your union look like? Would unions still exist? Would they be mixed-gender or women-only?
- What kinds of care and training spaces would exist?
- How would young people perceive this occupation? The final collective poem will be photocopied and printed for participants

Appendix E – Consent form interviews Spanish

Título del Proyecto: Navegando Vulnerabilidad y viabilidad en la Pesca Artesanal con perspectiva interseccional en Chiloé, Chile

Supervisor:

Dr. Prateep Nayak
Associate Professor, SERS
University of Waterloo
pnayak@uwaterloo.ca
519-888-4567, ext. 43112

Investigadora Principal:

Nayadeth Arriagada
Ph.D candidate in Social-Ecological Sustainability, University of Waterloo
E-mail: narriaga@uwaterloo.ca

Esta carta explica de qué se trata el estudio, los posibles riesgos y beneficios y sus derechos como participante de la investigación. Puede imprimir/guardar una copia para sus registros. Si no entiende algo en la carta, pregúntele a uno de los investigadores antes de dar su consentimiento para participar.

Propósito: El proyecto tiene como objetivo caracterizar el papel del género y otras categorías como la clase y la indigeneidad en cómo las mujeres y los hombres involucrados en la pesca artesanal en Chiloé, Chile, enfrentan los desafíos sociales y ambientales, y cómo intentan superarlos. Para lograrlo, el estudiante investigador realizará entrevistas, encuestas y grupos focales con pescadores artesanales locales en Chiloé. La atención se centrará en su capacidad para influir en la toma de decisiones, cómo se organizan dentro de sus sindicatos, sus propias perspectivas sobre los desafíos sociales y ambientales y cómo las mujeres sortean con precisión los diferentes tipos de barreras que hacen vulnerable a la pesca artesanal, y sus estrategias para superar esas barreras.

Procedimientos: como participante de este estudio, se le pedirá que responda una entrevista, que tiene una duración de 1 a 1.30 hora minutos, y se realizará a su conveniencia con la presencia del investigador. En este cuestionario, se le harán una serie de preguntas sobre su experiencia con la pesca artesanal en Chiloé, sus puntos de vista sobre el desarrollo de factores estresantes ambientales en Chiloé y sus desafíos personales. Su testimonio será confidencial y se le asignará otro nombre a su relato, por lo que no hay forma posible de vincular tus respuestas con su identidad. Esta entrevista será grabada (solo grabadora de voz) con fines de análisis y luego transcrita. Los resultados serán presentados como parte de la tesis doctoral del estudiante investigador, con la intención de su posterior publicación en artículos de revistas académicas.

Confidencialidad: si acepta participar en este estudio, su participación será confidencial y se asignarán otros nombres a su testimonio para que su entrevista no sea identificable. También podrá revisar las transcripciones de las entrevistas.

Riesgos: Su participación no implica riesgos distintos a los que encontraría en la vida diaria. Sin embargo, si se siente emocionalmente molesto o incómodo al responder y discutir algunas de las preguntas, puede negarse a responderlas.

Remuneración/Compensación: No hay remuneración disponible por su participación. Tu contribución puede beneficiarte al permitirte compartir tus experiencias y opiniones sobre la situación de la pesca artesanal en Chiloé.

Beneficios: No existen beneficios potenciales para usted al participar en este estudio además de la posibilidad de aumentar la conciencia de algunos de sus comportamientos y actitudes hacia su experiencia relacionada con Chiloé y sus preocupaciones sociales y ambientales. Sin embargo, en el futuro, otros pueden beneficiarse de lo que aprendamos en este estudio y podemos contribuir a la sociedad contando la historia de los desafíos de la pesca artesanal y los problemas ambientales de Chiloé.

Recopilación de datos: las grabaciones y transcripciones de su entrevista se almacenarán en la computadora del estudiante investigador, que está encriptada y necesita una contraseña para acceder a fin de garantizar la privacidad de sus registros. Al mismo tiempo, se almacenará una copia segura en la nube OneDrive de la Universidad de Waterloo, que también está segura y protegida. Sus datos se mantendrán almacenados de forma segura durante al menos 5 años y, después de eso, serán destruidos.

Participación voluntaria: Su participación en este estudio es voluntaria y usted es libre de retirarse en cualquier momento. También es libre de ocultar su opinión sobre experiencias particulares si lo desea. Se le permite retirarse del estudio en cualquier momento. Si se retira, no se recopilará más información sobre usted. Cuando indique que desea retirarse, el investigador le preguntará si se pueden utilizar los materiales ya recopilados en el estudio. Si ese no es el caso, el investigador documentaría el retiro, eliminaría los datos del estudio y eliminaría los registros pertenecientes al participante. Una vez que los materiales se publiquen en la tesis final y en futuros artículos de revistas, no es posible retirarlos.

Información ética: Este estudio ha sido revisado y recibido autorización ética a través de la Junta de Ética en Investigación de la Universidad de Waterloo (REB #45734). Si tiene preguntas para la Junta, comuníquese con la Oficina de Ética en Investigación, al número gratuito 1-833-643-2379 (Canadá y EE. UU.), 1-519-888-4440 o reb@uwaterloo.ca.

Personas de contacto: Si tiene alguna pregunta sobre este estudio, puede comunicarse con Nayadeth Arriagada.

Consentimiento: He leído este formulario y se me ha explicado el estudio de investigación. Me han dado la oportunidad de hacer preguntas y mis preguntas han sido respondidas. Si tengo preguntas adicionales, me han dicho a quién contactar. Acepto participar en el estudio de investigación descrito anteriormente y recibiré una copia de este formulario de consentimiento.

Firma participante

Fecha

Nombre (imprenta)

teléfono

Email

Appendix F – Consent form Interviews English

Project Title: Navigating Vulnerability and Viability in Small-Scale Fisheries through an Intersectional Perspective in Chiloé, Chile

Supervisor:

Dr. Prateep Nayak
Associate Professor, SERS
University of Waterloo
pnayak@uwaterloo.ca
519-888-4567, ext. 43112

Principal Investigator:

Nayadeth Arriagada
Ph.D. Candidate in Social-Ecological Sustainability, University of Waterloo
Email: narriaga@uwaterloo.ca

Purpose of this Information Letter: This letter explains what the study is about, the potential risks and benefits of participating, and your rights as a research participant. You may print or save a copy of this letter for your records. If there is anything in this letter that you do not understand, please ask one of the researchers before providing your consent to participate.

Purpose of the Study: The purpose of this project is to examine the role of gender and other social categories, such as class and indigeneity, in how women and men involved in small-scale fisheries in Chiloé, Chile, experience and respond to social and environmental challenges. To achieve this, the student researcher will conduct interviews, surveys, and focus groups with local small-scale fishers in Chiloé. The study will focus on participants' ability to influence decision-making, how they organize within their unions, their own perspectives on social and environmental challenges, and how women navigate the different types of barriers that contribute to the vulnerability of small-scale fisheries. The study will also examine the strategies they use to overcome these barriers.

Procedures: As a participant in this study, you will be asked to take part in an interview lasting approximately **1 to 1.5 hours**, conducted at a time and location convenient for you, in the presence of the researcher. During the interview, you will be asked a series of questions about your experiences with small-scale fisheries in Chiloé, your views on the development of environmental stressors in Chiloé, and your personal challenges. Your testimony will be kept confidential, and a pseudonym will be assigned to your account so that your responses cannot be linked to your identity. The interview will be audio-recorded for analysis purposes and subsequently transcribed. The results will be presented as part of the student researcher's doctoral dissertation, with the intention of subsequently publishing findings in academic journal articles.

Confidentiality: If you agree to participate in this study, your participation will be kept confidential. A pseudonym will be assigned to your testimony so that your interview cannot be identified with you. You will also have the opportunity to review the transcripts of your interview.

Risks: Your participation in this study does not involve any risks beyond those you might encounter in everyday life. However, if you feel emotionally distressed or uncomfortable when answering or discussing any of the questions, you may decline to answer them.

Remuneration/Compensation: There is no remuneration available for your participation in this study. Your contribution may benefit you by providing an opportunity to share your experiences and opinions about the situation of small-scale fisheries in Chiloé.

Benefits: There are no direct benefits to you from participating in this study, other than the possibility of increasing your awareness of some of your behaviours and attitudes related to your experiences in Chiloé and your social and environmental concerns. However, others may benefit in the future from what we learn through this study. The research may also contribute to society by documenting the challenges faced by small-scale fisheries and the environmental issues affecting Chiloé.

Data Collection and Storage: The audio recordings and transcripts of your interview will be stored on the student researcher's computer, which is encrypted and requires a password for access to ensure the privacy and security of your records. A secure copy will also be stored on the University of Waterloo's OneDrive cloud storage system, which is protected and secure. Your data will be securely stored for a minimum of five years, after which it will be destroyed.

Voluntary Participation: Your participation in this study is voluntary, and you are free to withdraw at any time. You are also free to decline to share your opinions about particular experiences if you wish. If you decide to withdraw from the study, no further information about you will be collected. When you indicate that you wish to withdraw, the researcher will ask whether the materials already collected may still be used in the study. If you do not wish for the previously collected materials to be used, the researcher will document your withdrawal, remove your data from the study, and delete the records associated with your participation. Once the materials have been published in the final dissertation or in future academic journal articles, it will no longer be possible to withdraw them.

Ethics Information: This study has been reviewed and received ethics clearance through the University of Waterloo's Research Ethics Board (REB #45734). If you have questions for the Research Ethics Board, please contact the Office of Research Ethics at: Toll-free: 1-833-643-2379 (Canada and the U.S.) 519-888-4440 reb@uwaterloo.ca

Contact Information: If you have any questions about this study, you may contact Nayadeth Arriagada.

Consent: I have read this consent form, and the research study has been explained to me. I have been given the opportunity to ask questions, and my questions have been answered. If I have additional questions, I have been informed of whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form.

Participant's signature

Date

Name

phone

Email

Appendix G – Consent form survey English

Principal Investigator:

Dr. Prateep Nayak
Associate Professor, SERS
University of Waterloo
pnayak@uwaterloo.ca
519-888-4567, ext. 43112

Student Investigator:

Nayadeth Arriagada
Ph.D candidate in Social-Ecological Sustainability, University of Waterloo
Phone (Canada): 604 442 3457
Phone (Chile): +569 91560579
E-mail: narriaga@uwaterloo.ca

Project Title: Navigating vulnerability and viability in SSF with an intersectional lens in Chiloé, Chile

Purpose: The project aims to characterize what is the role of gender, and other social categories such as class, indigeneity in the way women and men involved in artisanal fisheries in Chiloé, Chile. At the same time, the study seeks to explore how men and women navigate social and environmental threads and challenges (specifically, their social and environmental vulnerability) and how they try to overcome them. To achieve that, the student researcher will conduct different types of interviews, surveys and focus groups with local artisanal fishers in Chiloe. The focus will be on their capacity to influence decision-making and policies, how they organize within their unions, their own perspectives of social environmental challenges at different levels (individual, domestic and community), and how women specifically navigate different types of barriers that make artisanal fisheries vulnerable, and their strategies to overcome those barriers.

Procedures: As a participant in this study, you will be asked to respond a survey questionnaire. The survey will last 20 minutes and be conducted at your convenience or online if possible. In this questionnaire, you will be asked a series of questions about your experience with artisanal fisheries in Chiloe, your views about Chiloé's development of environmental stressors, and your personal challenges. Your responses will be 100% anonymous, so there is no possible way to link your responses with your name. The results will be presented as part of the student researcher's doctoral thesis, with the intention of further publication in academic journal articles.

Confidentiality: If you agree to participate in this study, your survey responses will be assigned a code that will make your answers not identifiable with your personal identity. You are allowed to withdraw from the study at any time. If you withdraw, no more information will be collected from you. When you indicate you wish to withdraw, the investigator will ask if the materials already collected in the study can be used. Your participation does not involve any risks other than those that you would encounter in daily life, but if you feel emotionally upset or uncomfortable when answering and discussing some of the questions, you are free to decline to answer any such questions.

Remuneration/Compensation: Apart from snacks during the interviews, no remuneration is available for your participation. Your contribution may benefit you as it will allow you to share your experiences and opinions regarding Chiloé's small-scale fisheries situation.

Benefits: There are no potential benefits to you from participating in this study besides the possibility of increasing the awareness of some of your behaviors and attitudes towards your experience related to Chiloé and its social and environmental concerns. However, in the future, others may benefit from what we learn in this study, and we may contribute to society by telling the story of the challenges of small-scale fisheries and Chiloé's environmental issues.

Data collection: The transcripts of your interview will be stored in the personal computer of the student investigator, which needs a password to access to ensure the privacy of your records. It will be kept safely in storage for 5 years, and after that, they will be destroyed.

Subjects' Rights: Your participation in this study is voluntary and you are free to withdraw at any time. You are also free to withhold your opinion about particular experiences if you wish. Your confidentiality will be protected by assigning other names to your interview, so linking your testimony with your name is impossible.

Contact Persons: If you have any questions about this study, you may call Nayadeth Arriagada. If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the University of Waterloo Office of Ethics Research: researchethics@uwaterloo.ca or phone 1-833-643-2379 (Canada y EE. UU.), 1-519-888-4440

Consent: I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and I will receive a copy of this consent form.

Participant signature

Date

Name (please print)

Phone Number

Email

Appendix H – Consent form survey Spanish

Título del Proyecto: Navegando Vulnerabilidad y viabilidad en la Pesca Artesanal con perspectiva interseccional en Chiloé, Chile

Supervisor:

Dr. Prateep Nayak
Associate Professor, SERS
University of Waterloo
pnayak@uwaterloo.ca
519-888-4567, ext. 43112

Investigadora Principal:

Nayadeth Arriagada
Ph.D candidate in Social-Ecological Sustainability, University of Waterloo
E-mail: narriaga@uwaterloo.ca

Esta carta explica de qué se trata el estudio, los posibles riesgos y beneficios y sus derechos como participante de la investigación. Puede imprimir/guardar una copia para sus registros. Si no entiende algo en la carta, pregúntele a uno de los investigadores antes de dar su consentimiento para participar.

Propósito: El proyecto tiene como objetivo caracterizar el papel del género y otras categorías como la clase y la indigeneidad en cómo las mujeres y los hombres involucrados en la pesca artesanal en Chiloé, Chile, enfrentan los desafíos sociales y ambientales, y cómo intentan superarlos. Para lograrlo, el estudiante investigador realizará entrevistas, encuestas y grupos focales con pescadores artesanales locales en Chiloé. La atención se centrará en su capacidad para influir en la toma de decisiones, cómo se organizan dentro de sus sindicatos, sus propias perspectivas sobre los desafíos sociales y ambientales y cómo las mujeres sortean con precisión los diferentes tipos de barreras que hacen vulnerable a la pesca artesanal, y sus estrategias para superar esas barreras.

Procedimientos: como participante de este estudio, se le pedirá que responda un cuestionario de encuesta. La encuesta tendrá una duración de 15 minutos, será administrada en formato papel y lápiz, y se realizará a su conveniencia con la presencia del investigador. En este cuestionario, se le harán una serie de preguntas sobre su experiencia con la pesca artesanal en Chiloé, sus puntos de vista sobre el desarrollo de factores estresantes ambientales en Chiloé y sus desafíos personales. Tus respuestas serán 100% anónimas, por lo que no hay forma posible de vincular tus respuestas con tu nombre. Los resultados se presentarán como parte de la tesis doctoral del estudiante investigador, con la intención de su posterior publicación en artículos de revistas académicas.

Confidencialidad: Si acepta participar en este estudio, su participación será confidencial. Si bien se le dará un número único a su encuesta, es por motivos logísticos y no para vincular sus respuestas con su identidad. Al mismo tiempo, si bien alguna combinación única de características demográficas podría hacer que se reconozca su identidad, esto es muy poco probable y no es el propósito de la encuesta. Las respuestas individuales no se resaltarán ni destacarán. Por el contrario, sólo se analizarán los resultados agregados en futuras publicaciones.

Riesgos: Su participación no implica riesgos distintos a los que encontraría en la vida diaria. Sin embargo, si se siente emocionalmente molesto o incómodo al responder y discutir algunas de las preguntas, puede negarse a responderlas.

Remuneración/Compensación: No hay remuneración disponible por su participación. Tu contribución puede beneficiarte al permitirte compartir tus experiencias y opiniones sobre la situación de la pesca artesanal en Chiloé.

Beneficios: No existen beneficios potenciales para usted al participar en este estudio además de la posibilidad de aumentar la conciencia de algunos de sus comportamientos y actitudes hacia su experiencia relacionada con Chiloé y sus preocupaciones sociales y ambientales. Sin embargo, en el futuro, otros pueden beneficiarse de lo que aprendamos en este estudio y podemos contribuir a la sociedad contando la historia de los desafíos de la pesca artesanal y los problemas ambientales de Chiloé.

Recopilación de datos: la base de datos que contiene las respuestas de su encuesta se almacenará en la computadora del estudiante investigador, que está encriptada y necesita una contraseña para acceder a fin de garantizar la privacidad de sus registros. Al mismo tiempo, se almacenará una copia segura en la nube OneDrive de la Universidad de Waterloo, que también está segura y protegida. Sus datos se mantendrán almacenados de forma segura durante al menos 5 años y, después de eso, serán destruidos.

Participación voluntaria: Su participación en este estudio es voluntaria y usted es libre de retirarse en cualquier momento. También es libre de ocultar su opinión sobre experiencias particulares si lo desea. Se le permite retirarse del estudio en cualquier momento. Si se retira, no se recopilará más información sobre usted. Cuando indique que desea retirarse, el investigador le preguntará si se pueden utilizar los materiales ya recopilados en el estudio. Si ese no es el caso, el investigador documentaría el retiro, eliminaría los datos del estudio y eliminaría los registros pertenecientes al participante. Una vez que los materiales se publiquen en la tesis final y en futuros artículos de revistas, no es posible retirar los.

Información ética: Este estudio ha sido revisado y recibido autorización ética a través de la Junta de Ética en Investigación de la Universidad de Waterloo (REB #45734). Si tiene preguntas para la Junta, comuníquese con la Oficina de Ética en Investigación, al número gratuito 1-833-643-2379 (Canadá y EE. UU.), 1-519-888-4440 o reb@uwaterloo.ca.

Personas de contacto: Si tiene alguna pregunta sobre este estudio, puede comunicarse con Nayadeth Arriagada.

Consentimiento: He leído este formulario y se me ha explicado el estudio de investigación. Me han dado la oportunidad de hacer preguntas y mis preguntas han sido respondidas. Si tengo preguntas adicionales, me han dicho a quién contactar. Acepto participar en el estudio de investigación descrito anteriormente y recibiré una copia de este formulario de consentimiento.

Firma participante

Fecha

Nombre (impresa)

teléfono

Email

Appendix I – Consent form participatory workshop Spanish

Título del Proyecto: Navegando Vulnerabilidad y viabilidad en la Pesca Artesanal con perspectiva interseccional en Chiloé, Chile

Supervisor:

Dr. Prateep Nayak
Associate Professor, SERS
University of Waterloo
pnayak@uwaterloo.ca
519-888-4567, ext. 43112

Investigadora Principal:

Nayadeth Arriagada
Ph.D candidate in Social-Ecological Sustainability, University of Waterloo
E-mail: narriaga@uwaterloo.ca

Esta carta explica de qué se trata el estudio, los posibles riesgos y beneficios y sus derechos como participante de la investigación. Puede imprimir/guardar una copia para sus registros. Si no entiende algo en la carta, pregúntele a uno de los investigadores antes de dar su consentimiento para participar.

Propósito: El proyecto tiene como objetivo caracterizar el papel del género y otras categorías como la clase y la indigeneidad en cómo las mujeres y los hombres involucrados en la pesca artesanal en Chiloé, Chile, enfrentan los desafíos sociales y ambientales, y cómo intentan superarlos. Para lograrlo, el estudiante investigador realizará entrevistas, encuestas y grupos focales con pescadores artesanales locales en Chiloé. La atención se centrará en su capacidad para influir en la toma de decisiones, cómo se organizan dentro de sus sindicatos, sus propias perspectivas sobre los desafíos sociales y ambientales y cómo las mujeres sortean con precisión los diferentes tipos de barreras que hacen vulnerable a la pesca artesanal, y sus estrategias para superar esas barreras.

Procedimientos: como participante de este estudio, se le pedirá que participe en un grupo de discusión, que tiene una duración de 2 a 3 hrs, y se realizará a su conveniencia con la presencia del investigador. Allí, se le harán una serie de preguntas sobre su experiencia con la pesca artesanal en Chiloé, sus puntos de vista sobre el desarrollo de factores estresantes ambientales en Chiloé y sus desafíos personales. Su testimonio será confidencial y se le asignará otro nombre a su relato, por lo que no hay forma posible de vincular tus respuestas con su identidad. Esta entrevista será grabada (solo grabadora de voz) con fines de análisis y luego transcrita. Los resultados serán presentados como parte de la tesis doctoral del estudiante investigador, con la intención de su posterior publicación en artículos de revistas académicas.

Confidencialidad: si acepta participar en este estudio, su participación será confidencial y se asignarán otros nombres a su testimonio para que su entrevista no sea identificable. También podrá revisar las transcripciones de las entrevistas.

Riesgos: Su participación no implica riesgos distintos a los que encontraría en la vida diaria. Sin embargo, si se siente emocionalmente molesto o incómodo al responder y discutir algunas de las preguntas, puede negarse a responderlas.

Remuneración/Compensación: No hay remuneración disponible por su participación. Tu contribución puede beneficiarte al permitirte compartir tus experiencias y opiniones sobre la situación de la pesca artesanal en Chiloé.

Beneficios: No existen beneficios potenciales para usted al participar en este estudio además de la posibilidad de aumentar la conciencia de algunos de sus comportamientos y actitudes hacia su experiencia relacionada con Chiloé y sus preocupaciones sociales y ambientales. Sin embargo, en el futuro, otros pueden beneficiarse de lo que aprendamos en este estudio y podemos contribuir a la sociedad contando la historia de los desafíos de la pesca artesanal y los problemas ambientales de Chiloé.

Recopilación de datos: las grabaciones y transcripciones del grupo de discusión se almacenará en la computadora del estudiante investigador, que está encriptada y necesita una contraseña para acceder a fin de garantizar la privacidad de sus registros. Al mismo tiempo, se almacenará una copia segura en la nube OneDrive de la Universidad de Waterloo, que también está segura y protegida. Sus datos se mantendrán almacenados de forma segura durante al menos 5 años y, después de eso, serán destruidos.

Participación voluntaria: Su participación en este estudio es voluntaria y usted es libre de retirarse en cualquier momento. También es libre de ocultar su opinión sobre experiencias particulares si lo desea. Se le permite retirarse del estudio en cualquier momento. Si se retira, no se recopilará más información sobre usted. Cuando indique que desea retirarse, el investigador le preguntará si se pueden utilizar los materiales ya recopilados en el estudio. Si ese no es el caso, el investigador documentaría el retiro, eliminaría los datos del estudio y eliminaría los registros pertenecientes al participante. Una vez que los materiales se publiquen en la tesis final y en futuros artículos de revistas, no es posible retirar los.

Información ética: Este estudio ha sido revisado y recibido autorización ética a través de la Junta de Ética en Investigación de la Universidad de Waterloo (REB #45734). Si tiene preguntas para la Junta, comuníquese con la Oficina de Ética en Investigación, al número gratuito 1-833-643-2379 (Canadá y EE. UU.), 1-519-888-4440 o reb@uwaterloo.ca.

Personas de contacto: Si tiene alguna pregunta sobre este estudio, puede comunicarse con Nayadeth Arriagada.

Consentimiento: He leído este formulario y se me ha explicado el estudio de investigación. Me han dado la oportunidad de hacer preguntas y mis preguntas han sido respondidas. Si tengo preguntas adicionales, me han dicho a quién contactar. Acepto participar en el estudio de investigación descrito anteriormente y recibiré una copia de este formulario de consentimiento.

Firma participante

Fecha

Nombre (impresa)

teléfono

Email

Appendix J – Consent form participatory workshops English

Principal Investigator:

Dr. Prateep Nayak
Associate Professor, SERS
University of Waterloo
pnayak@uwaterloo.ca
519-888-4567, ext. 43112

Student Investigator:

Nayadeth Arriagada
Ph.D candidate in Social-Ecological Sustainability, University of Waterloo
Phone (Canada): 604 442 3457
Phone (Chile): +569 91560579
E-mail: narriaga@uwaterloo.ca

Project Title: Navigating vulnerability and viability in SSF with an intersectional lens in Chiloé, Chile.

Purpose: The project aims to characterize what is the role of gender, and other social categories such as class, indigeneity in the way women and men involved in artisanal fisheries in Chiloé, Chile. At the same time, the study seeks to explore how men and women navigate social and environmental threads and challenges (specifically, their social and environmental vulnerability) and how they try to overcome them. To achieve that, the student researcher will conduct different types of interviews, surveys and focus groups with local artisanal fishers in Chiloe. The focus will be on their capacity to influence decision-making and policies, how they organize within their unions, their own perspectives of social environmental challenges at different levels (individual, domestic and community), and how women specifically navigate different types of barriers that make artisanal fisheries vulnerable, and their strategies to overcome those barriers.

Procedures: As a participant in this study, you will be asked to participate in a workshop led by the student investigator. The duration of the participatory workshop will be 2 hours approx., in a place to be confirmed. In this workshop, you will be asked a series of questions about your experience with artisanal fisheries in Chiloe, your views about Chiloé's development and environmental stressors, and fisheries governance. These sessions will be recorded (voice recorder only) for analysis purposes and then transcribed. The results will be presented as part of the student researcher's doctoral thesis, with the intention of further publication in academic journal articles.

Confidentiality: If you agree to participate in this study, other names will be assigned to your testimony in order to make your interview unidentifiable. You will also be able to review interview transcripts. You are allowed to withdraw from the study at any time. If you withdraw, no more information will be collected from you. When you indicate you wish to withdraw, the investigator will ask if the materials already collected in the study can be used. Your participation does not involve any risks other than those that you would encounter in daily life, but if you feel emotionally upset or uncomfortable when answering and discussing some of the questions, you are free to decline to answer any such questions.

Remuneration/Compensation: Apart from snacks during the interviews, no remuneration is available for your participation. Your contribution may benefit you as it will allow you to share your experiences and opinions regarding Chiloé's small-scale fisheries situation.

Benefits: There are no potential benefits to you from participating in this study besides the possibility of increasing the awareness of some of your behaviors and attitudes towards your experience related to

Chiloé and its social and environmental concerns. However, in the future, others may benefit from what we learn in this study, and we may contribute to society by telling the story of the challenges of small-scale fisheries and Chiloé's environmental issues.

Data collection: The transcripts of your interview/participatory workshop will be stored in the personal computer of the student investigator, which needs a password to access to ensure the privacy of your records. It will be kept safely in storage for 5 years, and after that, they will be destroyed.

Subjects' Rights: Your participation in this study is voluntary, and you are free to withdraw at any time. You are also free to withhold your opinion about particular experiences if you wish. Your confidentiality will be protected by assigning other names to your interview, so there is no possibility to link your testimony with your name.

Contact Persons: If you have any questions about this study, you may call Nayadeth Arriagada. If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the University of Waterloo Office of Ethics Research:
researchethics@uwaterloo.ca

Consent: I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and I will receive a copy of this consent form.

Participant signature

Date

Name (please print)

Phone Number

Email