

**SUSTAINABILITY OF SMALL-SCALE FISHING  
COMMUNITIES IN JAFFNA PENINSULA OF SRI  
LANKA: A MULTIDIMENSIONAL ANALYSIS  
ON VULNERABILITY**

**MAHINDA SENEVI GUNARATNE**

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LANKA: A MULTIDIMENSIONAL ANALYSIS  
ON VULNERABILITY**

by

**MAHINDA SENEVI GUNARATNE**

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## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENT</b> .....	<b>ii</b>
<b>TABLE OF CONTENTS</b> .....	<b>iv</b>
<b>LIST OF TABLES</b> .....	<b>xi</b>
<b>LIST OF FIGURES</b> .....	<b>xii</b>
<b>LIST OF ABBREVIATIONS</b> .....	<b>xiv</b>
<b>LIST OF APPENDICES</b> .....	<b>xvii</b>
<b>ABSTRAK</b> .....	<b>xviii</b>
<b>ABSTRACT</b> .....	<b>xx</b>
<b>CHAPTER 1 INTRODUCTION</b> .....	<b>1</b>
1.1 Background of the Study .....	1
1.1.1 A Global Perspective on Small-Scale Fisheries.....	3
1.1.2 Fisheries Sector in Sri Lanka .....	5
1.2 Problem Statement .....	9
1.3 Research Questions .....	15
1.4 The Objectives of the Study .....	16
1.5 The Significance of the Study .....	16
1.6 Scope and Limitations of the Research.....	19
1.7 The Organisation of the Thesis .....	21
<b>CHAPTER 2 LITERATURE REVIEW</b> .....	<b>23</b>
2.1 Introduction.....	23
2.1.1 Sustainability and Sustainable Development.....	23
2.1.2 Vulnerability of the Marine Ecosystems and the People .....	29
2.1.3 Management Practices in Small-Scale Fisheries .....	34
2.1.4 Vulnerability of the Coast and Fisheries in Sri Lanka.....	37
2.2 The Concepts of Vulnerability .....	44

2.3	Multidimensional Analysis of Vulnerability.....	51
2.3.1	Qualitative Approaches in Vulnerability Analysis .....	62
2.3.2	Vulnerability Studies in the Fishery Sector .....	66
2.3.3	Research Gaps in Vulnerability Analysis .....	70
2.4	Conceptual Framework for Multidimensional Analysis.....	74
2.4.1	Domains and Drivers of Vulnerability.....	77
2.4.2	Integrate Sustainability into Vulnerability Analysis.....	79
2.5	Operational Definitions.....	83
2.5.1	Small-Scale Fisheries .....	83
2.5.2	Sustainable Development.....	83
2.5.3	Sustainability.....	84
2.5.4	Vulnerability .....	84
2.5.5	Domains and Drivers of Vulnerability.....	85
2.5.6	Multidimensional Vulnerability.....	85
2.6	Conclusion .....	86
	<b>CHAPTER 3 METHODOLOGY .....</b>	<b>88</b>
3.1	Introduction.....	88
3.1.1	Research Design and Justification .....	88
3.1.2	Research Approach .....	91
3.2	Background to the Study Area .....	93
3.2.1	The Study Area in Detail – Jaffna Peninsula .....	96
3.3	Study Population and Sampling.....	101
3.3.1	The Population of the Study .....	101
3.3.2	Sampling Method and Subject Recruitment .....	102
3.3.3	Sample Frame for FGDs with Small-Scale Fishers .....	104
3.3.3(a)	Subject Criteria - Focus Group Discussions.....	105
3.3.4	Sample Frame for KIIs with Other Stakeholders.....	106

3.3.4(a)	Subject Criteria – Key Informant Interviews.....	107
3.3.5	Sample Size Estimation .....	107
3.4	Recruitment of Participants.....	108
3.5	Research Instruments .....	109
3.6	Ethical Approvals.....	111
3.7	Data Collection Process .....	111
3.7.1	Profiles of the Research Participants .....	113
3.7.2	Focus Group Discussions – FGDs .....	116
3.7.3	Key Informant Interviews – KIIs .....	118
3.7.4	Secondary Data Collection .....	119
3.8	Data Storage, Translation, and Uses .....	120
3.9	Data Analysis and Interpretation.....	121
3.9.1	Thematic Analysis .....	123
3.9.2	Six Phases in Reflexive Thematic Analysis.....	125
3.9.3	Computer-Assisted Qualitative Data Analysis Software.....	131
3.9.4	ATLAS.ti Qualitative Data Analysis Software.....	132
3.9.5	Using ATLAS.ti in Reflexive Thematic Analysis .....	134
3.9.5(a)	Getting Familiarised and Organising Data .....	135
3.9.5(b)	Creating Data Quotations and Coding .....	135
3.9.5(c)	Finetuning the Codes .....	136
3.9.5(d)	Generating and Reviewing the Themes .....	137
3.9.5(e)	Creating Visual Representations.....	137
3.9.5(f)	Analysis and Presenting the Results .....	138
3.10	Strategy for Improving Rigour in Qualitative Research .....	139
3.11	Ethical Considerations During Data Collection.....	142
3.11.1	Participants Vulnerability .....	142
3.11.2	Declaration of the Absence of Conflict of Interest .....	144

3.11.3	Privacy and Confidentiality .....	144
3.12	Ethical Review Board Approvals.....	146
3.13	Conclusion .....	146
<b>CHAPTER 4 RESULTS AND DISCUSSION.....</b>		<b>147</b>
4.1	Introduction.....	147
4.2	Results and Discussion .....	147
4.2.1	Objective One: Identifying Factors Contributing to Vulnerability .....	147
4.2.2	Scoping the Domains and Drivers of Vulnerabilities .....	149
4.2.2(a)	Domain 1: Vulnerabilities in Social Environment and Systems .....	150
4.2.2(a)(i)	Socioeconomic and Livelihood Issues.....	151
4.2.2(a)(ii)	Fishing Practices and IUU Fishing Issues.....	154
4.2.2(a)(iii)	Land, Housing, and Infrastructure Issues.....	155
4.2.2(b)	Domain 2: Vulnerabilities in the Governance and Institutional Systems.....	158
4.2.2(b)(i)	Issues in Communities and Organisations .....	159
4.2.2(b)(ii)	Issues in Governance, Institutes and Capacities .....	161
4.2.2(b)(iii)	Issues in Markets and Financial Services .....	164
4.2.2(c)	Domain 3: Vulnerabilities in Natural Environment and Systems .....	167
4.2.2(c)(i)	Land, Coast and Marine Environmental Issues .....	167
4.2.2(c)(ii)	Issues of Accessing Ecosystem Services .....	170
4.2.2(c)(iii)	Issues of Natural Events and Uncertainties .....	172



4.2.2(d)	Domain 4: Vulnerabilities in External Interventions and Influences .....	174
4.2.2(d)(i)	Issues of Development Interventions .....	175
4.2.2(d)(ii)	Issues of Poaching Indian Fishing Vessels .....	178
4.2.2(d)(iii)	Issues of Southern Migratory Fishers .....	181
4.2.2(e)	Domain 5: Vulnerabilities in Other Systems and Influences.....	183
4.2.2(e)(i)	War-Life, Security and Governance Issues.....	185
4.2.2(e)(ii)	War-Civil War and Postwar Development Issues .....	187
4.2.2(e)(iii)	War-Sociocultural, Ethnic and Religious Issues .....	190
4.2.3	Discussion: A New Domain Emerges.....	193
4.2.4	A Summary of Identified Domains and Drivers of Vulnerabilities.....	197
4.2.5	Objective Two: Analyse How Vulnerabilities Impact the Sustainability.....	200
4.2.5(a)	Impacts of Vulnerabilities on Economic Sustainability .....	205
4.2.5(a)(i)	Bottom Trawling Challenges the Development Rights.....	207
4.2.5(a)(ii)	Microcredits and Indebtedness Push People into Peril .....	208
4.2.5(a)(iii)	Poaching Indian Vessels Grab Marine and Livelihoods Resources.....	210
4.2.5(a)(iv)	War and Postwar Development Failures Sink Fisheries Economy.....	211
4.2.5(b)	Impacts of Vulnerabilities on Environmental Sustainability .....	213
4.2.5(b)(i)	Environmental Degradation Challenges the Life and Livelihoods .....	215

4.2.5(b)(ii)	Extreme Natural Events and Uncertainties take High Tolls. ....	217
4.2.5(b)(iii)	Impacts of Illegal Fishing on the Coastal and Marine Environment .....	219
4.2.5(b)(iv)	Irresponsible Behaviors Destroy Marine and Fishery Resources.....	221
4.2.5(c)	Impacts of Vulnerabilities on Social Sustainability .....	222
4.2.5(c)(i)	Impacts of the War and Post-War Militarisation on the Fishing Communities .....	224
4.2.5(c)(ii)	Ineffective Social Structures Challenge Peace and Coexistence.....	226
4.2.5(c)(iii)	Southern Migratory Fishers Intensify Inequalities and Disputes .....	228
4.2.5(c)(iv)	Weak Governance and Capacities Challenge the People's Rights.....	229
4.2.6	Summary of the Findings.....	231
4.2.7	Objective three: Devise Intervention Strategies to Mitigate Vulnerabilities.....	236
4.2.7(a)	External Interventions and Influences Domain: Intervention Strategies .....	242
4.2.7(b)	Governance and Institutional Systems Domain: Intervention Strategies .....	247
4.2.7(c)	Natural Environment Systems Domain: Intervention Strategies .....	252
4.2.7(d)	Social Environment and Systems Domain: Intervention Strategies .....	257
4.2.7(e)	Impacts of the Civil War and Post-War Torments Domain: Intervention Strategies .....	263
4.2.8	Summary and Conclusions .....	270
<b>CHAPTER 5 CONCLUSION.....</b>		<b>277</b>
5.1	Introduction.....	277
5.2	Summary of Research Findings .....	279

5.2.1	Identifying Domains and Drivers of Vulnerabilities .....	279
5.2.2	Impacts of Multidimensional Vulnerabilities on Sustainability.....	282
5.2.3	Devise Sustainable Intervention Strategies.....	283
5.3	Research Implications .....	285
5.3.1	Theoretical/Conceptual Implications .....	285
5.3.2	Policy and Practical Implications.....	287
5.4	Suggestions for the Future Research.....	292
5.5	Concluding Remarks.....	295
	<b>REFERENCES.....</b>	<b>302</b>
	<b>APPENDICES</b>	
	<b>LIST OF PUBLICATIONS</b>	

## LIST OF TABLES

		<b>Page</b>
Table 1.1	Annual fish production of Sri Lanka by sub-sectors (metric tons) .....	8
Table 2.1	A summary of studies on the concepts of vulnerability .....	50
Table 2.2	Summary of studies focused on multidimensional vulnerability analysis.....	61
Table 3.1	Fisheries-related details in the northern province of Sri Lanka (2016).....	95
Table 3.2	Fresh fish production by Fisheries Inspectors Divisions in Jaffna District .....	98
Table 3.3	Fisheries Cooperative Society Unions and respective Fisheries Inspector divisions in Jaffna District.....	104
Table 3.4	Details of participants in Key Informant Interviews (KIIs) .....	106
Table 3.5	Sample size as per research objectives .....	108
Table 3.6	Details of the Respondents in Key Informant Interviews (KIIs) .....	114
Table 3.7	Details of the Participants in Focus Group Discussions (FGDs).....	115
Table 3.8	Summary of the field data collection and analytical methods.....	122
Table 3.9	Key criteria for assessing rigour in qualitative research.....	140
Table 4.1	Details of the domains and drivers of vulnerabilities (themes) identified.....	149
Table 4.2	Quotations on the collapse of the fishing industry in Jaffna .....	154
Table 4.3	Domains and drivers of vulnerabilities and significant issues.....	198
Table 4.4	Analyse the impacts of vulnerabilities on the three pillars of sustainability.....	203
Table 4.5	Domains and drivers of vulnerabilities and strategies.....	239
Table 4.6	Drivers of vulnerabilities and intervention strategies in line with the SDGs.....	273

## LIST OF FIGURES

		<b>Page</b>
Figure 1.1	Exclusive Economic Zone and Pollution Prevention Zone of Sri Lanka (Arachchige et al., 2017).....	6
Figure 2.1	Conceptual Framework “System's vulnerability to hazards” (Turner et al., 2003). Figure retrieved from Ciurean et al. (2013).....	47
Figure 2.2	Vulnerability framework of independent dimensions (DeLeon, 2006).....	54
Figure 2.3	Outcome vulnerability and contextual vulnerability (O'Brien et al., 2007).....	55
Figure 2.4	Relationships between multiple vulnerabilities and risk concepts (Preston & Stafford-Smith, 2009). ....	57
Figure 2.5	The MOVE conceptual framework (Birkmann et al., 2013). ....	59
Figure 2.6	Integrated Assessment Map (IAM) - Domains of fishery and drivers of vulnerability (Mills et al., 2011). ....	69
Figure 2.7	The Conceptual Framework for multidimensional analysis.....	75
Figure 3.1	Schematic view of research design and implementation.....	90
Figure 3.2	Administrative Districts map of the northern province in Sri Lanka (Mallawatantri et al., 2014). ....	94
Figure 3.3	Different geographical areas in Jaffna Peninsula (Vipulan et al., 2019).....	97
Figure 3.4	Kilinochchi District Administrative Map (UN OCHA, 2006).....	100
Figure 3.5	Sankey diagram - Interconnectedness among different codes .....	139
Figure 4.1	Code network of the theme / the driver of vulnerabilities: Socioeconomic and livelihood issues .....	152
Figure 4.2	Different codes in the theme “Issues in communities & organisations” .....	159
Figure 4.3	Codes in the driver: Land, coast and marine environmental issues.....	169

Figure 4.4	Codes identified in issues of development interventions driver.....	176
Figure 4.5	Sustainable development goals (SDGs) in three pillars of sustainability. (Kostoska & Kocarev, 2019).....	201
Figure 4.6	Document groups, code groups (themes) and codes in impacts analysis.....	202
Figure 4.7	Different codes and number of quotations on the economic impacts.....	206
Figure 4.8	Interconnectedness among different codes in impacts analysis.....	206
Figure 4.9	Impacts (themes) and codes identified on environmental sustainability.....	214
Figure 4.10	Identified impacts (themes) and codes on social sustainability.....	224
Figure 4.11	Intervention strategies and codes to intervene in vulnerability domains.....	238
Figure 5.1	IVAS Framework with the domains and drivers of vulnerabilities identified.....	281

## LIST OF ABBREVIATIONS

ADB	Asian Development Bank
APWLD	Asia Pacific Forum for Women Law and Development
CAQDAS	Computer-Assisted Qualitative Data Analysis Software
CBSL	Central Bank of Sri Lanka
CCRF	Code of Conduct for Responsible Fisheries
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CFE-DMHA	Center for Excellence in Disaster Management & Humanitarian Assistance
CFRN	Canadian Fisheries Research Network
DFAR	Department of Fisheries and Aquatic Resources
DS divisions	Divisional Secretariats Divisions
EBFM	Ecosystem-Based Fisheries Management
EEZ	Exclusive Economic Zone
ESCR	Economic, Social, and Cultural Rights
EU	European Union
FAO	Food and Agriculture Organisation
FCS	Fisheries Cooperative Societies
FGDs	Focus Group Discussions
FI divisions	Fisheries Inspector divisions
FID	Fisheries Inspector Division
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GoSL	Government of Sri Lanka
HR defender	Human Rights defender
IAA	Integrated Assessment and Advisory framework

IAM	Integrated Assessment Map
IDPs	Internally Displaced Persons
ILO	International Labour Organization
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IUU (fishing)	Illegal, Unreported, and Unregulated (fishing practices)
JPEPM-USM	Human Research Ethics Committee of Universiti Sains Malaysia
KIIs	Key Informant Interviews
KKS East	Kankasanthurai East
KKS West	Kankasanthurai West
KWALON	The Netherlands Association for Qualitative Research
LtG	The Limits to Growth
LTTE	Liberation Tigers of Tamil Elam
MDGs	Millennium Development Goals
MFARD	Ministry of Fisheries and Aquatic Resources Development
MOVE framework	Methods for the Improvement of Vulnerability Assessment in Europe
NAFSO	National Fishery Solidarity Movement
NARA	National Aquatic Resources Research and Development Agency
NGOs	Non-Governmental organisations
PAR	Pressure-and-Release model
RBAs	Rights-Based Approaches
RH	Risk-Hazard model
RTA	Reflexive Thematic Analysis
RVA	Rapid Vulnerability Assessment methodology
SDG / SDGs	Sustainable Development Goals



SL Government	Sri Lankan Government
SSF	Small-Scale Fishing / Fisheries
SSF Guidelines	The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication
SWOT analysis	Strengths, Weaknesses, Opportunities, and Threats analysis
TA	Thematic Analysis
TBL	Triple Bottom Line
UN	The United Nations
UN DESA	United Nations Department of Economic and Social Affairs
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
UN Women	The United Nations Entity for Gender Equality and the Empowerment of Women
UNCSD	United Nations Commission on Sustainable Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNDROP	Declaration on the Rights of Peasants and other People Working in Rural Areas
UNEP	United Nations Environmental Programme
USA	United States of America
USD	United States Dollars
USM	Universiti Sains Malaysia
VGGT	Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security
WB	The World Bank
WCS	World conservation strategy

## **LIST OF APPENDICES**

Appendix A	Interview protocol / Discussion guide for FGDs
Appendix B	Interview protocol / Discussion guide for KIIs
Appendix C	Figures on the analysis and results
Appendix D	SDG 14 and its Targets

**KELESTARIAN MASYARAKAT NELAYAN BERSKALA KECIL DI  
SEMENANJUNG JAFFNA SRI LANKA: ANALISIS MULTIDIMENSI  
TERHADAP KEMUDAHERANCAMAN**

**ABSTRAK**

Perikanan merentasi sempadan antara India dan Sri Lanka merupakan salah satu daripada pelbagai isu yang membawa kepada kemudahterancaman (dalam kajian ini diklasifikasikan sebagai domain dan pemacu kemudahterancaman) persekitaran manusia mahupun alam semula jadi komuniti nelayan skala kecil (SSF) di Sri Lanka. Justeru, kajian kualitatif ini dilaksanakan bertujuan untuk; (i) mengenal pasti faktor yang menyumbang kepada kemudahterancaman komuniti SSF di semenanjung Jaffna di utara Sri Lanka; (ii) menganalisis bagaimana kemudahterancaman memberi impak terhadap kemampuan komuniti SSF di semenanjung Jaffna di utara Sri Lanka; dan (iii) merangka strategi intervensi untuk mengurangkan kemudahterancaman dan mempromosikan kemampuan komuniti SSF di Sri Lanka. Seramai 25 orang responden telah terlibat dalam kajian ini yang melibatkan ketua koperasi perikanan dan pihak berkepentingan lain dalam sektor perikanan berskala kecil di semenanjung Jaffna. Data telah di kumpul melalui temu bual informan utama dan perbincangan kumpulan berfokus dan dianalisis mengikut analisis tematik refleksi menggunakan perisian ATLAS.ti. Analisis data, pertama, mengenal pasti kemudahterancaman multidimensi, yang boleh dikategorikan kepada 15 pemacu kemudahterancaman mencakupi lima domain kemudahterancaman dalam konteks Sri Lanka iaitu kesan perang saudara dan penderitaan selepas perang. Analisis objektif kedua menunjukkan bahawa kesemuapemacu kemudahterancaman menjejaskan kemampuan ekonomi, alam sekitar dan sosial komuniti SSF. Oleh yang demikian, 15 strategi intervensi bagi

menangani pemacu kemudahterancaman atau punca kemudahterancaman telah dikenal pasti dalam objektif yang terakhir yang juga telah disesuaikan dengan sasaran SDG 14- *Kehidupan di bawah Air* dan enam SDG lain yang saling berkaitan. Hasil kajian ini menunjukkan bahawa domain dan pemacu kemudahterancaman serta impaknya adalah multidimensi dan saling berkaitan. Oleh itu, mengenal pasti dan menganalisis pelbagai kesan kemudahterancaman terhadap tiga dimensi kemampuan disamping menangani punca kemudahterancaman melalui strategi intervensi yang sejajar dengan SDG adalah cara paling berkesan untuk mencapai kemampuan. Kajian ini telah menemui domain dan pemacu kemudahterancaman yang merupakan fakta realiti serta telah mengembangkan pemahaman mengenai konsep dan teori tentang kemudahterancaman, kesan dan analisis intervensi dengan aplikasi yang praktikal. Dapatan kajian ini membayangkan bahawa intervensi yang sedia ada akan dapat menyumbang kepada pencapaian kemampuan, tetapi hal ini memerlukan pembuatan keputusan dan campur tangan secara partisipatif di semua peringkat, termasuklah kerajaan Sri Lanka dan India, agensi pembangunan, ahli akademik dan komuniti nelayan.

**SUSTAINABILITY OF SMALL-SCALE FISHING COMMUNITIES IN  
JAFFNA PENINSULA OF SRI LANKA: A MULTIDIMENSIONAL  
ANALYSIS ON VULNERABILITY**

**ABSTRACT**

Transboundary fishing between India and Sri Lanka is one of many issues that leads to vulnerabilities (classified as domains and drivers of vulnerability in the present study) in the human and natural environments of small-scale fishing (SSF) communities in Sri Lanka. Therefore, this qualitative study aims to (i) identify the factors that contribute to the vulnerability of SSF communities in the Jaffna peninsula in northern Sri Lanka, (ii) analyse how vulnerabilities impact SSF communities in the Jaffna peninsula in northern Sri Lanka, and (iii) devise intervention strategies that mitigate vulnerabilities and promote sustainability within SSF communities in Sri Lanka. A total of 25 respondents were involved in this study, including leaders of fisheries cooperative societies and other stakeholders in the SSF sector in the Jaffna peninsula. Primary data was collected through key informant interviews and focus group discussions and analysed following reflexive thematic analysis using ATLAS.ti software. The data analysis first identified multidimensional vulnerabilities deduced into 15 vulnerability drivers in five domains. The analysis found a new vulnerability domain in the Sri Lanka-specific context, i.e., the impacts of civil war and post-war torments. Analysis of the second objective suggests that all identified vulnerability drivers critically challenge the economic, environmental, and social sustainability of the SSF communities. Accordingly, 15 intervention strategies to address vulnerability drivers or root causes of vulnerabilities are identified in the final objective, aligning

them with the targets of SDG 14-*Life below Water* and the other six interlinked SDGs. The study results show that the domains and drivers of vulnerabilities and their impacts are multidimensional and interconnected. Therefore, identifying and analysing the impacts of multiple vulnerabilities in three dimensions of sustainability while addressing the root causes of vulnerabilities through intervention strategies aligned with the SDGs is the most effective way to achieve sustainability. This study has found domains and drivers of vulnerability, which are a factual reality, and expanded the conceptual and theoretical understanding of vulnerability, impact and intervention analysis with practical applications. The research findings imply that the interventions identified would contribute to achieving sustainability, but this requires participatory decision-making and interventions at all levels, including the Sri Lankan and Indian governments, development agencies, academics, and fishing communities.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Study

Sustainability of the fisheries sector has become a critical aspect of development discourse in Sri Lanka due to the impacts of climate change on the Indian Ocean, fragile coastal environments, and impediments in policies and development priorities (Ibrahim, 2020; MFARD, 2007; Rabbani et al., 2010). The vast majority of the coastal population involved in fisheries heavily depends on marine and coastal resources, leading to overexploitation and extinction of several fish species and coastal habitats (The World Bank, 2017). The 2004 Asian Tsunami took attention to the coastal areas of the country as devastating water waves washed over 40,000 lives and decades of development away. Damage caused to the natural environment and socioeconomic fabric adversely affected the sustainable development of the fishing industry (Silva & Yamao, 2007; Weerakoon et al., 2007). Moreover, protracted ethnic conflict and civil war in the north-eastern regions of the country jeopardised the lives and livelihoods of fishing communities in conflicted areas (Kadirgamar & Kadirgamar, 2018; Siluvaithasan & Stokke, 2006). Overexploitation of Indian ocean resources, destruction of natural habitats, and poaching of Indian bottom trawlers further challenge the sustainability of the fisheries sector on the northern seas of Sri Lanka (Manoharan & Deshpande, 2018; Sarvananthan, 2019b; Vincent, 2020).

The small-scale fisheries (SSF) in Sri Lanka is mainly at the subsistence level yet significantly contribute to the country's total fish production and food security (Amarasinghe & Jayasinghe, 2015; NARA, 2018). As an island nation, fishing activities are the source of livelihood for about 2.7 million people in coastal

communities (Gunaratne et al., 2021; NARA, 2019), yet regional disparities in terms of resource availability, technological infrastructure development, and socioeconomic conditions can still be observed especially on the northern coast of Sri Lanka (ADB, 2017; NARA, 2018; The World Bank, 2017; Wijayarathne & Maldeniya, 2003). Other unresolved issues include overlapping laws and poor governance; gaps in research and development; inadequate infrastructure facilities; post-harvest losses; health, safety, and gender disparities; ineffective disaster risk reductions; and policy mismatches (Amarasinghe & Silva, 2018; Edirisinghe et al., 2018; Pathmanandakumar, 2017).

Several studies stressed the importance of proper management structures and policy reforms in Sri Lankan fisheries and coastal resources management (Amarasinghe & Bavinck, 2011; Ibrahim, 2020; Jones et al., 2018; The World Bank, 2017; Wickramasinghe & Bavinck, 2015). However, existing socioeconomic, regional, physical, and cultural diversities and a poor understanding of local context-specific issues have left the problems unsolved (Ibrahim, 2020; Manoharan & Deshpande, 2018; Pathmanandakumar, 2017). Studies claim that regional disparities and issues (i.e., governance, impacts of civil war, Palk-Bay geopolitics, vulnerabilities, and ineffective sustainability interventions) in the SSF are comparatively high in the northern parts of Sri Lanka (Ibrahim, 2020; Munas & Lokuge, 2016). Moreover, illegal fishing gear, dangerous substances, explosives, and bottom trawling cause severe damage to coastal communities while destroying marine biodiversity (Sosai, 2015; The World Bank, 2017). Hence, the study aims to unearth multidimensional domains and drivers that make SSF on the northern coast of Sri Lanka vulnerable and find ways to make them sustainable. As UNDP (2011) explained, sustainability could be promoted by reducing vulnerability since these two concepts are closely interrelated, thus requiring integrated approaches.



### **1.1.1 A Global Perspective on Small-Scale Fisheries**

The SSF sector is the most disadvantaged in the fisheries industry due to a lack of market access, weak bargaining powers, and scarce production resources, yet it accounts for half of the world's fish production (Bennett et al., 2020; Jimenez et al., 2021; United Nations, 2017). Moreover, about 59.6 million people were involved in the fishing industry in 2016, while 85% lived in Asia. Despite 99% of global fishers being employed in SSF, they receive less attention than commercial fishing (B. L. Jones et al., 2018). Global fish production in 2015 was 167.2 million tons, which increased steadily and reached 179 million tons in 2018. The SSF sector contributes over half of the global fish production (FAO, 2015c, 2018, 2020; United Nations, 2017).

The importance of SSF on food security, livelihoods, and the sustainability of ocean resources emphasises its importance in achieving the 2030 Agenda for Sustainable Development, particularly Sustainable Development Goal (SDG) 14, Life Below Water (FAO, 2020; Lam et al., 2020; Mohammed et al., 2018; UNCTAD, 2019). The SSF widely contribute to food security, nutrition, and livelihoods of the disadvantaged population globally (Bennett et al., 2020; García-Lorenzo et al., 2021). For instance, over half of the fish catches in the developing world come from SSF, while about 90 to 95% of the products are utilised for local consumption (FAO, 2015c; García-Lorenzo et al., 2021). SSF is spread in the developing world as over 97% of fisher people live in those countries, while many people in the SSF fall under the poverty line, as about 5.8 million earn less than a dollar daily (The World Bank, 2012).

Negligence and marginalisation of SSF in development processes and policy agendas are becoming problematic (FAO, 2020). More importantly, SSF communities are the most affected by social disparities and are further marginalised due to ill recognition of the importance of the SSF (FAO, 2015c; The World Bank, 2012). Such circumstances cause apparent loss of livelihood, displacements, and forced migrations (FAO, 2018; Gunaratne et al., 2021; Wong et al., 2014). For instance, Bennett et al. (2021) identify ten social injustices from blue growth, which include "1) dispossession, displacement and ocean grabbing; 2) environmental justice concerns from pollution and waste; 3) environmental degradation and reduction of ecosystem services; 4) livelihood impacts for small-scale fishers; 5) lost access to marine resources needed for food security and well-being; 6) inequitable distribution of economic benefits; 7) social and cultural impacts; 8) marginalisation of women; 9) human and indigenous rights abuses; and, 10) exclusion from governance".

The Voluntary Guidelines for Securing Small-Scale Sustainable Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) propose a human rights-based approach to fisheries (FAO, 2015c, 2020). It includes critical areas such as responsible governance and tenure, sustainable resource management, social development, empowerment, and decent work; gender equality, for instance (Nayak & Berkes, 2019) yet faces many critiques and enthusiasm (Jentoft, 2014). Besides, the sustainability of the marine and coastal environments is a specific concern in the 2030 agenda of sustainable development goals, which SDG 14-life below water focuses explicitly on "conserve and sustainably use the oceans, seas and marine resources for sustainable development" (FAO et al., 2020; United Nations, 2015).

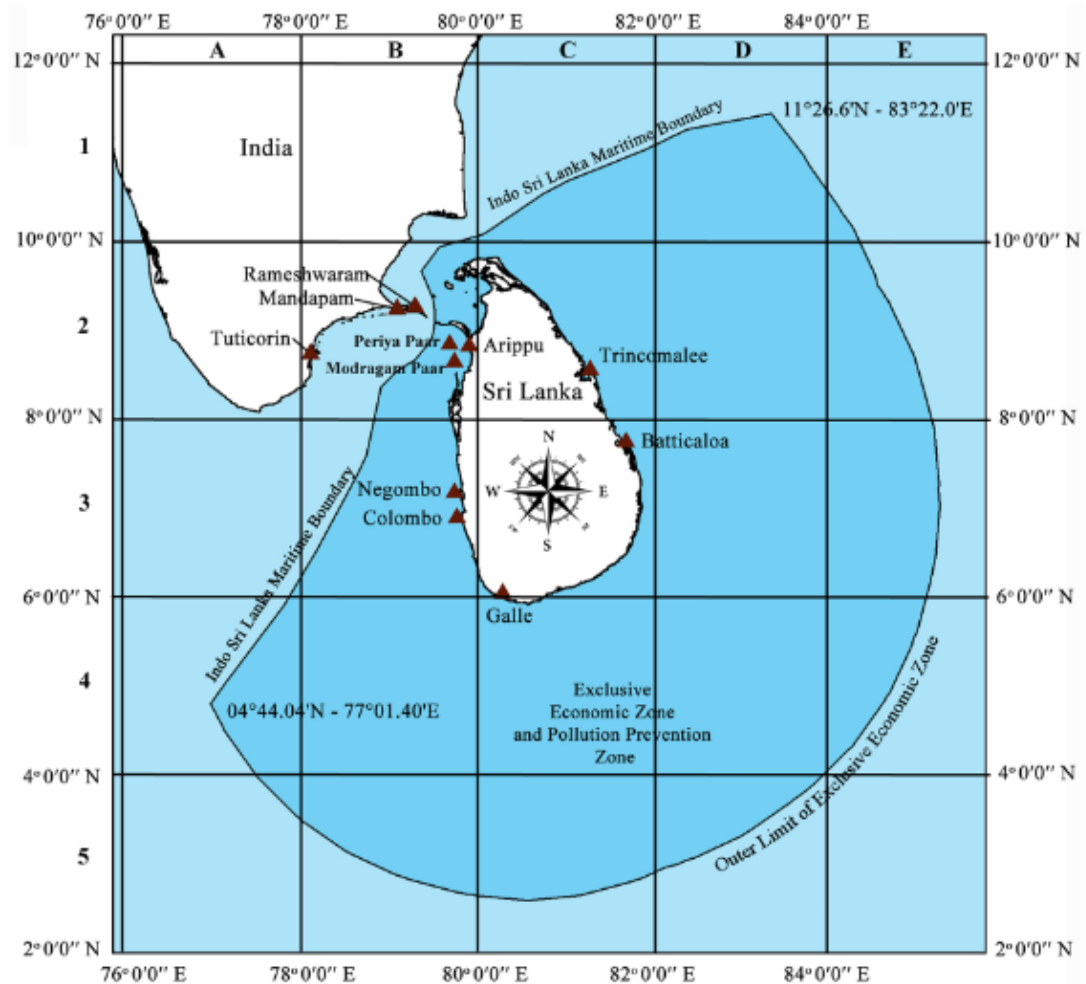
However, oceans are considered the source of development in the blue growth model, which has various negative consequences on the environment and people; thus, several studies claim a new idea of blue justice instead of blue growth (N. J. Bennett et al., 2021; Bogadóttir, 2020; Cohen et al., 2019; I. Ertör & Hadjimichael, 2020; Irmak Ertör, 2021; Gustavsson et al., 2021). Since most obstacles relating to SSF, precisely their social life, have been taking place above the water and societal contexts, focusing on local settings is required to capture their insights (Jentoft, 2020).

### **1.1.2 Fisheries Sector in Sri Lanka**

The Sri Lankan fisheries sector comprises three subsectors: coastal, offshore or deep-sea fishing, and inland and aquaculture (Azmy et al., 2021). Following the United Nations Convention on Law of the Sea of 1982, Sri Lanka has jurisdiction and sovereignty over its maritime zones. Sri Lanka's coastal line is 1,817.5 kilometres (km), while the land area is 65,000 square kilometres (sq. km), including several tiny islands. The "exclusive economic and pollution prevention zone" alias "exclusive economic zone (EEZ)" of Sri Lanka is 517,000 sq. km of the ocean, and its continental shelf is about 30,000 sq. km (Department of Census and Statistics Sri Lanka, 2018). It covers the territorial sea that extends seaward for 12 nautical miles (nm) or 22 km from the coastal line, and the contiguous zone extends from there up to 24 nm. The EEZ of Sri Lanka extends 200 nm from its shores, to which Sri Lanka has sovereign rights (Arachchige et al., 2017; Manoharan & Deshpande, 2018; Samarayanke, 2003; Scholtens, 2016a; Suthaagaran, 2018). Figure 1.1 shows the EEZ of Sri Lanka, including the India-Sri Lanka maritime boundary.

Sri Lanka's exclusive economic rights to a vast area of the Indian Ocean have enormous potential to increase fish production if fishing activities expand into the EEZ

and high seas (Naveenan, 2018; Samarayanke, 2003). However, it remains subsistent due to weak governance, unreliable and outdated fishery data, and the miserable quality care of fish products (MFARD, 2007). Moreover, factors such as scarce fishing technologies, impacts of civil war, inadequate infrastructure facilities, low investments in the fisheries sector, and inadequate training and research restrict access to international waters (MFARD, 2007; Naveenan, 2018). For instance, around 4,000 multiday boats operate within EEZ, while small boats are engaged in coastal fishing. About 1,576 vessels over 10.3 meters were permitted to enter the high seas in 2016, but only 1,461 were active (Hewapathirana & Gunawardane, 2017).



**Figure 1.1:** Exclusive Economic Zone and Pollution Prevention Zone of Sri Lanka (Arachchige et al., 2017).

Fishing activities on the continental shelf that extend for an average width of 12 nm from the coastal belt are referred to as the coastal fishing subsector while fishing in balance areas up to the edge of the exclusive economic zone is referred to as offshore or deep-sea fishing subsectors (Azmy et al., 2021; FAO, 2006). Coastal fisheries primarily carried out on the continental shelf are the fishing industry's dominant subsector in the fishing industry in Sri Lanka. However, offshore/deep-sea fishing is rapidly growing, while inland fishing provides livelihood and protein needs for the people around irrigation tanks and inland water bodies (MFARD, 2007; NARA, 2019). The private sector is dominant in the fish supply chains of the Sri Lankan fishing industry, which encounters several constraints due to failures in public institutions, policy misfits and internal conflicts. These include short supply, high costs, poor product quality, and uncompetitive markets, specifically in exports (Arunatilake et al., 2008; Edirisinghe et al., 2018).

About 583,000 people are employed in the fisheries sector, which provides livelihoods for over 2.7 million coastal communities in Sri Lanka (NARA, 2019). In 2019, the total fish production of Sri Lanka was 505,830 metric tons (MT), a sharp decline compared to previous years. The marine subsector produced 415,490 metric tones, while the rest, 90,340 MT, were produced by the inland and aquaculture subsector (MFSL, 2020). Table 1.1 provides details of fish production from the year 2015 to 2019, according to fisheries sub-sectors.

**Table 1.1:** Annual fish production of Sri Lanka by sub-sectors (metric tons)

<b>Fisheries sub-sectors</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Marine Sector (total)	452,890	456,990	449,440	439,370	415,490
Coastal	269,020	274,160	259,720	249,020	242,580
Offshore/Deep Sea	183,870	182,830	189,720	190,350	172,910
Inland & Aquaculture Sector	67,300	73,930	81,870	87,690	90,340
<b>Total</b>	<b>520,190</b>	<b>530,920</b>	<b>531,310</b>	<b>527,060</b>	<b>505,830</b>

Source: Ministry of Fisheries, Sri Lanka (MFSL, 2020).

Although Sri Lanka has 15 fisheries districts, 27% of the total marine fish production came from two districts (Hambantota and Puttalam), while three districts (Ampara, Anuradhapura, and Polonnaruwa) accounted for 44% of the inland fish production in 2018 (MFSL, 2020; NARA, 2019). The fisheries industry's contribution to Gross Domestic Product (GDP) declined to 1.3% in 2017 compared to 1.6% in 2014, in which about 90% of fish production was from the coastal and marine fisheries during the 2012-2017 period (MFSL, 2020; The World Bank, 2017).

Around 4.5% of total export earnings in Sri Lanka come from fisheries, contributing to 6.7% of employment (The World Bank, 2017). Thus, relevant government institutes make special efforts to promote export-oriented deep-sea fishing, mainly to increase the catch of high-value tuna fish. However, Sri Lanka remains one of South Asia's leading seafood-importing countries. Records showed that the country's fish imports increased from 71,413 MT in 2012 to 106,020 MT in 2017 (NARA, 2018). Sri Lanka imported a substantial amount of dry and canned fish products to cater to excess domestic demand, as local fish production largely depends on coastal fisheries (NARA, 2019). For instance, local canned fish production in 2018 was 2725 MT, while 28,068 MT of canned fish were imported (MFSL, 2020; NARA,

2019). However, in 2019, the quantity of fish products imported by Sri Lanka declined to 95,637 MT compared to 120,046 MT in 2015 (MFSL, 2020).

Even though Sri Lanka imports several fisheries products, the country has immense potential to expand the fisheries sector to boost the local economy and promote livelihoods, food security, and sustainable development (Karunathilaka et al., 2017; Nishanthan et al., 2019). However, several studies found that imbalances between the inputs and outputs of the SSF (i.e., poor supply chains, weak governance, illegal fishing, excessive workforce, user competition, inadequate infrastructure, and research and training) intensify the conflicts and overexploit the ocean and coastal resources (Edirisinghe et al., 2018; MFARD, 2007; Senanayake, 2019; Sosai, 2015; The World Bank, 2017; Wijayaratne & Maldeniya, 2003). Urbanisation, tourism, resource exploration, and marine pollution exacerbate disparities while risking sustainability in the fishing industry (Ibrahim, 2020; Stobutzki et al., 2006). Hence, this study attempts to identify multiple factors that make SSF in the Jaffna peninsula of Sri Lanka vulnerable and find ways to make them sustainable.

## **1.2 Problem Statement**

As an island nation with a densely populated coastal belt with mere conservation measures, Sri Lanka is susceptible to climate-induced and human-made disasters (Athulathmudali et al., 2011; BOBLME, 2013; Climate Change Secretariat, 2016; Pussella et al., 2015). Problems faced by the SSF in Sri Lanka are not limited to climatic change or depletion of natural resources, yet many issues related to social, political, economic, structural, and even cultural dimensions also seem to be critical (Gunaratne et al., 2021; Ibrahim, 2020; The World Bank, 2017). These issues can be scientifically understood by analysing and discussing them from a vulnerability lens

and framework. Such vulnerability frameworks comprise human conditions (social, economic, institutional structures, and people) and environmental conditions (natural and biophysical settings) (Turner II et al., 2003). Birkmann et al. (2013) expanded the vulnerability framework, including physical, ecological, social, economic, cultural, and institutional domains. However, a limited number of studies have used a multidimensional vulnerability framework to analyse vulnerability issues of SSF communities, particularly in Sri Lanka.

Sri Lanka faces sustainability issues in fisheries, such as user conflicts, illegal, unreported, and unregulated (IUU) fishing practices, ocean and coastal pollution, inequalities in supply chains, outdated policies and subsidies, and weak governance. Such issues cause multiple vulnerabilities in the fisheries and the coastal and marine environments that require sustainable interventions (Gunaratne et al., 2021; MFARD, 2007; Sosai, 2015; The World Bank, 2017). Hence, a multidimensional vulnerability analysis in the SSF communities in the Jaffna peninsula of Sri Lanka will contribute toward understanding multi-faceted vulnerabilities, where many issues are delicate, sensitive, controversial, complex, and even overlapped. The following paragraphs discuss some pressing problems relating to SSF communities in Sri Lanka.

In many developing countries, including Sri Lanka, socio-cultural and socioeconomic are among the significant factors that contribute to the vulnerabilities of the SSF (Nayak & Berkes, 2019; Pussella et al., 2015; Wedathanthirige et al., 2013). Considering the social and economic domains, women in the SSF sector are one of the most disadvantaged groups, as poverty, social exclusion, unemployment, lack of livelihoods, dependency, indebtedness, and matrimonial alliances create numerous problems for them (Lokuge, 2017; UN Women, 2020). In the Sri Lankan fisheries sector, women are the victims of poverty, depletion of natural resources, and extreme



climatic events. In the Jaffna Peninsula, women's involvement in fisheries seems invisible and unacknowledged, while policies in the fisheries sector are entirely men-oriented (Nilakshana et al., 2021).

Despite no studies on youth in fisheries in the former war-torn areas of Sri Lanka, data shows a gradual increment of active fishers after the end of the ethnic conflict. For instance, active fishers in the Jaffna district in 1989 were 24,839, which reduced to 9,614 in 1999, when the war intensified. Then, it reached 23,420 in 2012 after the war ended and gradually increased to 24,070 in 2019 (MFSL, 2020). The same trend can be observed in all five districts in the northern province. Moreover, youth in fishing communities tend to participate in fishing activities at a very young age, neglecting their education (Koralagamage, 2020; Munas & Lokuge, 2016). However, Scholtens (2016a) found that due to the declining catch, impacts on Indian trawling fishing, and declining fishing efforts, most young fishers left the industry and moved to odd jobs in Gulf countries or local construction works.

Apart from the typical socio-cultural and socioeconomic issues, studies show that the fisheries sector in Sri Lanka, particularly the northern region, is the most vulnerable due to the adverse impacts of the civil war protracted for over 30 years (Bavinck, 2015; Kadirgamar & Kadirgamar, 2018). Multiple displacements of almost the entire population in the northern region while the ethnic conflict has resulted in prevalent inequalities in every aspect of life, adversely affecting coastal communities (ADB, 2017). Neoliberal approaches in postwar development promoting market economies, such as highways, hotels, ports and airports, and acquiring coastal resources, lands and private properties challenged the livelihoods of SSF communities (Ibrahim, 2020). However, interventions in northern fisheries remain minimal despite multiple issues in deep-sea and small-scale fisheries (Arunatilake et al., 2008).

Indo-Sri Lanka maritime boundary line, demarcated by 1974 and 1976 bilateral agreements, is governed under the United Nations Convention on Law of the Sea (Adams, 2015). However, poaching Indian bottom trawlers trespass the maritime borderline and are involved in IUU fishing methods. Such issues are unresolved (Kularatne, 2020; Sarvananthan, 2019b) mainly due to the Sri Lankan government's weak institutions, static legislation, poor bargaining powers, and inadequate political will (Scholtens, 2016b). Northern fishers of Sri Lanka who were adversely affected by the ethnic conflict are still in trying conditions due to Indian trawler poaching, political repression, the collapse of fishery organisations, and the impotence of collective actions (Kularatne, 2020; Manoharan & Deshpande, 2018; Scholtens, 2016b). Indian bottom trawlers capture about 2,000 metric tonnes of fish in Sri Lankan waters daily, depleting the marine resources and coastal environment (Kularatne, 2020; Vincent, 2020). Subsequently, Indian poaching adversely affects the livelihoods of northern fishers who lost development opportunities during and after the war (Munas & Lokuge, 2016; Scholtens & Bavinck, 2018; Vincent, 2020).

Harmful fishing methods (such as explosives, cyanide, bottom trawling, overfishing, and destroying marine and coastal environments) have also threatened the northern fishing industry (Sarvananthan, 2019b; Sosai, 2015). Indian bottom trawlers targeting nearshore marine animals plough, smash, and destroy everything in the seabed of the Sri Lankan waters (Vincent, 2020). "Nevertheless, inadequate implementation of the relevant laws in Sri Lanka to address IUU fishing by foreign fishing vessels has been a serious concern" (Kularatne, 2020). Furthermore, overfishing is critical as Greenpeace and the International Union for Conservation of Nature warned that tuna fish in the Indian Ocean are under threat, and some species are nearing extinction in Sri Lankan waters (Senanayake, 2019).

High post-harvest loss in the northern province due to low technology, poor infrastructure, storage, and transportation facilities (Edirisinghe et al., 2018; MFARD, 2007) are mainly associated with ineffective fisheries governance. For instance, most of the country's fishing harbours and anchorages are located around the south and west coast, two in the east while none in the north (MFARD, 2018; MFSL, 2020). Besides, fisheries infrastructure on northern coasts, such as anchorages, landing sites, ice factories and storage facilities, fishing crafts, and fishing gear, were lost during the ethnic conflict, the 2004 Tsunami, and extreme weather events. However, these facilities have not been restored yet (ADB, 2017; The World Bank, 2017).

In the north and eastern regions of Sri Lanka, the Tamils are the majority, whereas the Sinhalese are the majority in the country. Hence, poaching Sri Lankan southern fishers (mostly Sinhalese) in the northern region creates social tension and economic competition as northern fishers feel that Sinhalese grabbed their livelihood resources (Koralagamage, 2020; Weeratunge et al., 2021). There are speculations among ethnic Tamils and international communities that the Sri Lankan government pays less attention to the development in former war-torn areas (Kadirgamar & Kadirgamar, 2018). Hence, Tamil society raises concerns about missing development opportunities due to socio-cultural differences (Lokuge & Hilhorst, 2017; Soosai & Stokke, 2006). For instance, while the Jaffna district had only 107 Inboard Multi-day Boats (IMUL) in 2018, Matara, Negombo, and Galle districts in western and southern regions have 1105, 874, and 676 IMUL boats, respectively (MFSL, 2020).

With its Exclusive Economic Zone, internal water bodies, climatic conditions, and the ocean around the island, Sri Lanka has immense potential to excel in fish production, value-added products, and import substitution (FAO, 2006; Suthaagaran, 2018). However, it is unclear how Sri Lanka could promote and industrialise deep-sea

fishing to maximise the benefits of EEZ (Hewapathirana & Gunawardane, 2017; Senanayake, 2019; Senaratne, 2013). Moreover, promoting inland fisheries and aquaculture would be an alternative since about 489,000 hectares of inland water bodies are scattered around the country (Pathmanandakumar, 2017).

The Sri Lankan government is responsible for mitigating fishing communities' vulnerabilities and making them sustainable. Fisheries development that integrates the management of coastal zones promotes the coastal economy, and policy reforms to address the regional disparities would be fundamental for Sri Lanka (Pathmanandakumar, 2017; The World Bank, 2017). Understanding the vulnerabilities of fishing communities and making them sustainable is indispensable as it involves millions of people's lives and livelihoods. Otherwise, they may collide below the poverty line (FAO, 2015a; The World Bank, 2012). Moreover, Sri Lankan fishers are natural resource dependents; thus, neglecting fishing communities and the fishing industry destroys the natural and human environments.

Accordingly, Sri Lanka faces multiple vulnerabilities that trap the fishing communities in multidimensional vulnerabilities that require sustainable interventions (Gunaratne et al., 2021; Sosai, 2015; The World Bank, 2017), particularly those in the northern region. For instance, multiple issues such as poaching Indian trawler vessels (Amaralal et al., 2021; Dodangodage, 2017; Scholtens, 2016a; Scholtens et al., 2012), impacts of ethnic conflict and post-war grievances (DeVotta, 2005; Ganguly, 2018; Jayasundara-Smits, 2018; Kadirgamar & Kadirgamar, 2018; Samarathunga et al., 2021), and socioeconomic and environmental issues (Athulathmudali et al., 2011; Ayoob & Fowsar, 2020; Ibrahim, 2020; Nishanthan et al., 2019) pose critical threats to the fisheries and fishery resources in northern Sri Lanka.

It further revealed that interventions in northern fisheries remain minimal (Arunatilake et al., 2008; Pathmanandakumar, 2017; Samarayanke, 2003). Moreover, past studies focused on different vulnerabilities separately rather than analysing them simultaneously. These studies do not reveal the cumulative impacts of vulnerabilities in different domains, thus limiting intervention strategies to resolve specific issues separately. Further, these studies do not comprehensively understand multiple vulnerabilities, their impacts and strategies to promote sustainability. Lack of comprehensive understanding of multidimensional vulnerabilities, their impacts on sustainability and ineffective intervention strategies left the most pressing issues in SSF communities in the Jaffna peninsula unsolved. Hence, this study aims to identify the domains and drivers of vulnerabilities in SSF communities in the Jaffna Peninsula of Sri Lanka, their impacts on sustainability, and intervention strategies to alleviate vulnerabilities and promote sustainability of the SSF sector in Sri Lanka.

### **1.3 Research Questions**

Based on the issues of the small-scale fisheries sector, as detailed above in the problem statement, the study aims to answer the following research questions:

- i) What makes the small-scale fishing communities in the Jaffna peninsula of northern Sri Lanka vulnerable?
- ii) How do vulnerabilities challenge the sustainability of small-scale fishing communities in the Jaffna Peninsula of northern Sri Lanka?"
- iii) How can the vulnerabilities be alleviated, and sustainability is promoted in the Sri Lankan small-scale fishing communities?

#### **1.4 The Objectives of the Study**

The study's main objective is to identify and analyse the domains and drivers of vulnerabilities of the SSF communities in coastal areas of the Jaffna peninsula in northern Sri Lanka and recommend ways to promote sustainable intervention strategies. The specific objectives of the proposed study are to:

- i) Identify the factors contributing to the vulnerability of small-scale fishing communities in the Jaffna peninsula of northern Sri Lanka.
- ii) Analyse how vulnerabilities impact the sustainability of small-scale fishing communities in the Jaffna Peninsula of northern Sri Lanka.
- iii) Devise intervention strategies that mitigate vulnerabilities and promote sustainability within small-scale fishing communities in Sri Lanka.

#### **1.5 The Significance of the Study**

As detailed in the problem statement, studies indicate that people in northern Sri Lanka are susceptible to multiple vulnerabilities, while SSF communities are among the most disadvantaged. Vulnerability studies on other areas like agriculture, urban development, tourism, livelihoods, or poverty in Sri Lanka mainly focus on climate change's impacts. Moreover, vulnerability studies on the SSF sector in Sri Lanka are limited to a few, focusing primarily on a single dimension, such as socioeconomic, climate change, or natural disasters. Hence, the lack of studies on multiple vulnerabilities, their impacts on sustainability dimensions, and intervention strategies to promote sustainability in SSF communities in the Jaffna peninsula of Sri Lanka motivated the present study.

Despite few studies analysing vulnerability and sustainability in different geographical settings together (Berry et al., 2015; Hay & Mimura, 2006; Turner II, 2010; Turner II et al., 2003), studies on achieving sustainability concerning SDGs are minimal. Moreover, such studies mainly focus on the environment, climate change, poverty, gender, or socioeconomic issues separately (Berry et al., 2015; Hay & Mimura, 2006; Posner & Armas, 2014; Thiault et al., 2021). Consequently, past studies do not comprehensively analyse the multiple vulnerabilities in multiple domains, hence little understanding of the cumulative effect of impacts on sustainability. Past studies also have gaps in intervention strategies since most studies do not relate the intervention strategies to SDGs.

Moreover, recent studies reveal that domains and drivers of vulnerabilities are constantly changing and location-specific (Bunce, Brown, et al., 2010; Dilshad et al., 2019; Mavhura et al., 2017; D. Mills et al., 2011). It implies that multiple domains and drivers of vulnerabilities would be unique to a study location and target population. Past studies, however, focused on a specific vulnerability driver in a single or few different domains or even in a single domain, such as the impacts of climate change on small-scale fisheries. Hence, finding multiple domains and drivers of vulnerabilities in SSF, identifying their impacts on sustainability, and linking them with sustainable interventions aligned to SDGs would be a distinct advantage in this study. Identifying the interconnectedness of the domains and the drivers of vulnerabilities would also be a novelty in this study.

Accordingly, the study aims to fill the gaps in theory and practice in vulnerability analysis, bringing multiple domains and drives together, then the gaps in our understanding of cumulative impacts of multiple vulnerabilities on sustainability and fill the gaps in practice in interventions by bringing SDGs to address the root

causes of multiple vulnerabilities. The critical issue is that no past studies have analysed multidimensional vulnerabilities in different domains, their cumulative impacts on sustainability, and identifying intervention strategies aligned to SDGs. Hence, the present study aims to fill critical gaps in vulnerability, impact, and intervention strategy analysis.

This study specifically aims to fill the gaps in vulnerability and sustainability analysis in the SSF sector since it is the least studied despite being one of the most deprived and marginalized communities in Sri Lanka. Hence, the findings would benefit the study population, SSF communities in Sri Lanka and similar social settings globally. Moreover, this study applies a qualitative approach, while most earlier studies on vulnerability analysis used quantitative methods. Quantitative studies primarily focus on the consequences of vulnerabilities, but this study aims to identify the root causes of the vulnerabilities, their impacts, and intervention strategies by capturing a wide array of human perspectives qualitatively.

This study will specifically benefit the SSF communities in northern Sri Lanka as research findings will address the multidimensional vulnerabilities in the SSF sector. Specifically, this study will be the novelty to identify the domains and drivers of vulnerabilities in SSF communities and address them through interventions aligned with sustainable development goals (SDGs). Research findings will recommend policy reforms and specific programmes to sustain SSF communities. In general, the tools and methods applied in this study and research findings will contribute to filling the knowledge gaps in vulnerability and sustainability analysis.



The study seeks to bring salient issues of SSF communities to the surface. Hence, it can be concluded that the importance of this study from two perspectives: concepts and practices. Conceptually, the study will determine the domains and drivers of vulnerabilities in SSF communities, and by doing so, it will identify what changes are required to make them sustainable. In terms of practice, the study aims to recommend policy interventions for sustainable fisheries development in Sri Lanka.

## **1.6 Scope and Limitations of the Research**

Sri Lanka, as an island, has 1,340 km of coastline, including dozens of small offshore islands. The coastal belt covers 14 administrative districts. Some are densely populated and strategic development centres, such as the capital city of Colombo. Fishing activities occur around the country, but this study limits its data collection to the northern coastal region, even though demography, socioeconomic and cultural diversities, and geographic, climatic, and environmental factors vary.

The northern coastal region consists of four fisheries districts, but only two districts, namely the Jaffna district and part of the Killinochchi district (since a part of the Killinochchi district is included in the Jaffna Peninsula), are observed. Most fishing communities in the northern region are physically and socio-economically diverse. However, primary data will be collected in different locations with fisheries cooperative society leaders, leaders of community organisations, government officials, religious leaders, academics, NGO leaders, policymakers, and social activists.

Moreover, the study followed the purposive sampling method, representing the SSF communities in the Jaffna peninsula. Hence, they do not explicitly represent SSF communities in other parts of the country. Thus, it is hard to generalise the findings, while the study purposely did this limitation following the literature review, which

confirmed that the target population is one of the most vulnerable. Such limitations and specifications further apply to the issues around war and ethnic conflict since the study area does not cover all war-torn areas of the country. Furthermore, the study population does not represent the fishing communities involved in inland fishing, aquaculture, or deep-sea fishing in the study area.

The study will specifically focus on the SSF communities; nonetheless, deep-sea fisheries, inland fisheries, and aquaculture contribute to the fishing industry in Sri Lanka. This is because the SSF sector is the least studied despite being one of the most deprived and diverse communities in Sri Lanka. The study will only look at factors affecting the vulnerability of the SSF communities, their impacts, and finding ways to overcome them and make the SSF communities sustainable.

The present study focuses on identifying multidimensional domains and drivers of vulnerabilities, analysing their impacts, and finding intervention strategies to restore the sustainability of SSF communities. Hence, the scope of the study appears broad, considering the different components and types of analysis involved in the research process. Such research requires considerable qualitative data, as quantitative data will not be able to provide the long narrations required in all three stages of the analysis. Hence, it limits the number of participants and study locations due to the data collection methods, cost, time and logistics constraints, and difficulties in data collection and analysis, including translations. Therefore, the study is limited to a specific geographical region in Sri Lanka and Tamil ethnicity.

## **1.7 The Organisation of the Thesis**

The thesis is developed into five chapters: i) Introduction, ii) Literature Review, iii) Research Methodology, iv) Results and Discussion, and v) Conclusions and Future Recommendations. Chapter One explains the background of the study by providing an overview of the fisheries sector and details the SSF sector, focusing on the Sri Lankan fisheries industry. It then describes the problems and why this research should be conducted while detailing the research questions, objectives, significance, scope and limitations, and the study's expected contribution.

Chapter two critically analyses the contemporary literature on the SSF sector with particular attention to vulnerability and sustainability analysis. It provides details on the existing research gaps, like theories, concepts, or interpretations, to verify the novelty of the proposed study. Then, it furthers the understanding of the research topic by providing a detailed analysis of concepts and terminologies used in this study. Finally, chapter two provides the study's conceptual framework, focusing on identifying domains and drivers of vulnerabilities, analysing how such vulnerabilities challenge sustainability dimensions and finding ways to promote sustainability through sustainable interventions referring to SDGs related to the fisheries sector.

Then, the subsequent chapter is on research methodology. It covers collecting relevant information and data, the sampling methods employed, the sampling frame, and inclusion and exclusion criteria. It further details the study area, demographics, environment and natural resources, and the study area's specific socio-political and economic features. Then, details on primary and secondary data sources, data storage, credibility of data, translation and usage of data, and the software used in data analysis are provided. Further, it discusses the ethical considerations, anonymity and

confidentiality of the data and the research participants and a briefing on the method of data analysis. It explicitly discusses the data analysis method -Thematic Analysis- and a briefing on computer-assisted qualitative data analysis software (CAQDAS) and the specifics of ATLAS.ti software used.

Chapter four details the results of the data analysis process explicitly relating to research objectives. Here, it describes the themes that emerged, concerns raised, and the solutions provided by the study participants according to the research instruments and the study's conceptual framework. It also explains how the research findings match the study objectives and discusses previous studies to test the importance of the research findings. Specific themes that emerged in the analysis are used as chapter subheadings, and then detailed discussions of the results with supportive figures and tables of the analysed data are provided.

The final chapter summarises the study findings by providing conclusions and future recommendations based on both primary and secondary data. These recommendations specifically cater for the respective government institutions, policymakers, international organisations, and non-governmental organisations focusing on the rights of the fishing communities, fisheries and aquatic resources and ocean governance, research and academic institutions, and the public. The list of references and other supportive documents will be provided at the end of the thesis.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

As detailed in the previous chapter, SSF communities are essential in global food security and sustainable development, yet they are among the most vulnerable and marginalized. This chapter, therefore, reviews and synthesises the literature related to the themes of the present study, which include sustainability and sustainable development, SSF and coastal communities, the Sri Lankan fishery sector, and multidimensional vulnerability. The literature review focuses on issues and controversies regarding vulnerability and sustainability, particularly regarding the SSF sector and marine resources. The scope, however, is directed to the Sri Lankan context and similar settings in developing countries. Ultimately, this review aims to critically review and synthesise previous studies to grasp the existing knowledge, identify the knowledge gaps and develop the conceptual framework for this study.

##### **2.1.1 Sustainability and Sustainable Development**

Sustainability is no longer a new concept. It is rooted in the early conceptions of social justice, conservation of natural resources, issues of the industrial revolution and natural disasters, development rights and other social movements (Barbier, 1987; Kuhlman & Farrington, 2010; Tisdell, 1988). As a result, different concepts of sustainable development evolved from the early 1960s due to development and environmental concerns. For instance, early 18<sup>th</sup> and 19<sup>th</sup>-century political economists raised concerns about finite natural resources, quality air, water, public goods, and the requirement of governments' interventions on externalities (Klarin, 2018; Mebratu,

1998; Tisdell, 1988). The overexploitation of finite common resources to achieve personal prosperity has driven humankind towards the tragedy of the commons, as the same resources would extinguish (Hardin, 1968; IUCN, 1980).

The modern idea of sustainable development emerged in the late 1960s and early 1970s due to limits to economic growth and environmental concerns (Du Pisani, 2006; Shi et al., 2019). Then, world leaders realised that applying sustainable practices to the development process at any scale, whether large or small, would lead to long-term positive impacts. Hence, sustainable development has become a key concept of policymakers and development interventions worldwide (Caldwell, 1984; Hammer & Pivo, 2017; Klarin, 2018). The sustainable development concept became popular during the 1970s and 1980s based on the notions of needs and redistribution of resources, the needs of future generations, and the development consistent with natural restraints (Feil & Schreiber, 2017; Klarin, 2018).

Presumably, a highly influential book of 1972, *The Limits to Growth* (LtG), explained using a computer-based systems approach that unlimited growth of humanity would eventually cause social and economic collapse by the year 2100 if humans do not impose a balance between population growth, production patterns and the environment (Meadows et al., 1972). The book's release immediately impacted sustainability debates while urging policy, technology and behaviour changes by bringing nature conservation and the global economy together (Turner, 2008). However, neoliberal politicians and economists harshly turned down the assertions of the LtG and continued with global capitalist economic approaches. Moreover, many scientific journals, articles, books and even educational materials were produced to humiliate the LtG contributions to sustainability studies (Butler, 2017; Gómez-Baggethun, 2020; Jackson, 2019; Kool, 2013; Meadows et al., 2005).