UNIVERSITY OF AMSTERDAM

UvA-DARE (Digital Academic Repository)

Small-scale fisher migration, conflict and wellbeing
A case study from Sri Lanka

Koralagamage, D.N.

Publication date
2020
Document Version
Other version
License
Other

[Link to publication](#)

Citation for published version (APA):
Koralagamage, D. N. (2020). *Small-scale fisher migration, conflict and wellbeing: A case study from Sri Lanka*. [Thesis, fully internal, Universiteit van Amsterdam].

3   Research methodology

3.1 Introduction

This chapter explains the research design, field research methods, and analytical tools employed for data collection and analysis. Section 3.2 describes how the review of academic and grey literature was undertaken. Section 3.3 explains the rationale for selecting the Northern Sri Lanka case study along the northwestern coast, followed by the research design and research procedure. Section 3.4 justifies the mixed method approach with several quantitative and qualitative data collection methods used to answer each research sub-question. Section 3.5 explains the exploration of quantitative and qualitative data together with applicable analytical tools for indicator construction. Section 3.6 wraps up the chapter with the practical issues of the research, limitations, and concluding remarks.

3.2 Literature review

The literature review helped to assess the state-of-the-art of existing theoretical, methodological, and empirical knowledge on small-scale fisher migration, conflict, and wellbeing in Sri Lanka. It was carried out by identifying the literature, focused reading, previewing, annotating, and summarizing (Sanders et al. 2009). Following key words were identified: migration, wellbeing, legal pluralism and governance, gender, place attachment, and fisheries conflicts complemented with ecosystem health, identity, and inclusive development in small-scale fisheries in Sri Lanka. Scholarly articles in Google Scholar database were filtered for the years 1990-2018. The literature was clustered according to titles and keywords. Figure 3.1 demonstrates the process of the literature review.

Figure 3.1 The process of the literature review
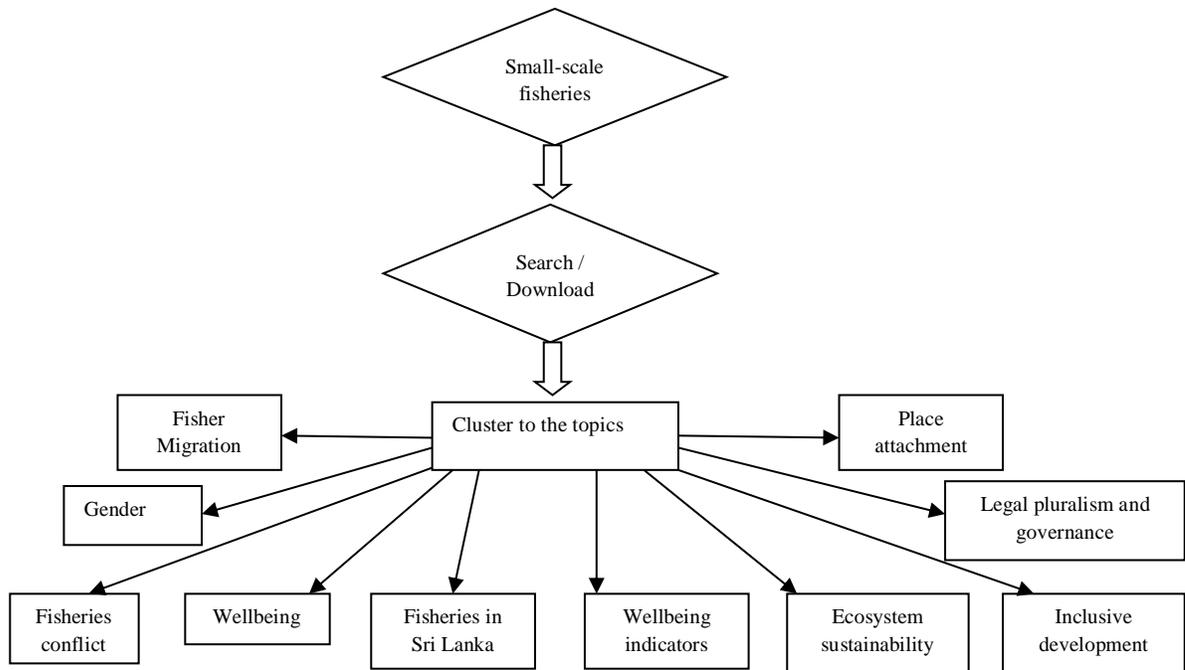
Source: Author

A body of grey literature, from government offices, legal documents, reports by NGOs, media articles, and others were used as background information and for triangulation throughout the dissertation. Both qualitative and quantitative secondary sources were used. Most of the qualitative sources were drawn from previous empirical research, government reports, and media reports. Quantitative secondary data was obtained from local statistical departments such as the Ministry of Fisheries and Aquatic Resource Development, the Coast Conservation Department (CCD), the Census and Statistics Department and global statistical data sources, including the World Bank, Organization for Economic Cooperation and Development (OECD), and Food and Agriculture Organization (FAO). Statistical data on global fisheries was used primarily in Chapter 1 and empirical findings were used in Chapters 4, 5, 6, 7, and 8.

3.3 Research design

In order to assess how small-scale migrant fishers pursue wellbeing in conflict-affected areas, this research combines a case study design and a mixed method approach employing quantitative, qualitative and spatial methods (Bryman 2012). Empirical wellbeing studies are usually built through a bottom-up approach, because people's needs and priorities are subjective while access and control over resources is context specific (McGregor et al. 2015; Coulthard et al. 2014; Hall and Rickard 2013). Therefore, a bottom-up inductive approach[2] is used to assess the issues that migrant fishers deem important in life and how their priorities and needs can be addressed in fisheries development policy and action (McGregor et al. 2015; Coulthard et al. 2014; Hall and Rickard 2013; Armitage et al. 2012; Bryman 2012). However, a basic policy analysis was conducted to evaluate the present policy documents and development plans to extract relevant policy priorities and wellbeing priorities for small-scale migrant fisherfolk in Sri Lanka.

### 3.3.1   Case study approach

A case study approach was used to answer the research questions. A case study is an empirical review to investigate a contemporary phenomenon set within its real world context (Yin 1984: 23) and allows for intensive description and analysis through an interpretive approach (Baxter and Jack 2008). A case refers to a bounded entity with a definite unit of analysis such as an event, an individual, groups, institutions, and community in an integral system (Merriam 2008: 8; Noor 2008). Case studies are designed for in-depth examinations (Merriam 2008; Zainal 2007) of a specific issue, a feature, or unit of analysis (Bryman 2012). In this research, two small-scale migrant fisher communities in northwestern Sri Lanka feature as cases. Through asking 'how' and 'why' type research questions, as an investigator, I had little or limited control over the phenomenon (Yin 2009: 4). This allowed me to explore how wellbeing and migration are influenced by the resource conflict setting. Fishing communities are characterized by multiple actors, nuances, complex social systems, fishing methods, routines, institutions, and practices (Jentoft and Cheupagdee 2015). These complexities in real life events are explained using quantitative and qualitative methods and data in case studies (Zainal 2007). This is useful in the professional practice of fisheries, decision-making and plural policy realms (Baxter and Jack 2008). Limitations regarding the generalization of research findings were partially overcome by triangulation (Yin 1984).

---

[2] The literature can be used for bottom-up and top-down approaches where the latter departs from existing theories, pre-defined concepts, and methods whether the objectives attained over time, how, and why (Woodhouse et al. 2015). The top-down approach investigates whether hypotheses established are valid or not; bottom-up approaches inductively define hypothesis.

3.3.2   Rationale for the selection of research areas

My case study encompasses two sites in the Mannar District of the Northern Province of Sri Lanka, namely Silavathurai and SouthBar (see Figure 3.2). This is because: a) the sites suffer from a transboundary fisheries conflict as well as micro level latent conflicts with migrant fishers; b) there is a prevalence of different legal systems and institutions; c) different group identities of fisher populations such as gender, location (local/migrants), and ethnicity (Muslim/ Sinhala/ Tamil); and d) seasonally inhabited by migrant fishers. I visited Mannar with Professor Soosai (University of Jaffna) during the first two weeks of June 2014 to be introduced to gatekeepers and key informants. I visited many fishing sites in Mannar including SouthBar, Thalaimannar, Pier and Old Pier, Pesalei, Vankalai, and Silavathurai (Figure 3.2). were visited. I held discussions with local fishers and long-time settlers[3] and focused on conflicts in the area, such as Indian trawling and illegal fishing techniques used by local fishers. Secondary data on the intended research locations was also gathered by visiting the regional fisheries office in Mannar.

Figure 3.2 Research locations in Mannar
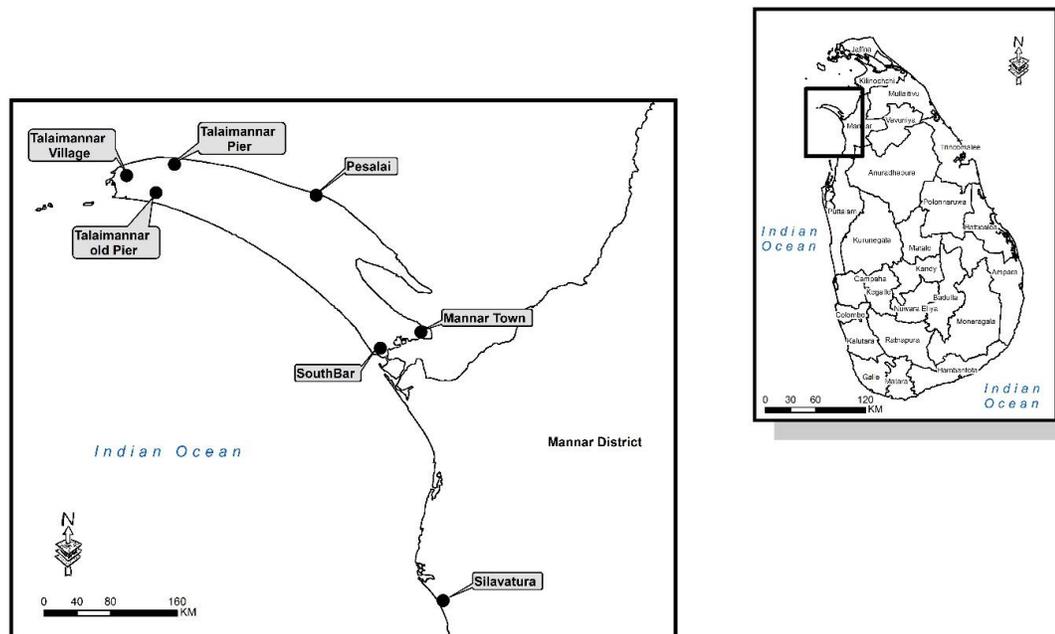
Source: Survey Department 2017

Pesalei, Arippuwa, and Vankalai were rejected as they were non-migrant sites. Thalaimannar-Old and New Pier were rejected due to the small number of migrant fishers and the relative absence of conflicting issues. SouthBar and Silavathurai were selected because these sites host migrants and there was evidence of conflicts among different fisher groups (Table 3.1).

---

[3] Long-time settlers are either from Negombo or Chilaw but now reside in Mannar (Old or New Pier) throughout the year. They fish in the old Pier for one season and the new Pier for the other season. They are there since the 1980s and even lived there during the war period.

Table 3.1 Locations selection in Mannar

Landing site	Description	Decision
Pesalai	Only Muslim small-scale fishers. Not a migrant site.	Rejected
Thalaimannar – Old Pier	Few migrant fishers. Locals and permanent settlers from Negombo and Chilaw work in harmony. No conflicting issues.	Rejected
Thalaimannar – New Pier	Few migrant fishers. Locals and permanent settlers from Negombo and Chilaw work in harmony. No conflicting issues.	Rejected
SouthBar	A migrant site. Conflicts are prevailing with fish merchants and local Tamil fishers.	*Selected*
Arippuwa	A Tamil fish landing site. No migrants. No conflicting issues other than Indian trawling.	Rejected
Silavathurai	A migrant site. Conflicts are profound among fish merchants, local Muslim fishers, and villagers.	*Selected*
Vankalai	Only local fishers are employing traditional fishing techniques.	Rejected

Source: Author

3.3.3   Research period

Fieldwork was conducted in two phases partially over two years from June 2014 to March 2015. The first phase lasted for five months from June to October 2014, when the migrant fishers resided in their home region. This was an explorative phase because it was the time to experience the fishing community, getting to know people, their lifestyles and daily routines, building trust with fishers, and contacting key informants. As per the research design presented at the end of this section (Figure 3.4), several Focus Group Discussions (FGDs), key informant (KI) discussions, and a survey were conducted.

The period from January 2015 to March 2015 was selected for the second phase to meet fishers at their migrating sites in the North. They were well settled by that time. However, it was slightly delayed until the last week of January due to the Presidential elections in Sri Lanka, which took place on the 8th of January, 2015[4]. The focus of the second phase was on fisheries livelihoods, living conditions, conflicts, and wellbeing in the two locations.

3.3.4   Units of analysis

Research questions were formulated at multiple levels directed at small-scale migrant fishers, their households, and communities. The individual household was the unit of analysis. Households mostly comprised one family –the fisherman (head of the family), his wife, children, and the wife's parents[5]; households are the core economic and social unit in the fishing community. The interviews and survey were conducted at the intra-household level, for men and women (husband and wife) separately. The sample comprised married respondents irrespective of whether they had children (Figure 3.3).

---

[4]The opposition party came into power and this created certain political turmoil.
[5]It is customary in other regions in Sri Lanka that the grandparents reside with the youngest son, whilst daughters are sent to their husband's house. The opposite custom was noticed in these regions, which might be due to the temporary migration behaviour.

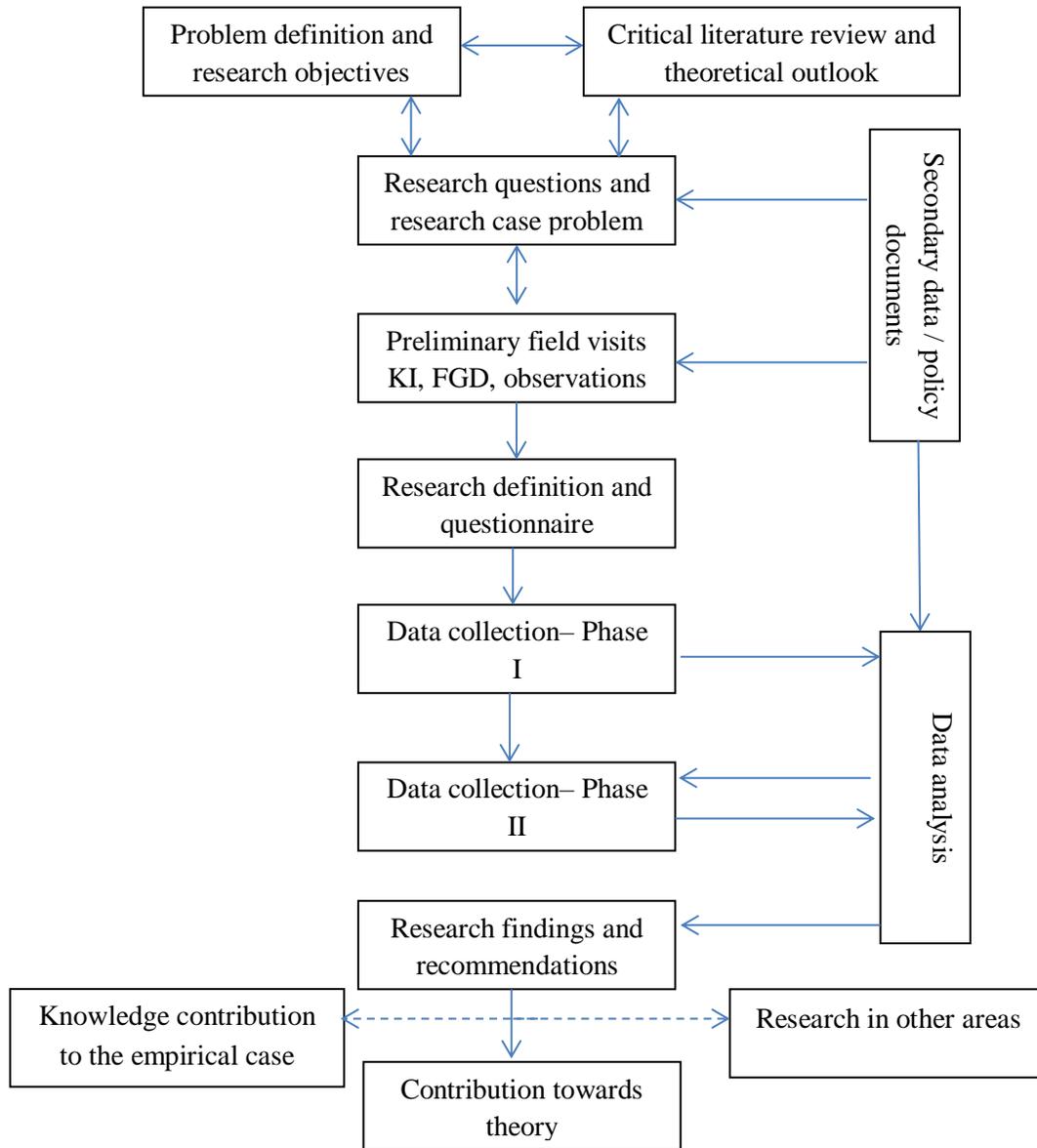**Figure 3.3 Units of Analysis of the case study**
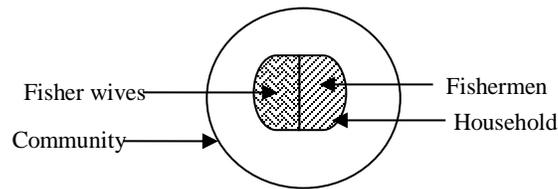
Source: Author

3.3.5   Research procedure

The preliminary steps of the research, including problem identification, research question, and objective formulation, were accomplished through a critical literature review. The research was initiated by qualitatively interviewing key informants (KI) from both Mannar and Negombo and by conducting two focused group discussions (FGDs) with fishermen and fisher wives in Negombo separately. The research was re-defined using this preliminary information. The research procedure is presented in Figure 3.4.

Preliminary investigations were helpful in the preparation of the questionnaire. A survey was used to collect both quantitative and qualitative data. Simultaneously, in-depth interviews with small-scale migrant fishermen and women, fish merchants, office bearers in local/migrant fisher's associations and Participatory Rural Appraisal (PRA) exercises with smaller groups (n=8) were carried out. Having completed phase I, data tabulation and data cleaning was undertaken. The basic analysis on phase I was accomplished at the University of Amsterdam over two months (November – December 2014).

Fisher relevant wellbeing indicators were tested to quantify the necessity and satisfaction using a Likert scale during the second phase in Mannar; Silavathurai and SouthBar. Simultaneously, two FGDs with PRA exercises were conducted to understand the prevailing situation. Office bearers of fisheries associations, several local fishers, fish merchants, navy officers, officers from the regional fisheries office and fisheries inspectors were interviewed formally as well as informally. Next, data was analysed to formulate the wellbeing index and other interpretations according to the research objectives.

Figure 3.4 The research design process for the case study

Problem definition and research objectives	Critical literature review and theoretical outlook

Research questions and research case problem

Secondary data / policy documents

Preliminary field visits KI, FGD, observations

Research definition and questionnaire

Data collection– Phase I

Data collection– Phase II

Data analysis

Research findings and recommendations

Knowledge contribution to the empirical case

Research in other areas

Contribution towards theory

Source: Author

3.4 Research methodology

3.4.1 Epistemology and methodology

Epistemology is the knowledge of social behaviour, its nature, form and the way it is acquired and communicated to others on the research discipline (Cohen et al. 2007: 7; Snape and Spencer 2003). There are two ways to view knowledge; (i) positivism –knowledge is viewed as a hard, objective, and tangible phenomenon where the research performs the role of an observer with allegiance to the methods of natural science (testing, measuring and so on), and (ii) interpretivism - views knowledge as personal, subjective, and unique (Ormston et al. 2014). My epistemological departure follows the interpretivist's view to understand migrant fishers' conflicts and wellbeing. Since "social reality has a mean for human

beings…human action is meaningful…" (Bryman 2012:16) I aim to access the fishers' common sense thinking and interpret their actions and worldview.

Furthermore, and linked to an interpretivist approach, the research methodology is a mixed method approach, combining qualitative and quantitative research methods and data (Adato 2008), but with some small elements of ethnographic research. The data collection and analysis were steered towards problem solving that was considered at the research outset (see also Bryman 2012). From an integrated perspective on resource conflicts, wellbeing, legal pluralism, and gender, a combination of qualitative and quantitative methods are important because of the differential nature of data sources. Wellbeing aspects were investigated via numerical measures and value-based perceptions with factual reasoning based on the respondents' perspectives. Moreover, elements of place attachment were evaluated through attitudinal, emotional, cognitive, and relational aspects. Gender theory was applied to understand gendered livelihoods and wellbeing based on qualitative measures. These theoretical departure points, together, call for both quantitative and qualitative methods and data because: 1) the (more) objective aspects of conflict, migration, wellbeing, and gendered livelihoods are best understood by means of factual and verifiable data; 2) the (more) subjective aspects of human-place attachment and wellbeing include (dis)satisfactions, perceptions, and ideologies and can best be explored by qualitative methods and data; 3) more hidden factors such as gender, culture, and identity are best understood by longer-term ethnographic and in-depth qualitative methods; and 4) the construction of wellbeing indicators is done by using quantitative methods. Thus, the mixed method approach was elaborated in a sequence of qualitative, quantitative, qualitative, and quantitative methods. Although the fieldwork covered some ethnographic methods, namely, participant observation, KI discussions, FGDs, PRA, and in-depth interviews, the research was not designed as an ethnographic research as I did not reside within the studied communities for a long period.

In sum, the methodology enabled me to answer the overarching research question addressing the lacunae in the existing research through the mixed method approach. The inductive nature infers new findings and implications to reassess the theories and dimensions together with untouched facets in wellbeing and place attachment literature.

3.4.1.1   *Qualitative techniques*

Immeasurable, flux, controversial, holistic social constructs, community, and individual behaviour are not possible to study only through quantitative methodologies with statistical results (Merriam 2008; Zainal 2007). PRA techniques, in-depth interviews, FGDs, document analysis, and personal observations were used to gather qualitative data for this study.

Participatory Rural Appraisal (PRA) techniques

I used PRA from social anthropology, which enabled me to use my best judgment (Chambers 1994: 959) and empower the participants by encouraging them to talk, interact, communicate, and present their outcomes through visuals, making communication with those who are illiterate possible. It enabled me to share, enhance, and analyse their existing knowledge, available information, and the situation of their lives, livelihoods, and living conditions. These were helpful to gather community-based information and understand collective decisions.

Pair wise ranking

Pair wise ranking is an important visual analytical technique (Cornwall et al. 1993) in the PRA toolbox to prioritize the burning issues prevailing in a community. This is a group activity; looking into how some fisheries decisions are taken collectively. First, the group members state the pressing problems in their day-to-day life (or in particular to the referred activity) and list these in a matrix, horizontally and vertically. Next, the group compares one problem against the other, discusses, decides, and prioritizes the most important issue from the pair. Likewise, all problems are compared collectively in a sequence. Finally, the frequency of each prioritized problem is counted and ranked in descending order. Four pair wise ranking exercises were undertaken for two fishing locations in both phases (See 5.2).

Relational mapping (Venn diagram)

A relational mapping visually presents the degree of importance and the interaction relationships of the service providing entities in the fishing community. This tool demonstrates the community perception on the service providing entities. First, I asked the group to list down all the service providing officers and organizations. Then the group was asked to rank them according to the importance of the service provided. Separate circles for each entity were made based on their importance. The larger the circle, the more important the service provided and vice versa. Next, they were asked to rank the degree of interaction and the relationship established by those entities with the community and positioned the circle accordingly. The closer the circle, the closer the interaction/relationship with the community and vice versa. The relational mapping exercise for SouthBar migrant fishers is presented in Figure 5.1.

Historical profile

The variation of certain variables over a timeline was presented by historical profiles. The time was determined using memorable and significant events in the past. Independence in 1948, the government change in 1977, the tsunami in 2004, the end of war in 2009, were mentioned as significant events by the respondent groups. Then, the changes were displayed in each period on selected variables such as fish catch, number of migrants in the area, number of local fishers, happiness and many others (fit for the objectives of the activity) in a comparative scale. The historical profile on Silavaturai migrant women is presented in Table 4.4, in Chapter 4.

Focus group discussions (FGDs)

Eight FGDs were held in Negombo, Chilaw, Silavathurai, and SouthBar for both men and women separately. Each group consisted of 6-8 participants. The purpose of the FGDs was to unravel information on i) conflicts prevailing in the area; ii) impacts of conflicts on their wellbeing; iii) plural legal systems and impacts; and iv) community specific wellbeing indicators. Discussions were facilitated by my research assistant[6] and me. In certain instances, when dominating characters emerged, the situation was tactfully navigated by giving opportunities to others for active participation.

---

[6]My research assistant is a graduate from the Faculty of Agriculture, University of Ruhuna where I am attached to. He is 25 years old and not from the fishing communities I studied. He was trained on Social Science research methods during his degree programme and by me on wellbeing related interviews. He helped me by surveying in Negombo and Chilaw in 2014 and Silavathurai and SouthBar in 2015. Further, he helped me to organize and conduct FGDs and PRA exercises.

Photo 3.1 Focus group discussion in Silavathurai

Source: Author- Fieldwork 2015

Key informant (KI) discussions
Inspired by ethnographic studies, I used KI discussions to harvest knowledge and understanding on community history, migration history, past- and present incidents from different perspectives, policy related issues from academics, government officials, NGO officials, and office bearers in CBOs (see Annex III).

In-depth interviews
I conducted 50 in-depth interviews with fishermen and women to explore the quality of life regarding life histories, desirables, values, wellbeing factors, and perceptions. A combination of informal talks, open interviews, formal interviews, topical interviews, and standardized interviews were held (inspired by Eriksen 2001). All the time, the interviews began with a more informal open-ended discussion and gradually developed towards topical and standardized interviews on fisheries conflicts and wellbeing. See Annex I for interview questions.

Participant observation
Inspired by anthropological approaches, I stayed longer hours in the study location so that the community felt that my presence was more or less 'natural' and I became a part of the society. Although that was difficult because of the differences in the financial situation, knowledge, and social status, I tried hard to be a neutral observer to understand the lives of the fishing community, their livelihoods, what people do and what they value. I rented a small apartment close to each of the study locations (not within the location) and stayed for about one and a half months. This arrangement was helpful to observe, interact, and engage with their day–to–day activities on the beach and at their homes (with women) building trust and friendship during daytime. Observation is an ongoing process with a lot of excitement, shock, panic, and fascination (Kraan 2009). Almost all the things, the environment, lifestyle, housing, and other factors are so different from what I was used to, that in the beginning, the fieldwork was intensive and exhausting. Gradually, I became used to the place, the community and the difficulties lessened.

3.4.1.2   Quantitative techniques

I used the quantitative technique in my survey by administering a questionnaire in both phase I and II (see Annex I). I administered the questionnaires myself, so that there was ample room for explanation and discussion exploring the 'why' behind the 'what' questions. The questionnaires administered in the first phase gathered data on basic household demographics, conflicts, problems and reasons for migration, impact of migration on wellbeing aspects such as income, job security, health, children, family relationship and fisher-relevant wellbeing factors with structured questions. In the questionnaire, I asked, "what is the most important thing you need for a good life?" Here, I tried to avoid the term money because in general, we can achieve most of our things with money. Sometimes, when respondents replied, "money is everything," I asked "what are the things/or what do you want to obtain with money" to make the question clearer.

The questionnaire in phase II was designed as a 'Life dimension Scale' (McGregor et al. 2015) to assess wellbeing over a number of important aspects in life (occupation, education, health, income), which was scored using a Likert scale. The survey provided an opportunity to observe and talk with a larger number of migrants and to re-visit the same households of phase I respondents. The survey was conducted by drawing a sample from the migrating fisher populations in Negombo and Chilaw.

Sampling technique

The regional fisheries office does not maintain a proper file on migrant fishers. Therefore, I listed all the names, migrating sites, and their permanent addresses to make an approximate sampling frame. While conducting the research, I was able to obtain lists of migrant fishers of each site from office bearers of the Migrant Fisher's Associations, which seemed to be reliable and accurate. Then, a purposeful random sampling technique was adopted in phase I (Table 3.2).

Table 3.2 Sample composition based on home region –Survey phase I (n=142)

Home region Category	Negombo	Chilaw	Total
Male	50	26	76
Female	46	20	66
Total	96	46	142

Source: Author-field work Phase I at Negombo and Chilaw

Comparatively, the second phase was easier due to the initial rapport built with respondents. The migrant sites were busy places with congested temporary huts on the beach but open to everyone. I could easily notice whether fishers were busy, relaxing, or ready to talk with me. Having all migrants in one location, 164 questionnaires were completed in total. The sample composition for phase II based on gender, migrating sites, and home regions is presented below (see Table 3.3 and Table 3.4).

Table 3.3 Sample composition on home region –survey phase II (n=164)

		Home town		Total
		Negombo	Chilaw	
Gender	Male	73	13	86
	Female	66	12	78
Total		139	25	164

Source: Author-field work Phase II at Silavathurai and SouthBar

Table 3.4 Sample composition based on research locations (n=164)

		Home town		Total
		Negombo	Chilaw	
Migrating Area	Silavathurai	78	20	98
	South Bar	61	5	66
Total		139	25	164

Source: Author-fieldwork Phase II at Silavathurai and SouthBar

Table 3.4 shows that most migrant fishers are from Negombo rather than Chilaw. The number of migrant fishers in Silavathurai is higher (192 households) than in SouthBar (43 households). This led to fewer respondents from SouthBar. Initially, the plan was to interview 40 male and female respondents from each site. Due to the lower number of women in SouthBar, the survey covered the entire female population of 26 and interviewed the rest from Silavathurai.

Variables
Three factors were crucial in designing the research: 1) the awareness of the relevant variables; 2) knowledge on the case to operationalize appropriate variables while avoiding the omitted variable biasness (King et al. 1994); and 3) incorrect emphasis on certain variables (Ragin 1987). Variables extracted from the literature survey, previous research (Wellfish project), FGDs, and KI discussions were considered for the questionnaire construction for the fieldwork Phase I (see Table 3.5).

Table 3.5 Variables used in the questionnaire

Description	Variables
Demography	Gender, migrating area, age, experience in fisheries, age when starting fishing, education level, migration, mode of migration
Present perception	Economic situation, national security, social condition, government support, fishing in future, children's involvement, life satisfaction
Material wellbeing	Savings, living condition, resource availability, standard of living, physical health, clean water, food consumption, housing
Relational wellbeing	Family relationship, ethnic health, support from the community, status in the community, social harmony, relationship with local villagers
Subjective wellbeing	Physical security, job security, mental health, satisfaction, achievement in life

Source: Author (based on literature review)

Interviewing time
The time factor was critical for the availability of male and female respondents. Small-scale fishers leave home by 2.00 – 3.00 am and return by 10.30 – 11.00 am. They rest (mostly sleep) from 1.00 – 3.00 pm and then go back to the beach for net-mending, cleaning, loading, and preparing for the next day's fishing trip. In fact, the only possible time to interview fishermen was from 11.00 am – 3.00 pm, which meant that I sometimes disturbed their rest. Women were busy until 9.00 am with kids, cooking, engaged in community services, social activities, shopping, and marketing. Since, I wanted to talk to women separately, I chose to visit them from 9.30 – 11.00 am. Though I could talk with women alone, the interviews with fishermen were frequently interrupted by their wives as they also wanted to participate in the discussion. This was overcome by interviewing women in the morning and men in the afternoon in the same household clearly explaining the importance of undisturbed information for the research. On certain occasions, I went to the beach and talked to fishermen while they were sorting fish, mending nets, or chatting in nearby shops. This procedure was practiced at all the places. The interviewing time for each interview varied between 45 minutes to 1.20 hours.

Global Person Generated Index survey
The Global Person Generated Index (GPGI) developed by the WeD group (Annex II) and widely used in QoL assessments (Britton 2012; Smith and Clay 2010; Camfield and Ruta 2007; Ruta 1998) to measure subjective wellbeing was initially used to assess important wellbeing factors. However, after a few attempts I realized that it was difficult to explain the tool and convince because the sample was not literate enough. I dropped the tool and used a simple alternative technique to understand the dominant wellbeing factors per individual. I assessed: (i) the important factors to live well; (ii) the satisfaction level based on a five point Likert scale; and (iii) the necessity of these factors for a good fishing life based on a three point Likert scale. A weighing system was used to evaluate the scores (see Chapters 6 and 8).

3.5 Ethical considerations
Ethics, norms of conduct for acceptable behaviour (Shamoo and Resnik 2015), are helpful in deciding how to act and analyse complex problems and issues in the methodology, procedure or perspectives (Resnik 2011). Ethical principles usually require an understanding whether the research causes harm to participants,

seeks informed consent, whether the privacy and confidentiality of respondents is respected, ensures voluntary participation in the study (interviews, FGDs, and survey), and minimizes any deception (Shamoo and Resnik 2015; Bryman 2012:135). These issues are explained in detail below.

Ensure quality and integrity of the research
In order to avoid deception and enhance the integrity of my research (Bryman 2012), I explained that the research was a study for a partial fulfillment of a university degree. I did not raise any expectations on aid, direct benefits, or financial support. However, they were happy to respond saying: "*Good, this is for your education purpose, we must provide you with all the details; at least you people are studying eventhough we couldn't*". I acted with sincerity and consistency of thought and action.

Informed consent
I acquired free, prior and informed consent (*ibid.*) from the community to ensure that their participation did not cause stress to the respondents. I sought oral consent from the government officials and the households for the survey questionnaires and interviews. Furthermore, I explained that they could withdraw their responses to the questionnaire if they decided not to contribute any longer. However, the respondents insisted on talking continuously. The respondents were informed of the publication procedure of the results in a book, papers, and presentations.

Respect the confidentiality and anonymity of the respondents
The anonymity and the confidentiality of the communications have been protected throughout the study. Thus, the names of the respondents have been withheld from the thesis and when tabulating data for analysis. However, the names of the communities are mentioned instead of individuals with the prior consent of the community office bearers and the *Grama Niladhari* (village chief). No outsiders were engaged in data collection other than the research assistant and me (for men and women respectively). Information on illegal fishing, users of illegal fishing techniques, and the malpractices of several officers were recorded but without names. However, the questionnaires and transcripts include the names of the respondents to ensure transparency and data verifications. The findings are presented as aggregated values or indices to ensure the privacy of the households. The respondents did not oppose to publishing in any language; rather, they asked me to spread their word throughout the world.

Ensure a voluntary participation to the study
Although the time of the day and household matters of the respondents affected certain discussions, the most relaxing time for a discussion was arranged for interviews. This was achieved by interviewing women in the morning hours and men while they were mending nets in the dockyard. Here, I was mindful to get the participation of at least a few elders, both men and women, to obtain better historical information and changes from the past to the present. The meeting place was also reserved with their approval and involvement. The discussions and interviews were held without providing any financial benefits but with snacks and refreshments. Being from the same region and nationality, I did not find many difficulties other than the Tamil-mixed Sinhala language they used.

Avoid harm to participants
Research can cause physical harm, stress, harm to participant's development, loss of self-esteem, and induce subjects to perform reprehensible acts (*ibid.*). I minimized the possibility of harm but noticed that

sensitive questions on wellbeing could make my respondents emotional. I instructed my assistant not to ask more questions in areas where respondents were reluctant to reveal anything further. I indirectly checked if such information was critical for the analysis. By developing a friendly rapport with the respondents, I reduced the risk of harm. In addition, physical and/or societal harm was minimized through a strategic approach to the community. Prior to data collection, formal meetings were held with the community leaders, fisheries officials, and office bearers of fisheries organizations. These meetings helped to fully inform them about the research focus, why it was being undertaken, why it was conducted in that particular area, what would be the outcome, and the possible implications for them.

I trained my research assistant on both qualitative and quantitative data collection methods. Both my research assistant and I jointly conducted discussions, interviews, and questionnaires to make sure that the respondents suffered no emotional or physical harm due to their involvement in the study. Further, the research assistant was also given the freedom to withdraw at any stage of the research if he no longer wanted to participate. However, he stayed involved in the study until the data entry was completed.

Data storage and sharing
The research was funded by the Netherlands Organization for Scientific Research (NWO) through the Conflict and Cooperation over Natural Resources (CoCooN) programme (WOTRO project number W076830200). Hence, the ethical protocol practiced by the larger project was followed. Originally, the raw data from interviews were recorded in field notebooks and as printed questionnaires during the interviews. Mostly, those were in the local language, Sinhalese. Next, the names of the interviewees were pseudo-named and the original names were kept in a password-protected document to ensure the confidentiality of the information. Transcribed data was stored in a separate device, also protected by a password. The data will be open after the completion of the Ph.D. but ensuring anonymity. Data sharing is also intended with similar studies where comparison is possible yet assuring the anonymity of the respondents.

3.6 Data analysis
The survey data was analysed in three stages: i) data preparation, which involved transcript preparation, data tabulation, coding, and summarizing the answers of closed, open-ended questions and interviews; ii) generation of descriptive statistics to check the distribution of the data set, frequencies, percentages, and cross-tabulations; iii) Statistical Package for Social Sciences (SPSS) and Excel were used for data analysis. A high internal consistency was achieved by employing different methods in the data analysis process. Results based on qualitative analysis are presented and discussed in Chapters 4 to 7. The quantitative analysis explorations and outcomes are presented in Chapters 6 and 8. The main analytical tool here was Principal Component Analysis (PCA) to extract the key factors on an objective (see also Osborne 2015; Jolliffe 2002).

3.6.1 Principal Component analysis
Principal Component Analysis (PCA) is a multivariate statistical approach used in numerous disciplines for development, refinement, and evaluation to analyse a data set with inter-correlated quantitative dependent variables (Ait-Sahalia and Xiu 2015; Abdi and Williams 2010; Jolliffe 2002). The advantages of factorial analysis are (William et al. 2010:2), it: (i) reduces the number of variables; (ii) examines the structure or relationships between variables; (iii) detects and assesses the uni-dimensionality of a theoretical construct; (iv) evaluates the construct validity of a scale, test, or instrument; (v) develops parsimonious analysis and

interpretation; (vi) addresses multi-collinearity; (vii) useful to develop theoretical constructs; and (viii) uses to prove/disprove proposed theories. Many researchers have different opinions regarding the sample size to use in factor analysis. Comfrey and Lee (1992) propose 100 as poor, 200 as fair, 300 as good, and 500 as very good. Tabachnick's rule of thumb (2012) explains the requirement of at least 300 cases for an effective factorial analysis. In this regard, due to the 164 sample units, the analysis did not restrict only to the factor analysis and a descriptive statistical analysis was also carried out.

3.6.2 Descriptive analysis

This study aimed to construct reliable, acceptable, and applicable wellbeing indices to assess the living status of conflict-affected migrant fishers in northwestern Sri Lanka. Due to the small sample size, the PCA was complemented with simple descriptive statistics. Even the literature shows that most of the multi-dimensional indices are descriptive (Adler and Seligman 2016); decision makers may choose the most appropriate indicators. However, the selected indicators, dimensions, transformation methods, substitutability, and assumptions made based on indicators and the weights allocated to each dimension/indicator make indices different (Decancq and Lugo 2013).

An index is a scalar value, which has been calculated as a weighted sum or other aggregation of constituent values (Leigh and Escande 2018:12). Index development is crucial because it: (i) evaluates the wellbeing status of resource-based communities; (ii) compares wellbeing over time, region, countries, and across different livelihoods; (iii) pre-requisites for policy formulation; (iv) provides insights on development frustrations; and (v) offers a tool for monitoring the change over time. Having no widely accepted theoretical framework to set trade-offs between dimensions, the researcher is allowed to rely on his/her common sense when deciding the weighting scheme (Decancq and Lugo 2013: 25). Having these concerns, equal weights were assigned to material, relational and cognitive dimensions considering all dimensions and indicators as equally important. The wellbeing index construction procedure adopted in this research is as follows.

1. The mean score of each dimension was calculated using SPSS software pertaining to each fisher category based on gender and migrating site.
2. The most important wellbeing items were arranged in descending order and the highest three or four wellbeing items were selected from each dimension. If two or more wellbeing items are with the same mean score, both factors were included.
3. The mean score per dimension was calculated based on the following formulas.

$$MWBI = (MWB_1+MWB_2+MWB_3\ldots MWB_i)/i \qquad\qquad (E.1)$$
$$RWBI = (RWB_1+RWB_2+RWB_3\ldots RWB_j)/j \qquad\qquad (E.2)$$
$$SWBI = (SWB_1+SWB_2+SWB_3\ldots SWB_k)/k \qquad\qquad (E.3)$$

Here, i, j, and k represent the number of wellbeing items considered per dimension: material, relational, and subjective.

4. The average of all three dimensions resulted in the wellbeing index (WBI) per fishing groups.

$$WBI = (MWBI+RWBI+SWBI)/3 \qquad\qquad (E.4)$$

5. Robust indicators appearing in all categories were calculated for the Composite Wellbeing Index (CWI).

$$\mathbf{CWI} = [(MWB_1+MWB_2+MWB_3\ldots MWB_n)/n + (RWB_1+RWB_2+RWB_3\ldots RWB_n)/n +$$
$$(SWB_1+SWB_2+SWB_3\ldots SWB_n)/n]/3 \qquad\qquad (E.5)$$

6. The same wellbeing items were used to calculate the wellbeing indices based on satisfaction levels, following the above procedure.

Policy analysis: Content Analysis

Although my research does not fully embed policy analysis or policy advocacy, certain steps have been taken to explore the present policies and development programmes concerning fisher migration and gendered wellbeing. Policies at different levels of governance systems were analysed for social and ecological perspectives. However, documents on climate change were not analysed due to time and scope limitations. The prominent territorial issues arising under transboundary seas law, national policies and Act on Fisheries were studied to gain knowledge on rights to access and exploitation of the marine resource. Further, legal instruments (ecology), manifestos (fisheries), national action plans (gender), and policies (fisheries, cooperatives, education, and gender) were examined. All these analyses were aimed at investigating the rules and instruments used by institutions at different levels of the governance systems including the international, national, local, and community. Although the study did not attempt to investigate how the migrants experienced these policies, impressions of the migrant fishers, wellbeing related grievances, frustrations, and unmet wellbeing aspirations were revealed. The fisher relevant policy inputs are presented in Chapter 9 based on the empirical findings of the research.

3.7 Conclusion

The success and reliability of Social Science research is determined by the level of understanding, literacy of the target population, the communication ability of the interviewer, and rapport between interviewer and interviewee. Three limitations were encountered due to the poor literacy and limited level of understanding of the respondents. First, I had to keep away from the GPGI survey (see 3.4.1.2) because the respondents could not grasp the method and the procedure due to its complexity. However, this difficulty was overcome through a step-by-step approach. Second, a broader Likert scale was replaced by a narrow three point Likert scale due to the limited understanding of the difference between the scales. The latter has more limited power to analyse the variance among variables. Third, the income losses, harvest losses, or indebtedness could not be quantified because the respondents could not express these as percentages. Thus, the impact of conflicts and wellbeing could not be illustrated quantitatively.

Interviewees do not always respond accurately and sometimes do not report their subjective experience. Hence, a systematic bias may occur (Kahneman and Kruger 2006). Moreover, the misreading of language translations can lead to inappropriate answers, especially on subjectivity-related questions. However, being a user of the same language (Sinhala) and belonging to the same ethnic group (Sinhalese), such barriers did not come up in my research. Difficulties of the Likert scale were overcome by studying the emotions from their faces (also with 'emoticons') to read their position easily and accurately in the questionnaire survey. However, all the bottlenecks permitted me to adopt a narrow scale when questioning necessity and satisfaction in phase II. The mixed methods approach, using both qualitative and quantitative methods was convenient to answer how, why, and what questions. Although PCA is a reliable and appropriate test for factor reduction in the wellbeing analysis, the application to my research was marginal because of the small sample size. Therefore, the wellbeing index construction remains more explorative.