



UNIVERSITY  
OF TURKU

# THE FISHERS OF THE ARCHIPELAGO SEA

– Resilience, Sustainability,  
Knowledge, and Agency

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Kirsi Sonck-Rautio





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*To my family*

UNIVERSITY OF TURKU  
Faculty of Humanities  
School of History, Culture and Arts Studies  
European Ethnology  
KIRSI SONCK-RAUTIO: The Fishers of the Archipelago Sea  
– Resilience, Sustainability, Knowledge, and Agency  
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## ABSTRACT

This doctoral dissertation combines ethnology and environmental science in order to recognise changes in the operational environment of the livelihoods and lifestyles of coastal small-scale fishers in the Archipelago Sea and the constraints that mostly influence the abundance and resilience of fisheries in the Archipelago Sea — from the fishers' perspective. This study focuses on recognising the mechanisms that are decreasing resilience as well as examining the relationships between policy-making, scientific research and knowledge by applying the framework of political ecology. Finally, the aim is to find solutions for promoting transformations that will foster cultural resilience and sustainability as well as other dimensions of both.

The research material for the doctoral dissertation was gathered by conducting ethnographic fieldwork, including 23 in-depth interviews and participant observation. Media and scientific articles and reports also formed a portion of the material analysed for this study. The research material was analysed abductively, and as a practical tool, qualitative analysis software Nvivo was applied as well. The timeframe of the analysis is from 1880 to the present, starting from the commercialisation of winter-seining in the Archipelago Sea and concluding with a discussion of the present-day challenges facing fisheries. There is, however, an embedded future-oriented thinking present throughout this study, as many of the concepts applied, such as resilience and adaptation, contain an implicit future-thinking aspect.

It was found that according to fishers, the most important constraint influencing the resilience of small-scale fisheries is the ever-increasing number of environmental policies and an unwillingness to acknowledge the local ecological knowledge possessed by the fishers. The ensuing environmental conflict is to some extent a consequence of not including the dimension of cultural sustainability in policy-making processes, or in research involving environmental management and conservation, and not recognising the potential offered by local ecological knowledge both for promoting overall sustainability and also as a tool for enhancing the social acceptance of environmental policies.

Keywords: Fisheries, ethnology, Finland, archipelago, small-scale fisheries, local ecological knowledge, resilience, sustainability, cultural sustainability, cultural resilience, adaptation, agency, socio-ecological system, management, policy-making, environmental management, island, Baltic sea, Archipelago Sea.

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## TIIVISTELMÄ

Tämä tutkimus yhdistää kansatiedettä ja ympäristötieteitä tutkiessaan kalastajien näkökulmasta pienimuotoisen rannikkokalastuksen toimintaympäristössä tapahtuneita muutoksia, sekä niitä tekijöitä, jotka haittaavat kalastuselinkeinon hyvinvointia ja joustavuutta Saaristomeren rannikkoalueilla. Tutkimuksessa tunnistetaan poliittisen ekologian tarjoaman teoreettisen viitekehyksen avulla niitä mekanismeja, jotka heikentävät kalastusyhteisöjen sopeutumiskykyä ja joustavuutta, sekä perehdytään päätöksenteon, tieteen ja erilaisten tiedon lajien välisiin suhteisiin. Lopulta tavoitteena on löytää ratkaisuja siihen, kuinka kalastuselinkeinossa tapahtuvat muutokset voisivat tukea muiden kestävyiden ja joustavuuden ulottuvuuksien lisäksi myös kulttuurista joustavuutta ja kestävyttä.

Tutkimusaineisto on kerätty etnografisin menetelmin, mukaanlukien osallistuvaa havainnointia sekä 23 syvähaastattelua. Mediamateriaali ja tieteelliset artikkelit sekä raportit muodostivat myös osan tutkimusaineistosta. Aineisto analysoitiin abduktiivisesti, käyttäen käytännössä työkaluna laadullisen aineiston analyysiohjelmaa Nvivoa. Tutkimus ajoittuu 1880-luvulta, jolloin Saaristomeren nuottakalastus lähti kaupallistumaan, nykypäivään. Tutkimuksessa on kuitenkin myös tulevaisuuteen suuntava ote, sillä monet tutkimukselle tärkeät käsitteet, kuten sopeutuminen ja joustavuus, pitävät sisällään tulevaisuusorientoituneen näkökulman.

Tutkimuksessa todettiin, että kalastajien näkökulmasta suurin haaste pienimuotoisen rannikkokalastuksen sopeutumiskyvylle ja joustavuudelle on jatkuvasti kiristynyt ulkopuolelta tuleva ympäristönhallinta, sekä päätöksentekoon liittyvien prosessien aikana huomiotta jätetty kalastajien paikallinen ekologinen tieto. Vallalla oleva ympäristökonflikti Saaristomeren alueella on jossain määrin seurausta siitä, ettei kulttuurisen kestävyiden ulottuvuutta ole huomioitu ympäristöön ja luonnon-suojeluun liittyvässä päätöksenteossa, tai tieteellisessä tutkimuksessa. Paikallinen ekologinen tieto voisi edesauttaa kokonaisvaltaisen kestävä kehityksen toteutumista, sekä osaltaan lisätä ympäristönhallintaan liittyvien päätösten paikallista hyväksyntää, mutta tämän potentiaalin hyödyntämättä jättäminen osaltaan syventää käynnissä olevaa ympäristökonfliktiä.

Avainsanat: kalastus, kansatiede, Suomi, saaristo, rannikkokalastus, paikallinen ympäristötieto, joustavuus, sopeutuminen, toimijuus, sosio-ekologinen systeemi, hallinta, päätöksenteko, ympäristöhallinta, saari, Itämeri, Saaristomeri

# Esipuhe

Veetään nuottaa,  
saadaan kaloja,  
kissalle kiisket,  
koiralle kuoret,  
ahvenet kylän akoille!  
Isot kalat myödeen,  
pienet kalat syödään.  
Kups kalat konttiin!  
- Tuntematon

Uskomatonta, että se on viimein valmis. Olen samalla epäuskoinen, helpottunut ja kiitollinen. Ennen kaikkea kiitollinen. Väitöskirjani on täyttänyt ajatukseni ja kalenterini viimeiset vuodet, ja vihdoinkin saan kirjoittaa kiitossanani niille, jotka ovat edesauttaneet sen valmistumista. Ensimmäiseksi kiitän ohjaajiani Turun yliopiston kansatieteen Professori Helena Ruotsalaa, sekä Turun yliopiston ympäristötieteen lehtoria, Dosentti Timo Vuorisalaa. Helenalle olen erityisen kiitollinen hänen luottamuksestaan ja uskostaan kykyihini. Ensi tapaamisestamme lähtien Helena näki vaivaa saadakseen tutkijanurani kunnolla alkuun, lähtien työpisteen järjestämisestä ensimmäisen rahoitukseni saamiseen. Timolle olen erityisen kiitollinen huikean monitieteisen näkemyksensä jakamisesta, sekä siitä, että hän joka tapaamisella valoi minuun uskoa ja itseluottamusta, joka silloin tällöin saattoi olla itseltäni kadoksissa. Lähdin hänen vastaanotoltaan aina pois hieman ryhdikkäämpänä, hieman luottavaisempänä. Kiitän esitarkastajaani Professori Hannu I Heikkistä monipuolisista ja huolellisista kommenteista, and I also want to thank my other pre-examinator dr. Rob van Ginkel for his comments. These comments enabled me to polish my manuscript into more complete form before publishing.

Väitöskirjaa kirjoittaessa suuri tuskailun aihe on rahoitus. Harvalla on mahdollisuus toteuttaa tavoitteitaan ilman taloudellista tukea, eikä sitä olisi ollut minullakaan. Taloudellisesta tuesta kiitän Suomen Kulttuurirahaston Varsinais-Suomen rahastoa (2013), Suomalaista Konkordia-liittoa (2013), Koneen säätiötä (2015–2019), sekä



Suomen Akatemian hanketta Eläinten toimijuus yhteiskunnassa – näkökulmia Suomesta 1890–2040, ja Koneen säätöön Applicability of birdwatchers' long-term monitoring and observation data to bird monitoring and environmental research -hanketta, joiden puitteissa sain työskennellä tohtorikoulutettavana.

Kiitän jokaikistä kansatieteilijää Turun yliopistolla, jotka ottivat minut, ulkopuolelta tulleen nuoren tutkijan, avosylin vastaan yhteisönsä, ja joiden kanssa jaoin vuosikautia käytävät ja kahvihuoneen. Työtoveruuden lisäksi heistä tuli ystäviäni, jotka elivät kanssani työasioiden lisäksi myös yksityiselämässäni tapahtuvat asiat. Olemme niin usein nauraneet poskemme kipeäksi etten pysty edes laskemaan, nauttineet mittaamattoman määrän lounaita, kahvikuppeja ja illanviettojakin. Kiitos Timo J. Virtanen, Anu Raula, Terhi Lehtinen ja Minna Heikkinen, Maija Mäki, Marja-Liisa Räisänen, Hanneleena Hieta, Niina Koskihaara, Jussi Lehtonen ja Maija Lundgren, sydämeni pohjasta. Aikani kansatieteen oppiaineessa oli teidän ansiostanne elämäni parhaimpia aikoja.

Väitöskirjatyöni hieman myöhemmässä vaiheessa löysin itselleni toisenkin akateemisen kodin. Humanistinen ja yhteiskuntatieteellinen meritutkimusverkostomme AHA – Aallonharjalle muodosti tiiviin yhteisön, jonka ytimestä muodostui innovatiivinen ja innokas tutkijaporukka. Työskennelyämme ja ideoituamme yhdessä erilaisia projekteja, yrityksemme palkittiin. Näiden projektien ansiosta olemme saaneet työskennellä yhdessä. Valtavasta inspiraatiosta kiitän teitä AHAlaiset ja Seaher- projektin porukka, Nina Tynkkynen, Silja Laine, Otto Latva, Jaana Kouri ja Tuomas Räsänen, jatkuvasta inspiraatiosta, ystävydestä ja aivan mielettömän hyvästä seurasta. Erityiskiitos Ninalle, joka on johtanut sekä meriaiheisia hankkeitamme, mutta myös sitä Package heroes -hankkeen työpakettia, jonka parissa olen saanut ilokseni jo jonkin aika työskennellä. Ninalle kuuluu kiitos siitä, että hän on mitä parhain esimies, esikuva ja mentori, ja sen lisäksi vielä ystäväni. Package Heroes -porukalle kiitos kiinnostuksesta tutkimustani kohtaan, ja ymmärryksestä silloin kun väitöskirjani on hetkellisesti vienyt ajatukseni pois pakkausten maailmasta. Ottoa ja Jaanaa kiitän vielä erikseen työtoveruudesta, onneksi olette olleet viime kuukaudet naapurihuoneessa, jakamassa uuden työpaikan aiheuttaman jännityksen.

Seuraavaksi kiitokseni ansaitsee Luonnonvarakeskuksen väki, jotka ovat ottaneet mielenkiinnolla tutkimukseni vastaan. Heiltä olen saanut tukea niin kalatalouteen kuin kalabiologiaankin liittyviin kysymyksenasetteluihin. Erityisen kiitoksen saa FT Pekka Salmi, jonka tietämys suomalaisesta kalastuksesta on vailla vertaa, ja joka tarjosi minulle asiantuntevaa apuansa useasti. Olen ylpeä siitä, että olen tehnyt hänen kanssaan töitä, ja yksi tämän yhteistyön hedelmä onkin esillä väitöskirjassani artikkelina. Toivon että yhteistyömme jatkuu vastaisuudessaakin.

Dosentti Katriina Siivonen on myös edesauttanut työni valmistumista monin tavoin. Katriinan kautta pääsin mukaan kulttuurisen kestävyuden maailmaan, käsite, joka lopulta valloitti suuren osan väitöskirjani temaattisesta kentästä. Kiitos

Katriinalle tästä johdatuksesta, kannustuksesta, sekä keskusteluista jotka ovat selvittäneet omia ajatuksiani.

Kiitän kaikkia niitä, jotka ovat olleet mukana väitöskirjatyössäni, tavalla tai toisella. Teitä on paljon, enkä teitä kaikkia voi nimellä mainita. Tietäkää kuitenkin että olen syvästi kiitollinen.

Aivan erityinen kiitos kuuluu tietenkin kalastajille, heidän perheilleen, ja kalastuksen parissa työskenteleville henkilöille, jotka ovat antaneet minulle aikaansa, muistojansa, ajatuksiansa, näkemyksiänsä. Kiitän teistä jokaista, mutten nimeltä, sillä olenhan teille nimettömyyden luvannut. Ilman teitä tutkimustani ei olisi.

Perheeni on kulkenut rinnallani koko väitöskirjatyön ajan. Aloittaessani työni, oli perheessäni vain kaksi jäsentä. Onneksi elämässä on tapahtunut paljon hyvää, ja työn valmistuttua perheemme onkin viisihenkinen. Puolisolleni Henrille iso kiitos niistä kaikista keskusteluista, luennoista, väittelyistä ja analyyseistä, sekä parhaimmasta kannustuksesta mitä voi tarjota. Jälleen, myös sinä olet valanut minuun uskoa itseeni silloin kun itselläni sitä ei ole ollut. Kiitos lapsillemme Miriamille, Alarikille ja Aatokselle, että olette kestäneet ne ainaiset yhteiskuntapoliittiset keskustelut ja kulttuurianalyytit, luennot ja väittelyt ruokapöydässä, autossa ja saunassa, milloin missäkin. Lupaan, etteivät ne tähän lopu.

Kiitoksia kirjoittaessani huomaan, että edellä olen useasti saanut kiittää ihmisiä jotka ovat uskoneet minuun. Olen usein itse horjunut ja epäillyt itseäni, mutta ympärilläni on ollut suuri joukko ihmisiä, jotka ovat tasoittaneet tietäni uskomalla minunkin puolestani. Äitini ja isäni, Anne ja Veli-Matti, te olette heistä ihan ensimmäiset. Kiitos teille siitä, ettette ole ikinä koskaan antaneet minun kuvitella ettenkö pystyisi siihen mihin ryhdyn, ettekä milloinkaan ole yrittäneet ohjata minua suuntaan, johon en haluaisi kulkea.

Syksyisen auringon paistaessa ikkunasta Paraisilla 11.10.2019

*Kirsi Sonck-Rautio*

# Table of Contents

<b>Esipuhe</b>	<b>6</b>
<b>Original articles</b>	<b>11</b>
<b>1 Introduction</b>	<b>12</b>
1.1 Objectives and Research Questions .....	15
1.2 Material, Methods, Research Process and Original Articles.....	16
1.2.1 Material .....	16
1.2.2 Research process.....	21
1.3 Fishers, Fisheries and Their Environment .....	24
<b>2 Previous Research</b>	<b>29</b>
2.1 Traditions of Fisheries Research in Finnish Ethnology and Other Related Fields .....	29
2.2 International Fisheries Research and Fisheries Management	32
<b>3 Theories and Concepts</b>	<b>35</b>
3.1 On Political Ecology and Agency .....	35
3.2 On Adaptation, Socio-Ecological Systems and Resilience .....	39
3.3 On Sustainabilities.....	42
3.4 On Knowledges .....	45
<b>4 Conclusion</b>	<b>50</b>
<b>References</b>	<b>54</b>
<b>Original Publications</b>	<b>67</b>



# Original articles

I Sonck-Rautio, Kirsi 2017. The Baltic Herring as agents in the socio-ecological system in Rymättylä fisheries. In: Syrjämaa, Taina & Tuomas Räsänen, eds., *Shared Lives of Humans and Animals: Animal Agency in the Global North*. New York: Routledge.

II Sonck-Rautio, Kirsi 2018. Adaptation and Cultural sustainability of the Winter-seining community in the Archipelago of Southwestern Finland. In: Birkeland, Inger, Parra, Constanza, Burton, Rob & Katriina Siivonen (eds.) *Cultural Sustainability and the Nature-Culture Interface – livelihoods, policies, and methodologies*. New York: Routledge.

III Salmi, Pekka & Sonck-Rautio, Kirsi 2018. Invisible work, ignored knowledge? Changing gender roles, division of labor, and household strategies in Finnish small-scale fisheries. *Maritime Studies*, 17, 103. <https://doi.org/10.1007/s40152-018-0104-x>

IV Sonck-Rautio, Kirsi 2019. The endangered coastal fishers in the coast of the Archipelago Sea – The environmental conflict in policy-making. *Ethnologia Fennica*, 2019 vol. 46 (accepted).

# 1 Introduction

Professor of Cultural Anthropology Jukka Pennanen studied winter seining in Rymättylä village in coastal Finland during the 1980s, and in his book *Talviapajilla* (1986) he expressed a concern about the future and overall prospects of winter seining in the midst of increasing global changes. As I arrived in Rymättylä, which was in fact my mother's birth town, I soon realised that winter seining as a livelihood had ceased to exist. I dedicated my master's thesis to examining the reasons for this decline and found out that although there were many social and economic reasons behind it — such as increased urbanisation, changes in vocational structures and a decline in profitability — the most dramatic reason had to do with the environment. From 1995 onwards, the winters in Rymättylä (and throughout all of the archipelago) have become so mild that the ice cover is no longer thick and durable enough to support winter seining. When I say support, I mean both literally and figuratively. The ice has to be thick enough to support a number of fishers and their gear, including tractors and snowmobiles, but there also must be enough ice days to support the fishers for the fishing season. Neither of these attributes have existed on a regular enough basis since the middle of the 1990s. So, the absence of a thick, extensive and long-term ice cover really was the last straw negatively impacting the livelihoods of those already struggling to exist (Sonck 2011). As a researcher, I was fascinated by such changes. Here, we can observe the effect of climate change that is having a major impact on the everyday lives of people and their lifestyles and cultural heritage. As I had finished my master's thesis, I concluded that it would be important to focus on fishing in general and on the current status of Finnish small-scale fisheries and their resilience in coping with global changes and their local impacts in particular.

Besides the resilience of fisheries, there was one other thought that I just could not put aside. There was a sense of loss, loss of the lifestyle and the environment that was dear to fishers. It also got me thinking about what it must have felt like to lose the ice that had once played such an important role in their lives. Finnish ethnology includes a long history of fishing research focusing on the material culture, quite often in a traditional categorising matter or in the commercial development of fisheries (e.g. Sirelius 2009 [1906, 1907, 1908]). As a point of departure, I wanted to focus my research more on other attributes that shape the identities of fishers — their

relationship with nature (the sea), how they experience nature and their local ecological knowledge.

There are many different types of fishers. For example, fishers could be categorised based on their fishing spots, based on their gear and the size of their unit, based on their annual income, based on their other vocational status or even based on their gender. Generally, fishing is a male-dominant livelihood, but in Finland women have worked as fishers as well. During the first half of the 20th century, women usually assisted their husbands on boats or practiced fishing with other women in the community while their husbands were away (article III: Salmi & Sonck-Rautio 2018, p. 216). As the categories of fishers are so diverse, there is a need to clarify the fact that in this dissertation, the focus is on small-scale coastal fishers (men or women) who are registered (full-time or part-time) fishers, regardless of their annual income or class status.

Inspired by the diminishing ice cover, my preliminary objective was to study the effects of climate changes on coastal fisheries in Finland. I was keen to scrutinise the ways fishers have adapted, and will continue to adapt, to changes in environmental conditions, and what kinds of adaptive strategies they employ in dealing with the climatic changes affecting the Baltic Sea. However, it became evident as I was conducting my interviews that fishers are not that worried about climate change from an occupational standpoint, although they are quite aware of the phenomenon in general and had been observing indicators of climate change effects during their fishing trips. One of the reasons they are not overly concerned about climate change from a professional perspective has to do with the fact that the majority of my interviewees were elderly, even past retirement age, and climate change does not seem like an acute problem to them. They had more urgent issues to deal with (field journal 2016), which was, to be honest, somewhat frustrating to me, since I was seeking to know their views on climate change. I was struck, however, by one of my informant's statements: he told me that fishers are quite resilient, they have always been able to cope with environmental changes and adapt accordingly. It is the ever-growing number of regulations and increasing competition over resources that they cannot adapt to (TYKL/aud/1279). This notion first started to guide me towards the framework of political ecology, a theoretical framework that addresses the issues regarding local communities' power to govern or influence their own environment.

As an ethnologist, I found that following my material and allowing my informants to name their own concerns was important. My objective at the start was to give voice to the fishers, which was, according to my pre-hypothesis, rather absent in previous research concerning resilience, environmental management and governance regarding conservation. Therefore, I decided to change course and focus on the factors that were, from the fishers' point of view, most detrimentally impacting their resilience as fishers.

The geographic area of my research is the coastal area of south-western Finland, in the Turku archipelago. To be more precise, my interviewees resided in the four different areas within the islands of the archipelago – Rymättylä, Parainen, Velkua and Kustavi. A significant number of Swedish-speaking Finns live on the islands in question, especially in Parainen, where Finnish is, in fact, a minority language. The Swedish-speaking minority's historical roots date back to crusades in the 12<sup>th</sup> century, when Swedish people migrated to and populated Finland, mainly the western coast and the islands (Lönnqvist 1981, p. 40). In 2017, Swedish-speaking Finns comprised little more than 5% of the overall population in Finland, whereas in Parainen the percentage is 55%. However, in the other areas included in my research Swedish speakers comprise less than 2% of the population (Statistics Finland 2018). My interviewees were mostly Finnish-speaking Finns, but even with the Swedish-speaking informants, we decided to communicate in Finnish. The language issue is therefore absent in this study, but several other studies have been conducted on the history of the Swedish-speaking communities or the identity of both Finnish-speaking and Swedish-speaking inhabitants of the archipelago (Lönnqvist 1981; Siivonen 2008; Hulden 2018).

The timeline of my research is between 1880 and the present, although my key concepts, such as resilience and cultural sustainability, all carry an embedded implication of futures thinking. Therefore, the arguments of this research do point to the direction of future developments of fisheries. I was intrigued to develop my research more to the direction of Futures Studies, but soon realized that the idea was beyond the scope and width of this particular study. I chose the 1880s as the starting point since, during that time, the long-standing livelihood of fishing first began to develop into a more commercial and professional subsistence mode of making a living (Pennanen 1986). From such an historical perspective, I focus especially on the winter seining community of Rymättylä, which offers an illuminating example of the changes affecting one community and the socio-ecological system, as I describe in article I (Sonck-Rautio 2017). Consequently, as the community undergoes transformations due to the stress it is facing, the nature of its adaptation is closely dependent on its level of resilience. This transformation process and the resilience of Rymättylä's socio-ecological system is analysed from a retrospective point of view in article II (Sonck-Rautio 2018). Returning to the present, I examine more closely the status quo of coastal small-scale fisheries in the Archipelago Sea and the challenges and possibilities they are facing. This examination focuses mostly on issues highlighted by the fishers and other interviewees during my fieldwork. The fishers identified such crucial issues as increasing competition over resources with other species, namely the grey seal and the great cormorant, and being left out of the decision-making processes, which consequently makes fishers feel that they have no voice. As one fisher put it:



I have always said that we have practically lost all [power] — there are so few of us. We have no voice. It is so easy to ignore us, with the majority. They have [referring to environmentalism as an ideology and politics] so much political power. And no one really has the guts to stand up for us, because one would be labelled as not being environmentally friendly. If someone dares to say publicly that the seal population should be thinned out, he is automatically a bad person. (TYKL/aud/1274)

The issues identified from the interviews seem to be common in fisheries globally, and they have been for decades (e.g. van Ginkel 2009, pp. 14–15; Bennet 1990, pp. 446–449). The conflicts over resources and the idea that politicians ignore the fishers' point of view in environmental governance and research was studied in more detail in articles III (Salmi & Sonck-Rautio 2018) and IV (Sonck-Rautio 2019).

## 1.1 Objectives and Research Questions

The starting point and a primary objective of my research is to examine the small-scale fisheries in the Archipelago Sea and the changes occurring in their operational environment from the perspective of fishers and the people working in the fisheries sector. I see these changes as global changes, since most of the changes are local-level consequences of global or national events or decisions.

Fisheries all over the world are in crisis, and their resilience is at risk (see Symes, Philipson, and Salmi 2015). At the same time, fisheries are facing many external (and internal) stresses that underscore their need to transform and adapt. Even though many researchers see a diversification of livelihood as the answer to enhancing the community's resilience, not everyone is willing to diversify or even capable of it. The main objective of this study is to recognise the factors that, from the fishers' perspective, mostly constrain their ability to cope with, transform and/or maintain their sense of resilience. Although the research on fisheries in Finland is rather extensive, it mainly focuses on the biological, ecological or economic sides of the livelihood (with a few exceptions, like the Natural Resource Institute Finland, which has conducted research focusing on the social sciences of fisheries research). I must highlight here that ethnology is a study of communities, people and their everyday lives, and therefore the emphasis of this research is strongly on the perspectives of the fishers, their views on and experiences with the phenomena concerning their everyday lives.

In order to meet my objectives, I seek answers to the following questions:

- I) What are the characteristics of the socio-ecological system of coastal fishers in the Archipelago Sea, and what are the factors that should be considered when analysing the system? (Especially article I and II)

- II) What are the factors influencing the resilience of fisheries in the Archipelago Sea area from the fishers' perspective, and what are the mechanisms behind these factors? (Especially articles III and IV)
- III) What are the means for promoting overall sustainability, increasing cultural resilience and promoting transformations that are as beneficial as possible for the socio-ecological system? (All the articles)

## 1.2 Material, Methods, Research Process and Original Articles

### 1.2.1 Material

This study is an ethnographic study, which means that it was conducted using ethnographic methods. Ethnographic methodology highlights the importance of ethnographic fieldwork, including interviews and participant observation, and of learning from within a particular community and through experience (Ruotsala 2005, p. 46; Eskola & Suoranta 1998, p. 106). In my case, learning from within the community became easier when I moved to one of my study locations in 2014 permanently. Although my study location is not necessarily representative of other fishing villages per se, still living in it allowed me to have spontaneous and unplanned encounters with the people I had interviewed or otherwise had communication with during my research. I also found that living in a town that can be defined as part of the archipelago helped me to bond with my interviewees. My family roots are in Rymättylä, and my grandfather's father was a well-known figure in the archipelago region, which also helped me to find common ground with some of the interviewees. They recognised my family surname and were willing to share stories about my grandfather's family. In some cases, having 'archipelago roots' helped me to be accepted. (Field journal 2018; Field journal 2016) Ethnographic approach, however, can also include analysing material other than collected during fieldwork, and fieldwork often is about combining various methods and sources of material, such as newspaper articles, and discussion forums online (Hämeenaho & Koskinen-Koivisto 2018, p.12; Ruotsala 2005, p. 46, Fingerroos & Kouhki 2018, p. 83). Although my main material was collected by interviews and participant observations, I do include media material and scientific material into my set of material.

I divided the research material into four different categories.

1. Interviews, which I also divided into two sub-categories: a) interviews with the winter seining community of Rymättylä 2006–2007 and b) interviews with fisheries stakeholders 2015–2018.
2. Participant observation — field journals and notes.

3. Media material — social media channels, newspaper articles and commenting sectors.
4. Scientific material — scientific reports, statistics and scientific articles.

**Category 1** consists of interviews. At the beginning of my doctoral research, I had the material collected for my master's thesis to build upon. During my fieldwork as a postgraduate student in 2006–2007, I interviewed eight people who had been closely involved in winter seining in Rymättylä before its decline. Four of the interviewees were women and four of them were men. Each of them was over 60 years old. I utilised the material for this doctoral research as well.

Even though I had previous experience with fishing communities in the Archipelago Sea region, the beginning of my fieldwork in 2015 was not easy. I soon realised that although old winter seiners had generally been eager to share their stories, memories and perspectives, the current fishers were not so forthcoming. I found it hard to even find any contact information on fishers to start with. After considering the problem, I decided to ask for help and contacted a person that I thought might have access to some fishers.<sup>1</sup> This person became my first informant and, through this informant, I acquired a list of other fishers and the promise to put in a good word on my behalf. It was highlighted that the fishers needed to be convinced that I was not there to promote environmentalism,<sup>2</sup> but rather to study the fishers themselves, their livelihood and their lifestyle (field journal 2015). I contacted everyone on the list, receiving six positive responses for conducting an interview. Later, I had the chance to interview one more member of a fishing household.<sup>3</sup> Gaining an initial level of trust within the field was not easy. Fishers are for the most part familiar with the researchers dealing with fisheries, and I was a new face. They also harboured a deep distrust towards some researchers due to previous bad experiences. Later, this mistrust, which indicated the existence of an environmental conflict similar to those often described in the field of political ecology, became an important theme of this study.<sup>4</sup>

My interviews were in-depth thematic interviews, during which time I highlighted certain themes, but otherwise gave the interviewee permission and opportunity to

- 1 In 2013, there were only 89 full-time fishers in the Archipelago Sea area, only some of whom live in the area of my study location.
- 2 Here, environmentalism means an ideology or political movement that supports environmental protection. Fishers feel that the environmentalists' agenda is threatening their livelihoods and lifestyles (field journal 2017).
- 3 All of the interviewees were fishers, although not all of them were registered as such. It is only required that one person in the fishing household is registered as professional fisher (for more details, see Salmi & Sonck-Rautio 2018). Only one of the seven fishers interviewed was a woman, although I did get the chance to talk to two fishers' wives while I was conducting an interview in their homes. These discussions were, however, more informal and not recorded. They are, however, described in my field journals.
- 4 Examined especially in article IV (Sonck-Rautio 2019).

guide the direction of the conversation. Many of the interviews were conversation-like in nature, with only a few being in more of the style of an interview.<sup>5</sup> This was, for the most part, due more to personal dynamics in the interview situation than to any other reason. I found thematic interviews to be the most appropriate for my purposes since I did not want to guide the conversation too much towards the questions that I wanted to ask, but instead sought to give the interviewee an opportunity to bring up the issues he/she felt were most important. This type of interview can be described as seeking an understanding of the study subjects' realities and the essential themes and meanings underlying them (See Ruotsala 2002, p. 29; Korkiakangas 1999, pp. 164–165). This approach proved its value when I realised that my pre-hypothesis that climate change, or the environmental changes related to it, would be one of the main themes raised by the fishers. I was wrong. Instead, the fishers had other environment-related concerns, which also guided me to add managers and researchers as interviewees. These additional interviewees were 'hand picked' and approached personally after establishing personal contact with them during my fieldwork. Their names usually came up in conversations, and they were well known among the fishers. The additional set of interviewees represented the managers of fisheries (3) as well as persons in the field of education (2) and researchers (3). The total number of interviewees was 23.

**Category 2** includes participant observation. I started my fieldwork gradually 2013, but the intensity of my fieldwork grew significantly, as I became a resident in one of my study fields, Parainen, in 2014. I participated in many different events, such as fishing fairs and markets and seminars directed at fisheries actors. Altogether, I participated in more than 25 events, counting both those in which I had an official role and those which I attended as an observer. In most these events,<sup>6</sup> I was merely an observer, while in others I had a role as a presenter. In two of the local events in Parainen, I was part of the organising committee. I find these events to have been remarkably good in providing material, since fishers and other actors actively sought out my company after a presentation, commenting on my presentation or offering their opinions. Also, following the general discussions among the actors during these events was fruitful in helping me form an overall picture of the atmosphere in the field. These observations, 'coffee-table conversations', and casual meeting in local venues were recorded only in my field journal, since I did not want jeopardise the integrity and spontaneous nature of them by using a recorder.

5 The interviews varied in length, but the shortest interview lasted approximately one hour, whereas the longest one was more than 2.5 hours. In general, the interviews took about two hours.

6 For example, fishers' cruise on Viking Amorella 2018

**Category 3:** I also utilised discussion groups in social media, namely discussions under the Facebook profiles of fisheries organisations.<sup>7</sup> I found those discussions to be good for opening up the full spectrum of viewpoints, since the interviewees included all those who had strong opinions and were willing to share them in an attempt to have an influence. The commenting sections in tabloids and newspapers also provided important insights on general opinions and public discourse. Articles and opinion pages in the major national newspaper and tabloids also provided me with an overview of the social discourse surrounding the environmental issues affecting fisheries. All and all, I followed the profiles of two fisheries organizations on social media, following in particular the conversation threads regarding the problems of grey seals and great cormorants. Regarding media sources, I utilised the webpages of YLE (the Finnish Broad Casting Company). Articles and especially the comments sections in *Helsingin Sanomat*, which is the largest newspaper in Finland, as well as the tabloids *Ilta-Sanomat* and *Iltalehti*, also provided material. They, however, are not the main point of focus here, since I was interested more in the fishers and actors who work closely with the fishing sector as researchers, managers and teachers, to name just a few examples.

**Category 4** focuses on the scientific data gathered from scientific institutions, such as Natural Resources Institute Finland. This data consists of statistic regarding fisheries, but also such reports as ‘The Report on Conditions of Fisheries’ (Setälä et al. 2018, 2017), ‘Report of the Great Cormorant Working Group’ (Ministry of the Environment 2016) and the ‘Report on the Perceptions of Fishers on Seal Protection Reserves’ (Salmi & Salmi 2006). In addition to reports, I also utilised scientific articles written by researchers in the field of fisheries research as a reference, but also as a way to analyse the conflict of viewpoints between researchers. This conflict came up in the majority of interviews with fishers and researchers and managers, and it was also apparent in the content of the scientific journal articles. Table 1 at the end of this chapter describes the methods, material and concepts applied and utilised in all of the original articles to further illustrate how the material has been applied in each article.

Ethnographic research always touches upon certain ethical concerns. As essential part of the project has to do with deciding on how to formulate the research questions in the humanities and social science with respect to ethical questions and concerns: To whom is this research made for? From whose perspective is this research being conducted? (Tuomi & Sarajärvi 2009, p. 129). To what extent should these premises be made known to informants? Sociologist Karen O’Reilly notes that although the ethical question of whether ethnographers should be covert or overt in pursuing their

7 For example, Saaristomeren kalatalousryhmä (Archipelago Sea’s Fisheries Action Group) (translation my own) and Kalatalouden keskusliitto (The Federation of Finnish Fisheries Association).

agendas was the cause of much heated debate in the 1980s, covert ethnography is currently widely considered unethical, and to large extent, not practiced. To hide one's premises, though, is still not the same as covert research. In contemporary ethnography, however, it is recommendable to inform the research participants as thoroughly as possible (O'Reilly, 2009, pp. 57–64). I had formulated that my initial goal for this study was to give voice to local fishers, whatever that voice might sound like, and I was forthcoming with that goal from the start with every informant. Even still, some ethical issues arose when conducting participant observation. I have, without having previous knowledge or intentions regarding the topic, observed unofficial situations and taken notes after conversations, even if they were not interviews, but rather, everyday life encounters. I have had conversations with fishers who have never been asked to participate in my research, yet their perceptions might have been included in some aspects of the research process. I am also part of the scientific community, which, in part, is also under study in my research. In addition to interviews done at formal meetings, informal encounters have also become part of my field journal, without participants' knowledge, which is why I chose not to archive my notes from the field. However, none of these encounters, conversations or observations occurred without the participants being aware that I was doing research, and they have always been aware of my research goals and questions.

The overt strategy described above comes with side effects. For example, the researcher has agency in the field, and can affect people's perceptions. On the one hand, the people who are being studied might see the researcher as a means to having an impact and introducing perspectives that in reality are not that crucial, or else exaggerate issues that feel important. On the other hand, some issues might be kept silent due to, for example, a trauma or shame (e.g. Ruotsala 2002, p. 30; Korjonen-Kuusipuro, p. 36). I find that my ethnographic material of interviews, participant observations and media form a triangulation that helps demonstrate that the issues are real and were not brought up in the hopes of having an influence on the researcher.

As practical tool, I used qualitative data analysis software NVivo. I analysed the interviews and other text material by recognising and coding the theme words and topics most often mentioned by the interviewees. During the analytical process, which took place simultaneously with my fieldwork, I recognised the most important themes to be 1) worry over fishers' subsistence, but also over the fishing lifestyle in general, 2) a lack of control over one's own environment, including the lack of power to affect the decision-making process, and 3) conflicts with policymakers, researchers and the general public (the general opinion that fishers are exploiters of the environment and that fishers are no longer respected). This conflict was illustrated by the ongoing problems regarding the grey seal, great cormorants and the landing size of pike perch. A fourth theme, a theme related to each of the other themes, had to do with local ecological knowledge and how the fishers felt that their knowledge is not valued

or even acknowledged in policy-making or in research. This was demonstrated in the form of mistrust and polemical rhetoric directed at researchers and policy-makers (field journal 2018). After identifying the major themes regarding fishers' concerns, I decided to interview researchers and stakeholder other than fishers. These emerging themes guided me towards the relevant research questions.

As my research method was to conduct open thematic interviews with no clear structure, but with an indication of certain themes involving environmental change and adaptation and several theoretical hypotheses related to them, my research approach could be described as abductive.

Abduction as a term was famously introduced by Philosopher Charles Peirce, a concept that he developed throughout a career spanning a number of decades. In his essay 'On the logic of Drawing History from Ancient Documents,' (1901), Peirce writes about abduction as follows: 'Abduction makes its start from the facts, without, at the outset, having any particular theory in view, though it is motivated by the feeling that a theory is needed to explain the surprising facts' (Peirce Edition Project 1998, p. 106). However, the abductive approach has been developed further since Peirce's time, albeit while still retaining its basic idea. The abductive approach is an approach to conducting qualitative data analysis that aims at theory construction. It is, however, not lacking in theoretical background, as it acknowledges that there are certain theories relevant to the subject at hand, and there might even be theories that guide the analytical process. Nevertheless, the abductive approach does not provide a means for testing the analysis, but for acknowledging, identifying and perhaps even embracing the previous knowledge acquired. With abduction, theory does not determine the qualitative data, but it has an influence on the way the data is interpreted. During abductive analysis processes, it is also quite plausible that the researcher will encounter empirical findings that contradict existing theories, thus directing the researcher to seek new theories and hypotheses. (Tuomi & Sarajärvi 2009, pp. 95–96; Timmermans & Tavory 2012, pp. 169–172)

### 1.2.2 Research Process

As I had begun my research among the fishers of the Archipelago Sea already in 2006, I did have some pre-assumptions. I had concluded in my master's thesis that one of the reasons that winter seining as a livelihood was in a state of decline had to do with the warming climate and, consequently, the loss of sufficient ice cover (Sonck 2011). From this basic hypothesis, I developed an objective for my doctoral research: to assess the challenges faced by small-scale fisheries in the Archipelago Sea in regards to climatic changes now, but even more so in the future, for which more research on fisheries' adaptive strategies and adaptive capacity is needed. In 2012, when I started my PhD studies, many strategies for climate change adaptation had been adopted, including Finland's National Strategy for Adaptation to Climate Change (see Ministry

of Agriculture and Forestry 2005) and a new one was in the making (see Ministry of Agriculture and Forestry 2014). However, these strategies were rather general and focused on forestry and agriculture, neglecting local perspectives on, for instance, fisheries and reindeer herding (e.g. Sairinen et al. 2010). I wanted to fill in some of the gaps and study the climate change adaptation of fisheries from as local a point of view as possible — the point of view of the fishers themselves.

As my initial intention was to focus my study on climate change adaptation, many of the concepts drawn from climate change adaptation research became the starting point for my study. These concepts include socio-ecological system, adaptive capacity, adaptive capacity determinants, resilience, vulnerability and sensitivity. These concepts will be further discussed in Chapter 3. I struggled to come to terms with these concepts, and especially with their overlapping and intertwined nature, but later realised that they were actually present in each of my interviews, just stated in different terms. The fishers and other fisheries actors talked about vulnerability and resilience when they mentioned how they can no longer deal with the changes they are facing or about their anger and frustration with the new regulations. They talked about adaptive capacity determinants when mentioning increasing competition over resources or the changes that have occurred in the value chains of fish.

Choosing a proper approach for analysing the fisheries community and their environment was a challenge, and I circled around the ideas provided by cultural ecology, the ecosystem approach in anthropology (e.g. Moran 1990; Ellen 1982) and political ecology (e.g. Neumann 2005; Robbins 2012). In the end, political ecology offered me an applicable framework theory-wise, and in addition I chose to approach my community and its environment as if they formed a socio-ecological system, although I realise the artificial nature of such systems. Socio-ecological system as a tool was present in studies on adaptations to climate change and also widely applied in fisheries research, so eventually it became a logical choice. But still, I was not fully satisfied. I had a feeling that something was missing. I realised what it was when I was introduced to the idea of non-human agency. I came to the conclusion that in order to offer more local, specific and versatile knowledge about the human–nature interface and interrelations, a perspective of non-human agency is needed. I also concluded that the actors and the nature of such agency can be recognised and acknowledged via local ecological knowledge when using the winter seiners and the Baltic herring as an example. This notion is examined more closely in article I (Sonck-Rautio 2017).

As I proceeded with my theoretical and conceptual exploration, the use adaptation as a term (in the field of studies on adaptations to climate change) started to bother me. What I had learned from my fieldwork in 2006–2007 was that, although viewed from many perspectives, the old winter seining community had adapted



successfully<sup>8</sup> to environmental changes, such as the loss of ice. But the old winter seiners' perceptions of such adaptations varied. Many were saddened by the decline of winter seining and the old lifestyle, or at least some part of it. I questioned the notion of adaptation being unconditionally a positive thing, asking the following questions: If the direction of adaptation is not embraced by the community involved, does it really count as successful or sustainable in every dimension? Should the level of resilience of the socio-ecological system be considered high if their way of life was lost in the process? This is why I decided to examine the adaptive capacity determinant from the perspective of cultural sustainability and resilience in article II (Sonck-Rautio 2018). I found that many of the indicators did have cultural aspects within them, but they were not articulated as such, and therefore could easily have been left out of the analysis. I found that adding cultural aspects to adaptation research would foreground cultural sustainability, which in turn could benefit the adaptations and transformations, making them also seem more culturally resilient and sustainable.

When assessing adaptive capacity and resilience, strategies are needed. Fisheries have developed many strategies to cope with environmental changes over the years. One clear message that emerged in the interviews fishers' prior experiences of having reduced opportunities to practice their own 'science of survival',<sup>9</sup> which affected their strategy building as well. I could recognise an emerging frustration on the part fishers towards research and policy-making efforts, which also manifested itself as behaviour that could be characterised as mildly rebellious.<sup>10</sup> Many of the fishers told me that their expertise is undermined. This notion led me to conversations with other fisheries researchers who had recorded similar perceptions. Article III (Salmi & Sonck-Rautio 2018) explored these observations. We examined the roles of women in fisheries and utilised the framework of feminist political ecology while analysing the mechanisms through which women's work and gendered knowledge regarding livelihood and the environment have been invisible in research and statistics. As a consequence, gendered knowledge has become marginal within the marginal when considering local ecological knowledge and its contribution to policy-making and research. As Pekka Salmi was in charge of writing the introduction, and about the gender roles and division of labor in general, I was responsible of theoretical framework and of the section about women in the winter seining community. The

8 They had diversified their subsistence modes, concentrating on, e.g. agriculture and tourism. The local community was thriving economically (see Sonck-Rautio, 2018).

9 Rochelieu et al. (1996, pp. 7–8) wrote about the gendered science of survival in their book *Feminist political ecology: Global issues and local experience*.

10 For example, some of the fishers were no longer willing to participate in research and preferred throwing their fish samples away rather than handing them over to certain researchers. Some researchers and policy-makers were also strongly challenged during their presentations in seminars, whereas others (whose speeches were more in the line with fishers' views) were loudly applauded.

article analysed the issues described above through two cases: Merikarvia and the Archipelago Sea area. Pekka Salmi contributed to this article with his expertise on the Merikarvia area, whereas the Archipelago Sea area was primarily my case study. We utilised both our interviews as data and wrote the analysis and conclusion of the article together with rather equal contributions.

I later further applied the framework provided by political ecology in article IV (Sonck-Rautio 2019) to analyse one more set of problems brought up by the fishers. This set of problems consists of the conflict over resources in the Archipelago Sea area. The conflict proved to be highly multilayered in their opinion, with many different dimensions being discussed. One of the most visible dimensions has to do with the concrete conflict between the grey seal, great cormorant and the fishers, who are all competing for the same resource — the fish. The conflict is, however, also political, since there are several human stakeholders involved: fisheries managers, policy-makers, the researchers who provide policy-makers with scientific knowledge, NGOs, recreational fishers and environmental administration. For the purpose of keeping my focus, I chose to exclude NGOs and recreational fishers from my analysis, although in further research it would be advisable to include their involvement as well. I used the framework of political ecology framework to scrutinise the ways through which fishers have become powerless in governing their environment. This conflict also includes a dimension that resides between the different types of knowledge, which leads to the dominance of one at the expense of another. I concluded that the conflict over resources and the marginalisation of the fishers, as well as ignorance about their local ecological knowledge, is reducing their resilience, which, consequently, is also reducing cultural sustainability and the overall sustainability of fisheries.

The methods, material and important concepts and theoretical frameworks of each article are further illustrated in Table 1.

### 1.3 Fishers, Fisheries and Their Environment

The Turku archipelago is part of the area within the Baltic Sea called the Archipelago Sea. The Turku archipelago consists of 20 000 islands, most of them uninhabited. The Baltic Sea is actually brackish water, being connected to the Atlantic Ocean only through the Danish straits, making the fluctuation of water relatively small. Salt pulses penetrating through the Danish straits are irregular and unpredictable, but they do have an impact on the quality of the water — such as oxygen levels and salinity of the water — thus affecting the flora and fauna of the Baltic Sea as well. Moreover, as the Archipelago Sea is in the Northern Hemisphere, it freezes over to some extent every winter. However, the effects of climate change can be detected in the Baltic Sea area, as the duration of ice cover, as well as the extension of ice cover have decreased ever since the 16<sup>th</sup> century, most notably during the last few decades (e.g. Lépy 2012, Korpinen et al. 2019, 36). The most crucial environmental factor affecting the condition

Table 1. The methods, material and important concepts and theoretical frameworks of the original articles.

Article	Material	concepts / theoretical framework
I) Sonck-Rautio, Kirsi (2017). 'The Baltic Herring as agents in the socio-ecological system in Rymättylä fisheries'.	Interviews with old winter seiners (or household members) 2006–2007, 2 interviews in 2015, field journal	Agency, socio-ecological system, local ecological knowledge.
II) Sonck-Rautio, Kirsi (2018). 'Adaptation and Cultural sustainability of the Winter-seining community in the Archipelago of Southwestern Finland'.	Interviews with winter seiners in Rymättylä 2006–2007, field journal	Adaptive capacity indicators, adaptation, resilience, adaptive capacity, sustainable development, cultural sustainability, Socio-Ecological System.
III) Salmi, Pekka & Kirsi Sonck – Rautio (2018). 'Invisible work, ignored knowledge? Changing gender roles, division of labor, and household strategies in Finnish small-scale fisheries'. <i>Maritime Studies</i> , 17, 213–221	Interviews with winter seiners in Rymättylä 2006–2007, interviews in the Archipelago area 2015–2018, field journals, participant observation + Pekka Salmi's material (interviews)	Gender roles, feminist political ecology, gendered knowledge, Local Ecological Knowledge.
IV) Sonck-Rautio, Kirsi (2019). 'The endangered coastal fishers in the coast of the Archipelago Sea - The environmental conflict in policy-making'. <i>Ethnologia Fennica</i> vol. 46. (Unpublished manuscript, accepted with revision)	Interviews 2006–2007, interviews 2015–2018, field journal, participant observation, social media and other media material, scientific reports and statistics, scientific articles.	Resilience, Local ecological knowledge, Socio-Ecological System, cultural resilience, cultural sustainability, environmental conflict, political ecology

of the Baltic Sea is eutrophication, which leads to, for example, turbidity of the water body, oxygen depletion and algal bloom, and consequently alters the biomass of marine species (Korpinen et al. 2019, 18). These environmental realities have set up the conditions in response to which the fisheries have had to develop.

The resources provided by the sea, such as fish and seals, have played a very important role in facilitating habitation along the coastal areas of Finland (Pääkkönen et al. 2016). Seal hunting has been practiced extensively in the area since the early Neolithic era, and it was still an important livelihood in the Middle Ages. Seal hunting in the Archipelago and Åland Islands was significant as late as the beginning of the 20th century. The seal hunting season was long, lasting 9-10 months per year. Although seal meat was consumed, the most important product was the seal fat,

which was quite valuable and became an important item of trade (Talve 1980, pp. 70–71).

Even as agriculture became more important, fishing retained its status as nearly an equally important mode of subsistence. In the 17th century, Baltic herring was the most prominent fish commercially, but fishing methods for other fish as well were highly developed. Other commercial fish species were harvested when there was no ice, more specifically depending on the spawning periods of each species, but Baltic herring was caught with nets in spring and autumn. Seines were also used regularly, even in medieval times. During wintertime, when the sea was covered by ice, fishers relied on winter seining, which had a significant role in the Archipelago Sea as early as the 15th century. There were several types of celebrations scattered throughout the seining season, and the seining season dictated the daily, weekly and monthly schedule of the community for the winter months. Although winter seining in Finland started to lose its importance at the turn of the 20th century, winter seining in the archipelago of southwest Finland maintained its viability for almost a century longer (Talve 1980, pp. 72–74).

Seining is a complex procedure that required extensive local ecological knowledge of the currents of the sea, the migration of the herring and the characteristics of ice. For example, the extent and thickness of the ice cover had to be just sufficient enough to support a large number of workers, their equipment and the horses or tractors. Each seine was owned by approximately eight households, with each household owning one piece of the net and its share of the other equipment. Every winter, after the ice became thick enough, each group of seine fishers started their journey in search of the best possible seining spot. Each seine cooperative employed around 50 people — a number that has changed significantly, from the 100 employees of the 1880s to the approximately 10 employees of the 1990s — including the owners. People engaged in several different kinds of occupations on the ice, but the seine king was the person in charge of the seine, although it was quite rare that he was one of the owners. Seine kings were the ones who possessed the utmost knowledge about the herring, its movements and its nature. The seine kings were highly respected members of the community and their knowledge was held to be irreplaceable — until the arrival of echo sounders in the 1970s.

It is not hard to understand the need for a workforce once one grasps the dimensions of the net. The net itself could be as high as 35 metres and its circumference as much as 400 metres. On its own, the net would weigh approximately 600 kilograms. The net was laid under the ice using dozens — or even close to a hundred — holes cut into the ice, and transported towards the main hole, from which the fish were pulled up with the help of a wooden stick (*uitto*), which was 30 metres long. The catch was pulled up by several men using barrels and horses, and later tractors. It was not an easy task, since the catch quite often contained tonnes of fish. The all-time record for the size of a catch was set in 1984, when local fishers caught 214 tonnes of herring.

It took them six days to harvest all the herring. Despite the enormous catches of the 1980s, the livelihood soon declined, and by the end of the 1990s, there were virtually no winter seiners on the ice anymore. This was not so much due to the lack of herring, but to the lack of ice — winters in the 1990s were very mild. In addition, changing demographics, rapid urbanisation, increasing competition and the ageing of the fishers, who had no one to take over their cooperatives, had a major influence on the decline of seining as a livelihood.

Historically Archipelago Sea communities have been distinctively fishing communities, and fishing households inhabited even the harsh outer islands. For example, during the years 1918–1939 archipelago dwellers were mostly fishers descended from fishing peasants. However, in the years 1950–1970 the number of coastal fishers declined dramatically due to a general decline in the conditions for practising fishing — with urbanisation, globalisation and environmental changes being the main reasons (Eklund 1994). Political will and social discourse turned in favour of recreational fishers and conservation, adding to the competition over resources (Salmi 2015; Sonck-Rautio 2017). In 1934, there were 3447 fishers in the area of the southern Archipelago Sea, whereas in 2015 less than a hundred were left. In the 1980s, there were approximately 500 fishers in the whole Archipelago Sea area, but by 2013 the number of registered fishers was 290, with only 89 of them working as full-time fishers. (Salmi 2018 pp. 70). A thorough comparison of the number of fishers is, however, very hard to make since the definition and indicators for classifying professional, part-time and full-time fishers have changed many times over the years.

As professionals, fishers share a strong cultural and professional group identity. According to anthropologist Rob van Ginkel, the factors affecting group identity are, to name a few, skills and expertise, the fusion of private and professional life, social norms and practices, rituals, esoteric knowledge and jargon that includes myths and anecdotes and legends (van Ginkel 2001, p. 177). The interviews with the fishers of the Turku archipelago were filled with such esoteric (environmental) knowledge, such as myths and anecdotes. Most of the stories recorded were about winter seining trips, focusing on the excitement and danger of them or on funny consequences. It also became clear that for most, fishing was not just a profession, but a way of life — maybe even a calling. ‘A fishers does not retire. He just dies,’ in the words of one informant (TYKL/aud/1274).

Apart from only one fisher that I interviewed, all the rest of the fishers had been fishing ever since they were children, continuing with their parents work.

‘Well, you can say that I’ve been fishing ever since I was a kid. We live on an island, you see, where I was born. I have only been away for a short while, like when I went to army.’ (TYKL/aud/1272)

‘Well, there was nothing more to do really [but to fish], on an island. There were no other children either, since we were the only household there.’ (TYKL/aud/1273)

‘I have always loved fishing. I remember when I was a child — it was back in those times when parents did not really worry about their children’s whereabouts — we were just ice fishing on thin ice with my brother.’ (TYKL/aud/1268)

Ninety per cent of fisheries in Finland are coastal small-scale fisheries. They are mainly small family businesses, employing 1–2 family members (Natural institute Finland 2018). The methods used by the fisheries can vary, depending on, for example, the species harvested. Nowadays, Baltic herring is mainly caught by trawlers in the open sea, so it is no longer an important commercial fish for coastal fishers, although in numbers and by value herring is still the most important fish for the fishing industry. For coastal fishers, the most important fish commercially are pike perch (*Sander lucioperca*), white fish (*Coregonus lavaretus*) and perch (*Perca*) (Natural resource institute Finland 2019b).

## 2 Previous Research

### 2.1 Traditions of Fisheries Research in Finnish Ethnology and Other Related Fields

In its early stages, Finnish ethnology did have a focus on traditional Finnish subsistence modes, among other things. The most profound study on Finnish fishing culture was the ethnologist U.T Sirelius's ambitious trilogy *Suomalaisten kalastus* [Finns and fishing, translation my own]. The first Part, 'Suomalaisten kalastus I', was published in 1906 (part II in 1907 and Part III in 1908). Sirelius's study was faithful to its time and mainly examined the material culture of fisheries and the distribution of different modes of fishing. Subsequently, U.T Sirelius focused his attention on research topics other than fishing, resulting in a decades-long gap in fisheries research in Finnish ethnology (Korhonen 2009), until its revival in the 1920s when Kustaa Vilkuna became a prominent fisheries researcher. Vilkuna published several studies related to fishing over the next decades (Vilkuna 1929, 1940, 1951, 1956, 1964, 1966 and 1972). He conducted some research in the Archipelago Sea as well, mainly among Rymättylä's various winter seining communities. Several other, smaller studies were also published around mid-century (i.e. Valonen 1953). Kustaa Vilkuna must also be thanked for one important cultural historical contribution, that is, a series of films describing some of the most traditional professions in Finland at the time. This series of ethnographic films was named 'Isien työt 1936–39' ['the labours of our ancestors 1936–39', translation my own], and it included such traditional types of labour as slash-and-burn agriculture, tating in Rauma and, most interesting for my own purposes, winter seining in Rymättylä. These films can be found online.<sup>11</sup> Ethnologist Veikko Anttila studied salmon harvesting in Sumisaari (1965) and the development of Rymättylä's winter seining fisheries (1968). Nils Stora (1968) studied the harvesting of sea birds in northern Eurasia. Later, he studied the environment, adaptation strategies of the Archipelago Sea dwellers (1993) and the Baltic herring trawlers of Åland (2012). Researchers from the 1970s onwards, such as the anthropologist Jukka Pennanen, studied winter seining both in fisheries in the archipelago of south-western Finland (1986) and offshore fisheries, such as Pyhjärvi

11 [Kansatieteellisetfilmit.fi/videot.html](http://Kansatieteellisetfilmit.fi/videot.html)

in Säkylä. Outi Tuomi-Nikula studied fishers in Ostrobothnia in her dissertation (1982), and Ari Lappalainen scrutinised the changes in fishing cultures in the midst of the tremendous social changes of the 1990s (1998). Though not concentrating on fisheries, ethnographic studies on the archipelago dwellers have been conducted by Monica Nerdrum (1998), Eva Lettinen (2004), Katriina Siivonen (2008) and Niklas Hulden (2018).

In Finland, fisheries research from the social and cultural perspective was mainly conducted by ethnologists until 1994, when sociologist Erland Eklund published his study on coastal fishers and changes in the organisational and social structures as well in the operational environment of fisheries from 1860 to 1970. Sociologist Matti Sipponen did research on the economic systems of inshore fisheries (1999), and sociologist Pekka Salmi's dissertation (2013) focused on fisheries governance and the challenges it is facing, the power structures impacting Finnish fisheries governance and also the different types of knowledge systems affecting governing and administration. In addition to his dissertation, Salmi has continued to work on fisheries and has published several articles on fisheries-related social sciences. Salmi's work has had a great influence on my own research as well. Currently, a number of fisheries-related social science studies are being conducted by the Natural Resource Institute Finland (e.g. Salmi 2015; Reunanen & Mellanuora 2013).

In addition to fisheries research, this study is related to, and adds to, other fields of research within ethnology and anthropology. Environmental ethnology, a study of human-nature relations, to put it simply, has been studied from various Finnish perspectives and with subject matter other than fisheries. This relationship is often examined through a nature-based subsistence mode, such as fishing or reindeer herding. Ethnologist Juhani Korttesalmi (1996) studied reindeer herders in northern Viena (Karelia), while ethnologist Helena Ruotsala (2002) studied the meanings and perceptions of change within the reindeer herding communities of Finland and Russia, anthropologist Hannu Heikkinen (2002) examined the adaptation of reindeer-herding communities to the post-industrial operational environment in Finland between 1980 and 2000, and anthropologist Anneli Meriläinen-Hyvärinen (2008) has studied the survival strategies of four communities in northern Finland between 1680 and 1990.

Finnish ethnology has a long-standing research tradition of examining a wide range of Finnish workers and professions, with the profession of fisher being one of them. Previous studies have focused on a variety of different occupations, such as glassworkers in Finland in the early 20th century (Nurmi 1989), lumberjacks in Finnish Lapland (Snellman 1996), foresters in Finland from the 1860s to the early 2000s (Paaskoski 2008), pilot boat staff and lighthouse keepers (Nyman 2011), and dock and harbour workers in Helsinki and Kotka in the 1950s (Steel 2013).

One emerging field of research that this study has contributed to is the social approach in ethnology. A book regarding the new social approach in ethnology



was recently published (Fingerroos et al. 2017) as a demonstration of ethnology's opportunities to provide relevant information about crucial social issues. The social approach in ethnology focuses on giving a voice to the people behind the statistics or to other more quantitative data; it also seeks explanations for social phenomena that cannot be found in quantitative data or to give voice to those groups who are otherwise marginalised in research, for example local inhabitants' views on municipal mergers (Koskihaara & Mäkinen 2018). The social approach in ethnology highlights the importance of knowledge gained through experience, but also the importance of tacit knowledge and silent agreements among decision-makers, which may have a major impact on the nature of decisions (Lappi 2005, p. 293). As my research seeks to give voice to fishers who are otherwise generally left out of the decision-making processes, as well as to examine the unofficial views of researchers and policy-makers, it can be considered to fit quite well within the social approach of ethnology.

My work is also connected to climate change adaptation research, as it forms the starting point for my research, although the direction of this study took a turn and I found myself not able to concentrate on climate change after all. However, climate change adaptation research is mainly about the local effects of global phenomena. Anthropologists and ethnologists working in the field are eager to study how local communities are able to maintain their local cultural characteristics while at the threshold of great changes, but also contribute to finding solutions to climate change and its effects (e.g. Dove 2014; Crate 2011; Crate & Nutall 2009). Research on environmental policy-making is closely connected to climate change adaptation research, and as anthropologists Nora Haenn and David Casagrande (2007, pp. 101) have asserted, anthropologists and ethnologists have been found to work as cultural brokers, as their skills as delineators and negotiators across different stakeholder and identity groups would benefit policy-makers greatly. My research takes a local stance on environmental policymaking, thus offering an interface with climate-related policymaking and its local acceptance as well as its connection to discussions on sustainabilities and local ecological knowledge.

This research also continues the long-standing tradition of anthropologists and ethnologists to study islands. Starting with the pioneering ethnologists and anthropologists, such as Bronislaw Malinowski, whose famous study *Argonauts of the Western Pacific* (1922) focused on the communities of the Trobriand islands, Franz Boas, who conducted extensive research on the Kwakiutl of Vancouver Island (e.g. Boas 1889, 1895, 1897), and Margaret Mead and her work in Samoa (e.g. Mead 1928). Researchers working outside the disciplines of anthropology and ethnology have also looked to islands as living laboratories, where the local population, whether human, animal or plants, is often less complex when considering the geographical limits and relative remoteness and isolation of islands. The potential that islands have for researchers was probably most famously taken advantage of by Charles Darwin in the Galapagos Islands, among others, a fieldwork trip that consequently led to the

publication of the groundbreaking *Origin of the species* in 1859. Nowadays, islands are being studied from various point of views, although they have not lost their special status as living laboratories. Islands are popular research sites for those working on issues of climate change adaptation and resilience since they offer a small-scale example of social structures and ecosystems, but also because the effects of climate change are often more visible on islands (e.g. Kelman 2018; Barnett & Waters 2016). In general, the field of study focusing mainly on the characteristics of islandness and its consequences is called nissology. Among nissologists, a wide range of research has been conducted, including work on innovation, resilience and coastal management and, most importantly in my case, fisheries research (e.g. Baldacchino 2004).

## 2.2 International Fisheries Research and Fisheries Management

Commercial fish stocks all over the world have declined due to intensified fishing pressure and technological improvements to fishing vessels and gear. For example, according to the United Nations' Food and Agriculture Organization (FAO 2019), the growing efficiency of fishing and human consumption of fish have led to a situation in which 87% of commercial fish stocks are either fully exploited or overexploited. Due to these developments, the management systems of fisheries have had to change. Fisheries policies were directed at securing fish stocks and ensuring the economic benefits of fisheries, in other words, at building ecological and economic sustainability. Social and cultural issues have been, to a large extent, ignored, although a number of fisheries today are struggling with the implications of such policies (e.g. Urquhart et al. 2014). Many studies have focused on the problems of management and inequity, resilience, adaptive capacity and sustainability of fisheries. These studies have a clear focus on the apparent recession of small-scale fisheries (e.g. Symes et al. 2015; Salmi 2015; van Ginkel 2009; Symes 2007; Jentoft 2000).

As fisheries policies in Finland are subject to the EU Fisheries Act, all fisheries must follow the guidelines defined by the Common Fisheries Policy. The Common Fisheries Policy 'aims to ensure that fishing and aquaculture are environmentally, economically and socially sustainable and that they provide a source of healthy food for EU citizens' (European Commission 2018). Even so, it has become evident that the aims of achieving overall sustainability have not been met, as the profitability of fisheries is decreasing and the number of fishers is declining remarkably (e.g. Urquhart et al. 2014). A large portion of research scrutinises the processes through which the numbers of local, small-scale fisheries are diminishing due to the rise of capitalism, competition over resources, the international large-scale fishing industry, the loss of the traditional kin-based form of entrepreneurship or problems with governance. Most of the research fits within the framework of political ecology, whether it is articulated or not (i.e. Bavinck et al. 2018; Loring 2017; van Ginkel 2014; Symes

2007; Jentoft 2000; Salmi 2000). Similar problems are occurring in many other nature-based livelihoods with regards to management and global changes. In Finland, for example, reindeer herders are struggling with conflicts over conservation strategies for large carnivores (Heikkinen et al. 2011), ever-increasing tourism, which threatens the landscapes of reindeer herders (Ruotsala 2010), and an intensifying market-based economy (Ruotsala 2002).

Before modern times, the decision-making process in Finnish fisheries was dictated by local norms and practices, which in turn were often based on local ecological knowledge. One good example of such a decision-making process was the Seine Law in Rymättylä, which was established to keep the practice of winter seining reasonable. The Seine Law is described in more detail in articles II and I. These local norms later developed into laws and regulations, which were supervised by state authorities. Traditional decision-making gave way to centralised fisheries management, governed in a top-down manner. This managerial principle was based on scientific knowledge, as centralised management aimed to achieve equity and objectivity. This model of management is often referred to as managerialism (Salmi 2013, p. 34). Managerialism is, as we will later establish, often criticised by social scientists studying conservation and biodiversity. Many debates over the need to transition from managerialism to a more co-management-based model are currently taking place, but still the paradigm of centralised and bureaucratic fisheries management is marginalising local decision-making processes and diminishing the opportunities for different stakeholders to have an impact. One of the most important examples of this top-down strategy is the fisheries management legislation of the European Union. Symes (2001, p. 48) argues that managerialism is decreasing the adaptive capacity and resilience of fisheries and weakening the self-esteem and social identity of fishers.

In Finland, fishing has been a subject of agriculture and forestry administration since it constitutes part of coastal and rural primary production. According to Salmi (2013), fisheries and fishing was neglected compared to agriculture and forestry when the Finnish welfare state began taking shape in the 20th century. Ownerships issues over land and water have been challenging, as the majority of professional fishers have been landless and access to fishing rights has been relatively exclusive. In addition, the political power of fisheries unions has been rather weak. Compared to agriculture and forestry, their financial support has also been low; fisheries have been supported by the granting of small loans and the insurance system. In addition, herring fisheries were aided by a price-fixing system. These national guidelines were revoked after 1995, when Finland joined the European Union and started following EU fishing policies (Salmi 2013, p. 13). Due to the restricted space and framing of my research, I will not go into more detail on the development of management and administration regarding fisheries, but one can find more extensive descriptions of the developments in Finnish fisheries governance in other studies (e.g. Salmi & Muje 2001; Salmi 2009; Salmi 2013).

Fisheries researcher Maarten Bavinck et al. (2018, p. 46) argue that the social struggles within and over fisheries are intensifying and that these intensifying patterns generally follow four different trends: 1) the conditions of fisheries have become a zero-sum game, with the result being that one group wins while another one loses; 2) there are a new set of controls with respect to the fish value chain that enhances the risk of exploitative behaviour by merchants over fishers; 3) the introduction of new business interests in the marine space, which alter the power structure in regards to access to natural resources; and 4) the increasing participation, or even interference, by the state in what used to be predominantly the affairs of fishers. They further argue that although many fishers are both aware of and willing to contribute to sustainable development, their concerns are overridden by such issues as social injustice connected to environmental degradation and the costs of regulations. As Bavinck et al. put it, 'addressing social justice concerns may be a precondition for achieving sustainable human-nature relations' (Bavinck et al. 2018, p. 47).

What then are the social injustices that small-scale fishers' in the Archipelago Sea are mostly struggling with? Is it the case that these social injustices are constraining sustainable human-nature relationships? If so, what are the mechanisms through which these social injustices are enacted, and how do they effect local small-scale fisheries? The four trends of intensifying social struggle complement the ideology of political ecology, which offers an appropriate framework for such an analysis and which is examined in more detail in Chapter 3.

## 3 Theories and Concepts

This chapter illustrates and examines the theories and concepts applied in this dissertation. First, in section 3.1 the theoretical framework of political ecology is introduced, which is the underlying framework throughout the dissertation, as is the concept of agency, which is an important concept for both the human and non-human dimensions of this dissertation. In section 3.2, the concepts of adaptation, socio-ecological system and resilience are examined more closely. Adaptation is briefly defined as it is applied in this study, and the development and relevance of socio-ecological systems are discussed with respect to this study. Resilience, however, is one of the key concepts of the study, and it is therefore examined in more detail. Section 3.3 is dedicated to examining sustainabilities, cultural sustainability in particular. Finally, in section 3.4 the problems and discourse regarding different types of knowledge are examined, focusing especially on the knowledges relevant to this study — local ecological knowledge and scientific knowledge.

### 3.1 On Political Ecology and Agency

Political ecology can be seen as being derived from the traditions of human geography and cultural ecology. In the context of anthropology, then, political ecology has same ‘ancestors’ as the socio-ecological system framework. Cultural ecology was strongly criticised by many, with one of the most noted critics being Eric Wolf, a student of Julian Steward’s at Columbia University, whose book *Europe and the People Without History* (1982) was a critique of synchronic research forgetting the history of its subjects, labelling non-Europeans as passive subjects who have no agency of their own. Eric Wolf, although not explicitly formulating a political ecology perspective, is widely considered as one of the pioneers of the field. Another notable critic of cultural ecology was the geographer Michael Watts, whose influence on political ecology has been significant. In 1970s and 1980s, political ecology focused on third world countries and such issues as poverty and the capitalistic economy in the context of self-regulating homeostasis and adaptation (e.g. Neumann 2014 [2005], p. 22). Michael Watts’s famous article ‘On the Poverty of Theory: Natural Hazards Research in Context’ (1983) strongly criticised the cultural ecological tradition for embracing the Newtonian-Cartesian mechanistic view of the world and for applying biological

concepts such as homeostasis and feedback merely as a way of reducing people to nothing more than products of biology and rational behaviour. He then suggested, as had Wolf, that human–environmental relations should be more engaged with social theories, especially with Marxist political economy (Neumann 2014 [2005], p. 22). Watts's formulations of political ecology were mainly based on the field of natural hazards, and his book *Silent Violence: Food, Famine and Peasantry in Northern Nigeria* (Watts 1983b) was an attempt to redirect natural hazards research more in the direction of Marxian theories, as he was convinced that the vulnerability of peasant societies was not due to maladaptation or the irrational behaviour of the peasants, but was instead a result of the colonial-state and global capitalist system entering into the space of local pre-capitalist modes of production (Watts 1983b; Neumann 2014, p. 25).

At the same time, most research conducted in the spirit of political ecology was concerned with third world environmental degradation, which includes a wide range of environmental problems, such as soil erosion and the loss of biodiversity. From the context of environmental degradation, researchers have also examined the technocentric and managerial issues of development. Now, we are getting close to the centre of my research. According to Neumann (2014 [2005], p. 27), a managerial approach to development assumes that environmental degradation is caused by, for example, the over-exploiting of local resources by local people, and the solution to such a problem is to introduce new, more rational managerial procedures developed by scientific specialists. This assumption reflects the problem of squaring different types of knowledge, which is also apparent in the case of Turku archipelago fisheries. The governance and management of fisheries still tend toward managerialism and scientific expertise. This causes many conflicts among the different stakeholders exerting agency in the area, such as between fishers and other competing species like seals and great cormorants, but also among fishers, scientists and managers. These conflicts are illustrated in article IV (Sonck-Rautio 2019). Also, when relying upon scientific data only, a great amount of knowledge is lost, since the statistics hide the circumstances and people behind the facts, not only neglecting the fishers' knowledge, but also the gendered knowledge that is mostly possessed by women in fisheries, who deal with fishing-related issues as well but are not registered fishers themselves (article III, Salmi & Sonck-Rautio 2018). Related to managerialism is the famous notion of 'The Tragedy of the Commons' (Hardin 1968), which has subsequently been criticised by many political ecologists for its biased implication that the common property regimes common in third world countries are bound to fail, providing an excuse for state intervention and the privatisation of resources (e.g. Neumann 2014, pp. 27–28; Franke & Chasin 1980). The same critique of common pool management triggered the development of the socio-ecological system framework, as will be established later in this study. A large number of political ecological studies have been conducted ever since, proving that the managerial approach is not sufficient for solving local

ecological problems, and, due to its lack of analysis of political power relations or social contexts, the approach can also be quite harmful. Several significant studies along these lines were *Seeds of Famine* (Franke & Chasin 1980) and *The political Economy of Soil Erosion in Developing Countries* (Blaikie 1985). The latter is considered one of the most influential books in political ecology, since it is viewed as laying the foundation for current political ecology (Neumann 2014, p. 30).

In article IV, I analysed the current conflict affecting fisheries within a framework introduced by Paul Robbins (2012 [2004]). Robbins divided political ecology into five main themes: degradation and marginalisation, conservation and control, environmental conflict, environmental subjects and identities, and political objects and actors. These five themes can be overlapping, but for the purpose of my analysis I found the following three to be most relevant. First, degradation and marginalisation, which highlight the tendencies of environmentally inoffensive production systems to be labelled as exploitative, eventually becoming so due to intervention on the part of the state or authorities. It is common for traditionally and communally managed systems to become unsustainable, as the traditional ways of dealing with, e.g. property, are being imposed by new institutions. Quite often this development leads to decreasing sustainability as well as to decreased equity in resource distribution (Robbins 2012 [2004], pp. 159–160). Small-scale fishers are quite often seen as contributing to environmental degradation, whether it is a question of preserving wildlife or the over-exploitation of fish stocks. Although it is true that overfishing is a serious problem, it is rarely only small-scale fishers who are to blame for the over-exploitation or degradation of fish stocks. There are also increasing numbers of predators (grey seals and great cormorants mostly) and recreational fishers exploiting the same resource. For example, there are nearly 1.6 million recreational fishers in Finland (Natural Resource Institute Finland 2019). Scapegoating fishers is an embedded attitude implicit in research and management, which is highlighted in managerialists' views regarding 'the tragedy of the commons'. The second relevant theme is conservation and control, which examines the process whereby the implementation of conservation procedures to ensure sustainability, community or nature consequently leads to the loss of resources for some groups. Officials, legislation and various regulations quite often negatively impact local systems of livelihood, institutions, and maybe even ways of life via their efforts at conservation and control. There are many cases where the local subsistence systems have been productive and relatively sustainable, and yet they have been declared unsustainable by the state actors willing to take control of the resources (Robbins 2012 [2004], pp. 178–179). In Turku archipelago fisheries, this development has occurred within the context of, e.g. the conservation of grey seals and great cormorants, but especially through the regulation of pike perch. The conservation of other species has indeed led to a decline in resources for the fishers. The third relevant theme, environmental conflict, addresses situations where different types of regulations enhance the

tensions between stakeholders, politicising the environmental dilemmas at hand and eventually even creating serious conflicts between the groups (Robbins 2012 [2004], p. 200). In Turku archipelago fisheries, the conflict between groups has developed into serious disagreements involving many different stakeholders. Conservation organisations, administrators, managers, fishers, local dwellers, researchers and even general public — especially in the case of the grey seal — all have opinions on and solutions for how best to deal with the problems. Fishers feel like they are left alone with their point of view and that they are vilified by the general public.

With regards to renewing the basis of knowledge, feminist political ecology offers a new perspective on the knowledge acquired via scientific research. Although political ecology quite often concentrates on analysing the injustice of political and social environment-related issues, the analysis mainly focuses on class or ethnicity. However, once one adds a feminist lens to the analysis, one finds structures that are used to marginalise yet one more group: women. In their groundbreaking book *Feminist Political Ecology: Global Issues and Local Experiences* (1996), Rocheleau, Thomas-Slayer and Wangari bring up the notion of gendered knowledge. They note that women are more often than not left out of research, and the knowledge that women possess has not been considered important. In article III (Salmi & Sonck-Rautio 2018), we argue that the research conducted among small-scale fisheries has indeed ignored women, since their duties have generally not been directly involved with fishing as a practice. Regardless, their input has had a major influence on household strategies in fishing communities. Many of the women in the households are actually fishers themselves, but since there is usually a need for only one registered fisher in the family business, there is no reason to add to the bureaucracy by registering two fishers. Therefore, women who fish do not actually show up in the statistics that many of the policies are based on. At the same time, social sciences and the humanities also tend to ignore women, since men are considered to be more available or even more capable of being interviewed. This attitude is also nurtured by the women themselves, who were quite reluctant or shy to offer their expertise for the study (Salmi & Sonck-Rautio 2018; Koralagama et al. 2017). However, even those women who do not fish have essential knowledge of, e.g. social networks, resource accessibility and community. This is similar to what Rocheleau et al. (1996, p. 8) called a ‘gendered science of survival’. If women are not seen as actors or are not represented in the research, there is a void in the information and data and an important perspective on fisheries and livelihoods is lacking.

So, what then are the means for avoiding the oversight described above in a manner that could benefit more holistic ways of ensuring the success of fisheries? In resilience and adaptive capacity studies, the study object is often regarded as socio-ecological system. Since fisheries form a multidimensional socio-ecological system, more multidisciplinary and interdisciplinary research is needed. In all of my articles, I make some suggestions as to how to achieve this task by applying an ethnological and



more qualitative approach. In article I, I suggest that as a socio-ecological system is often used as a tool for analysis, agency within the system is often granted to humans operating in the ecological sphere. However, I argue that animals are often ignored in the analysis in the sense that they are not treated as agents, with agency often being seen only as a cognitive moral quality that human beings possess (Sonck-Rautio 2017, p. 104). Sarah McFarland and Ryan Hediger (2009) have, however, pointed out that agency can also be expressed via the pursuit of happiness, the need for liberty or simply the right to live. Bruno Latour expanded the definition of agency with his famous actor-network theory and by stating that agencies are always present in ‘making some difference to the state of affairs, transforming some As into Bs through trials of Cs’ (Latour 2005, p. 53). On this account, all natural things, whether living or non-living, have agency in a socio-ecological system. In the context of archipelago fisheries, non-human actors, such as fish, do have agency in the socio-ecological system, as argued in article I. For this reason, the agency of non-human actors should be fully recognised and added as a dimension for socio-ecological systems analysis, and consequently, also to environmental governance and management. For example, ice plays an important role in the behaviour of fish, seals and the cormorants. Therefore, ice has agency that is significant to the functioning of a socio-ecological system. The influences caused by different actors can be quite local, and therefore difficult to examine using scientific methods. Local ecological knowledge plays an important part in calling attention to locally important actors and also the relationships between different actors.

In his book *Politics of Nature* (2004), Bruno Latour describes his political ecology as a critique of such environmental politics that claim to speak for nature. Latour sees nature as objective, whereas anything subjective should be labelled social. This leads to viewing nature as an external realm, and non-human actors are represented by certain spokespersons. Who gets to be the privileged person speaking for non-human actors is definitely political. Currently, the spokespersons are, according to Latour, mostly scientists. Latour’s political ecology introduces the idea of a newly formulated democracy, a collective which would include non-human actors. These non-human actors, however, need spokespersons to speak on their behalf. This would be an opportunity for fishers to act as spokespersons for the non-human actors of their environment and offer perspectives for analysing the interface between social, cultural and natural perspectives or systems that are either social or ecological.

### 3.2 On Adaptation, Socio-Ecological Systems and Resilience

The starting point and main concept for this study was *adaptation*. The definitions of adaptation may vary according to the system that is being examined. In cultural ecology, which was famously articulated by Julian Steward (1955), adaptation as a term

was of key importance, referring to the process by which communities adjust to their (environmental) surroundings. Similarly, human ecologists have developed the idea that human communities can be studied with similar biological analogies as applied in ecology, a notion that was eagerly adapted by human geographers. Anthropologists also were attracted by the multidisciplinary nature of fieldwork, collecting data on rainfall, crops, energy density, and so forth, consequently decreasing the application of biological concepts within anthropological research (Ellen 1981, pp. 67–70). Soon, the term ecosystem, introduced by the ecologist A.G Tansley (1935), gained in popularity among scientists. An early assumption was that ecosystems strive for homeostasis, a state of balance. Ecosystems science later developed to serve conservation research, among other fields (Moran 1990, p. 6). Later, it was recognised that ecosystem models were not sufficient to analyse the social sphere of systems. This critique led to development of political ecology on one hand, as on the other hand, in order to overcome the issues created in sustainable common pool management, and to criticise the notion of the ‘tragedy of the commons’, the theory of socio-ecological systems (SEs) was developed (Gardener, Ostrom & Walker 1990; Berkes & Folke 1998; Agrawal 2001). Interestingly socio-ecological system thinking followed some of the same principles that were earlier applied in cultural ecology, for example John W. Bennett’s ideas about adaptive dynamics in ‘The Ecological Transition’ (1976). The socio-ecological system concept has developed into a mainstreamed field of research focused on the mutually dependent connections between social and environmental change, and how those connections influence sustainability goals. An socio-ecological system framework also emphasises that both spheres are equally important, and their functions are coupled and co-evolutionary. Socio-ecological system thinking also stresses that the distinction between social (and cultural) and ecological is artificial (Berkes and Folke 1998; Berkes 2011; Young et al. 2006).

In research, small-scale fisheries are increasingly conceptualised as integrated socio-ecological systems. Applied ecologist Fikret Berkes (2011, p. 10) highlights that in order to restore the unity in managing marine social-ecological systems, such as fisheries, the need to connect natural sciences with social sciences together with humanities perspectives is crucial. The socio-ecological system framework has faced a fair amount of criticism, which environmental geographers Stojanovic and his colleagues (2016) have explained in terms of four main themes. I will briefly outline the categories here. Critical theorists accuse the socio-ecological system framework of depoliticising the situation that it represents, whereas antinaturalists’ main cause for critique is that a systems approach assigns methodological determinism: instead of representing social entities accurately, an approach that fits the requirement of system modelling is chosen. In short, in their view a concept that is purely naturalistic is forced upon the social sciences domain. The third set of critiques highlights the fact that a systems approach has weaknesses in apprehending certain realms of social reality. Finally, the fourth category of criticism concentrates on concerns over the

social-ecological system framework's lack of explanatory power and a bias in explanations. (Stojanovic et al. 2016). Although a thorough analysis of the different functions and links between socio-ecological systems, as well as any attempt to answer let alone resolve the problems recognised in the social-ecological system framework, is beyond the scope of this study, it is natural to employ the social-ecological system framework throughout this study. However, I do see the role of culture and cultural resilience in the social-ecological system framework as problematic. This issue is further discussed later in this chapter. With this caveat in mind, small-scale fisheries and their natural environment in the Turku archipelago are also treated analytically as socio-ecological systems.

Another key concept of this study is *resilience*. Resilience as a concept was first introduced by the ecologist C. S. Holling (1973) in his famous article 'Resilience and stability of ecological systems', and its revolutionary idea was that instead of highlighting the importance of homeostasis, the resilience of ecosystems was more important in terms of adapting to external changes. The term describes the degree to which a system is able to rebound and recover from a stimulus or stimuli and still maintain its state variables (Holling, 1973). Resilience as a concept can be related to both the biophysical and social realms. Resilience is not easy to define, as it is not easy to observe. There is no clear consensus over the indicators of resilience either. For example, the biodiversity of an ecosystem does not necessarily imply its resilience. Often, coastal ecosystems can be defined as highly resilient, since, although simple, they offer a wider range of subsistence modes to choose from (Adger 2000, p. 349). Therefore, the diversity of options seems — on some level at least — to indicate a high level of resilience. Resilience can then be thought of as a buffer for a capacity of sorts. Environmental scientist Emily Boyd and ecologist Carl Folke (2011) defined resilience as the 'ability to reorganize following crisis, continuing to learn, evolving with the same identity and function, and also innovating and sowing the seeds for transformation' (Boyd & Folke 2011, p. 266). This definition of resilience is the one used in my research.

Human geographer Neil Adger (2000) has tried to determine the parallels between social and ecological resilience and argues that a common ground can be found in social stability and resource dependency. He argues, as do geographer Barry Smit and climatologist Olga Pilifosova (2001), that resource dependency, i.e. specialisation, increases the risks for a community's resilience. Hence, he suggests that a diversification of subsistence modes increases the resilience of communities. The resilience of a particular system is based on the ecosystem, but also on institutional rules. Social resilience therefore can be examined by observing social exclusion, marginalisation and social capital. Social resilience is carried out mainly via social institutions, which in turn are in charge of the economic system, especially the structure of economic systems and distribution of assets (Adger 2000).

Following Adger's views, resilience literature often proposes the diversification of subsistence modes as a way of improving resilience, but not every community is willing to diversify. Symes et al. (2015, p. 250) asserts that sometimes diversification can reduce local autonomy, independence and the ability to engage in livelihoods in a traditional manner. Resistance to diversification brings up the necessity for other dimensions of resilience, such as cultural resilience. Cultural resilience has been described as a way of enhancing the resilience of a community in its entirety (e.g. Forbes 2013, p. 7) or as a community's ability to maintain its characteristics and cultural heritage in a manner desired by the community (Crane 2010, p. 3). What, then, is the role of culture in a social–ecological system? Climate adaptation scientist Todd A Crane (2010, p. 2) asks if it is possible for the ecological and material components of a system to be resilient, even if at the same time the cultural group within it is pushed over a threshold, leading it to transform itself into a new state in which the most valued practices and beliefs become untenable, thereby transforming the culture itself. Do such transformations even matter? I find this question to be essential precisely because it highlights the importance of adopting a cultural resilience perspective. Crane (2010) has suggested that the term 'cultural resilience' should be defined 'as the ability to maintain livelihoods that satisfy both material and moral (normative) needs in the face of major stresses and shocks; environmental, political, economic, or otherwise'. The logical result of a lack of cultural resilience is then cultural transformation.

Cultural transformations of some degree are sometimes needed in order to meet the demands of overall sustainability. However, in order to avoid the types of cultural change that endanger the integrity and well-being of a people — or even eventually the overall sustainability of a community — and advocate for change that similarly promotes cultural resilience, the notion of cultural sustainability is needed. In the next section, I examine the dimensions of various sustainabilities, and especially their interplay, more closely.

### 3.3 On Sustainabilities

Environmentalism started to gain ground in the 1970s, after the release of such classics as *Silent Spring* by Rachel Carson (1962), *Our Synthetic Environment* by Murray Bookchin (1962), using the pseudonym of Lewis Herber, or *The Population Bomb* by Paul Ralph Ehrlich (1968). In 1968, the Club of Rome was established, and its famous book *Limits to Growth* was published in 1972 (Meadows et al. 1972), with the majority of people now becoming aware of environmental issues. (Lummaa, Vuorisalo & Rönkä 2012, p. 15) Ever since, different environmental issues have become mainstreamed, i.e. stratospheric ozone depletion, the greenhouse effect and climate change. In 1987, the Brundtland Report was published, and the notion of sustainability was more or less institutionalised. Sustainable development was defined as

follows: ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (Brundtland 1987, p. 16). However, the original idea of sustainable development as a tool for discovering fair complementarities and harmony between nature and humanity has been wiped away by the rationales of ecological and economic sustainabilities, which have come to dominate the science of sustainability. The social and cultural dimensions of sustainability have only recently begun to enter the general discussion regarding sustainability (Parra 2018, p. 51). In sustainability-related studies, culture has been added to the dialogue in myriad ways, but most relevant of these dialogues is the one connected to resilience, adaptive capacity and sustainability, where culture has been seen as a form of communication with the impacts of climate change and risk management (Parra et al. 2018, p. 1).

Social scientist Constanza Parra (2018) analyses the diversity of contributions through which culture has been connected to sustainability. She divided their findings into five different groups. Group 1 connects sustainable development and culture via issues of development and social sustainability. Group 2 stresses the relationality of nature, society and culture. Group 3 emphasises the importance of culture’s role as a pillar — either the fourth pillar or the central pillar. Group 4 highlights the importance of culture from the perspective of material culture, art and cultural heritage. The fifth group sees culture as fundamental, where the role of culture should be embedded in all policies (Parra 2018, p. 52). Katriina Soini and Inger Birkeland (2014) have studied the representations of cultural sustainability in scientific research and recognised seven different storylines. These storylines are cultural heritage, cultural vitality, economic viability, cultural diversity, locality, eco-cultural resilience and eco-cultural civilisation. In Article II (Sonck-Rautio 2018), I identified my research as best fitting with storyline of socio-cultural resilience, since it embraces the systemic way of thinking and highlights the importance of both the natural and social sciences, but also the importance of local ecological knowledge and tradition.

Jon Hawkes (2001) has defined cultural sustainability as ‘a society’s ability to cope with the challenges and possibilities in a way that reflects the values and aspirations of its citizens’ (cited in Daugstad & Fageraas 2018, p. 181). This definition is complemented by Katriina Siivonen’s viewpoint: according to Siivonen, cultural sustainability is also about a community’s ability to participate in decision-making processes, its ability to have agency and its ability to define its own direction of development and nature of cultural heritage (Siivonen 2007, p. 17). This is also my view, which I articulate in article II (Sonck-Rautio 2018). When viewing cultural sustainability in this way, one can clearly see how it is similar to and differs from the definition of resilience. The definition of resilience highlights the importance of coping in a way that does not fundamentally change the essence of a system, whereas cultural sustainability seeks a change that reflects the values and will of the members of the system.

Here is where cultural sustainability and cultural resilience collide, and where they support each other.

Agricultural economist Joost Dessein and his co-authors (2015) have defined cultural sustainability based on three different dimensions: culture *in* sustainability, culture *as* sustainability and culture *for* sustainability. Dessein et al. (2015, p. 21) define culture in this context as follows:

a loosely integrated totality of practices, institutions and mechanisms that deal with the production, distribution, consumption and preservation of collectively shared meanings, as well as the explicit and implicit rules that govern the relevant processes. The cultural system is only relatively organised and embraces the tensions and internal contradictions of the social and spatial world, in which it appears, perpetuating and subverting its norms of behaviour and power relations, as well as providing loopholes for escape from its everyday routines to imaginary spaces.

Culture *in* sustainability highlights the self-promoting role of culture in sustainability, seeing it as the fourth pillar of sustainability, alongside the three traditional ones. This dimension includes the notion of cultural elements being preserved in the midst of transformation. Dessein et al. (2015, p. 29) note that although this dimension seems rather straightforward, it should not be confused with only preserving the arts or material cultural elements, but might just as easily consist of more abstract element, like values or knowledge systems. Cultural *as* sustainability refers to a form of development where culture is used as a mediator of transformations. Culture *for* sustainability, on the other hand, sees cultural elements as potential tools for achieving the goals of sustainable development. Cultural sustainability is not about stability, or, to put it in systemic terms, about homeostasis. It is about change. An essential core of sustainability is transformation, including cultural transformation. However, cultural resilience is needed in order for the transformation to follow the lines articulated above.

So why, then, is cultural sustainability not included in policymaking research? It was earlier established that, for example, the goal of the EU's common fisheries policy was only to ensure three of the pillars of sustainability. Similar development can be detected in reindeer herding, for instance, where specialization has seemingly enhanced the sustainability of the livelihood, but at the same time is not promoting cultural sustainability (Heikkinen, Lakomäki & Baldrige 2007). It might be that cultural sustainability is excluded from the policy for one simple reason — it is challenging to articulate the relationship between ecology (or nature) and culture and how culture and sustainability are connected. Environmental scientists Jules Pretty and Sarah Pilgrim (2009) explained this connection as follows: 'Nature provides the setting in which cultural processes, activities and belief systems develop, all of which

feedback to shape biodiversity. (---) As a result, there exists a mutual feedback between cultural systems and the environment, with a shift in one often leading to a change in the other'. This systemic interdependency can also be understood as a socio-ecological system. Pretty and Pilgrim determined four bridges that describe how nature and culture are connected. The first bridge is beliefs and worldviews, which refers to the ways culture can be seen as systems through which people understand the world. Parra et al. (2018) note that within this framework, one of the most important factors is the way people have valued and seen nature in the course of history (Parra et al. 2018, p. 5). Another bridge is livelihoods and practices (Pretty and Pilgrim 2009). Livelihoods and cultural practices do shape the environment — and also biodiversity, for humans favour certain plants, certain landscapes and certain ways of moulding their surroundings. The third, and very relevant bridge from the point of view of my research, is knowledge; as Pretty and Pilgrim note, 'If diverse cultural practices and worldviews are central to the management of biological diversity, then the key link between Nature and culture is knowledge. How people know the world governs behaviours, understandings and values that shape human interactions with Nature' (Pretty and Pilgrim 2009). Knowledge therefore includes learning about nature and utilising it. Knowledge can also be seen as a stock of knowledge about nature that is assembled via a 'knowledge – belief – practice' system (Berkes et al. 2000; Parra et al. 2018).

I argue, therefore, that local ecological knowledge could be utilised both in promoting cultural resilience and cultural sustainability in fisheries management and related research. The concept of local ecological knowledge, the discourse surrounding the concept and the nature of different knowledges will be elaborated on further in the next section.

### 3.4 On Knowledges

Political scientist Frank Fischer (2000) notes that many current political conflicts stem from the over-application of scientific logic when it comes to public policy-making. This mostly expert-driven type of policy-making tends to question the knowledge and ability of average citizens to make political decisions. According to Fischer, this development poses many challenges for democracy both in theory and in practice (Fischer 2000, preface). In environmental policy-making, the paradigm of scientific knowledge presents itself most clearly in managerialism. However, arguing against a managerialist point of view, Berkes et al. (1994) assert that it is practical to involve local people and take advantage of their local knowledge in the planning of biodiversity conservation, since local people are more familiar with the area and the species that inhabit it than are outside researchers or managers. Local knowledge is based on observations and broad contextual comprehension of the surroundings, which is highly beneficial for conservation purposes. Also, Berkes et al. (1994) note

that that ensuring the co-operation of local people is a key element in the successful implementation of conservation measures, since top-down policies are quite often welcomed with hostility of some degree by locals (Berkes et al. 1994, p. 285). Additionally, according to Smucker and Wangui (2016), the Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climatic Change Adaptation (IPCC 2014) found strong evidence that, as well as a high level of consensus within the research literature, local knowledge together with scientific expertise can contribute to risk reduction and enhance the possibilities for effectively adapting to climate change.

Local ecological knowledge is closely connected to ethnoecology, which is a field of anthropology focusing on local understandings of the environment and the realm of experience. Local Ecological Knowledge is often defined as tacit knowledge that is acquired by working and/or otherwise spending a significant amount time in a certain environment and observing it. This knowledge is transmitted through speech and everyday practices (Cruikshank 2005, p. 9). Local Ecological Knowledge comes with many names, such as Traditional Ecological Knowledge (TEK) or Indigenous Knowledge (IK). Since my research does not focus on indigenous people, I find indigenous knowledge as a term to be misleading. I also avoid the term traditional ecological knowledge, since, although the knowledge of local fishers might be very traditional, it is not exclusively traditional. Finnish coastal fishers are generally very much aware of scientific knowledge regarding their livelihood, and they have been part of the Finnish schooling system and a highly educated society ever since they were born. Therefore, I find the term Local Ecological Knowledge to be most appropriate, while nonetheless keeping in mind that this particular type of Local ecological Knowledge is very much intertwined with the scientific knowledge system. I must emphasise, however, that even though the focus of this study is mainly on *de facto* knowledge, local environmental knowledge one can also refer to skills and know-how that is acquired by acting together with the environment and the community.

According to anthropologist Virginia D. Nazarea (2006), one of the basic ideas of ethnoecology is to acknowledge the ignorance and dismissive attitude of Western science towards other people's ways of seeing the world (Nazarea 2006, p. 35). As ethnoecology has certainly focused more on other peoples' points of view, it can just as well be applied within the Western world, where other existing knowledges — albeit having been influenced by scientific knowledge — are also present. Small-scale fisheries and the Local Ecological Knowledge the community represent only one example. Another perspective that is common in ethnoecology is to seek justification of affirmation for Western scientific categorising and classification systems by cross-referencing native systems with Western one in order to find similarities. The objective of this kind of approach is more often to prove the universality of classification patterns. This approach is often referred to as the Berlin approach because the ethnobotanical study done among the Tzeltal people by Berlin, Breedlove, and



Raven (1973) has served as a model for such an approach. Nazarea (2006) points out that this type of approach merely tests the legitimacy of local classification systems, downplaying the cultural dimension that have had, and will continue to have, a major influence on shaping and formulating this knowledge. Nazarea highlights the importance of recognising the distinctions between these two approaches, since our notions of humans-in-environment and biodiversity, intellectual property rights and self-determination will or should indicate the direction of our national, regional or international discussions about biodiversity (Nazarea 2006, p. 35). I would argue that Berlian approach is widely applied by natural scientists showing an interest in local knowledge systems. It is natural to choose this approach, since local knowledge systems are easier to understand when adopting such perspective. One example of this line thinking can be found in one of my earlier articles (article I), where I describe how those living and fishing in the Archipelago Sea area had notices the decreasing amounts of Baltic herring, an empirical observation that needed to be proved by natural scientists before it became the official truth (Sonck-Rautio 2017).

Nazarea concludes that even if ethnoecology is a study of perceptions, cognition and use of the natural environment, still it can no longer ignore particular historical and political underpinnings impacting such understandings and practices or avoid addressing the question of access, distribution and power that is shaping knowledge systems and the practices resulting them (Nazarea 2006, p. 38). This articulation links the problem of knowledges with political ecology, as the political ecology of knowledge raises a question that is rather crucial for this research project as well: How can policy-makers recognise and acknowledge the importance of scientific knowledge in political decision-making and similarly promote grassroots participation in decision-making and governance? (Forsyth 2003, p. ii.)

Anthropologist Nora Haenn (1999) has demonstrated this contrast between two knowledge systems via the example of farmers in the Mexican state of Campeche and the different conservation settings, including those of policy-makers and researchers. She noticed that although both knowledge systems have the same organisational focal point, i.e. the height of the forest, their perceptions were not at all similar. The farmers saw forests as places where people's role is to carry out subsistence work, and the forest's height was a mark of human activities in the past. However, from the policy and conservation perspective, forest growth was depicted from the point of view of people not being present in the forest (Haenn 1999, p. 483). In conservation ecology, the ideal of an environment without humans is often promoted, which consequently often leads to the perception that ecology should be understood without human involvement (Haenn 1999, p. 483; Hunter 1996, p. 695). Similar contrasts between two knowledge systems can be seen in conservation strategies for the Archipelago Sea region. As discussed in article IV, environmental administrators in charge of conserving the grey seal and great cormorant do not promote issues important to

fisheries; their objective is to conserve and preserve species and the environment. As one of my interviewees, a civil servant in fisheries management, explained:

Environmental administration and the people working in it, they are honestly working on the behalf of an animal that is protected. It is their job to ensure that no one touches the protected animal. It is genuine conservation and protection, without having to think about the subsistence of people trying to make a living in the same system as the animal is living and consuming the same product that people want to buy from the supermarkets. This is where the conflict originates! To understand that someone is actually making a living there, and there should be something left for them too. (TYKL/aud/1281)

However, many of the fisheries researchers I interviewed found that there is no consensus among researchers regarding what kind of a role local ecological knowledge should play in scientific research, how it should be implemented or why exactly it would be important (article IV, Sonck-Rautio 2019).

Local knowledge has developed to play an important role whenever the question of conserving biodiversity is raised. Nazarea (2006b) points out that both local knowledge and cultural memory play an essential role in ensuring that cultural and biological diversity continue to flourish (Nazarea 2006b, p. 318). Biodiversity as a term was first introduced in 1986 at the National Forum on Biodiversity, and it rapidly gained enough ground to become one of the core concepts promoted at the famous Rio Earth Summit in 1992. Biodiversity has been defined as ‘the variety of life forms, the ecological roles they perform, and the genetic diversity they contain’ (Wilcox 1984, p. 640). Biodiversity as a term was problematic to begin with, and many anthropologists dismissed it as merely a ‘historically produced discourse’ (Escobar 1998, p. 54).

Already in 1996, David Symes stated that both the fishing industry and the science supporting it are in a state of crisis (Symes 1996, pp. 5–6), hence there is an urgent need to renew the basis of knowledge. Natural sciences and economics have formed a paradigm in fisheries-related search, a paradigm that my research, among others, is criticising. However, as researchers have realised that social acceptance plays an important role in the implementation of policies and that politics, policies and management are fundamentally based on human social action, they have called for more research from the perspective of the social sciences. Even though the situation is similar when trying to manage any nature-based subsistence mode, fisheries do present particular challenges, such as the heterogeneity of the actor groups and the insecure nature of scientific knowledge — marine environments and ecologies are still relatively unknown to us compared to many other ecosystems (Salmi 2013, p. 15).

Local ecological knowledge about the natural environment, another species, social constructions of the fisheries community, fishing skills and the household

strategies possessed by each member of a fishing community irrespective of gender or age can contribute to the sustainability of socio-ecological system.

## 4 Conclusion

### Cultural Sustainability Promoting Resilience and Sustainable Development

Small-scale fisheries in Finland have overcome many changes over the centuries, but many of the most significant changes have only occurred in the past few decades. The heyday of commercial fishing in Finland (often fishing peasants) occurred during the years 1918–1939. During these years, the Archipelago Sea area was particularly well known for its winter seining activities, which was a collective form of fishing, one that employed practically the whole community during the winter months. Many factors, such as urbanisation, globalisation, environmental changes (such as milder winters and subsequent ice loss), combined with increasing societal emphasis on recreation and conservation, disrupted the livelihood opportunities of fishers, leading to a rapid decline in the number of fishers. Opportunities for small-scale fishers have become even more limited with the increasing numbers of species that are exploiting the same resources as well as stricter top-down fishing restrictions. The number of fishers in the Archipelago Sea area has decreased drastically ever since. In the whole Archipelago Sea area, the number of full-time fishers in the 1980s was circa 500, while in 2013 the total number of commercial fishers was 290, only 89 of whom were classified as full-time operators.<sup>12</sup> Fisheries households are creating new strategies to overcome the challenges impacting the profitability of fishing by concentrating on, for instance, fish processing and direct marketing. These new strategies highlight the roles of women, since although women had a major role in fisheries before as co-fishers, cleaning the gear and taking care of the household (including the cattle) while the men were fishing, at present women's role in fisheries have taken on a new tone. Women often work at processing the fish product, selling the products and also fishing themselves. In many households, women work outside the fishing business, and their steady income enables the fishing business to be kept alive by men (article III, Salmi & Sonck-Rautio 2018, p. 214).

Socio-ecological systems thinking is often applied in environmental management and conservation, although I previously established that the human dimension is more often excluded in ecology and research related to conservation. Using Socio-ecological system as a tool for analysis highlights the fact that both ecological and social systems are intertwined and should not be delineated. The altering of one

12 The trend is similar throughout Finland with coastal small-scale fisheries.

causes changes in another. The fisheries in the Turku archipelago form socio-ecological system around natural resources such as the fish, but also marine conditions, weather, climate, ice, the quality of the water, other species and invading species, to name but a few. Equally importantly, a socio-ecological system forms around the cultural and social practices of fishers and their households, including, but not restricted to, community, infrastructure, skills and knowledge. In article I (Sonck-Rautio 2017), I argued that socio-ecological system analysis often lacks the notion of human agency, but also the agency of non-human actors. I used the Baltic herring as an example of the fish's importance to local socio-ecological system and concluded that environmental governance and management would benefit by adding this perspective into an analysis of the functioning of the system in question. Following this argument, and Bruno Latour's (2005, p. 53) insights that anything that has an effect on the state of something else has agency, I argue that agency should be extended to other non-human actors as well. For example, ice has an important role in the operational environment of the fishers, since it has an impact on the behaviour of the fish, seals and great cormorants as well as the fishers.

One problem then is, how to acquire knowledge about non-human agents? As I established in articles I and II, fishers possess extensive knowledge about the environment in which they operate. This local ecological knowledge could offer important insights into the attributes and functions of non-human agents that influence the social-ecological systems either directly or indirectly. Also, local ecological knowledge should have a self-proclaimed status in creating knowledge about the relationships and interface between the natural and human and the social sphere that affects the ecological sphere. However, as was argued in articles III (Salmi & Sonck-Rautio 2018) and IV (Sonck-Rautio 2018), fishers are marginalised in decision-making processes and, on many occasions, in scientific research as well. The scientific data applied in fisheries and environmental management mostly consists of statistics, which rarely reveal the cultural and social dimensions behind the answers; on the contrary, they often hide something essential. In article III (Salmi & Sonck-Rautio 2018), we argued that statistics hide the fact that women have an essential role in the household strategies of fishing families and therefore play an important role in transformation process of socio-ecological systems. Still, as women's work remains invisible in research, their knowledge also tends to be ignored.

Small-scale fisheries in Finland are in crisis, as are small-scale fisheries globally. Many fisheries researchers point out that the resilience of fisheries has decreased for many reasons (e.g. changes in household strategies, industrialism). This study focused on the experiences of small-scale fishers in the Turku archipelago in regards to the constraints on and opportunities for practicing their livelihood. There was a consensus to a large degree among the fishers that environmental changes, such as the need to protect the grey seal and the great cormorant, are not the problem per se, but rather the regulations and top-down policies themselves are the most crucial factors

negatively impacting their livelihood. The fishers also felt very strongly that their voice is not heard in policy-making and that they have no power. They also reported feeling that their expertise with respect to their own environment is not acknowledged and their local environmental knowledge is ignored in research. Within the framework of political ecology, I recognised some of the mechanisms contributing to the social struggles currently impacting fisheries. The identified mechanisms were *degradation and marginalisation*, which demonstrate the development through which inoffensive production systems become offensive after state intervention, *conservation and control*, which often leads to one group gaining access to resources at the expense of another group, and *environmental conflict*, which is triggered by enhanced regulations, thereby increasing the tensions between different stakeholders and even creating open conflicts. All these mechanisms share a common origin, that is, intensified fisheries management which focuses on managerialism and objectivity as well as promoting the ecological aspect of sustainability while neglecting the social and cultural perspective of socio-ecological systems.

The objective of fisheries management is to ensure the resilience and sustainability of fisheries (Common Fisheries Policy). However, the cultural dimensions of both resilience and sustainability are rarely acknowledged. In the context of this study, cultural sustainability is understood as seeking change that complements the values and objectives of the members of the community, i.e. culture *in* sustainability, but also as a tool for promoting sustainability in every dimension (ecological, social and economic), i.e. culture *for* sustainability. Cultural resilience, on the other hand, highlights the importance of being able to cope in a way that does not change the cultural essence of the system (or the community). Most conservation policies focus on the ecological and economic dimensions of sustainability, but, as I argue in article II (Sonck-Rautio 2018), they can be incompatible with cultural sustainability. So, whose sustainability are we talking about? Cultural sustainability can also be in conflict with ecological sustainability and the cultural transformations required in order to meet ecological needs (Siivonen 2018, p. 24). This is also true in fisheries. But as Berkes et al. (1994) noted, people are more prone to advocate change and conservation policies related to it if they have been involved in developing those policies. In other words, change is more acceptable if it is conducted in a way that promotes cultural resilience. Since one cannot exclude humans from the equation with respect to socio-ecological system, the most effective way of advocating for overall sustainable development is to empower people to have access to policy-making and guide their own way to more sustainable development. One way to do this is to include all the stakeholders of a socio-ecological system, including those who are not present in statistics, and recognise the importance of the local ecological knowledge they each possess. An important thing to take into account, of course, is to develop ways to integrate different types of knowledge and ways to recognise the pitfalls and challenges of applying local ecological knowledge. Cultural sustainability has been seen to hold many dimensions,

such as culture *in*, *as* and *for* sustainable development (Dessein et al. 2015). In this context in particular, the cultural element, i.e. local ecological knowledge, can act *for* sustainable development, since it can help to release the tensions between actors and promote the social acceptance of policies. I also find that local ecological knowledge is therefore part of culture *in* sustainability, as it is an element that, at least to some extent, should be preserved in the transformation processes that are required in order to achieve sustainable development.

As I have established, local ecological knowledge provides environmental management and the research related to it with valuable tools for advocating social acceptance, co-creating knowledge about additional factors in socio-ecological systems and also potentially promoting social well-being and overall sustainability through increased cultural resilience. Therefore, further developing education about local ecological knowledge among policy-makers and researchers and even in university curricula would be beneficial for all parties involved. Strict managerialism, on the other hand, tends to increase social injustice, marginalise certain groups, create conflicts and, in the worst-case scenarios, enhance environmental degradation through inefficient, unacceptable and holistically unsustainable policies.

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All the transcripts of the interviews are archived in the archives of History, Culture and Arts in the University of Turku. Each transcript has an individual archive code (in brackets). All the field journals are in the possession of the author.

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Fisher 2, female, 60-70 years, June 2007. Interview at her home. (TYKL/aud/1268)

Fisher 3, male, 70-80 years, June 2007. Interview at his home. (TYKL/aud/1269)

Fisher 4, male, 70-80 years and Member of a fishing household 1, female, 70-80 years. January 2007. Married couple, interviewed at their home. (TYKL/aud/1270)

Member of a fishing household 2, male 60-70 years. May 2007. Interviewed at the seminar room in the University of Turku. (TYKL/aud/1271)

Fisher 5, male, 70-80 years, August 2015. Interviewed at diner in Turku. (TYKL/aud/1272)

Fisher 6, male 70-80 years, April 2016. Interviewed at his home. (TYKL/aud/1273)

Fisher 7, male 70-80 years, March 2016. Interviewed at his home. (TYKL/aud/1274)

Fisher 8, male 40 – 50 years, March 2016. Interviewed at his home. (TYKL/aud/1275)

Fisher 9, male 40-40 years, March 2016. Interviewed at his home. (TYKL/aud/1276)

Fisher 10, male 60-70 years, March 2016. Interviewed at local café. (TYKL/aud/1277)

Researcher 1, female 50-60 years, June 2018. Interviewed at her summerhouse. (TYKL/aud/1278)

Researcher 2, male, 50-60 years, April 2018. Interviewed at his workplace. (TYKL/aud/1279)

Researcher 3, male 50-60 years, May 2018. Interviewed at his workplace. (TYKL/aud/1280)

Administrator 1, (Governmental organization, fishing sector) , male 50-60 years, May 2018. Interviewed at his workplace. (TYKL/aud/1281)

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- Member of fishing household 4, female 70-80 years, Member of fishing household 5, female 90-100 years, Joint interview, interviewed at their home. Recording was ruined, so notes were made afterwards. (TYKL/spa/1195)
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Sonck, Kirsi 2011. Se on Rymättylän niin vanha perinnehomma toi ammatti” – Ympäristön, yhteiskunnan ja paikallisyhteisön vuorovaikutus Rymättylän talvonuottauksen muutoksessa 1880-luvulta 1980-luvulle. Unpublished Master's thesis, Faculty of Humanitis, University of Oulu, Finland.

This doctoral dissertation examines the changes in the operational environment of the livelihoods and lifestyles of coastal small-scale fishers in the Archipelago Sea and the constraints that mostly influence the abundance and resilience of fisheries in the Archipelago Sea — from the fishers' perspective. This study focuses on recognizing the mechanisms that are decreasing resilience as well as examining the relationships between policy-making, scientific research and knowledge. Finally, the aim is to find solutions for promoting transformations that will promote cultural resilience and sustainability as well as other dimensions of both.

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