Mapping Resilience – Coastal Communities in Iceland

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Dissertation submitted in partial fulfillment of a
Philosophiae Doctor degree in Geography

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Abstract

Designing a truly sustainable fisheries management regime has been a challenge internationally. Iceland is not an exception in this regard. Icelandic fisheries and their management has gone through tremendous changes since the 1980s. The implementation of individual transferable quotas (ITQs) was especially important. During the same period, Icelandic coastal communities have faced major socio-economic and demographic challenges. A very prominent question in public and political debates has been to what extent the development in the fishing industry has played a part in the negative development of many fishing communities.

Yet, questions about the regional and local development implications of the Icelandic fisheries management system have never been answered unequivocally. Available data have not been utilized fully in order to understand the complex processes that have affected fisheries-dependent localities. One way to approach such questions is provided by the concept of resilience. The assessment of the resilience of Icelandic fisheries communities to the structural changes in the fishing industry was the focal point of this research project. In addition, the notion of structural change – from a social and geographic point of view – is introduced and combined with a theoretical treatise of fundamental values such as solidarity and justice.

A quantitative, countrywide analysis was undertaken, making use of diverse existing data, on fisheries on the one hand and on local socioeconomic developments on the other. This statistical analysis was supplemented with qualitative data, derived from case studies. Two communities that have followed different development trajectories were chosen for an in-depth analysis of those factors that have contributed to a higher or lower degree of resilience. Substantial differences were found in the level of resilience of these two coastal villages.

The analysis has revealed two theoretical limitations of the concept of resilience as it has been used in social science: the often narrow focus on endogenous strategies, which does not pay much attention to the broader political economy; and the avoidance of the inevitable discussion of a socially acceptable ‘endpoint’ to resilience-building measures. These weaknesses are addressed in the theoretical discussion of the concept that is presented in the thesis.

This thesis thus addresses a crucial domestic issue, as well as contributing to a very important and rapidly evolving field of science that centers on resilience, regional development and fisheries management. This is combined with a call for considering flexible and inclusive ‘top-led, bottom-fed’ approaches, breaking the rigid dichotomy of bottom-up and top-down strategies.

Keywords: Resilience, fisheries management, community development, structural change, Adaptive Co-Management, Iceland

Útdráttur

Seigla íslenskra sjávarbyggða

Víðs vegar um heim hefur reynst erfitt að koma á fót fiskveiðistjórnunarkerfum sem eru sjálfbær í víðri merkingu þess orðs. Ísland er þar engin undantekning. Sjávarútvegur og fiskveiðistjórnun á Íslandi hefur tekið miklum breytingum síðan á níunda áratug síðustu aldar. Innleiðing framseljanlegra fiskveiðiheimilda (kvóta) var eitt af því sem mestu máli skipti. Á sama tíma hafa íslenskar sjávarbyggðir staðið frammi fyrir erfiðum úrlausnarefnum er varða efnahagslíf og íbúafjölda. Í stjórnmálum og almennri samfélagsumræðu hefur mjög verið rætt um að hve miklu leyti neikvæða þróun margra sjávarbyggða megi rekja til breytinga í sjávarútvegi.

Spurningum um áhrif íslenska fiskveiðistjórnunarkerfisins á svæði og byggðir hefur aldrei verið svarað á afgerandi hátt. Tiltæk gögn hafa ekki verið nýtt að fullu til skilnings á þeim flóknu ferlum sem hafa verið að verki í sjávarbyggðunum. Hugtakið „seigla“ getur varpað ljósi á spurningar um þessi efni. Í verkefninu var þess freistað að leggja mat á seiglu íslenskra sjávarbyggða. Kenningar um breytingar á formgerð atvinnulífs – frá félags- og landfræðilegum sjónarhóli – eru reifaðar og settar í samhengi við fræðilega umfjöllun um grundvallargildi á borð við samstöðu og réttlæti.

Gerð var megindleg greining á landsvísu, þar sem margvísleg fyrirliggjandi gögn um sjávarútveginn og staðbundna þróun efnahagslífs og samfélags voru nýtt. Til viðbótar hinni tölfræðilegu greiningu voru gerðar tilviksathuganir þar sem eigindlegum gögnum var safnað. Tvö byggðarlög sem hafa þróast með ólíkum hætti voru rannsökuð til að fá dýpri skilning á þeim atriðum sem hafa stuðlað að meiri eða minni seiglu. Verulegur munur á seiglu kom í ljós í þessum tveimur sjávarbyggðum.

Greiningin leiðir í ljós tvenns konar takmarkanir seiglu-hugtaksins, eins og því hefur verið beitt í félagsvísindum. Oft hefur hugtakið leitt til þröngrar áherslu á byggðaþróun sem sprottin sé af innrænum forsendum, án þess að veitt sé athygli þeim ramma sem félags- og hagfræðileg formgerð setur. Umræðunni um hvort eða hvenær sé réttmætt, í samfélagslegum skilningi, að hætta tilraunum til að auka seiglu, hefur enn fremur verið ýtt til hliðar. Fjallað er fræðilega um þessa veikleika í ritgerðinni.

Doktorsverkefni þetta tekur á efni sem mikilvægt í íslensku samhengi, en leggur einnig til fræðilegrar umræðu á afar mikilvægum sviðum, þar sem fengist er við seiglu, svæðisbundna þróun og fiskveiðistjórnun. Lagt er til að hin stífa tvíhyggja sem gerir ráð fyrir ofanstýrðri nálgun annars vegar eða neðanstýrðri hinsvegar verði aflögð. Í staðinn verði unnið að mótun sveigjanlegri nálgunar, þar sem stjórnvöld leiða en heimafólk er einnig virkir gerendur.

Lykilorð: Seigla, fiskveiðistjórnun, byggðaþróun, atvinnulífsbreytingar, samstjórnun, Ísland

To my parents

Hans & Hildegard

Preface

> The first man who, having enclosed a piece of ground, bethought himself of saying *This is mine*, and found people simple enough to believe him, was the real founder of civil society. From how many crimes, wars and murders, from how many horrors and misfortunes might not any one have saved mankind, by pulling up the stakes, or filling up the ditch, and crying to his fellows: "Beware of listening to this imposter; you are undone if you forget that the fruits of the earth belong to us all, and the earth itself to nobody!" (Rousseau, 1973 [1754], p.84)

One does not need to recall Jean Jacques Rousseau to show that the discourse on property rights is an old yet unresolved one. However, these lines exemplify the difficulty one faces when trying to square the circle: finding a way to manage resources that belong to all but yet to no one. This thesis is embedded exactly in this discourse. It is about the consequences of privatising one of the most precious – and thus contested – resources that the ocean around Iceland has to offer. The very first article of the Iceland Fisheries Management Act defines "the exploitable marine stocks of the Icelandic fishing banks [as] the common property of the Icelandic nation" (Alþingi, 2018). Reality looks very different. Nonetheless, in contrast to Rousseau, I do not think that, just because the imposters weren't stopped, the people of Iceland are undone. Reclaiming resources and contesting inequality is not at all an impossible task.

Table of Contents

List of Figures

List of Tables

List of Papers

Paper I — Kokorsch, M., Karlsdóttir, A., & Benediktsson, K. (2015). Improving or overturning the ITQ system? Views of stakeholders in Icelandic fisheries. *Maritime Studies*, 14(1), 15.

Paper II — Kokorsch, M. & Benediktsson, K. (2018). Prosper or perish? The development of Icelandic fishing villages after the privatisation of fishing rights. *Maritime Studies.*

Paper III — Kokorsch, M. (2017). The Tides they are a Changin': Resources, Regulation, and Resilience in an Icelandic Coastal Community. *Journal of Rural and Community Development*, 12(2-3).

Paper IV — Kokorsch, M. & Benediktsson, K. (2018). Where have all the People gone? The Limits of Resilience in Coastal Communities. *Norsk Geografisk Tidsskrift – Norwegian Journal of Geography.*

Abbreviations

ACM	Adaptive Co-Management
CFP	Common Fisheries Policy
FMA	Fisheries Management Act
FLAG	Fisheries Local Action Group
ITQ	Individual Transferable Quotas
LAG	Local Action Group
RAC	Regional Advisory Council
SES	Socio Ecological System

Acknowledgements

I have always been interested in societal changes, processes of transformation as well as the living conditions and of people around the world: a good combination for a human geographer, and not surprising given the fact that I grew up in an area that knows how to spell Strukturwandel (German for 'structural change'). Although I had enough material to study in my backyard, remote places in the Arctic had spurred my interest from an early age on. Why do people (still) live in remote, sometimes forbidding, places under harsh conditions? This question has kept on haunting me. Consequently I came to Iceland in 2010 for an exchange year and it was a class taught by Gísli Pálsson eventually made me skip plans to become a teacher in Germany: I decided to come back to Iceland, which I did in 2012, with the plan to write the final paper for my previous studies – by no means having a PhD-project in mind.

It was my friend Taina who gave me an important advice: "Go and talk to Karl if you want to learn more about regional development in Iceland." And so I did, not knowing that this was going to be the first out of countless conversations with Karl. Some five years after the PhD project started it is now time to say thank you – not only to Taina for the advice and Karl for several things more. Since I am in the very fortunate situation to have met plenty of wonderful and inspiring people over the years, I have doubts they all fit on one page. And since it would not be fair to mention just a few, I just say thanks to everyone who has contributed to my work academically, emotionally and/or through personal support. The same counts for the people in the two case study locations. Thank you a lot for the trust and for sharing your stories with me.

Of course such a PhD project is almost impossible to realise without financial support. First of all I want to acknowledge the funding of the Icelandic Centre for Research, which supported the project with a grant from the Icelandic Research Fund. That I was able to travel to conferences was generously supported by the University of Iceland Research Fund and the Student Support Fund of the Department of Geography and Tourism. And there was Tønnes Berthelsen from KNAPK who made it possible for me to come to Nuuk and present my project – two days in Greenland: an experience that I will not forget and that I am very grateful for.

Thanks also to the committee, starting with the two co-supervisors Anna Karlsdóttir and Kevin St Martin. Kevin, unfortunately we did not talk that often, but your advice following the Mid-term evaluation and during the writing up of the thesis was very valuable. Thank you Anna, not only for the field trips at the beginning of my research, giving me some new insights into qualitative studies and life in rural Iceland, but also for the good personal talks, your cheerful and encouraging attitude. And then there is Karl Benediktsson, the supervisor of this PhD project. 'Thank you' is certainly not enough for all that you have done during the past few years – not everything was self-evident. I appreciate particularly that you have given me full academic freedom. You have patiently been waiting for my writings and accepted each and every postponed deadline; most likely caused by some road trip or football match.

On the other hand it was you who kept on reminding me not to forget all the beautiful things outside the ivory tower and take a look both to the left and right of the academic track. Once you even took me on a fishing trip, after which I knew why I was studying fishing villages on terra firma and not fish itself. Eventually you always managed to find the common thread and bring me back on track when I was too occupied discovering all the interesting facets left and right. I really enjoyed working and discussing with you.

Last but not least, I want to say Danke to Hans und Hildegard, my parents. Thank you for never having put any pressure on me regarding my professional plans. Instead you not only accepted them but supported them wholeheartedly. Your patience, open-mindedness and optimism have been a tremendous support.

PART ONE
SYNOPSIS

1 Introduction

The management of natural resources is a complex endeavour. Different actors demand influence, or at least consideration. Resource management is influenced by the *Zeitgeist*, the political framework and the general discourse. In particular, resources that are characterised by scarcity, high economic value, as well as high ecological and cultural values, are the focal point of heated debates, conflicts and not infrequently wars.

Any modification of resource management policies comes with consequences for the actors involved. Moreover, it can affect the norms and values that are dominant in a given societal system. Some of the consequences are immediate, while others come with a time lag.

Fish is a resource of this kind, and fisheries management certainly is a challenging task. Special ecological and economic challenges are presented by the very nature of the resource. In short, unregulated fisheries seemingly confirm to the 'Tragedy of the Commons' (Hardin, 1968; see also Ostrom, 2008), with potentially disastrous environmental and economic consequences. The solution has often been seen as the allocation of clear and unequivocal property rights. Much effort has been put into the development of 'rights-based fishing' (Hannesson, 1991, 2005; Neher, Árnason, & Mollett, 1988; Runólfsson, 1997).

In Iceland, the introduction of a quota system in fisheries in 1984, and its subsequent development into a fully-fledged individual transferable quota (ITQ) system in 1990, has been extensively analysed, especially by economists paying attention primarily to the macro-economic effects (Agnarsson & Árnason, 2007; Matthíasson, 2003, 2008; Runólfsson, 1999). The Icelandic ITQ system has in fact been held up as a model of rights-based fishing, to be emulated by other countries (Árnason, 2005, 2012; Árnason, Hannesson, & Schrank, 2000; Gissurarson, 2000). But the system has also been subjected to severe critique, including by several social scientists (Benediktsson & Karlsdóttir, 2011; Einarsson, 2011a, 2011b; Eythorsson, 1996, 2000; Karlsdóttir, 2008; Pálsson, 1998; Pálsson & Helgason, 1995, 1996). Many of these authors point to the problem of scale: a convincing and comprehensive judgement of the success of the system should not only be concerned with the macro-scale, but also the realities experienced 'on the ground' as it were, in local communities that have depended on fisheries for their existence. This is also a common theme of critique in many international contributions to the fisheries management literature (e.g. Carothers & Chambers, 2012; Degnbol & McCay, 2007; St Martin, 2006). The social side of sustainability has been overlooked if not deliberately sidelined, in order to further economic (and ecological) goals, according to some authors.

In the public debate in Iceland, the ITQ system has been trenchantly criticised on many fronts. One of the critical issues is regional and local development: the system is frequently presented as a major, if not the major, factor contributing to a decline of many coastal communities. Indeed, many changes other than the introduction of ITQ management have occurred – in the national economy, in the fishing industry itself, and in the communities that depend on the fisheries. Technology has changed immensely, resulting in the

substitution of labour by capital in both fishing itself and the fish processing industry. Markets for marine products have changed considerably, in tandem with the radical restructuring of the Icelandic economy as a whole that has taken place in recent decades as well as with developments in the global economy. All this has contributed to radical structural changes to value chains in the fishing sector (Knútsson et al., 2008). Moreover, general social and cultural processes have been at work in the coastal communities that have changed them irrevocably (Bjarnason & Thorlindsson, 2006; Skaptadottir, 2004).

Having come into force some 30 years ago, the Icelandic quota system is among the ITQ systems with longest history. A comprehensive analysis of its long term effects, social and spatial, has not been presented yet. The changes within the Icelandic fisheries – the industry and its management – that have been ongoing since 1990 are the focal point of this research. Apart from an assessment of overall development trajectories, special focus is set on coastal villages whose livelihood once depended – or still depends – on fish. This is coupled with an assessment of how the current management regime is perceived by relevant stakeholder groups and which changes are called for.

1.1 Theoretical foundations

Searching for an approach to assess and evaluate changes in a socio-ecological system, I decided at the beginning of the PhD project to combine three explanatory models. First of all, resilience theory was chosen, as it looked like it would provide suitable tools for the planned research. For a deeper explanation of changes in communities with a monotonous economic and industrial structure that has been disrupted, I adopted sociological and geographical approaches that focus on structural change. Finally, the concept of adaptive co-management (ACM) was taken up, as it provides a policy-making instrument that is not only theoretically sound, but also at least partially tried out in practical bottom-up and inclusive decision making.

Resilience – the ability of individuals, communities and systems to adapt to change (Berkes & Ross, 2013) – is a central theme in discussions of socio-ecological systems and regional development. This concept has been developed in two quite different contexts. The first is the analysis of the dynamics of ecological systems (Gunderson, Allen, & Holling, 2010; Peterson, 2000), where it is used as a description of a structural property of the system. In Ostrom's Social-Ecological Systems (SES) framework (Ostrom, 2009), which has been increasingly used in research about fisheries systems (Basurto & Nenadovic, 2012a), resilience is seen as an ecological performance measure. The second context is that of psychology and hazard studies. This use of the resilience concept is much more agency-centred, and is used for instance to understand how people cope with natural disasters (Brown & Westaway, 2011; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008). Strong arguments have been made for joining these two aspects of resilience in a way that would enable a more holistic assessment of how communities and individuals deal with change (Berkes, 2007b; Berkes & Ross, 2013b). More than the concept of sustainability – to which resilience is certainly related – the idea of resilience implies aspects of uncertainty and insecurity (Christophersen et al., 2010).

While some authors (e.g. Davidson, 2010) have been somewhat hesitant about merging the systemic and agency aspects of resilience, the use of the concept in this way can yield important insights to an analysis that aims to get beyond the macro- or structural

perspective so often employed in previous research on fisheries management and its impacts. This enables a much more comprehensive assessment of sustainability than previously possible. Yet the macro- or structural perspective, particularly the political framework, needs to be considered as well. As the research proceeded, and as will be shown in the thesis later on, resilience has some weaknesses in this regard. Policy implications, or man-made 'shocks' that a system has to adjust/adapt to, have not been the focal point of resilience studies and need further examination.

Since resilience theory alone cannot explain the complexity of processes that have been going on in Icelandic coastal communities and fisheries management, a complementary approach was needed. Based on my personal and academic background, I considered it suitable to introduce the term *structural change* at this stage. Growing up in a region where you stumble over the term *Strukturwandel* (German for structural change) at an early age (the Ruhrgebiet), I had an inherent interest in the changes of (old) industrial areas where one dominant economic mainstay disappeared for one reason or another. Structural change is used in regional and economic geography for the assessment of processes at work in the socio-economic development of a location, a region and its related industries. Reactions to structural changes, but also the proactive avoidance of the negative impacts of such changes, can be explained through the concept of resilience, and thus the combination of the two approaches seemed appropriate.

However, industrial location and human settlements are part of the broader social and political system and delivering only a geographical explanation – assessing mainly the macro-structure – is not enough. Local structural changes affect, and are affected by, the system of governance. Hence, the analysis of both structures is evident and decided to connect geographical and sociological approaches to the term structural change.

Starting the PhD project I had the idea to not only provide a retrospective evaluation of structural changes and local resilience building strategies. I intended much more to introduce proactive proposals for future fisheries management and regional development. Resilience and structural change are satisfactory up to the moment when recommendations for political actions are required. Neither concept leads to a proactive political agenda, nor do they not necessarily deliver an answer how to rearrange or revolutionise the political sphere for essential shifts in commonly economic end-goal driven and top-down management regimes.

This points the way to the concepts of *adaptive management* and *co-management* (Berkes, 2009; Holling, 1978) – the third founding idea of this project. The first concept deals with optimal decision making under the conditions of uncertainty, where a need for adjusting to changing circumstances is ongoing (Berkes, 2009). It is based on the three-decades-older concept of co-management, which is defined as "the sharing of power and responsibility for resource management between the government and local resource users" (Berkes et al., 1991: 12). The development of adaptive co-management methods has been advocated as a tool for achieving a more sustainable livelihood (Armitage, 2007) and has been proposed as a viable alternative for avoiding the tragedy of the commons (St Martin, 2001). This is of great theoretical and practical interest for the resource-dependent coastal communities of Iceland.

1.2 Scope and aim of the thesis

The main objective of the PhD project is the assessment of the resilience of Icelandic fisheries communities faced with ongoing structural changes in the fishing industry and its management. The Icelandic version of a socio-economic structural change – in terms of society, politics and spatiality – was embedded in the general question of whether common pool resources, such as fish, could be managed in a truly sustainable and resilient way. With insights from Iceland, this thesis contributes to an international controversy on resource management and regional development.

For achieving the main objective, three partly overlapping phases were envisaged, that can be clearly divided into quantitative and qualitative halves. Starting with an assessment of stakeholder involvement in the decision making (a literature review) and stakeholders' perceptions (a quantitative survey) of the current management regime (phase one), I continued with a detailed empirical analysis of existing quantitative data (phase two). These data did not only include the development of local fishing and fish processing, but also demographic development, labour market composition and other socio-economic variables in the coastal communities. The statistical analysis was temporal as well as spatial, giving a detailed picture of the development trajectories of individual coastal communities over a 30-year timespan. Descriptive statistical measures that enable the tracing of overall developments through time were developed.

Having identified varying degrees of resilience among coastal communities, the qualitative half of the PhD project consisted of detailed case studies in two Icelandic coastal towns that represent different local development trajectories (phase three). Building on the previous analysis, two villages were identified for case studies. Those case studies focused on in-depth analysis of the changes – and local responses – regarding the socio-economic and demographic structure against the background of the local fishing industry. A mixed methodology approach was adopted in this phase: interviews, participant observation and workshops were utilised in order to provide a nuanced account of those factors that have contributed to a higher or lower degree of resilience. Possible reactions to local changes that occur due to forces of outside powers are described by adaptation over time or adjustment to sudden shocks. Using these terms, the main question of this phase was how Icelandic coastal communities have managed to successfully adapt or adjust to the implemented changes in fisheries management, that have taken place in a dynamic social and economic context.

This PhD project thus centres on different development trajectories of Icelandic fisheries communities since the introduction individual transferable quotas (ITQs) and a de facto privatisation of fishing rights. It focuses on social aspects, participatory approaches and regional development. The research questions and aims can be summarised as follows:

Aims

- To assess the resilience of Icelandic fisheries communities to the structural changes in the fisheries management.

- To explain the causes of variable development trajectories of different communities for the past 30 years.

- To analyse in detail stakeholder involvement in fisheries policy making.

Research questions

- What are the main social consequences, particularly at the community level, that have followed the privatisation of fishing rights?

- Which endogenous and exogenous strategies have been developed in (former) fisheries-dependent communities to cope with the changes in fisheries and employment opportunities?

- Which future scenarios are envisaged by local people – particularly adolescents?

- How do stakeholder groups perceive the management system; is increased participation in decision-making favoured by the most affected stakeholder groups?

- To what extent can the concept of resilience be used for the analysis of social systems and structural change? Which shortcomings need to be addressed in future research?

1.3 Outline of the thesis

The research project was developed as a 'thesis by publication', and thus the thesis itself is divided into two parts. The first part sets out a detailed theoretical grounding, summarises the four peer-reviewed research articles that have been written as part of the project, and provides an encompassing discussion and conclusion. The second part is the collection of the original research articles. Of the four manuscripts, three are already published and one is accepted for publication. The two parts are followed by one appendix, which is a published viewpoint article that is related to the subject matter of the thesis but not part of it.

Following this introduction, chapter 2 focuses on natural resource management and the main conflict line between open access and privatisation. After a brief outline of both opportunities, one of the most prevalent theoretical concepts, namely the 'tragedy of the commons' (Hardin, 1968) will be critically analysed. This is necessary since this decidedly theoretical and economic concept has been repeatedly used – sometimes without it being directly stated – to rationalise decisions regarding natural resource management, predominantly resulting in privatisation. Iceland is no exception.

Building on this, essential norms and values, such as solidarity and justice, will be discussed. These values embody a crucial counterpart to the tragedy of the commons, since proponents of this theory tend to neglect the discussion of societal norms and values. Two theories are offered in this thesis for a definition of justice: principles argued for by John Rawls are linked to the well-known criterion of Vilfredo Pareto – both deliver models for just and fair procedures in decision making. The theories are combined with Durkheim's conceptualisation of solidarity.

In chapter 3 the structure of social systems and their interdependence with internal and external variations are presented from different angles. Due to the fact that 'structure' has many different connotations in the academic discourse, this chapter is divided into two

parts. The first part is of a sociological nature and introduces important concepts and components of Weber, Habermas and Parsons regarding social actions. They deliver suitable approaches and theories for the subject matter of this thesis and provide a solid foundation for argumentation. The second part of the chapter introduces concepts of economic and regional geography as well as resource management with regards to structure, and more precisely structural change.

After two chapters that centre on resource management, the structure of social systems and regional geography, chapter 4 is concerned with potential responses to the altering of the underlying economic and social structures. Resilience is one way to assess responses and strategies; their achievements and shortcomings. Resilience is frequently used in combination with sustainability – either as an add-on or as potential replacement. The main differences and similarities of these two central concepts will thus be highlighted in the beginning of this chapter, followed by a conceptualisation of resilience with regards to social sciences, regional development and resource management. While resilience provides the theoretical foundation, adaptive co-management (ACM) offers the practical approach to new forms of resource governance and community development. After a theoretical introduction, the focus shifts to experiences of ACM in practice.

With the theoretical and practical setting in mind, the methodological toolbox will be equipped in chapter 5. First the idea of methodological triangulation will be elucidated before the various quantitative and qualitative research methods that I used will be described. A short section centres on the ethical aspects that appeared during the field work, in particular the question of how to discuss sensitive and political topics appropriately.

Chapter 6 provides a brief summary of the four papers, their aims, novelty, research questions, main results and policy recommendations. Chapter 7 adds some findings that were not mentioned explicitly in one of the papers. The main theoretical concepts from chapter 3 are drawn upon here as well, providing means to better understand the structural change that Iceland has experienced since 1990.

Chapter 8 provides a conclusive discussion of the main results and provides ideas about a potentially ‘novel path’ of resource management. This can be located somewhere between theories of a possible ‘third way’ that suggest reforms within the given political framework, (Giddens, 2000; Hale, Leggett, & Martell, 2010) and more radical, possibly revolutionary, shifts of the underlying regime (Armitage, Berkes, & Doubleday, 2007a; Gibson-Graham, 1996, 2008; White & Williams, 2016).

2 Natural resource management

2.1 Natural resources between open access and privatisation

As mentioned in the introduction, fisheries management is a complex task, for which a plethora of approaches has been offered (Blackmore, 2007; Jentoft & Chuenpagdee, 2009). Three dichotomies can be applied to categorise these approaches. The first differentiation is between *open vs. restricted resource access,* and centres on the distribution of property rights (Berkes, 2006; Campling, Havice, & Penny McCall, 2012; Grafton, Hilborn, Squires, Tait, & Williams, 2010; Schlager & Ostrom, 1992). The restriction of access is commonly achieved through privatisation (Berkes, Feeny, McCay, & Acheson, 1989). In the table below (table 1) four grades of resource-access and different property rights regimes are illustrated. The other two distinctions centre on the level of resource governance, policy making and spatiality. *Bottom-up vs. top-down approaches* point to the hierarchical structure of the governance regime (Gunderson, 2015; Jentoft & Chuenpagdee, 2015). *Centralised vs. decentralised decision making* can be a result of hierarchies too, but this dichotomy includes the spatial dimension (Berkes, 2010; Fabricius & Currie, 2015; Jentoft & Mikalsen, 2014). This builds on the question how much power (geographically) distant institutions should have over locally used resources (Acheson, 2006; Fabricius & Currie, 2015).

Table 1 Different forms of property rights and their characteristics

Form of access*	**Characteristics***	**Example**	**Source**
Open access	Absence of enforced property rights	International waters, global commons; fisheries in some developing countries; Maine offshore lobster fisheries	Acheson et al., 2015; Anderson et al., 2014; Berkes et al., 1989; Feeny, Berkes, McCay, & Acheson, 1990
Group/communal property	Resource rights held by a group of users who can exclude others; can include aspects of self-governance and/or co-management	Forest commons in Ethiopia; "urban green commons"	Berkes, 2006; Clay, Kitts, & da Silva, 2014; Jentoft, 2000a, 2013a; Langdon, 2015
Individual property	Resource rights held by individuals (or firms) who can exclude others	Quota systems (ITQs); Rangeland, e.g. in US, England and Sweden	Acheson et al., 2015
Government/state property	Resource rights held by a government that can regulate or subsidise use		Grafton, 2000

***** Based on Ostrom et al. (1999) and Berkes et al. (1989, p.91). Examples added by the author.

2.1.1 Open access

For a better understanding of the discourse of open access, common-pool resources and restricted access, some definitions and differentiations are required. Often common-pool resources are equated with open access, which is not always correct. A regulatory framework is absent in open-access regimes, which is not necessarily the case in common-pool resources (Acheson, 2006; Acheson et al., 2015; Berkes et al., 1989; Ridgeway & Schmidt, 2010). The exploitation and subtraction of resources is free to everyone in open-access regimes (Acheson, 2006; Feeny et al., 1990). Unsurprisingly, a totally unregulated system is prone to problems such as overexploitation, overcapitalisation, resource depletion and collapse (Acheson, 2006; Berkes et al., 1989; Copes, 1996; Ostrom, 2009). This is particularly true for fisheries (Cox & Sumaila, 2010; Matthiasson & Agnarsson, 2010; Satia & Jallow, 2010).

The problems accompanying open access can be linked to broader concepts and theories that are concerned with individual and collective behaviour and the overall conception of man. Table 2 below illustrates frequently brought up problems and theories within the discourse of resource management.

Table 2 Important aspects of the discourse about open access

Problem/ theory	**Characteristic**	**Sources**
Rational Choice	Individuals are by disposition egocentric, parsimonious and atomistic. Maximizing individual gain as driving force of action. Utility maximization as primary motivation of individuals.	Guyader & Thébaud, 2001; Gyuris, 2016; Hersoug, Holm, & Rånes, 2000; Jentoft, McCay, & Wilson, 1998, 2010
Social dilemma	Individual profiting from selfishness. Reaping benefits from others restraint.	Acheson, 2006; Berkes et al., 1989; Bierhoff & Küpper, 1998; Lopez, 2012; Ostrom, Burger, Field, Norgaard, & Policansky, 1999
Social traps	Inability of individuals or societies to cooperate due to the absence of trust. Individual short term gain is contrasted by long term societal loss.	Costanza, 1987; Gunderson & Light, 2006; Jentoft & Johnsen, 2015
Free-rider problem	Others bear the cost of restraint while individual continues to harvest at the usual rate. Cultural norms, ideology, and value systems appear to affect the degree of free riding.	Árnason, 2007; Coleman, 1990; Feeny, Hanna, & McEvoy, 1996; Khushf, 1998

As mentioned before, fisheries are a classic example for the explanation of different management regimes. International waters are one of the few remaining open-access areas, even though the gradual extension of the exclusive economic zone (EEZ) has reduced this

tremendously (Campling et al., 2012). With the reduction of international waters, the handling of maritime resources became the responsibility of nation states and/or supranational institutions such as the European Union (EU). While some problems of the former open-access regime were solved in several nationally governed systems, new problems evolved (Grafton et al., 2010). Those will be partly addressed in the following section and appear in the subsequent chapters likewise.

2.1.2 Restricted access and privatisation

Restricting access is one way to avoid the seemingly inevitable resource loss that might follow open access. The question of implementation is very controversial however. One of the most prominent, yet contested, ways to restrict access is the privatisation of property rights and the distribution of endowments and entitlements to selected actors only (Adger, 2000; Bromley, 2009; Carothers & Chambers, 2012; Glassman, 2006; Harvey, 2006; Matthiasson, 2003; Rettig, Berkes, & Pinkerton, 1989; Rotherham, 2013b; Symes & Crean, 1995).

Presumed positive aspects of privatisation that are frequently brought up are stewardship ((Bromley, 2009; Carothers & Chambers, 2012; Grafton et al., 2006; Ridgeway & Schmidt, 2010), economic efficiency and viability (Árnason, 2008; Grafton, Squires, & Fox, 2000; Hilborn, 2007; Høst, 2015). Those who advocate privatisation argue that this brings aggregated benefits for society at large (Árnason, 2008; Punt, 2010; Ruseva & Fischer, 2012). Of course, those are desirable outcomes, compared to the threat of resource overexploitation. For its proponents, privatisation is the *recta ratio*, in which the end justifies the means. But this sidesteps some important matters of economic and social justice. The question of what happens to those that are excluded from further competition or lack the economic assets for participation, usually receives less interest. Neo-classic and neoliberal economic models tend to either overlook this issue completely or rely on gross simplifications (Chambers & Kokorsch, 2017; Jentoft & Chuenpagdee, 2009; Pinkerton & Edwards, 2009; Symes, 1997). As such models are predominantly concerned with economic end goals, questions of equity and efficiency are usually discussed separately (Heal & Kriström, 2014; Pinkerton, 2013).

As mentioned at the beginning of this chapter, the question of what constitutes appropriate resource management is bound to the current narrative and *Zeitgeist*. Privatisation is the hallmark of the (neo-)liberal school of thought that became the dominant narrative in the late 20th century in much of the world (Benediktsson, 2014; Harvey, 2007; Mansfield, 2004). Neoliberalism and privatisation, however, have greatly exaggerated social and spatial inequalities, both at global and national scales (Benediktsson, 2014; Brown & Schucksmith, 2015; Durrenberger & Pálsson, 2015; Harvey, 2006; Huijbens & Þorsteinsson, 2017). This entails a 'capitalocentric' view and an economisation of society, politics and natural resource management, which translates into new socio-spatial realities (Gibson-Graham, 1996; Harvey, 2001; Hay, 1959; Lee, 2010; St Martin, 2001; Wilson, 2013b). The main arguments that are levelled against the privatisation of natural resources, are listed in table 3 below. Not all of them can be discussed in detail.

Table 3 Problematic issues in resource privatisation

Problem	References
Justice and equity	Brandt, 2005; Glassman, 2006
Initial allocation	Copes, 1996; Mackenzie, Hanley, & Kornienko, 2008; Ridgeway & Schmidt, 2010; Stavins, 1995
Unequal distribution of wealth	Flaaten, 2010; Guyader & Thébaud, 2001
Imbalanced distribution of power	Jentoft & Chuenpagdee, 2009; Kokorsch, Karlsdóttir, & Benediktsson, 2015
Scale-related issues, e.g. small scale vs. large scale fisheries	Chambers & Carothers, 2017; Crilly & Esteban, 2013; Jentoft & Chuenpagdee, 2015; Langdon, 2015; Symes, 2014
Property rights as assets	Benediktsson, 2014; Durrenberger & Pálsson, 2015; Langdon, 2015
'Closed shop' and exclusiveness	Urquhart, Acott, Symes, & Zhao, 2014a
Social cohesion threatened	Olson, 2011; Symes, 2014
Insecurity for resource dependent communities	Eythórsson, 2000
Concentration of ownership	Clark, 2010
Spatial blindness and footloose industries	Gyuris, 2016; Harvey, 2001
Alienation the appearance of new class structures	Clark, 2010; Harvey, 2006; Helgason & Pálsson, 1997; Høst, 2015; Pinkerton & Edwards, 2009; Soliman, 2014
One-sided understanding of sustainability	Kokorsch et al., 2015
Market failure/ imperfect market	Acheson, 2006
Externalities and social costs	Glassman, 2006
Transitional gains and intra-/intergenerational justice	Tullock, 1975

2.1.3 Tragedy of the commons – a critique of an omnipresent concept

As indicated in the previous sections, several theories and concepts deal with dilemma situations and choices of individuals and societies (see also table 2). One of the most prominent treatises regarding the dichotomy of open vs. restricted access is the 'tragedy of the commons' (Gordon, 1954; Hardin, 1968). Particularly the essay of Hardin has received astonishing attention and continuous to be enormously popular. Barely any scientist dealing with resource management and property rights dares to omit a reference to this article. However, the concept is usually referred to in an uncritical manner. Yet, like any other thought experiment or model, it should not be taken literally or as major source for conclusions and policy recommendations (Ostrom et al., 1999; Rotherham, 2013a). The concept has been criticised by numerous scholars. Table 4 summarises some of the main critiques.

Table 4 Criticism of the 'tragedy of the commons'

Critique	**Reference**
'Tragedy' as narrative to legitimate privatisation	Berkes et al., 1989; Knobloch, 2014; Rotherham, 2013a
Apportion of blame to only one specific group (fishers/ herders)	Neilson, Gabriel, Arroz, & Mendonça, 2014
Confusion of open access with common property	Berkes et al., 1989
Simplistic and deterministic model	Berkes, 2006; Berkes et al., 1989; Gyuris, 2016
More of a dogma than an empirically founded truth	Carothers & Chambers, 2012
'Tragedy' as disempowering and pessimistic vision of the human prospect	Ostrom et al., 1999
Humans characterised as fully rational agents that are interested maximisation of profits only	Gyuris, 2016
Overstatement of the undesirable effects of traditional common utilisation	Rotherham, 2013a
Ignores community	Jentoft, 2000a
Insensitivity to social complexity and aspects of distributive justice are neglected	Ommer, 2000
Self-regulating capabilities of users are not considered	Berkes, 2006; Berkes et al., 1989

That the critique is at least partly substantiated can be seen in Hardin's relativizing responses in later publications and the rephrasing of the tragedy of the commons to the 'tragedy of the unmanaged commons' (Hardin, 1998, 2007). Nonetheless the genie was let out of the bottle and has been used for the justification of privatisation and closing of access to common pool resources (Árnason, 1998, 2005, 2012; Berkes, 2006; Grafton et al., 2010; McCay & Acheson, 1987; Pálsson, 1998; Wilner, 2014).

Some aspects of the critique have not been touched upon or need further attention. For example, basic principles, social values and norms that are the foundation of specific communities and broader societies are set aside (see below). Terms such as 'solidarity' do not occur a single time. Neither can the reader find anything on 'mutual trust' (Coleman, 1990), 'collective conscience' (Ritzer, 2008; Thompson, 1985), 'social control' or 'moral and normative obligations' (King, 2011; Parsons, 1966b). On the contrary, Hardin states:

> An idiot can inherit millions, and a trust fund can keep his estate intact. We must admit that our legal system of private property plus inheritance is unjust – but we put up with it because we are not convinced, at the moment, that anyone has invented a better system. The alternative of the commons is too horrifying to contemplate. Injustice is preferable to total ruin. (Hardin, 1968, p. 1247).

Injustice as *ultima ratio* might indeed be tolerable to total ruin (cf. Horn & Scarano, 2002; Poli, 2015). However, in socio-ecological systems there are usually more choices available to overcome the tragic symptoms described by Hardin and his followers than purely market-based solutions (cf. Bromley, 2009; Feeny et al., 1990; Gyuris, 2016). Concluding from this, one may ask whether the threat of 'total ruin' for all that comes with unregulated

commons legitimates, upon reversion, for the prosperity of a few in perpetuity (see 5.2). The question of to what extent the end justifies the means, and how much injustice can be justified, needs to be considered. This is directly linked to aspects of justice and solidarity; two abstract values that are dealt with in the following section.

2.2 Norms and values in natural resource management

As the closure of a common-pool resource and restriction of access puts stress on aspects of solidarity and justice, this section centres on these two norms with a strong focus on resource management. Even though there are more norms and values coupled to resource rights than solidarity and justice, these two can be seen as most important, concluding from the discussion above. They will be discussed further in chapter 3, in relation to structural societal change(s), as well as in chapter 7 where the topic of future management regimes will be taken up. The question of what exactly constitutes justice has sparked debates ever since to the days of Plato and Aristotle (Cammack, 2015; Horn & Scarano, 2002). The discussion here is based on a brief general review of justice-related concepts in resource management. This is followed by a specific outline of John Rawls' perception of justice and a few thoughts on the concept of Pareto optimality. A discussion of another essential value, solidarity, rounds off this section.

2.2.1 Justice in resource management

For some authors, *justice* is the most important virtue and principle for society (Leontsini, 2014; Pirie, 1983; Rawls, 1971). Despite its importance, or perhaps because of it, a universal definition cannot be found. On the other hand, most people can easily identify the absence of justice. It might thus be easier to define this very value by its opposite, or to add a prefix for a more specific definition.

When discussing justice in relation to natural resource management and access rights, a diverse set of prefixed adjectives exists. Among the most common ones is that of *social* justice (Clay & Olson, 2008; Holm, Raakjær, Jacobsen, & Henriksen, 2015; Hubbard, 2014; Räikkä, 2014; Symes & Phillipson, 2009; Urquhart, Acott, Symes, & Zhao, 2014b). This is not surprising, since resource extraction is much more than the sheer act itself. It is entangled in social ties and structures. This is clearly the case in indigenous communities, but to a certain extent also in industrialised societies (Grafton et al., 2010). Social justice is usually closely intertwined with *distributional* justice (Brunk & Dunham, 2000; Copes, 1996; Davis & Bailey, 1996; Flaaten, 2010; Jentoft, 2013b). The question of distribution concerns not only contemporary society but also future generations. Hence, concepts of *inter- and intragenerational* justice build on the distributional aspects (McConney & Charles, 2010; Neis & Morris, 2000; White, 2015). *Environmental* justice and animal rights need to be considered in a truly holistic approach to justice (Poli, 2015; Schroeder, St Martin, Wilson, & Sen, 2008)[1].

These three forms of justice centre on the question who should receive how much of a certain share, at the expense of whom, and under which conditions. Finding a solution to

[1] However, adding these "actors", nature and animals/fish, to the discourse would go beyond the scope of this thesis.

these questions requires looking at another two aspects of justice. With consideration of end goals and the means for achieving them, *procedural* justice concerns the assurance of fair rules, while substantive justice assures fair outcomes (Drew, 2013; Mels & Mitchell, 2013).

This very brief introduction into the topic, can be closed with quoting Emile Durkheim, for whom

> there cannot be rich and poor from birth without there being unjust contracts' [and further, with reference to the necessity of rules and regulations] 'but it is not enough that rules exist. They must also be just, and for that be so, the external conditions for competition must be equal (Durkheim in: Thompson, 1985, p. 57).

Concluding from this, Durkheim (1977) elaborated theories on justice and solidarity that will be taken up again after an introduction of Rawls' and Pareto's conceptualisations of justice and solidarity.

2.2.2 Rawls and justice

For the work here, I envisage an approach to justice and solidarity that can be conceptualised and operationalised; one that is contemporary but yet building on a solid theoretical foundation. Arguably, John Rawls' treatise, *A Theory of Justice* (Rawls, 1971), meets these requirements (Hermans & Knippenberg, 2006; Horn & Scarano, 2002; Mandle & Reidy, 2014; Rawls, 1958, 1971). Rawls' theory can be characterised as intersubjective, as it opposes the paradigm of utilitarianism and ideas of value-scepticism (Habermas, 1996, 1998). In addition, his argumentation is directed against the ever-growing influence of economic elites (Lorenz, 2013)[2]. The theory of distribution and justice emerged in a period that was determined by the propagation of neoliberalism and its gradual, sometimes radical, way into politics (Clarke, 2009; Gyuris, 2016; Harvey, 2006). Rawls contrasted this prevailing construct with a concept for distributional, environmental and intragenerational justice ('just saving principle') that I consider combinable with principles of sustainable development (Ando & Baylis, 2014; Freeman, 2014; Hermans & Knippenberg, 2006; Rawls, 1999). For Rawls there are two main principles for justice based on an imagined prerequisite. The first principle is that of 'the greatest equal liberty', connected to the 'difference' principle. The 'veil of ignorance' is the underlying model for just and fair procedures and decision making (see below).

In his first principle, Rawls states that "each person is to have an equal right to the most extensive basic liberty compatible with a similar liberty for others" (1971, p. 60). This principle affirms each citizen's equal claim to a system of basic liberties fully adequate to the development and exercise of her moral capacities. In his second principle, Rawls states that

[2] Whether or not Rawls theories and his ideas of libertarianism can be interpreted as an anti-capitalistic move has been frequently debated (Chambers, 2006; Connin, 1985; DiQuattro, 1983). An extended discussion would lead too far. However, I consider the writings of Rawls as providing inspiring additional ideas that allow a flexible reading and thus a necessary compromise between the rather dogmatic positions held by those on the left and right.

> social and economic inequalities are to be arranged (a) so that they are to be of the greatest benefit to the least-advantaged members of society, consistent with the just savings principle and (b) attached to offices and positions open to all under conditions of equality of opportunity (1971, p. 266).

This is based on the precondition that people should not benefit from arbitrary gifting (Freeman, 2014; Hale, 2010). Both principles open the opportunity for some sort of inequality, but at a very low level. The two principles embody a new maxim for distributional end-goal thinking; one that exceeds classic efficiency-oriented approaches and utilitarian paradigms. One can read into it the avoidance of inherited advantages, based on property rights, entitlements to a resource or endowments that derive from rules and procedures that violate most of the aspects of justice described above.

Concluding from the two principles, the question remains of how decision making needs to be designed. How can solutions to dilemma situations be solved and decisions that ensure a just resource distribution be achieved; how can the aims of procedural fairness and substantive justice be achieved (Drew, 2013)? For that the 'veil of ignorance' is a necessary device (Rawls, 1958). It builds on the assumption that decision makers arrive at (just) rules and conclusions – regarding both moral principles as well as equal and just distributions – if they are decided upon behind the 'veil of ignorance'. As the actors involved have no idea about where they would end up in the final distribution and order, it would be in the actor's interest to create a system that is for the advantage of the least well off (Conybeare, 2007; Gyuris, 2016; Mandle & Reidy, 2014). They themselves might end up in the category of the least advantaged (Clark, 1986; Lorenz, 2013; Waterstone, 2010).

The veil model and the just savings principle, which can be linked to the idea of reciprocity, certainly have a generational and environmental dimension and thus a connotation to sustainable development (Castle, 1993; Hermans & Knippenberg, 2006; Lopes, 2015; Macleod, 2014; Pasqual & Souto, 2003; Weale, 2017). Concluding from Rawls, resource management should have its point of departure from the benefits for the least advantaged societies and communities. The generational aspect is manifested in the idea of just savings and the assumption that the current resource exploitation should not compromise the well-being of future generations (Rawls, 1999).

Talking about decision making that considers the least advantaged groups and actors, one can recall the 'Pareto criterion', proposed by Vilfredo Pareto in the early 20th century. Rawls and Pareto deliver concepts that indeed appear in tandem occasionally, yet with some differences (Castle, 1993; Conybeare, 2007; Hermans & Knippenberg, 2006; Konow, 2003; Pasqual & Souto, 2003). The Pareto criterion builds on justice and fair distribution, too. In its original meaning, a distribution meets the criteria of Pareto when it is achieved that one party's situation improves while no other party is worse off (Conybeare, 2007; Seravalli, 2015). In fully market-based solutions the Pareto criterion can hardly be realised, however (Flaaten, 2010). The restriction of access and the distribution of resource rights inevitably creates de-facto classes of haves and have-nots (see below).

Rawls idea of the 'difference principle' points in the same direction as the Pareto criterion, as it is based on the idea that social and economic allocations need to consider those worst off. Both authors allow for some form of injustice and, unless taken literally, the emergence of winners and losers cannot be avoided. In complex systems it is inevitable that some individuals are worse off eventually, and some individuals might interpret any

outcome that does not lead to a palpable improvement as disadvantage by default. The maximisation of individual profits is still feasible – the profits are, however, made within an assessable and justifiable frame.

Are these ideas of Rawls and Pareto appropriate for resource management and everyday politics then? The answer to this question depends on how literally one takes the recommended actions (Gyuris, 2016; Nikolakis & Grafton, 2014). Rawls' conceptions can be interpreted as a radical way to overcome the existing capitalist order with its democratic deficits (Little, 2014). However, a veil of ignorance in its original sense cannot be implemented except figuratively. Besides, considering each and every stakeholder and his or her possible disadvantages before a decision is made is not feasible. However, Pareto and Rawls deliver guiding principles and targets to aim for. They can assist in calibrating the moral compass for rethinking the privatisation of property rights and resource access.

Shifting the focus from neoclassic and neoliberal economics to the perspective of the actors that will (possibly) be most disadvantaged from a decision is therefore necessary. With the criteria of Rawls and Pareto in mind, it is difficult to justify the privatisation of property rights and comparable forms of property in perpetuity, especially when aspects of intra- and intergenerational justice are considered.

2.2.3 Solidarity

The concepts of Pareto and Rawls call for the consideration of one more basic value, namely *solidarity*, which also focuses on those least advantaged (Follesdal, 2014). While justice has been defined as one of the fundamental values of a society, the status of solidarity is not similarly uncontested and unambiguous (Barrett, 2015; Gibson-Graham, 2008; Harvey, 2001; Ignatieff, 1984; Parsons, 1966a, pp. 10,14; Thome, 1998). According to Parsons,

> no society can maintain stability in the face of varying exigencies and strains unless the interest constellations of its members are grounded in solidarity and internalised loyalties and obligations (Parsons, 1966a, p. 14).

But before the importance of solidarity in a social system gets clarified, this value needs to be defined.

The roots of solidarity are in ancient Rome and appear first as legal concept through the law of obligation and liability *(obligatio in solidum)* (Bayertz, 1998). Afterwards it gradually made its way into moral philosophy and became an important terminus (Habermas, 1986; Wildt, 1998). An essential characteristic of solidarity is reciprocity. Solidarity evolves when some form of emotional tie or functional association is given, but also when a specific sense of belonging to a group and particular commitments can be ascertained (Bayertz, 1998; Conybeare, 2007; Khushf, 1998; Tönnies, 1991). Solidarity is thus coupled with some form of a normative bond and entangles aspects of loyalty and consensus (Wildt, 1998). For living in a community, a certain level of solidarity is the precondition. Building on this, Harvey (2001, p. 192) states that "it is important to understand the processes that produce, sustain and dissolve the contingent patterns of solidarity that lie at the basis of this 'thing' we call 'a community'" (see also chapter 3). This identifies a first distinction of the concept from that of justice, which can be perceived individually and does not require a specific community. Solidarity, however, is not

possible for an individual; it needs a distinct 'other'. Thus, solidarity and reciprocity describe a situation or action in which the individual's destiny is dependent on the community's action/situation and vice versa (Engelhardt Jr, 1998).

Remaining on the theoretical front, Durkheim differentiates between two forms of solidarity, namely *mechanical* and *organic* solidarity. He used this distinction for describing societal transformations through the underlying relationship of the economic, cultural and ethical dimensions (Durkheim, 1984b; Scott, 2012; Thompson, 1985). Mechanical solidarity, or 'solidarity by similarities', is one that does not need to be "consciously worked at but has arisen 'mechanically' through the continuous patterns of life, [and] rooted in similarities, stable and relatively unchanging institutions, shared lifestyles and deference to authorities" (Durkheim in: Giddens & Sutton, 2017, p. 78). This form of solidarity builds on the 'conscience collective', which encompasses the mutual mental and moral orientations of societies (Durkheim, 1984a; Thijssen, 2012). It can be further defined as follows: "The totality of beliefs and sentiments common to average members of the same society forms a particular system with a life of its own life; one might call it the collective or common consciousness" (Thompson, 1985, p. 59). Organic solidarity arises from the division of labour and it appears when "the common culture becomes more generalized in content and more concerned with balancing the autonomy of each individual against all others" (Durkheim in: Scott, 2012, p. 19). This form appears with the changing of societal structures (see also chapter 3). The main change here is that from pre-modern communities to functionally differentiated societies and modernity.

Mechanical solidarity is the synthesis of subjective identification with group-based communality. It usually appears in small and homogeneous communities (clans and tribes). Organic solidarity, on the other hand, involves subjective motivations related to functional interdependence, it is a characteristic of heterogeneous, or functionally differentiated, societies (Thijssen, 2012). Group pressure, or pressure to conformity, is no longer given and the driving forces behind solidarity are of a rather rationalistic character. Some form of 'rational reciprocity' can be ascertained. This might sound like a pessimistic vision of a deeply rational society without any emotional basis, yet for Durkheim it is an inevitable and rather positive aspect that comes with the evolution of societies. Heterogeneity is not seen as a threat – unless individualism turns into egoism – but rather as an improvement for the societal development (Bayertz, 1998; Göbel & Pankoke, 1998; Waglé, 2013). To what extent this assumption finds verification in present societies will be debated later on.

Building on this reasoning, solidarity needs to be located in the resource management and property rights discourse. First of all, sustainability thinking cannot take place without solidarity thinking (Dahl, 2015; Haas, 2015; Hermans & Knippenberg, 2006; MacCallum, Moulaert, Hillier, & Haddock, 2009). Solidarity is of importance as its absence can cause inappropriate handling and overexploitation (Jentoft, 2000a). Like justice, solidarity can be linked to every part of the value and production chain in a resource-dependent system. Taking the example of a fishing community, solidarity and reciprocity can be found among the crew members on a vessel, but also within the entire community. One can also discuss whether the very end of the production chain is somewhat shaped by solidarity, when the paying of a sufficient price is interpreted as some sort of solidary act[3]. Thus solidarity can

[3] At least in new forms of consumer behaviour this might be the case, when a conscious consumer pay more for a product that fulfils certain societal and environmental standards

be defined from different perspectives. Examples are the societal view (Harvey, 2001), notions of place-based solidarity (Price, 2013), the spatial connotation (Bennett, 2010; Gibson-Graham, 2008), resource management (Poli, 2015), communities in general (Barrett, 2015) and fishing communities in particular (Degnbol et al., 2006; Jentoft, 2000a).

As stated above, the changing of not only the entire management regime, but also minor modifications of it, impact the underlying chain and values and eventually the broader communal or societal structure. Especially traditional societies and communities are shaped by norms like kinship, trust and reciprocity that comprise solidarity. That is precisely why some tend to equate solidarity with social cohesion (Barrett, 2015; Bock, 2016; Thome, 1998). The closing of access to a common-pool resource through restrictive and exclusive property rights is such a change, with far reaching consequences. As Jentoft states:

> [M]anagement systems are eroding social solidarity among resource users by weakening their social bonds, their traditional values and sense of social responsibility. Fishermen, among whom norms of equity and reciprocity used to reign, have now, much as a consequence of fisheries management, become selfish profit-seeking individuals, who regard management systems in opportunistic terms. As a result fishermen have become more like the social actors that Garrett Hardin portrayed, thus making his theory of the tragedy of the commons into a self-fulfilling prophecy (Jentoft, 2000, p. 54).

Alienation and a disrupted social cohesion can be the adverse effects of such a development (Durkheim, 1984a; Glassman, 2006; Irwin, 2007; Pedersen, 2014; Thijssen, 2012; Thome, 1998). Particularly, capitalist regime shifts yield new variants of societal structures and thus vague forms of solidarity and the attached conscience collective (Khushf, 1998) (cf. Barrett, 2015; Bock, 2016; Rawls, 1971).

2.3 Interim conclusion

In this chapter some fundamental concepts and thought-experiments regarding the management of natural resources were introduced. Natural resource management is in an interdependent relation with vital societal values, of which I consider solidarity and justice as paramount. Changing the structure of the management regime by altering property rights and thus generating new classes – of haves and have nots – certainly adds stress to justice and solidarity.

The choice of an appropriate management regime, as well as the evaluation of its success, is commonly connected to worldviews, ideals and the perception of man. Major conflict lines exist regarding the question of the distribution of property rights, entitlements and endowments to a resource, but also regarding the dichotomies of bottom-up vs. top-down as well as centralised vs. decentralised decision making.

Iceland, as will be shown later own, has not been free from these conflict lines. The closure of an open-access or common-pool resource through privatisation of property rights has not been uncontested. In the writings of those critical of privatisation one can frequently find discussions about the violation of solidarity, equity and justice, which have been subordinated to macro-economic end goals, such as efficiency. The question about

whatever happened to justice and solidarity in coastal communities, and whose access to resources has been deliberately limited, was one of the questions that followed me through the project.

Regarding the question of solidarity, Durkheim's distinction between mechanic and organic solidarity provides an inspiring approach to the assessment of this important value in combination with questions regarding 'common consciousness' and aspects of social cohesion.

Apart from Durkheim, another two theories that relate to justice have been of importance for my work. Theories from Rawls and Pareto have been essential for the analysis of equal basic rights (here the access to fish) under the new regime. Building on this I wondered to what extent the least-advantaged members of the society and communities are represented in the current management regime. In combination with justice and solidarity the theory of Rawls is a good basis to discuss aspects of sustainable development, particularly that of intragenerational justice. This leads to the assumption that arbitrary gifting and/or inherited advantages violate fundamental aspects of justice, which is an essential point in this research.

3 Structural change

As the research project deals with social systems, geography and resource management, it is necessary to elaborate on the terms *structure* and *structural change*. These terms carry several meanings and are used in different ways in sociology and geography. In this chapter, both sociological and geographical understandings will be discussed. The aim is to provide a better understanding of the interdependent processes, actions and structures that comprise social systems and are thus an integral part of human and economic geography.

For me, individual actions and social structures are closely related to geographic processes – or geographic realities as I called it previously. The structure of a society is based on individual actions and vice versa. With these basic premises in mind I will first explore the relations between individual actions and social structures a little further, before entering the field of economic and regional geography. For this I turn to values such as justice and solidarity again, before linking them to individual actions. Translated to the Icelandic context, the question would be: how does the changing of property rights affect the (new) holders of these rights; and which consequences does that have for the scope of action for those that are not holding rights? What does it do to a close-knit society when new classes of resource 'owners' evolve?

The answers certainly depend on the different roles of an actor and the context, but also the social norms and values, customs and traditions that are present. There is of course no shortage of approaches to explain social actions, the structure of societies and their functioning. In contemporary geography, there is a vibrant ongoing discourse between structuralism and poststructuralist approaches (Barrett, 2015; Gibson-Graham, 2008; Gyuris, 2016; Harrison, 2014; Mather, Johnsen, Sonvisen, Sridhar, & Stephen, 2017; Murdoch, 2006). But also the question whether contemporary societies have reached modernity, or post-modernity, or even whether society has ever been modern at all (Beck, Giddens, & Lash, 2014; Clarke, 2014; Harvey, 1989; Latour, 2012; Massey, 2001), calls for consideration.

A thorough discussion of these theoretical arguments would lead too far. However, the Icelandic case requires to consider the topic. The necessity is demonstrated in the conclusion of a special investigation committee (*Rannsóknarnefnd Alþingis*) that was set up for investigating the financial crisis that hit Iceland in 2008.[4] This committee reasoned that one the collapse was partly caused by "weak social structures and public institutions that are needed to sustain a well-functioning democratic society" (Árnason, 2013, p. 329; cf. Árnason, 2010). Even though this committee dealt with the crisis, I think that the weak structures and public institutions did not appear all out of a sudden, but gradually evolved. The privatisation of a previous common-pool resource certainly played an important role as the following chapter will show.

I have chosen the approaches of Weber and Habermas to provide a first explanation of social actions and relationships, processes of commodification and juridification. This is followed by the theoretical identification of possible patterns and roles in social

[4] The topic has been discussed frequently, often with a strong focus on the role of the fishing industry (Benediktsson, 2014; Durrenberger & Pálsson, 2015, see also paper I).

relationships. I consider Parsons' model of 'pattern variables' as especially useful for the explanation of the Icelandic case.

3.1 Sociological understandings of structure and action

3.1.1 Typologies of social action

When it comes to the explanation of different types of individual social action, the broader political decision making and the affected social relations, Weber provides a solid classification scheme. I will now provide a brief summary of his well-known theorizing of the rationalities of action. Weber classifies four different explanations for deliberate individual actions. Social actions can thus be either *instrumentally rational* (*zweckrational*), *value-rational* (*wertrational*), *affectual* (*affektuell*), or *traditional* (Kalberg, 1980; Weber, 1981, 1984).

An action can be called *instrumentally* rational when it is exclusively purpose-oriented. The action is concerned with the expected outcome and accordingly with the adjustment of means and instruments for achieving it (D'Agostino, 2011; Weber, 1981). In case of multiple purposes, the decision about how to act can be based on the underlying social norms and values. This can result in *value-rational* actions. They differ from the instrumentally rational actions, as they are not dominated by the possibilities of success but the overriding commitment, beliefs and obligations (D'Agostino, 2011; Gane, 2005). Building on the differentiation of instrumental or value orientation, one can further differentiate between material and ideal interests (Gerth & Wright Mills, 1946; Swidler, 1986). *Affectual* and *traditional* actions are both linked to a feeling of belonging to a community (Gane, 2005). Affectual are those actions that are determined by specific feelings and sentiments of the actor, while traditional actions are based on 'ingrained habituation' (Gane, 2005). Actions that are characterised as instrumentally rational are clearly contrary to affectual and traditional actions.

From this typology of social actions one can continue with Weber's distinction of *open* and *closed* relationships, that indicates the exclusiveness or inclusiveness of a social affiliations (Gane, 2005; Schluchter, 2000; Weber, 1984). In an open action process, participation is possible for every actor, while in a closed process it is either restricted or bound to conditions. With special regards to the subject matter of this thesis – the restriction of resource access – it is of importance to reconsider how the closing of the action process took place and how the conditions were agreed upon. Of similar importance is the act of 'appropriation', that appears within the binary of open and closed relationships. Appropriation describes the effective exclusion of certain actors from an opportunity, usually through distinct property (Weber, 1922). When increased rationalisation is coupled with a rigid form of association and exclusiveness, an 'iron cage' (in German, *'stahlhartes Gehäuse'*, or a 'shell hard as steel') can be the inconvenient and inflexible scope of (social) action (Baehr, 2001).

With his ground-breaking theories on social action and social relationships, it is hardly surprising that Weberian thinking has affected theories of resource management,

geographical realities and class formation (Barrett, 2015; Jentoft, 2000b; Kemper, 2009; Krott et al., 2014; Shucksmith, 2012). One example would be the distribution of property rights and privatisation. The common justification for this meets the criteria of instrumentally rational actions and a focus on expediency. With the closing of a common pool, and the dispensation of entitlements to a resource, a process of appropriation and association is the result, which can lead to social stratification and new class structures. Furthermore, the accumulation of property rights by an individual actor increases his or her economic (market) power and thus, indirectly, the political power (cf. Gane, 2005; Treviño, 2005; Weber, 1981).

With a reference to Weber, Habermas states that the separation of the political and the economic system paves the way for a new system that is decoupled from traditional relations (Habermas, 2015). Apart from traditional relations, strategic and utilitarian orientation of the actors dominates the action. The utilitarian orientation then is shaped by profit maximisation and competition. Hence, traditional value-orientation is replaced by interest-orientation (Habermas, 2015). Commodification and juridification are common consequences of such processes (Allan, 2006; Habermas, 1981; Scott, 2012). Commodification describes a system that is governed by economic control, whereas juridification is a system driven by bureaucratic administration (Habermas, 1981; Scott, 2012).

3.1.2 Pattern variables

Having discussed social actions and their consequences as well as the driving forces behind different actions, the focus shifts to patterns and functions that can be detected in social actions and structures. Talcott Parsons delivers a suitable analytic framework with his ‘pattern variables’ (Parsons, 1991; Parsons, Bales, & Shils, 1953; Ritzer, 2008). For Parsons a structure is defined through “a set of relatively stable patterned relationships of units” (Parsons, 1954, p. 230). While at first glance this statement appears to be trivial, three complex questions arise from it: when can a pattern be considered as stable, how do relationships manifest, and what are the institutional and personal frames of the underlying system or society? Answering these questions and understanding patterns helps to understand processes at work in societies.

To start with, Parsons established five dichotomous ‘pattern variables of role-definition’ that can explain individual actions within social systems (see table below) (Parsons, 1991). Next to Weber’s typology, these variables provide a complimentary classification scheme for different actions and underlying role-expectations.

Table 5 Pattern variables

Pattern variable*	**Explanation/ Dilemma**
Affectivity – affective neutrality	Gratification–Discipline dilemma: defines the extent of emotions in social actions and relations
Diffuseness – specificity	Choice between modalities of the social object: defines whether the specific role of an actor or the whole unit is affected
Particularism – universalism	Choice between types of value-orientation: defines whether the action affects only an individual actor or the whole society
Ascription – achievement	Definition of scope of interest in the object: are the actions the result of previous performances or of allocation?
Collectivity orientation – self-orientation	Private vs. collective interest dilemma: are vested interests or public benefit the driving force behind an action?

* after (Parsons, 1991)

Out of these five dichotomies, I consider three as particularly important for the explanation of structural changes in resource dependent communities. First of all, when it comes to an essential change of a management regime, such as the closing of a common pool through privatisation, the distinction between *particularism* and *universalism* is of interest. In other terms: do the possible outcomes of this change merely affect the (individual) actors involved, or can consequences for the society at large be anticipated? This is followed by the aspect of distributional justice in the new system. The question of *achievement* and *ascription* needs to be addressed: who receives entitlements or endowments to a resource and how can it be justified? This question can be linked to the theory of Rawls discussed in the previous chapter, and questions of arbitrary gifting and inherited advantages. A combination is thus promising for the case of Icelandic quota management, as the discussion later on will show. The dilemma of *private* and *collective* interests, that distinguish between collectivity orientation and self-orientation, is also of importance, when discussing the closing of a common-pool resource to the benefit of some individuals (cf. Habermas, 1981; Pahl, 1978).

3.2 Structural change in regional and economic geography

The previous section covered different sorts of collective and individual actions and their subsequent ramifications. Aspects of spatiality have not been dealt with explicitly so far, even though most social actions leave a spatial footprint. On the other hand there is the governing body that can deliberately support regions and enact growth programmes, enable or restrict mobility or resource access. In addition, there are locational decisions by private

companies and industrial corporations. This section provides a spatial approach to structural change and its related phenomena and explanatory models.

3.2.1 Origin of the term structural change

Geography has not incorporated the terminology 'structural change' distinctively. Against a more specific background, particularly in the German literature and research, the term *Strukturwandel* is a firm component, however (Franzen et al., 2008; Habrich & Hoppe, 2001; Stadelbauer, 2000). This can be attributed to the fact that several regions experienced such a change from the mid-1900s on and provide a prominent laboratory for structural change in progress. This counts especially for the Ruhr area (Ruhrgebiet) in western Germany with its declining coal and steel industry. But also most rural parts in the former East Germany (GDR) have been of interest after the reunification in 1990 (Bock, 2016; Hassink, 2010; Lambooy, 2010; Martinez-Fernandez, Kubo, Noya, & Weyman, 2012). For the development in the east, the notion of a *Transformationsschock* (transformation shock) has been applied too (Wink, Kirchner, Koch, & Speda, 2016).

Structural change typically affects old industrial regions. Typical symptoms are one-sided economic structures in concert with dependence on single companies, structural unemployment, out-migration and social erosion, industrial fallows and brownfields, and a low potential for innovation (Hamm & Wienert, 1990; Läpple, 1991; Maier, 2009).

On this basis, one can differentiate between *benign* and *perverse* structural changes (López, 2014). The distinguishing characteristics are the level of resource access, degradation and distribution and whether push- or pull- forces are mainly at work. Benign structural change is identified by shifting labour demands that stem from an increasingly productive urban non-primary sector. This attracts (pulls) labour force to this sector, to the detriment of the rural regions or periphery. Perverse structural change is pushed by the depletion and degradation of rural natural assets and/or by the disenfranchisement of the rural poor. Lack of investments or productivity improvements can propel the process of rural labour force migration (López, 2014).

The dichotomy of benign and perverse structural change can be related to the mechanisms of social mobility and conflict that Blau (1994) identified. The process of structural change is usually accompanied by 'forced' mobility due to educational and work-related reasons. Accordingly, structural change can result in new geographical realities. Due to the fact that not all inhabitants of a community or region are willing or able to exercise spatial mobility, new social structures and potentials for conflict evolve. From a social perspective it is of interest to identify migration patterns. But also it is important to consider those individuals that remain in a location – intentionally or due to necessity – that has been affected by structural change.

As mentioned earlier, structural change and the aspect of transformation (or transformation shock) are used for the description of regional development trajectories. The main difference between the two notions is rooted in the political dimension. Transformation relates to political process and regime shifts, while structural change is not automatically bound to the political sphere (Amundsen, 2012; Brown & Williams, 2015; Salmi, 2015). Furthermore, the concepts vary in their temporality. Transformation describes comparatively rapid and sudden changes, while structural change is a slow and gradual process, shaped by long-term changes, not like common economic cycles or short-term

effects (Maier, 2009). In addition, structural change is a continuous and open ended process. The processes at work can cause social, spatial and economic polarisation, which in turn can lead to exclusion, fragmentation and 'perpetual perishing' (Kemper, 2009; Price, 2013).

Resource management can be both cause and effect of structural change and transformation shock, depending on the policy dimension and aspects of temporality. The sudden closure of a common-pool resource can cause a transformation shock, in case of a gradual policy implementation, it is more of a structural change. An example for both can be found in the history of coal mining in Europe. While the abovementioned Ruhr area has taken the path of gradual decline for its coal mining industry and in consequence has gone through a process of change, Britain under Thatcher experienced a sudden ending. Both ways can be – and indeed have been – debated.

3.2.2 Path dependence, embeddedness and lock-in

Structural change is commonly used for the explanation of development trajectories in old industrial areas. In such contexts, another three terms appear frequently: *path dependence*, *embeddedness* and *lock-in* (Bathelt & Glückler, 2003). Path dependence is characterised by technology and process related decisions made in the past that influence later choices of method, designs, and practices (Martin & Sunley, 2010). Furthermore,

> it does not mean a rigid sequence determined by technology and the past, but a road map in which an established direction leads more easily one way than another – and wholesale reversals are difficult. This logic applies to industrial locations as well (Martin & Sunley, 2010, p. 62).

As a consequence, path dependency shapes the identity of a place and the dominant form of work (McDowell, 2013). The concept provides an important explanatory approach for regional disparities and economic specialisation (Bathelt & Glückler, 2003; Marquez, Ramajo, & Hewings, 2012; Martin & Sunley, 2010). Path dependency – even more though the path creation in the first place – is part of the institutional setting and enabling factors (Fischer & Nijkamp, 2014; Strambach, 2010). The institutional framework can be related to aspects of embeddedness.

Embeddedness adds a social connotation to the rather economic reading of path dependency. Social ties and bonds, as well as the 'institutional milieu' are features of embeddedness (Chriss, 2007; Cooke, Clifton, & Oleaga, 2005; Rodriguez-Pose & Comptour, 2012; Swidler, 1986). Furthermore embeddedness is characterised by the collaboration of local actors, network creation, the sharing of knowledge and ideas. It is about collective norms, values and rules, but also kinship ties and peer pressure, framed by a regional context (Rutten & Boekema, 2007; St Martin, McCay, Murray, & Johnson, 2007). These characteristics allow for a linkage to aspects of solidarity and provide a contrast to the rational choice mantra that is presented in classic economic geography (see chapter 2) (Granovetter, 1985, 2005; Mitchell, 2008; Rutten & Boekema, 2007; Thornburg, 2013).

Embeddedness can have undesirable side effects though. Inflexibility, resulting from closeness, is one of those effects and can result in 'over-embeddedness' (Bathelt & Glückler, 2003; Steiner & Atterton, 2015). This happens through 'structural

embeddedness', which is coupled with historic relations (Cooke et al., 2005; Granovetter, 1985), but also 'territorial embeddedness' (Kibler, Fink, Lang, & Muñoz, 2015; Rodriguez-Pose & Comptour, 2012). These embeddedness-related effects can also undermine the autonomy of companies and local agency in a certain way (Bærenholdt & Aarsæther, 2002).

No matter whether embeddedness is perceived as an obstructive or constructive phenomenon, alteration of the established embeddedness can be detected with the shifting of economic realities. Particularly neoliberal economies – and the processes of centralisation and the advent of footloose industries that are associated with such economies – have stimulated 'disembedding mechanisms' (Barrett, 2015; Giddens, 1990; Ritzer, 2008; Symes & Phillipson, 2009). These mechanisms are an aspect of the 'dynamism of modernity', which can be construed as "practices that lift our social relations and interactions from local context" (Allan, 2006, p. 276). This rather neutral statement has been radically extended by Barret, who posits that

> [t]he traditional embedded community has been disembedded by the homogenising forces of modernity – market forces, urbanisation, the transportation and communication revolutions and the state […] Globalisation has compressed time and space, consigning community independence and stability to a bygone era. Changes introduced by capitalism break down communal bonds, leaving a wasteland of individuation and anomic malaise in its wake (Barret 2015, p. 184).

Embeddedness and path dependence are thus important explanatory concepts when it comes to regional disparities and structural changes (Dahl, Ostergaard, & Dalum, 2010; Strambach, 2010). They can be supplemented by lock-in, which relates to regions and their particular economic specialisation (Djanibekov, 2016; Grabher, 1993; Martin & Sunley, 2010; Underthun, Hildrum, Svare, Finsrud, & Vareide, 2014). Lock-ins appear in old industrial branches, "in which initial strengths based on geography and networks, such as industrial atmosphere, highly specialized infrastructure, close inter-firm relations and strong support by regional institutions, turned into barriers to innovation" (Hassink, 2010, p. 450). They can be the result of the 'mutual stiffness' of regional actors (Johansson, 2014). Lock-ins are thus the adverse result of undiversified local and regional economies and relate to the over-embeddedness and structural change. This comes with a rigidity to changes and a hesitance towards adjustments, modifications and new technologies (López, 2014; Martin & Sunley, 2014).

One can differentiate between functional, cognitive, organisational and political lock-ins (Arbuthnott, 2011; Bathelt & Glückler, 2003; Grabher, 1993; Hassink, 2010). Functional ones appear in declining industrial areas with strict hierarchical networks and ossified leaders. The crusted structures hinder the shift to alternative development path and necessary reorientations (Hillier, 2016; Underthun et al., 2014). Cognitive lock-ins describe processes in which "world views and strategies tend to be homogenous in the sense that hinders innovative imagination" (Arbuthnott, 2011; Underthun et al., 2014, p. 122). Organisational lock-ins are linked to cognitive lock-ins and the overreliance on local networks and ties, but also to institutional inertia (Arbuthnott, 2011; Underthun et al., 2014; cf. Wilson, 2013a). The political lock-ins are of particular interest here as they are illustrated as

> thick institutional tissues aiming at preserving existing traditional industrial structures and therefore unnecessarily slowing down industrial restructuring and indirectly hampering the development of indigenous potential and creativity (Hassink, 2010, p. 453).

Combined political and cognitive lock-ins have the potential to manifest a 'self-sustaining coalition' (Hassink, 2005). Over-embeddedness and lock-ins constrain processes of innovation and diversification. However, the adverse effects of structural change make innovative and diversifying processes inevitable (Schliephake & Schenk, 2009).

3.2.3 Evolution and functionality

Having discussed structural change and its features, two aspects are still missing: evolution and function. They need to be addressed for the analysis of possible responses and people-oriented approaches later on (both part of chapter 4). The evolution and function of communities are of course very much debated. This is particularly the case when structural change is part of the discussion. When it comes to the structural change of regions and communities, aspects of evolution, function and identity are part of the discourse (Bathelt & Li, 2014; Halseth & Sullivan, 2003; Martin & Sunley, 2014; Shucksmith, 2010). Or, in other terms, the 'functioning of systems' is highlighted (Berkes & Ross, 2013a; Bristow & Healy, 2014). According to Storper one of the crucial parts of geographical analysis is

> to understand the functional nature of the action spaces involved, and the substantive content of the conventions–relations – the world of action – by which actors coordinate and give shape to their concrete, functioning activities in that domain (Bristow & Healy, 2014, p. 930; cf. Storper, 1995).

Building on this, one needs to ask whether or not one can treat a community or certain place as a unit that has a particular lifetime, like a product or technology. That indeed would be more of the utilitarian and rational choice criterion for regional development and not applicable in welfare states or for critical geographical analysis (Gyuris, 2016; Harvey, 2001). That functionality and evolutionary thinking is an integral part – and most likely always has been in some sense – of contemporary geography and policy making can hardly be doubted. For Shucksmith (2012), the middle of the twentieth century was determined by a functional and pragmatic approach to spatiality, which then gradually turned into a paradigm of 'evocative locality'. That fits the perception of 'functional regionalisation' in which a clash of local emotions on the one side and 'central rationality' on the other was detected (Zimmerbauer & Paasi, 2013). In this regard, the political character and Zeitgeist of structural change become apparent. One can identify places that are the result of locational decisions of industries, based on resource extraction and vicinity. The loss of an ascribed function, for example when disembedding mechanisms set in, can cause a 'functional crisis' (Matos Fernandes, 2013). Building on this, the question is whether or not community is a constant, or subject to evolutionary thinking and can therefore be threatened by extinction (Boschma & Martin, 2010; Schamp, 2010; Wink et al., 2016). For Simmie and Martin (2010), 'generalised Darwinism' is one possible avenue for communities, that includes aspects of variety, novelty and selection.

But what exactly is a community's function? Is it the sheer provision of work-places and accommodation and as a result a materialist object? Community function can also be equated by meaning, thus giving it less of an classical economist connotation (cf. Halseth

& Sullivan, 2003). One can argue that both, function and meaning of regions and communities are attitudinal and constructed in a certain way (Berger & Luckmann, 1991; Clarke, 2009; Harvey, 2001; Wilson, 2012). Barrett (2015) and Anderson (2006) go one step further and ask whether or not the very notion of community is a myth.

Whether communities are (mythical) constructions or not cannot be answered here, but the question is of importance and will be considered in the subsequent chapters. With this in mind, the focus is now on the different approaches to community function. For a start, a separation of four different categories is relevant: community can be a group of individuals sharing a resource-based livelihood; a spatial unit; a social structure; or a shared set of norms and values (Allison & Ellis, 2001; cf. St Martin, 2006). In this thesis it is interpreted as a spatially fixed and bounded locality and local (social) system, while community as a type of relationship plays a subordinated – yet not to be neglected – role (cf. Newby, 1980). With the frame of analysis being set, one needs to reconsider what comprises the local social system and how a geographical space is turned into a social place. Communities entail more than a pure economic 'function' – they express social and cultural values:

> All communities have symbols that can attract wide-based identification and loyalty. The interesting question is under what circumstances they become manifest, who identifies with them, and what functions they serve. We need to distinguish backward-looking from forward-looking symbols. Homogeneous communities of long-standing settlement may be more likely to invoke backward-looking symbols that build upon a sense of nostalgia for lost traditions (Barrett, 2015, p. 122).

Functionalist view on places is contrary to the emotional ties and social bonds that connect the inhabitants to a place that they were possibly socialised and raised in. It is thus the dichotomy of an assemblage of concrete with a price tag, contrasted by social realities and values that cannot be materialised. In strict economic thinking, the 'hard factor', in this case surplus creation, profit maximisation and property value takes precedence over the 'soft factor' of emotional ties and place attachment (cf. Gustafson, 2001). This is yet another example of linguistic discourse shaping, as social values are everything but soft. Hard economic factors might be given, but they are a very weak indicator in terms of an envisaged end-goal of sustainable development (Moffat, 2014).

Concluding from this, one can either phlegmatically accept a seemingly evolutionary process, or deliberately opt for alternatives. This builds on the model of Parsons: how do structural change and transformation shock translate to the social subsystem and community members? What happens to those who have to 'unlock' their community and walk a new path – and even more, what happens when this new path does either generate new dependencies or leads to a dead end? How such changes can look like is discussed in the following chapter, where people-oriented perceptions will be embraced, detached from pure functionalist and materialistic thinking (Gibson-Graham, 2008; Harvey, 2001; Helfrich, 2014).

3.3 Interim conclusion

Different perspectives and theories regarding social actions, relationships and their structure, patterns of roles, and the structures of social subsystems have been the core of this chapter. They were necessary for the explanation of geographical structures and their

changes that followed. I consider the theories of Weber and Habermas useful for a first classification of social actions. Their categorisations help to understand, in retrospective, how policy changes have come about and whether or not they have resulted in processes of appropriation and commodification. Besides, the typologisation of social actions and their rationale as well as the emergence of new relationships – closed or open – spurred my interest with regards to privatised resources and new social structures. With these first categorisations in mind, I continued to divide general social actions into specific role expectations of actors involved, applying Parsons' pattern variables.

Due to the fact that social actions and relationships as well as the structure of the four subsystems of society can explain spatial phenomena only to a certain degree, I have also drawn upon for geographical approaches to structural change. Also here a first distinction between two forms of structural change – benign or perverse – can help to classify the processes at work. This dichotomy is linked to individual mobility, which is of particular interest in the Icelandic context, where unbalanced migration tendencies can be found. Mobility is one key characteristic in the analysis of structural change, and is, at least indirectly, connected to the functions of a certain place, but also its social cohesion and cultural norms (cf. Milbourne & Kitchen 2014). For my research, it is important to highlight that these functions are not only bound to the economic lifeworld of the inhabitants; community attachment and other emotional ties are of equal interest and importance. This is an aspect that is often overlooked in academic discourses regarding structural change.

A last distinction that was made in this chapter, and which is of importance for the Icelandic context, is that between structural change and transformation shock. The main difference lies in the political and temporal dimension. While transformation shocks describe a rather sudden regime shift, structural change is comparatively slow and gradual process that is not necessarily bound to a regime shift.

4 Responses to structural change and resource privatisation

Responses to structural change can be characterised by creativity or apathy, acceptance or rejection, and they affect all levels, from the individual to society at large. This chapter looks further into such responses. It is divided into three parts. The first centres on a particular explanatory and analytical approach for the assessment of structural change: the resilience approach. Since the sphere of policy making is not addressed sufficiently in resilience (see below), a complimentary concept is needed. Adaptive co-management (ACM) provides one way to combine resilience thinking with the political. With these two concepts in mind, the last section is concerned with novel ways of policy making, resource governance and community development in general.

4.1 Resilience

Resource privatisation is a major structural change, that has consequences not only for the resource itself, but also at the social and community level. The question then is how such changes can be analysed comprehensively. The concept of *sustainability* offers one solution. It has a long record in interdisciplinary discourse (Adger, Brooks, Bentham, Agnew, & Eriksen, 2004; Olsson, Galaz, & Boonstra, 2014; Wallimann, 2014). However, it has some deficits. *Resilience* has become the new catchword in the analysis of ecological and social systems as well as natural resource management (Berkes, 2010; Bristow & Healy, 2014; Brown & Williams, 2015). And indeed it provides several analytic tools for addressing changes and responses. We will thus start by delving deeper into the concepts of sustainability and resilience. The second part of this section deals with central elements of resilience, such as panarchy, the question of equilibria, and adaptive cycles. With these three major themes in mind it will be clarified to what extent resilience can be a productive concept for the three fields of research that matter for this thesis: regional development, resource management and social systems.

4.1.1 Sustainability and resilience – a distinction

Even though the sustainability approach appeared over a decade after the introduction of resilience to the ecological discourse, it has received much more attention until recently[5]. Resilience took off after the millennium and has gained popularity since, particularly as an interdisciplinary paradigm. Both approaches can now be considered as established schools of thought. Sometimes the terms seem to be used somewhat arbitrarily and as they were interchangeable. Both approaches share some characteristics, such as an interdisciplinary aspiration and a focus on change and stability. I consider the two concepts as complementing one another: resilience is portrayed as a key to sustainability, and respectively sustainable management appears as a prerequisite for resilience-building strategies (Adger, 2000, 2014; Benson & Garmestani, 2011; Brown & Williams, 2015; Vlasova & Volkov, 2016). By implication, vulnerability, which is usually referred to as

[5] Both terms occurred earlier, but for sustainability it was arguably the "Brundtland report" that established the terminology (Atkinson, Dietz, Neumayer, & Agarwala, 2014), while resilience is attributed to Holling's, writing from 1973 (Holling, 1973).

opposite of resilience, has its origin in unsustainable practices (Adger, 2006; Cutter et al., 2008; van den Bergh, 2014).

Furthermore both concepts can be seen as normative (Bristow & Healy, 2014; Hahne, 2016; Martin & Sunley, 2014; Meerow, Newell, & Stults, 2016; Welsh, 2014; Wilson, 2012). This counts for the question what exactly defines stability and function and who decides about it (see 4.1.4). The question remains whether stability is axiomatically the desirable state, especially with reference to evolutionary thinking (Adger, 2000). This question indicates one of the major differences. Sustainability is rather narrowly focussed on the conservation aspect, which does not necessarily have to be the best choice available (Poli, 2015). Resilience goes deeper in this regard and allows for flexible readings and creative solutions (Holling, 2001). Instead of focussing on the sheer maintenance of a system's function, or the persistence of a certain state, it includes the possibilities of transformation, improvements and change (Hahne, 2016; Keck & Sakdapolrak, 2013; Maguire & Cartwright, 2008; Meerow et al., 2016). This can also be linked to the focus on risk and coping that receives more attention in the resilience literature than in writings about sustainability (Clay & Olson, 2008; Holling, 2001; Martin & Sunley, 2014; Salmi, 2005; Welsh, 2014).

With regard to the subject matter of this thesis, the main difference is well captured by Symes at al.:

> [R]esilience building strategies should focus not on securing the survival or sustainability of individual fishing enterprises or even individual fishing communities, but on the overall integrity, flexibility and dynamics of the underlying ecological and social systems (Symes et al., 2015, p. 248).

One last difference that is central here, lies in the discussion of equilibria and stability that can be found mainly within sustainability, while resilience emphasises shocks, disruptions, uncertainty and perturbations (Hillier, 2016; Martin & Sunley, 2014; Salmi, 2005; Welsh, 2014).

Before discussing the question of equilibria in the following section, a short note should clarify my personal stance regarding the two concepts. First of all, I see resilience is a necessary extension of sustainability. The concepts should be considered interdependent instead of mutually exclusive or antagonistic. Arguably resilience is more holistic, multidimensional and flexible than sustainability. Even though the notion that 'everything is connected' appears frequently in discussions on sustainability, this is not enough for a sound theoretical framework. Resilience goes one step further with the introduction of ideas about panarchy and adaptive cycles, which will follow the discussion on equilibria.

4.1.2 Equilibrium, panarchy and adaptive cycles

Structural changes or policy transformations can be the reasons for shocks, which are part and parcel of resilience research. Shocks can lead to a (sub-)system's instability, as was brought up in the previous chapter. Following a shock, the system may achieve some kind of equilibrium and/or stability again, but collapse and destruction are another possible outcomes.

The initial definition of resilience by Holling clearly shows the distinction from rigid equilibrium thinking that comes with resilience:

> One [property] can be termed stability, which represents the ability of a system to return to an equilibrium state after a temporary disturbance; the more rapidly it returns and the less it fluctuates, the more stable it would be. But there is another property, termed resilience, that is a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables (Holling, 1973, p. 14).

From this point of departure, the question of equilibrium remains contested (Berkes & Ross, 2013a; Brown & Williams, 2015; Hodgson, McDonald, & Hosken, 2015). For some the return to an equilibrium is an integral part of resilience, while others highlight the necessity of concepts that go beyond single equilibria (a good discussion is presented by Bristow & Healy, 2014; Hillier, 2016).

For social and community resilience, equilibrium can be understood as the return to a desirable previous state, the restoration of key functions or the retaining of structure and identity (Wilson, 2012). Meerow et al. (2016) stress that one needs to consider that the previous or original state itself might have been an undesirable one. In this case, the option of bouncing back should not be the preferred one. This is precisely where the aforementioned aspect of normativity comes in: what is the key function and which structure is talked about; to which state is a resilient system meant to bounce back? But not only is it normative in certain respects; it is also related to the phenomenon of path-dependency to which equilibrium orientation is bound (Petrick, 2016).

Meanwhile, resilience is different from steady-state thinking and recognises non-equilibrium or at least multiple and dynamic equilibria as option, which opens up for the possibility of different development paths (Benson & Garmestani, 2011; Berkes & Ross, 2013a; Brown & Williams, 2015; Hermans & Knippenberg, 2006; Lorenz, 2013). This is the natural result of complexity, uncertainty and instability. Hence, single-equilibrium thinking is not applicable in resource management (Allison & Ellis, 2001; Berkes, 2006; Bromley, 2009; Garcia, 2010; Martin & Sunley, 2014; Moxnes, 2010; van den Bergh, 2014). Concluding from this, the notion of 'post-equilibrium' thinking is discussed for future management regimes of dynamic, or wicked systems (see 4.2.) (Johnson, 2013).

Resilience thinking has brought with it some essential new concepts. One of those, which highlights the problem of the multitude of equilibria, is *panarchy* (Slight, Adams, & Sherren, 2016). A combination of the name of the Greek god of nature, Pan, who incorporates characteristics such as unpredictability and change, with the latter part of hierarchy, it is a concept for the understanding and analysis of complex systems (Holling, 2001). It represents an attempt to add more flexibility to traditional concepts of strict hierarchical orders and top-down management, and takes into consideration the non-linearity and non-persistence of nature and complex systems in general (Gunderson & Holling, 2001; Holling, 2001; Slight et al., 2016).

Panarchy is a model that merges social and ecological systems into socio-ecological systems (SES) and combines them with complexity theory (Welsh, 2014). A central aspect of panarchy is the consideration of different perpetrators of a crisis, disturbance and the following transformation or adaptation (Olsson et al., 2014). Yet, as the allusion to

hierarchy indicates, the concept adds the aspects of scale, both in terms of time and space as well as governance (Brown & Williams, 2015; Cutter et al., 2008; Simmie & Martin, 2010; Slight et al., 2016; Welsh, 2014).

Panarchy is meant to capture the way living systems persist and yet innovate (Holling, 2001; Holling & Sundstrom, 2015). The coupling happens in an adaptive and interdependent way; it is about interlinked systems in never-ending adaptive cycles (Holling, 2001; Keck & Sakdapolrak, 2013). The adaptive cycles usually consist of four periods: accumulation and growth; stagnation, rigidity and lock-in; sudden collapse; and re-organization and renewal (Cumming, 2014; Keck & Sakdapolrak, 2013).

4.1.3 Resilience in regional development

Since an ecology-rooted concept can hardly be transferred directly to social phenomena, the application of resilience thinking to theories of regional development is not uncontested (Christopherson, Michie, & Tyler, 2010; Martin & Sunley, 2014; Simmie & Martin, 2010; Tonts, Plummer, & Argent, 2014). One can read into regional resilience a concept that is about the maintenance of the underlying management and governmental system, but it can also be interpreted as call for a fundamental change. This is particularly highlighted in the difference between adaptation and transformation.

Some definitions and interpretations allow for the conclusion that resilience is uncritical towards the political and economic framework. Resilience is then defined as an economic growth target (Slight et al., 2016; Wink et al., 2016). For example Brown and Williams (2015, p. 1421), define resilience as "the capacity of a system, community, or society to resist or to change in order that it may obtain an acceptable level in functioning and structure". Simmie and Martin consider a resilient regional economy as one

> [that] adapts successfully and either resumes, or better still improves, its long-run equilibrium growth path. A non-resilient regional economy would presumably be one that fails to transform itself successfully and instead becomes 'locked' into an outmoded or obsolete structure, with a consequential lowering of its long-run equilibrium growth path (Simmie and Martin, 2010, p. 4).

Applying the idea of panarchy and adaptive cycles to regional development can look like this: usually regions can be characterised by adaptive cycles of growth and decline, stability and change (Bristow & Healy, 2014; Simmie & Martin, 2010). The cycles might be adjusted and thus the adaptive cycles for regional development consist of the four following phases (Simmie & Martin, 2010, p. 15):

- innovation and restructuring
- growth and the seizing of opportunities
- stability and increasing rigidity
- release phase and eventually the repetition of the cycle over various periods of time

Resilience and panarchy, when applied to regional development, are thus part of the economic growth mantra. This is understandable when the definition of ecological resilience and its population dynamics are interpreted literally and are translated into some sort of 'counting heads' or measuring solely economic performances. This is probably the

easiest measure. Yet politics and economy need to be considered as possible stressors (Amundsen, 2012; Berkes, 2006). What if the underlying system, that proclaims growth and prosperity as ultimate goals while implementing politics of austerity and unsolidarity, is not the effect but the cause?

Regional and community resilience are about much more than the number of people, the stability of local economies and the prosperity of regional industries. Function and structure, adaptation and transformation can be seen from another point of view as well. This view is considers classic economic growth targets and equilibrium thinking as cause for stress. A definition for a rather critical approach to regional development is that of Amundsen:

> Community resilience is the ability of a community to cope and adjust to stresses caused by social, political, and environmental change and to engage community resources to overcome adversity and take advantage of opportunities in response to change (Amundsen, 2012, p. 1).

One of the critical points is the handling of transformation and adaptation (Brown & Williams, 2015; Meerow et al., 2016; Olsson et al., 2014). Transformability describes the general capacity to create a fundamentally new system, the reconfiguration of a given system or the alteration of the system and moving to a new state (Amundsen, 2012; Brown & Williams, 2015; Salmi, 2015). The difference to adaptation can be defined as follows:

> Transformations are different from adaptations because they typically challenge rather than seek adjustments to or maintain the current system or the status quo. A key feature of deliberative transformations is recognition that fundamental shifts in some elements of a system or sub-system are needed to achieve desirable futures (Armitage et al., 2015, p. 246).

Transformability describes the general capacity to create a fundamentally new system, the reconfiguration of a given system or the alteration of the system and moving to a new state (Amundsen, 2012; Brown & Williams, 2015; Salmi, 2015). The idea of transformation can certainly be linked to some sort of ‘creative destruction’ and depends on the ‘transformative capacities’ within the system (Keck & Sakdapolrak, 2013; Roberts & Townsend, 2016; Tonts et al., 2014). Building on this, resilience can be understood as transformation in a creative sense and thus:

> It accepts that change is inevitable, rather than seeing change as a ‘stressor’ from which a community needs to recover to its original state. The view of resilience as transformation embraces the dynamic character of communities and human-ecosystem interactions and sees multiple potential pathways within them. Deterministic views of resilience which see resilience as a community simply returning to a pre-existing state are unable to incorporate this complexity (Maguire & Cartwright, 2008, p. 5).

For transformations, Olsson et al. (2006) outlined a three-phase heuristic that includes three stages. The first one is about the preparing for change, while the second phase navigates the transition from one regime to another. The final stage centres on the building of resilience in the new regime. Strategies to operationalize such heuristics then necessitate

the discussion of new forms of management, such adaptive management and governance (Armitage et al., 2015).

Even though some might interpret resilience solely through transformation and change, this does not necessarily have to be the case. A system that has not changed for decades does not necessarily have to be non-resilient – some might ask for the need to change a running system – it is more about the overall ability to change, adjust and transform. However, for an unaltered system that has been persistent for decades, the threat of rigidity and lock-in is severe (Holling, 2001).

4.1.4 Resilience and resource management

Conventional resource management has been criticised on many fronts. Classic resource management, particularly fisheries are very much based on models that define equilibria, such as a maximum sustainable yield (Allison & Ellis, 2001; Benson & Garmestani, 2011; Johnson, 2013; Welsh, 2014). They centre on the trinity of a given stock, the fleet and the market (Garcia, 2010). Furthermore conventional management is narrowly framed by control and stability, while the scientific input is usually reductionist and positivistic (Symes, 2014). Hence, this sort of management is comparatively inflexible for adaptation (McConney & Charles, 2010). Solutions to urgent problems are rather ad hoc and technical (Degnbol et al., 2006; Symes, 2014). Thus it is little surprising that calls for sustainable and resilient resource management are growing louder.

As discussed above, sustainability and resilience are interdependent concepts, especially against the background of resource management. Sustainability is of importance, particularly with regards to inter- and intragenerational justice; the nucleus of the concept. In addition, the continued existence and preservation of a resource should be the overall objective of resource management. With the limitations of sustainability and classic resource management that have been discussed, resilience comes in and with it the implementation of more flexible approaches that allow for adaptation and adjustment (Berkes, 2006; Nelson, Adger, & Brown, 2007; Williams & Nichols, 2014). Resources are prone to cycles of crisis, collapse, recovery and reorientation. Thus they require a management regime that can adjust to it, allows for flexibility and considers non-linearity as norm and not exception (Berkes, 2006) (Blackmore, 2007; Hodgson et al., 2015).

Resilience widens the adaptation process by opening up for transformation, which is arguably a weighty argument in the discussion of resource management. In other terms, some resources are – either already or in the long run – not extractable on a large scale. Some species and stocks will need decades for recovering. Thus, it is essential to shift the focus and aim for novel forms of resource utilisation. Translated to resilience, that means the exploration of alternative stable and robust states. By no means is that advocating the acceptance of resource depletion, or the legitimation of over-exploitation. It should be understood as a necessary shift of mindsets, away from a quantitative focus, to quality-oriented ways of resource exploitation. Resilience can thus be understood as call for proactive attempts in resource management (Brown & Williams, 2015; Graham et al., 2013).

Concluding from the previous elaborations, resilience in resource management has to tackle all levels of the management and governance process (Chuenpagdee & Mahon, 2013; Fabricius & Currie, 2015). That means that not only the resource needs to be

governed for resilience, but the underlying system itself has to be resilient. That the management process needs to be inherently resilient does not mean that it is rigid or locked-in, but rather flexible and adjusting to changes. It is adaptive and maybe even ready to transform. A resilient governing system thus has the capacity to recover from undesirable events and to learn from inaccuracies (Allen & Garmestani, 2015a; Jentoft, 2007; McConney, Pomeroy, & Mahon, 2003).

4.1.5 The politics of resilience and panarchy

As mentioned before, resilience thinking is very much bound to the political processes at work. Politics can be both, the possible stressor but also the enabling component for adaptation and transformation (Amundsen, 2012; Berkes, 2006). Despite the fact that resilience and panarchy can hardly be interpreted as politically neutral concepts, the political dimension has seldom be focussed on. Since contemporary place-based communities are in a constant struggle and defence at 'myriad nodes' intertwined in the triangle of politics, capital and space, it is however of tremendous importance to address the political framework (Russell, 2008, p. 35).

Some authors highlight the endogenous character of adaptive cycles (Keck & Sakdapolrak, 2013), which can lead to the assumption that those cycles are (only) perpetuated from within, and thus are a closed system. Walker et al. disagree in this regard by highlighting that:

> [B]ecause of cross-scale interactions, the resilience of a system at a particular focal scale will depend on the influences from states and dynamics at scales above and below. For example, external oppressive politics, invasions, market shifts, or global climate change can trigger local surprises and regime shifts (Walker et al. 2004, p.5).

Furthermore, resilience is about different systems, hierarchies and interactions in between that make up the whole system (Lorenz, 2013; Westley, Carpenter, & Brock, 2002). The question is, then, who is object and subject in these interactions, which leads into aspects of efficacy and agency (Berkes & Ross, 2013a; Roberts & Townsend, 2016).

In connection to that, the question of 'resilience *for* whom' has been frequently addressed (Adger, 2000; Cretney, 2014; Meerow & Newell, 2016), while the question 'resilience *by* whom' seems to be more important in most contexts. The answer to both questions is usually of political significance. Tackling vulnerability, be it through resilience-building measures, depends on enabling factors, which can be provided by the governing bodies. However, there is reason to suspect that in some occasions resilience is used as a last-resort action and the responsibility for future development strategies is handed back to those actors that were the victims of oppressive politics and austerity beforehand (Bock, 2016; Bristow & Healy, 2014; Roberts & Townsend, 2016). However, not every development path ends in a new equilibrium or 'alternative stable state'. Ideas and capacities for coping strategies might be present in the community, but they are dependent – to a varying extent – on enabling factors coming from outside the community, such as governing bodies and economic support schemes.

One might come to the conclusion that academic handling of resilience has been blind on the political eye, or deliberately avoiding the discussion of politics. And even though the political spectrum is recognised as an agent nowadays, the political framing of resilience

building still receives too little attention (Cox & Hamlen, 2015; Keck & Sakdapolrak, 2013; Welsh, 2014; Wilson, 2013a).

4.2 Adaptive Co-Management

From the existing resilience literature and the discussion in the previous section, one can conclude that conventional political and economic concepts, driven by inflexible bureaucratic administration and end-goal oriented economic control in a top-down policy making process, are deficient when it comes to handling complex SES in a comprehensive way. Implementing purely 'instrumentally rational' policies that might result in commodification and juridification (see chapter 3) is not a sufficient move when aiming for a truly sustainable and resilient system. Adaptation or transformation has to take place at all levels of the management regime, and thus encompass all sub-systems. With reference to Rawls, policy making and resource governance should include the allegedly weakest link. Procedural and substantive justice, as well as participation and feedback, also need to be considered.

One concept that incorporates these aspects and can help to overcome the deficits of conventional practices is adaptive co-management (ACM). The following section centres first on the theoretical part, before a brief section highlights examples of the successful introduction of ACM.

4.2.1 ACM in theory

The idea to combine ACM, resilience and sustainability is not novel, but rather a logical consequence (Fabricius & Currie, 2015; McConney & Charles, 2010; Olsson, Folke, & Berkes, 2004; Smit & Wandel, 2006; Walker et al., 2004). These concepts can form a promising symbiosis, particularly when the aspects of adaptation, or adaptive capacity, as well as transformability are considered (Berkes, Armitage, & Doubleday, 2007; Folke et al., 2010; Olsson, 2007; Olsson et al., 2014). ACM allows for the recognition of non-equilibrium and instability in social-ecological system and integrates different knowledge types (Allison & Ellis, 2001; Benson & Schultz, 2015; Chuenpagdee & Jentoft, 2013; Johnson & Williams, 2015; Vlasova & Volkov, 2016). But one important aspect has to be kept in mind for bridging the concepts: resilience theory is incompatible with ACM when it is purely normative and neglects the aspect of power-sharing (Armitage, Berkes, & Doubleday, 2007b; Kofinas, Herman, & Meek, 2007). In case the aspect of normativity is minimised, the actors themselves can decide about the desired state that their system should bounce back or forward to.

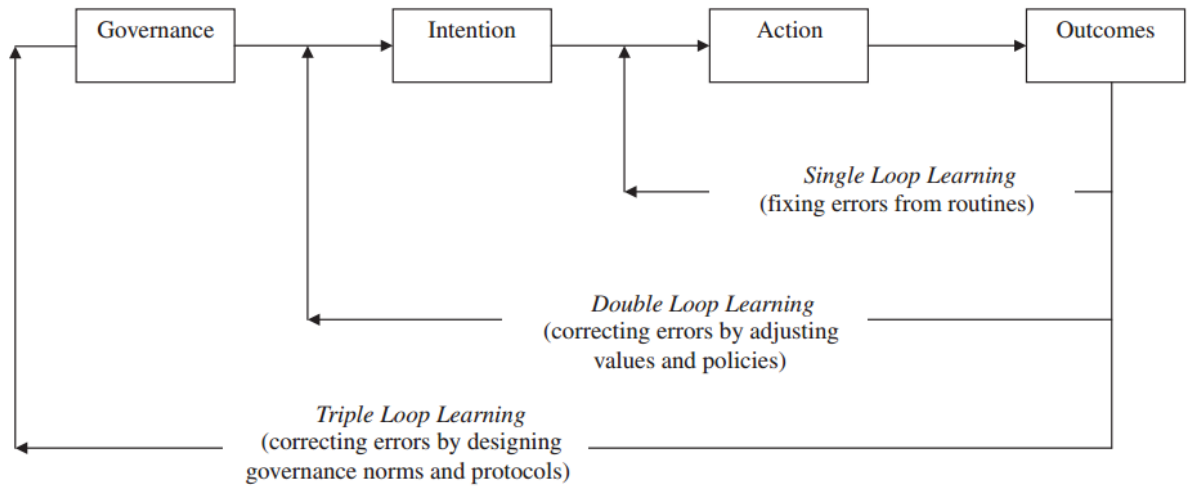
As stated before, conventional management practices focus mainly on the end goals and subsequently on the means for achieving them. In contrast, ACM should be understood as process and not an endpoint (Berkes et al., 2007; Fabricius & Currie, 2015). The table below (Table 6) summarises some of the key characteristics that comprise ACM and it processes. Not all the aspects will be further elaborated, as this is done in one of the published articles (Kokorsch et al., 2015). Thus the main focus will be on highlighting aspects that are not dealt with in that article and to combine resilience thinking with ACM.

Table 6 Key characteristics that comprise Adaptive Co-Management

Characteristic/feature	**Source**
Learning by doing and the recognition of uncertainty	Allen & Garmestani, 2015a; Armitage et al., 2007b; Armitage, Marschke, & Plummer, 2008; Fitzpatrick, 2014
Integration and sharing of different knowledge systems	Allen & Garmestani, 2015a; Jentoft & Chuenpagdee, 2015; Jentoft et al., 1998
Collaboration and dialogue	Carlsson & Berkes, 2005; Fabricius & Currie, 2015
Feedback loops and iterative processes	Fabricius & Currie, 2015; Nielsen & Holm, 2007
A degree of autonomy for different actors at multiple levels	Armitage et al., 2007b
Individual and community empowerment	Pomeroy, 2007
Devolution of power	Plummer, Armitage, & De Loë, 2013
Decentralisation of power, authority and responsibility from the central government to lower or local level institutions	Pomeroy, 2000
Subsidiarity	Berkes, 2007a
Delegation of management responsibilities and authority	Jentoft et al., 1998
Transformability	Olsson, 2007

The focus of ACM is on collaboration, dialogue and the integration of different forms of knowledge. This happens on all levels, from local initiatives to (supra-)national institutions and also between scientific disciplines (Gunderson, 2015). It can thus be considered the (cognitive) foundation for the aforementioned (deliberate) transformation (Armitage et al., 2015; cf. Cox & Hamlen, 2015; Fabricius & Currie, 2015; Gunderson, 2015). The knowledge integration can be connected to the 'triple loop learning', which is one of the main ACM characteristics (Allen & Garmestani, 2015b).

The three loops are presented in the figure below. It shows that the consequent implementation of ACM affects all actors involved in resource management. The three forms of learning can be defined as follows (Armitage et al., 2008; Blackmore, 2007; Nielsen & Holm, 2007): The fixing of errors from routines describes single-loop learning, yet without any alteration of the underlying norms, values or overall policies (Armitage et al., 2008; Blackmore, 2007). The correction of exactly those errors through an adjustment of values and policies is thus central in double-loop learning processes. Triple-loop learning affects governance norms and protocols. It can also be understood as 'evolutionary' or 'transformational learning' as it does not only aim for new tools and practices but a fundamental rearrangement of the 'paradigmatic structure' of the system of governance (Armitage et al., 2009; Blackmore, 2007; Gunderson, 2015).



(after Armitage et al., 2008, p. 89)

Figure 1 Triple loop learning in ACM

Another strong argument for ACM is that conventional management comes with a marginalisation of stakeholders, which has adverse effects on equity and might harm community welfare eventually (Berkes, 2009; Fabricius & Currie, 2015). Building on this, ACM questions power relations and structural inequalities (Olsson et al., 2014). With regards to fisheries and justice, unequal power-sharing certainly violates aspects of 'creative justice', which is characterised by the "opportunities to develop and share knowledge, to influence understandings about fisheries and fishery ecosystems, and to act on those understandings" (Neis & Morris, 2000, p. 174). The re-installation of creative justice is one strong argument for ACM, that combines all sorts of 'valid knowledge' that the different actors bring with them (Neis & Morris, 2000). Equity and justice are two reasons for ACM, that can be enhanced by social acceptance of governance outcomes that derive from collaborative forms of decision making and thus contribute to the overall legitimacy (Fabricius & Currie, 2015; Maguire & Cartwright, 2008; Oteros-Rozas, Ravera, & Palomo, 2015).

Concluding from this, ACM can be interpreted as counter-capitalist and as antagonistic to conventional resource management (Nadasdy, 2007). However, it is not by default a revolutionary concept. Like with resilience, the underlying political processes have to be critically scrutinized and need fixes that go beyond single-loop learning, allowing for the readjustment or reformation of the governance norms and protocols (see figure above). Carlsson and Berkes (Carlsson & Berkes, 2005, p. 71) thus conclude that "co-management can bring about a degree of power-sharing but without necessarily eliminating power relations within the community. Thus, co-management is not a panacea for all problems in society and is not good or bad per se".

ACM certainly has some weak points. Above all, its success depends on the conception of man and the underlying worldviews. With the idea of rational choice prevalent and the neglecting of aspects such as selflessness, solidarity and a shared vision, co-management is basically inconceivable (Jentoft et al., 1998, p. 425).

From these statements one can continue to the difficulty of whom to include in the management process (Brunk & Dunham, 2000). However, not only the question about whom to include but also the number of stakeholders warrants consideration. While the first part has been frequently discussed, the latter has rather rarely be addressed (Griffin, 2010; Kokorsch et al., 2015; Reed, 2008; Reed et al., 2009). This remains the problem of ACM that tries to be inclusive and yet flexible and efficient (Linke & Bruckmeier, 2015).

Moreover, the assumption that the best solutions can only be found in a decentralised way can be doubted. Or that, by implication, resources that are managed at the local scale and from the bottom-up do *per se* secure positive outcomes. Local tunnel vision and a lack of solidarity are also features that can be found at the community scale. The critique can be summarized in the following statement:

> In recent decades 'community' has become widely, and for the most part uncritically, acclaimed as the appropriate unit for implementation of resource conservation and environmental management. Among the factors that have contributed to this recognition has been an increasing disillusionment with conventional centralized and hierarchical approaches to conservation and management (Mulrennan, 2008, p. 69).

Regionalisation of politics can result in separatism or balkanisation. Thus aspects of solidarity and justice as well as clear structures and objectives for the procedure of ACM are inevitable. The dichotomy of top-down versus bottom-up is certainly too short-sighted. For ACM approaches the alternative of 'top-led and bottom-fed' seems to be the best compromise.

4.2.2 ACM in practice

With these theoretical underpinnings in mind, the following section centres on ACM in practice, even though not all examples here refer to themselves as ACM. Some of the examples applied some features of co-management, carry certain characteristics or varieties of progressive moves for new and cooperative forms of management.

Forms of co-management receive increasing attention from the local to the global scale, particularly when it comes to environmental and climate related issues (Plummer & Baird, 2013; Schultz, Duit, & Folke, 2011). Examples can be found for all sorts of resource use, such as forest management (Elbakidze, Angelstam, Sandström, & Axelsson, 2010), water management (Medema, McIntosh, & Jeffrey, 2008), landscape politics (Enengel, Penker, & Muhar, 2014) and fisheries (see below).

More precisely, some seven major fields for the application of co-management can be considered in resource management (Carlsson & Berkes, 2005; Kokorsch et al., 2015; Pinkerton, 1989). These are data gathering, logistical and allocation decisions, protection of resource from environmental damage, enforcement of regulations, enhancement of long-term planning, and more inclusive decision-making. Suitable examples for these fields can be found in the table below.

Table 7 Examples of applied adaptive management and/or co-management

Field for (adaptive) co-management	Examples
Data gathering	Participatory action research in Florida (Bolton, Brennan, Pracht, & Terry, 2010)
	Farming in Northern Tanzania (Clavel, 2014)
Logistical decision	Caribbean coastal resource management (McConney et al., 2003)
	Subsistence fisheries in Western Canadian Arctic (Ayles, Bell, & Hoyt, 2007)
Allocation decision	Marine protected areas in Galicia (de Oliveira, 2013)
	Community harvesting plans in Nova Scotia (Grafton et al., 2006) Stakeholder and women empowerment for enhanced governability (Frangoudes, Marugán-Pintos, & Pascual-Fernandez, 2013)
Resource protection	Community-based fisheries in New England (Tolley & Hall-Arber, 2015)
	Selective gear fishing in Lake Vättern (Mackinson & Wilson, 2014)
	Collective action in Amazonian flood plain (Castro, 2012)
	Regional restoration efforts in Everglades (Gunderson & Light, 2006)
	Forrest harvesting in North America (Holling & Sundstrom, 2015)
Enforcement of regulation	Coastal and fisheries co-management in South Africa (Hauck & Sowman, 2001)
	Lay-up system in British Columbia fisheries (Pinkerton, 2013)
Planning	Forest initiatives in Sweden and Russia (Elbakidze et al., 2010)
	Wetland landscapes, Kristianstadt (Holling & Sundstrom, 2015; Olsson, 2007; Olsson, Folke, & Hahn, 2004)
Decision making	Irish inshore fisheries (Karlsen, 2001)
	Stakeholder-driven management of Cook-River (Fabricius & Currie, 2015)

In fisheries alone, some 130 examples of regimes that match the criteria of co-management can be found around the world (Cinner et al., 2012; Gutiérrez, Hilborn, & Defeo, 2011; Le Floc'h et al., 2015; McConney et al., 2003). Particularly in Asia, greater devolution and decentralisation as well as community- and ecosystem based management systems seem to have gained popularity (Makino, 2010; Pomeroy, Katon, & Harkes, 2001; Williams & Staples, 2010).

4.2.3 Lessons learned from the EU Common Fisheries Policy

Components of ACM have not only gained popularity in Asia. For the Icelandic case it is of interest to shift the focus towards other European fisheries management regimes. On the one hand there are two independent fishing nations with a comparatively high annual catch, Norway and Iceland, while on the other over 20 national fleets operate under the 'Common Fisheries Policy' (CFP) of the European Union (EU). The CFP is an ambitious

endeavour as it has to include locally embedded fisheries, large and small scale operations, and a myriad of subsystems.

The shortcomings and failures of this project – particularly the top-down nature and highly science-based approaches – have been extensively discussed and the critique seems to have had some impact (Linke & Bruckmeier, 2015). The latest CFP thus highlights aspects of regionalisation and improved stakeholder consultation for best scientific advice. Examples for the implication of some projects that fit certain criteria of co-management ideas are the 'regional advisory councils' (RAC) and 'fisheries local action groups' (FLAGs).

Regional advisory councils were one step towards more inclusiveness and participatory decision making in the early 2000s (Gallizioli, 2014; Linke & Bruckmeier, 2015; Österblom et al., 2011). They are defined as stakeholder-led organisations and have the task to provide recommendations for the EU fisheries management in an interdisciplinary and regionalised context (Frost, 2010; Hegland & Wilson, 2009; Mackinson & Wilson, 2014). It is an attempt to overcome complexity, institutional inflexibility and inconsistencies.

(F)LAGs were introduced in 2007 and are a response to the lack of co-management tools in the EU in general (not only fisheries, then referred to as LAG). They indicate the general willingness for reciprocity and the inclusion of local knowledge. Consequently, FLAGs are located in areas that are distinct with regards to their geographical, environmental and economic conditions, as well as their cultural and social structures (Linke & Bruckmeier, 2015; Symes et al., 2015; Walle, Gomes da Silva, O'Hara, & Soto, 2015). The overall aim is the strengthening of the resilience of local fishing industries and communities through cooperative tools, such as partnership building (Budzich-Tabor, 2014; Symes, 2014). Furthermore the competitiveness of community-scale enterprises is envisaged through the exploitation of new branches within in the marine environment.

Regardless of the many substantial arguments levelled against the CFP, it shows the general possibility of reforms within a rather rigid and inflexible system such as the EU. It can be debated whether or not (adaptive) co-management has been successful in European waters. From a truly holistic perspective it might even be impossible unless the third learning loop is consequently gone through. Until then, it is rather the small stories one can learn from. One should thus keep in mind that ACM is a process and involves continuous learning, adjustment and/or transformation (Österblom et al., 2011).

Concluding from the overall literature, and especially from the first cautious attempts for devolution and decentralisation by the usually cumbersome EU, a few common mistakes can be identified. These need to be addressed; otherwise the idea of co-management remains an illusion. In general ACM appears to be incompatible to "contexts where stakeholder capacity is lacking, governance is weak, problems are 'tame', solutions are urgent and trust is low" (Allen & Garmestani, 2015a, p. 7). This usually happens when the local context and institutions are not addressed sufficiently. Another problem in this regard is an institutional design that turned out to be top-down (Berkes et al., 2007).

Problems at 'the bottom' occurred when participation took place in an ambiguous settings and the scope of agency was limited or when 'nested hierarchies' appeared (Berghöfer, Wittmer, & Rauschmayer, 2008). It is thus not surprising that embeddedness and path

dependency regarding complex (political) networks can also be found among co-management experiences (Tonts et al., 2014; Wilson, 2013a).

Nested hierarchies, embeddedness and path dependency are a problem of disciplinary boundaries and inflexible thinking. Lacking advise and expertise from social sciences was considered a possible flaw (Fitzpatrick, 2014; Symes & Hoefnagel, 2010). The translation of scientific advice, and the realisation of theoretical recommendations can be linked to the previous concerns (Allen & Garmestani, 2015b). Another aspect regards the scale of implementation and the level of jurisdiction. Problems occurred when co-management was only envisaged at operational but not at the constitutional level (Fitzpatrick, 2014; Jentoft et al., 2010) and when they were brought in as last resort action (McConney & Charles, 2010).

Even though the overall political rigidness and the lack of fiscal support are frequently mentioned problems, one can assume that improvements are more connected to the changing of the mind-set than the actual policy (Berkes et al., 2007; Holling & Sundstrom, 2015; Pascoe & Tingley, 2010).

4.3 Interim conclusion

How can structural change – or a transformation shock – be dealt with by the different actors involved and which tools are available for an improved and inclusive natural resource management? These were the basic questions dealt with in this chapter, and which have in fact been prominent throughout the PhD project. Resilience has been its major theoretical concept and provides the foundation of three papers, while ACM as policy/decision making instrument is presented in one article as an alternative to conventional top-down resource governance.

For me, resilience is a necessary extension of sustainability thinking due to shifting the focus away from strict maintenance of a systems function or persistence: transformation and collapse are conceivable avenues. The question of equilibria and/or stable states is prominent in the resilience discourse. This made it particularly suitable for my studies, during which I came across communities that have experienced several ups and downs – regarding socio-economic, demography and the fishing industry.

For social and community resilience, equilibrium can be understood as the return to a desirable previous state, the restoration of key functions or the retaining of structure and identity. This understanding can be linked to chapter 3, in which the function of places was discussed. For fishing communities in Iceland with a one-sided economic structure, questions about desirable states, key functions, structures and identities are difficult to answer. Since resilience should be detached from steady-state thinking while recognising non-equilibrium, or at least multiple and dynamic equilibria as option, it opens up for the possibility of different development paths.

Even though resilience has proven to be a suitable theory with good tools for an assessment of local development trajectories, its application in the analysis of regional development is not uncontested. Resilience theory has been accused of being uncritical towards the political and economic framework. Politics and economy need to be considered as possible stressors, however. Resilience-building strategies should never come as a last-resort action. Empowering small and vulnerable communities and

responding to local needs is progressive in itself, but it needs a solid financial foundation and expertise. It is not a resilience-building strategy when communities first lose their economic mainstay – the access right to local resources –followed by closures of local services, before they are made responsible for developing their own future strategies. The responsibility is thus handed back to those who have been disenfranchised before. Resilience building needs to set in at an early stage, when the scope of action may include more than merely crisis management. However, this needs governance structures that are flexible and adjusting to changes, adaptive and maybe even ready to transform.

When resilience-building strategies enable power sharing, ACM and the integration of different knowledge types – at best through triple-loop learning – enter the stage. Limitations of classic resource management have been frequently discussed and arguments for the implementation of more flexible approaches that allow for adaptation and adjustment have also been delivered – in theory and practice.

From theory and practice the following points are most central for the discussion and analysis of the Icelandic case later on: First, ACM should be understood as process and not an endpoint. Second, the assumption that the best solutions to a resource dilemma and local development strategies can only be found through decentralisation is a fallacy. Nor are resources that are managed at the local scale and from the bottom-up immune to mistakes and mismanagement. As a compromise for the dichotomy of bottom-up versus top down, I consider the flexible reading of 'top-led and bottom-fed' to be more promising.

5 Research methods

The analysis of a fisheries management system, regional development and community resilience is too complex to rely on a single approach or data set. The entanglement of the spatial and temporal dimensions adds to the complexity. Consequently, use was made of several methods in the PhD research. It includes a survey, quantitative spatial and temporal analysis of available statistical data, as well as qualitative results deriving from two case-studies. In terms of spatiality and governance, the research started at the national-level and became more specific gradually, ending at the local level.

5.1 Methodological triangulation

The research was designed as both quantitative and qualitative, with the aim to secure methodological triangulation. The collected data is thus more robust and validity threats as well as mono-causal conclusions can be reduced or at best eliminated (Berg, 2007; Creswell & Clark, 2007; Stolz, 2016; Tonon, 2015). Consequently, this complies with the different quality criteria, validity, objectivity and reliability (Vanderstoep & Johnston, 2009).

For being considered as methodological triangulation, the research needs to be more than just a loose combination of different methods and data; it requires a meaningful relation between them and application for mutual validation. Hence, methodological triangulation is defined as the utilisation of at least three methods for studying the same particular phenomenon or object (Hussein, 2015; Kimchi, Polivka, & Stevenson, 1991; Mitchell, 1986). Whether the conducted research meets the requirements of data triangulation is up to discussion. Temporality, spatiality as well as socio-economic and demographic factors are covered, so that this form of triangulation is covered to a certain extent (cf.Berg, 2007; Hussein, 2015). A very distinct form of spatial triangulation has been achieved in this study, following the maxim of Hassink (2010), that the study of regional economies and development, especially lock-ins in old industrial areas, needs to be contextualised around all spatial levels, from the local to the supra-national.

Even if methodological triangulation is applied, it can still be argued that the results are subject to the researcher's interpretation and his personal – epistemologically or ontologically derived – construction of social reality. However, equipped with sound quantitative and qualitative data, the foundation for generalizable assumptions and conclusions is much more solid (Hussein, 2015; Mabry, 2008).

The quantitative research was conducted during the first two years. It involved an assessment and overview of demographic processes, socio-economic development and the performance of the fishing industry. With an evaluation of different development trajectories in Icelandic fishing villages and the interpretation of the survey data, the subsequent case studies were quantitatively substantiated and justified (cf. Fielding & Fielding, 2008).

Places of varying resilience and vulnerability in different context were identified with a cluster analysis. Two vulnerable fishing villages were identified and selected for case studies afterwards to validate previous findings. The case studies were conducted in order

to ascertain the causes and consequences of local structural change and find out which responses had unfolded afterwards.

5.2 Quantitative research

The quantitative phase of the research was divided into two parts: a survey and the compilation of a data set. The survey itself was not set up by the author in its original form. The formulation of the questions was not the researcher's task and thus it will not be dealt with in this section.

5.2.1 The survey

The survey was meant to grasp the opinions of the wide array of stakeholders in fisheries. The research group (see section 1.4) had a comprehensive definition of stakeholder in mind and did not only approach those who hold the power or study the fisheries elite, but we aimed to reach those stakeholders at the factory floor as well (cf. Hoffmann-Lange, 2008). Furthermore we wanted to avoid the mistake of purposive sampling (Mabry, 2008). Hence, in the survey a distinction was made between the educational background and the participants' role(s) in the fishing industry. We were aware of the possible weaknesses and errors that can appear in the survey process. Sampling and coverage error appear when only a subset of a population is chosen (Weisberg, 2008). As a consequence, we divided the survey distribution.

For achieving a broader distribution of participants, the survey was distributed in field trips around the county. Several fishing companies were contacted and visited. A permission to approach the different groups of workers during their breaks, and thus in their familiar surroundings and work environment (Hoffmann-Lange, 2008), was usually given without problems. These visits to companies and factories included numerous informal interviews with the administrative bodies. At the harbour sites we approached the fishermen to get an impression of the daily work routines.

Since we were well aware of the fact that only a limited degree of the population and villages can be covered this way, an online version of the survey was distributed in parallel. Spatial and professional bias was thus avoided and the threat of sampling and coverage errors kept to a minimum [6].

5.2.2 Data compilation and cluster analysis

The survey was followed by another quantitative phase. The aim was to identify different development trajectories of Icelandic fishing villages after the introduction of ITQs. A data set with three major fields – demography, socio-economics and fisheries – was set up. A variety of data from numerous relevant institutions were analysed and integrated, with the aim to secure verification, convergence, complementarity and holism (Bergman, 2008; Fielding & Fielding, 2008).

Some minor constraints occurred during the data collection. In general, no cohort or panel studies were available for the assessment of changes over time at the local level. The only

[6] More detailed descriptions of all methods used are found in part two of the thesis and the papers.

census data available were that of 2011. Another limitation was that of changed statistical units: municipality amalgamations that have taken place since 1990 have changed the geographical boundaries for statistical data collected by some institutions.

Data were requested from unions, fisheries-related institutions, offices for regional development, innovation and education. However, the smallest unit for data collection was either the regional level or the municipality level after the last round of amalgamations; in some cases data were not provided from further back in time than the year 1990, or access to the data was restricted due to privacy reasons. Hence, not all the data provided were utilised, as they could not be standardised for the whole period of analysis. Nonetheless a sufficient number of variables was reached, with data from five institutions.

The data were analysed with cluster analysis, a technique somewhat similar to factor analysis, which was also considered. However, cluster analysis discloses sets of individuals (here villages) that show strong association between homogenous members, and weak association between members of different groups (Blaikie, 2003; Hughes & Sharrock, 2007). It can be used for the identification of patterns of similarity and difference, while minimising the loss of information that the data carries (Dyer, 2011).

5.3 Qualitative research

Even though numerous recent literature is available for the preparation of case studies, it was fieldwork from the 1930s – which I read about a few years ago – that has sparked my interest. The seminal work of Jahoda, Lazarsfeld and Zeisel (1978) is a prototype of a combined quantitative and qualitative study and provides a well-equipped toolbox for the study of villages in difficult socio-economic terrain. The setting of my case study was certainly a different one, since *Die Arbeitslosen von Marienthal* (English title: *Marienthal. The Sociography of an Unemployed Community*.) was conducted in Austria just prior to World War II. Furthermore, the empirical work of Jahoda et al. focused on the effects of socio-economic stress on the individuals of a village, but also the community structure. Nonetheless, some of their essential observations and thoughts came to my mind before and during the case studies. Those thoughts centred on aspects as resignation, apathy, (social) functioning, resistance and solidarity.

The fieldwork was based on a mixed-methodology approach, primarily consisting of participant observation, individual interviews and focus group/workshops. Furthermore I incorporated ‘double hermeneutic’ which is defined as follows:

> Any generalized theoretical scheme in the natural or social sciences is in a certain sense a form of life in itself, the concepts of which have to be mastered as a mode of practical activity generating specific types of description […]. Sociology, however, deals with a universe which is already constituted within frames of meaning by social actors themselves, and reinterprets these within its own theoretical schemes, mediating ordinary and technical language. (Giddens, 1976, p. 162).

A precondition of the double hermeneutic is the researcher’s openness to non-discursive knowledge, which necessitates the study of local everyday terms, concepts, customs as well as traditions and to reveal in how far those constituted collective identities (Giddens, 2014).

The aim is to explain the constitution and reproduction of communities and societies as a result of social action. For this a coupling of local biographies within overall social dynamics is appropriate (Uprichard, 2011). In line with this is the identification of what exactly constitutes the 'collective memory' of the community (Aldermann & Inwood, 2013; Cloke, 2013). The exploration of such a collective memory is important for the explanation of processes of transformation and modernisation at the local level (Giddens, 2014; Halbwachs, 1992). Furthermore, a collective memory is essential for being prepared for living with uncertainty, which is the link to resilience and vulnerability (Lorenz, 2013).

5.3.1 Choice of localities

As mentioned before, the two villages were identified on the basis of results from the cluster analysis, but also with the support of a thorough literature review (see following section). Two places were chosen that had been among the best performing fishing villages in the early 1990s; yet had ended up in lower categories in 2014. Besides, both places have experienced a dramatic population loss, with one community counting less than 300 people – a threshold[7] identified before.

Skagaströnd, the first village I visited, was chosen because it had lost almost all traditional fisheries and the number of inhabitants fell by some 30% within 30 years. On the other hand, the community embodies some promising characteristics for resilience building. It seemed like a perfect playground for putting community resilience theory to a test.

A second case study location, Raufarhöfn, with a comparable development path in terms of fisheries, was chosen for a comparison. From a political point of view both places were of interest. While the people in Skagaströnd almost unanimously decided against an amalgamation with other municipalities in the region, an amalgamation with a larger municipality was agreed upon by the inhabitants of Raufarhöfn. In addition, the community is part of a special scheme for communities with negative demographic and economic development.

5.3.2 Literature analysis and interviews

An extensive literature research was conducted before the actual case studies commenced. Primarily, this included an analysis of newspaper articles. Iceland provides a well-structured corpus of newspaper articles in the public archival record (timarit.is). Articles that have been published since 1900 were skimmed through for a pre-selection. Afterwards, those articles that centred on fisheries, community and population development were analysed thoroughly. A collection of relevant articles that covered major events in the villages' histories was then taken to the field and discussed with all key informants and most of the interview partners. In some cases the author of the articles was located and interviewed.

The newspaper articles were the foundation of an assessment of emotions and feelings among the local population; they were used for spotting major events, turning points and the possible reasons for the local structural change. The key dates of the community from

[7] Even though I warn against using population figures as an indicator of succesful strategies, the cluster analysis revealed that no community that counted fewer than 300 inhabitants had been able to reverse the downward trends.

the archives in combination with the individual place specific versions and interpretations facilitated the detection of a middle way between some sort of skewed nostalgia of locals and the interpretation of journalists, historians and other scientists from outside the community.

The choice of interview partners was based on categories (Root, 2007). For a comprehensive picture, some three to five participants of each of the following categories were contacted: policy-makers or administrative authorities, entrepreneurs, fishworkers and/or quota holders, newcomers to the community and professionals in education. The groups were not mutually exclusive. Adolescents are missing from this list, since their perceptions were approached with a different method (see below). In total some 45 interviews were conducted, transcribed and analysed with ATLAS.ti. Both communities were home to less than 500 inhabitants and thus it was not necessary to contact all possible participants beforehand. The key informants in both communities were usually a good source for identifying suitable interview partners. In the end only one individual rejected the participation.

Apart from some walking interviews, the vast majority of interview partners were visited in a convenient and familiar setting (Evans & Jones, 2011). Usually the first few minutes were then used to talk about the surroundings (usually the ocean) and the clarification of some demographic and factual questions indirectly. The interviews were semi-standardised and kept flexible with open-ended questions. The questions varied between different types, such as description (the place, everyday life, events), comparison (temporal and spatial), general feelings, opinion and value questions (Vanderstoep & Johnston, 2009). To ease the transition between the different sets of questions, the interviewees were introduced to the topic beforehand and the structure of the interview was clarified. This was done after the reading of an 'Informed Consent Document' in which a short description of the research project was presented.

Regarding the sequencing, general and standardized questions in the initial and final phases were asked regardless of the ascribed role of the interviewee. The wording of questions was kept as coherent as possible, but explanations were added when necessary. The main part of the interview was built around specific questions, tailored to the person's role and thus very subject-oriented; occasionally extra and/or probing questions were added (Berg, 2007). The wording of a previously unanswered question was changed for eventually receiving an information or opinion. The probing questions aimed for a deeper elaboration of previous general questions.

The very first question, after the organisational part had been dealt with, centred on the individual perception of the place and allowed for revealing comparisons later on (cf. Gustafson, 2001). The question was simply: "What are the first three words that come to your mind, when you think of Raufarhöfn/Skagaströnd?" It was assumed – and verified – that people would mainly come up with terms relating to a feeling ('home') and function ('fisheries'). Whether or not fisheries-related terms were brought up, this was a good introduction into the issue of the communities' development. In an analytic part after the case studies, the three initial words were looked into more closely and interpreted for an assessment of self-stigmatising, self- perception and aspects of place-based solidarity in a broader sense (Price, 2013).

In between, I tried to assess the degree of optimism and pessimism, both among the interviewed person, but also with regards to fellow people in the community. Apart from some questions, a diagram with a simple continuous up- and down curve was used. The interviewees were then asked to indicate, in population terms, where they see their community on this graph. This was followed by a question about where they would see themselves, as well as the village, in some 10 years. In some interviews – usually with those from the administrative level – I also asked which population figure they envisaged in some 5-10 years.

In a second diagram the community's population development from the early 1900s until 2016 was shown. As mentioned above, this was used in combination with the newspaper articles to identify turning points (structural changes) and possible shocks. But it was also a way to (re-)construct the collective memory through the aggregated individual perceptions. None of the resilience- or structural change-related terminologies was used in the initial questions for keeping them as neutral as possible.

The interviews were framed with very personal questions and thus the end was about positive and negative perceptions, with a spatial connotation. For that reason another map was presented, illustrating the community and its surroundings. The last question then was to identify a place in the community/region that triggered a positive feeling, and vice versa, a place that caused melancholy or sadness. Especially the (non-) responses to the last questions were telling. Without exception or hesitation, every interviewee came up with a favourite place in town and region – usually in nature. The contrary question, however, was barely answered in the first community, while in the second most people referred to the abandoned harbour sites.

As soon as the last official question had asked and the recorder switched off, some interviewees started to get into a monologue. Usually I asked the partners for the permission to record them again and to repeat the previous statements. Some very revealing comments followed in this informal second round. Some of the interviewees added information in the following days and weeks. Particularly the closing questions (about a melancholy-triggering place) made the interviewees interactive and contemplative.

Apart from the structured interviews, countless informal conversations took place. No recorder was used then, but keywords and core statements jotted. Whenever people were met on the street I asked them about the scenery and landscape, or about the function of buildings. Usually, this resulted in anecdotal stories.

5.3.3 Participant observation

In addition to the interviews, participant observation was another method applied continuously. In both communities I spent a few days in various roles. For that, I visited public offices (bank, post and mayor's office) different laboratories and research institutions. I spent several days in the artist residency and frequently interacted with the artists. Politicians, decision makers and entrepreneurs were frequently approached and accompanied in their daily routines. In addition, every official event that has taken place during the five-weeks stays has been attended. The spectrum of events ranged from bingo evenings and pub-quizzes to community meetings, information sessions and even the Easter mass. But also other places and communities within the region were visited.

Noteworthy is an industrial development and infrastructure project (Bakki) in Northeast Iceland, which is within the enlarged municipality to which Raufarhöfn now belongs.

During the previous survey distribution, it had proved valuable to approach the harbour-master in each fishing village as source of information. A few days were thus spent in the harbourmasters' offices, resulting in a first-hand account of the harbour's history, the vessels that (once) landed, quota-holdings and transfers of quotas. In each of the two communities, the harbour site itself was visited on a daily basis. Fishworker were observed and approached, preferably while landing fish or the preparation of trips.

A diary and field notes were used to record the information and observations. Depending on the context, field notes were taken differently. Usually I took abbreviated notes, or 'cryptic jottings' covertly while in the field and in informal talks (Berg, 2007). All notes and detailed descriptions were transferred on to a standardised sheet daily. The sheets were enhanced with screenshots from two institutions that summarized the daily landings at the local ports and the general fishing activity in the vicinity of the harbours.

5.3.4 Workshops

Apart from the two qualitative methods that have been described, special workshops were organised. The first session of workshops was with a particular focus group (adolescents in the 10th grade of the local school). The last workshop was more of a conventional 'community group meeting', open to all interested people within the community (Berg, 2007).

As mentioned before, the adolescents of the communities were approached differently, due to several reasons. The interviews were predominantly narratives of the past; a retrospective assessment of the collective memory and major events. Possible future scenarios were also discussed, but they represented only a small fraction of the interviews. Much of the history had of course not been witnessed by the adolescents. On the other hand, they are the ones charged with the task of contributing to and writing the possible narrative of the future. Envisaging possible future pathways called for alternative methods than classic interviews (Uprichard, 2011).

In addition, the group of pupils from the graduating class – primary school ends after the 10th grade in Iceland – were faced with some important decisions once the school year ends. As the two case study sites do not have a high school, those students who want to continue their school career have to leave the community unless they are ready for tedious daily commuting over long distances. For me as a researcher, it was of particular interest whether or not the out-migrating pupils intended to move back once they graduated from high school or university. And, in case the students planned a life outside, I wanted to explore the reasons for this decision and what it would take to convince them of a life back in their community of origin or primary socialisation.

A workshop, partly based on a variant of scenario methods, seemed most promising for reaching the intended results. A workshop of this kind makes use of the participants' creativity, is interactive and can thus lead to some mutual inspiration and imagination. Unfortunately I was not able to repeat the very meaningful workshops in Raufarhöfn, where the last people in the relevant age group left for seeking further education elsewhere some two years ago.

I was given three lessons of the regular English class for the workshops after having explained the plans to the English teacher and headmaster beforehand. Both assured me that it was a good group to work with. Having a teacher degree myself, I was methodologically well equipped with moderation techniques, the structuring of classes and for dealing with dynamics among adolescents (cf. Smithson, 2008). Besides, it was a homogeneous group regarding age and socialisation; all students were raised in the community. Furthermore there were no dominant personalities within the group that could overpower the group's responses (cf. Berg, 2007). Having been active in the beginning of the workshops, I was able to become a passive observer once the methods were explained and internalised.

The students were introduced into the topic and told what to expect from the next three units. In the first lesson the aim was to assess the general willingness of the students to stay in the community or to come back once their studies or vocational training were completed. Apart from that, some personal information was asked for in a playful approach. Therefore I prepared some posters with statements and one map (see figures below). One poster dealt with the dream profession. Since none of the participants mentioned a fisheries-related profession, this fact was used for a short and spontaneous discussion. Furthermore, some newspaper articles, pictures and artefacts of Skagaströnd and its (historic) fisheries were presented in the beginning to assess the general awareness of the community's tradition and culture.

After this introduction, an interactive map was used to get into discussions of the future and spatiality (See figure 3). Each student was given four adhesive tapes, each representing a different date. They were then asked to identify in which corner of Iceland, or the world, they saw themselves in 2, 5, 10 and 25 years. Apart from Iceland, all continents were offered as options. The different time spans were not chosen arbitrarily, but represent the end of high school, the possible end of undergraduate studies or vocational training, the end of graduate studies and first work experiences, as well as the possible place for settling permanently. Two more posters were added, on which I collected general terms as well as positive and negative features that the students ascribed to their community.

Figure 2 Poster from workshop. "I like/dislike ... in Skagaströnd". On the very right hand side, the pupils then added some six items they missed themselves.

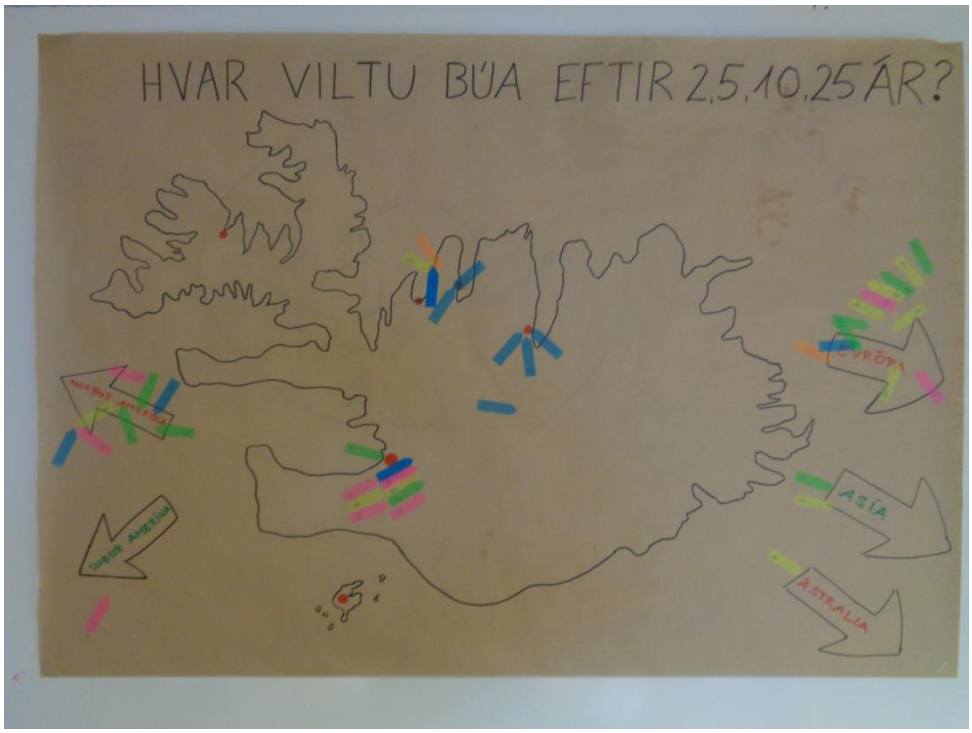


Figure 3 Poster from workshop with the graduating class. „Where do you want to live in 2 (blue), 5 (orange), 10 (yellow) and 25 (green) years"?

Anybody who has worked with 15-year-olds is well aware of the importance of motivation. I was prepared for the possibility of lacking interest or activity. Motivation was envisaged through aspects of identification (with the topic) and a common goal setting, the activation of the group and continuous interaction and movement. This can certainly go wrong, but my experience as teacher has shown that activation and inspiring methods usually yield excellent results.

Due to group dynamics and the presence of others, some participants are uncomfortable to utter their opinion or talk in groups (Kent, 2009; Smithson, 2008). For assuring the participation of all students, a bit of homework was given. The task was to write a letter to an imagined partner school in England that was about to come for a visit to the community. The students were asked to describe the village, the possible activities for youngster, their everyday life and routines.

After the first class, the second and third parts were based on scenario planning. With the results of the first class in mind, I started with a simple statement: "Skagaströnd will be a thriving and vibrant village in 2030". Then the students were separated in small groups that had the task to identify the needs for realising this objective. The rules of the scenario method were on constant display, stating among other things, that there were no false answers or ridiculous ideas. On the contrary, unconventional and exotic ideas were deliberately wanted, detached from any restricting frames. The full collective inspiration and 'social imaginary' was meant to flourish (Preston, 2008). The results of the groups were collectively evaluated and commented in the last phase.

The results from these three classes were presented to the general public in a conclusive workshop. One week after the end of the case studies and a phase of disengagement in which preliminary results were summarised, the community was revisited. All participants of the interviews and the general public were invited to this open seminar/workshop beforehand. The aim was twofold: First of all, I wanted to give something back to the community. I received a lot of information and trust during the five weeks; the locals and visiting artists were very open and interested in my work and asked me about my interpretation and results. I simply did not want them to wait for a publication in a scientific journal. Handing back the preliminary results had a positive side effect: I used it for the (e)valuation of my results, which was the second aim. Taking back the aggregated results after the individual interviews, the chance of a member validation, confirmation and reassurance of my conclusions was given (of course the opposite was also possible). In this workshop, which lasted some 2.5 hours, I prepared a presentation in which I added some provocative statements, explained scientific concepts and discussed the different dilemma situations in which I saw the community embedded. The feedback was positive and the discussions afterwards were useful for the following analysis.

5.3.5 Ethics in case studies

Particularly the qualitative phase demanded a careful consideration of ethical issues (Guillemin & Gillam, 2004; Hopf, 2004). The overarching theme was the handling of politically sensitive topics and thus dealing with 'ethics in practice' more than with 'procedural ethics' (Guillemin & Gillam, 2004). Before entering the field it was important to keep several things in mind for handling the elephant in the room – ITQs – and the asking of delicate questions in interviews (Snow, Zurcher, & Sjoberg, 1982).

Other researchers identified the introduction of ITQs as one of the major turning points in Icelandic fisheries management and by implication community development before. Arguably the social consequences of this regime shift have been drastic for some communities, but also of course for the fate of individuals. In informal interviews during field trips this was indicated, and the feeling was strengthened during the case studies. The privatisation of fisheries is without a doubt a topic that requires the researcher to handle the topic cautiously and responsibly.

However, the results of the quantitative phases had to be left aside, as it is important "not to import inappropriate assumptions and preconceptions into the fieldwork, [and it is] important not to project onto the phenomenon but to identify it" (Hughes & Sharrock, 2007, p. 216). First and foremost, I had to present myself as a value-neutral researcher, and be careful to neither become advocate or critic nor to confuse my role(s) with that of an investigative journalist (Berg, 2007; Root, 2007).

The interview partners comprised the whole variety of fisherfolk: CEOs of fish-companies, quota-holders or -traders, fishermen and former fishermen, crew members and workers from the fish factory floor. Recapped, it was the Icelandic fisheries in a nutshell. In the interviews I approached the hot topic of fishing rights with care. General and innocuous questions about fisheries were asked first. During the responses some interpretation of the nonverbal channels, such as body language and facial expressions, was crucial (Berg, 2007). In the majority of interviews it was not important to interpret the nonverbal channels though, as most interviewees were willing – almost eager – to discuss the quota issue and uttered their opinions frankly. In these cases it was important to avoid any supportive statements and to keep the value neutral position. While this is somewhat self-evident and appears easy in theory, the reality looked different, especially when the interview partners ended their responses on a critical or personal question themselves.

Particularly in social sciences one should be cautious to use terms such as 'truth' and 'reality', but also norms such as 'justice' and 'solidarity' are highly subjective. Considering my interpretation of the results, the question of validity is important (Mabry, 2008). For achieving valid and reliable data, I wanted to conduct the research as transparently as possible. That counts for the quantitative phase, of which almost all data is accessible, but even more for the qualitative results, which were validated collectively in workshops.

Transparency includes also the duty to inform the interviewees fully before the interview (Hopf, 2004). The necessary information included the purpose of the research, the interview duration, procedures during and after the interview, the right to decline and withdraw, and the possibility to contact me afterwards (Fisher & Anushko, 2008). A sheet of informed consent was signed before the interview started and privacy/anonymity was assured when wanted. The majority of participants allowed to use the name and other identifiers. However, I did not make use of it and kept all information except age and gender covered in the articles; any other information would have allowed to track the participants. In communities of that size, I considered it appropriate to secure privacy strictly (Schwartz, 2009).

6 Summary of papers

The four papers that follow the first part of the thesis are the result of two interdependent empirical phases, as described in chapter 5. While the first centred on the quantitative assessment of perceptions and impacts of the ITQ system, the second focused on a qualitative exploration of local development paths, as well as adaptive and coping strategies associated with the Icelandic version of a structural change.

The articles show that structural change took place on all levels of society and also within the institutional framework. Structural change affects, and is affected by, power relations, as shown in the first paper. In addition the socio-economic foundation of communities, their demographic development and overall fisheries trajectories, are in an interdependent relation with this form of change (discussed in article II). Finally, structural change makes community and individual responses necessary, which is elucidated in the latter two articles.

6.1 Co-authored articles

Of the four articles that were written, three are co-authored. Hence, my contribution will be briefly explained.

The first paper is titled "Improving or overturning the ITQ system? Views of stakeholders in Icelandic fisheries" and has been published in the journal Maritime Studies (Kokorsch et al., 2015). Anna Karlsdóttir and Karl Benediktsson co-authored the article. The paper is the result of Anna Karlsdóttir's and my collaboration in an international project of the European Union's Seventh Framework Programme, namely EcoFishMan. The project included 13 partners and dealt with the development and implementation of a new integrated fisheries management system in Europe based on increased stakeholder involvement. Due to the fact that I joined this project in the last stage and the survey preparation was completed, I did not contribute to the formulation of questions. My task was the distribution of surveys in field trips around the country with Anna Karlsdóttir. Afterwards I was in charge of the online version of the survey and the analysis of the data. The interpretation of the results was done in collaboration with the two co-authors. Furthermore I conducted the literature review on stakeholder involvement in Icelandic fisheries management as well as ACM in general.

Paper two is titled "Prosper or perish? The development of Icelandic fishing villages after the privatisation of fishing rights" and has been accepted for publication by Maritime Studies in November 2017. The paper has been co-authored by Karl Benediktsson, who contributed to parts of the writing process and the preparation of figures. During the first half of the PhD project I collected socio-economic, demographic and fisheries-related data from different points in time for all Icelandic fishing villages. I analysed and interpreted this data for this paper and backed it up with a thorough literature review of the concepts of resilience and vulnerability.

Paper three, for which I am the single author, is the result of my first case study. The results of the second case study, and the comparison of the two cases, are presented in the fourth paper titled "Where have all the People gone? The Limits of Resilience in Coastal Communities". The paper has been accepted for publication by the Norsk Geografisk

Tidsskrift – Norwegian Journal of Geography in December 2017. It was co-authored by Karl Benediktsson, who contributed a thorough overview over the regional development policies in Iceland – or, as it is called in the paper, the policy corridor – throughout the 21st century until now and contributed to parts of the writing process. I was in charge of the preparation and the analysis of the qualitative data collected during the case studies and combined it with theories of social and community resilience.

6.2 Paper I

Kokorsch, M., Karlsdóttir, A., & Benediktsson, K. (2015). Improving or overturning the ITQ system? Views of stakeholders in Icelandic fisheries. *Maritime Studies*, 14(1), 15.

The theoretical approach for this paper was the theory of adaptive co-management (ACM). It was combined with a general stakeholder analysis in the decision making process in Iceland before and after the introduction of ITQs, based on a thorough literature review. The main contribution of this paper was the introduction of ACM and the attached stakeholder analysis to the Icelandic fisheries management discourse.

The results lend support to my feeling, based on a literature review, that the ITQ system had some drastic negative social implications. Stakeholder involvement in decisions and policy making, particularly by municipalities, had decreased over time. A general consensus about the need for a broader decision making process was confirmed. The critique of the ITQ system was not homogenous, however, and striking differences between stakeholder conceptions of ecological, economic and social aspects were detected. Trust in institutions is lacking and a gap between scientific knowledge and the practical knowledge of fishers was abundantly clear in the survey results.

Negative social consequences were unequivocally confirmed in the survey, yet with varying strength in the different regions. Also a general discontent with the ITQ system was detected. However, the interpretation of the results did only allow for the conclusion that stakeholders demand improvements instead of a full overturning of the management system. Besides, the two major amendments to the system so far, regional quotas and coastal fisheries, have been deemed considerably negative. Thus the next step of the research project was to assess the regional and social impacts of the ITQ system and to elaborate more on these two amendments to the fisheries management act.

6.3 Paper II

Kokorsch, M. & Benediktsson, K. (forthcoming). Prosper or perish? The development of Icelandic fishing villages after the privatisation of fishing rights. *Maritime Studies* (accepted for publication).

Regarding the chronology of submissions this was the last manuscript submitted. However, the collection of data had started in early 2015 and the results contributed to the choice of localities for papers III and IV.

Since the first paper had revealed regional differences regarding the perceptions of social consequences of the quota system, I wanted to further explore regional and social disparities. Thus one of the main questions was to what extent demographic and socio-economic changes since 1991/92 have paralleled the development in the fisheries sector.

Data from three different points in time were used. The first point was the first fishing year under the ITQ system. The second point was the last year before the first amendment (community quotas) was introduced. Finally, and due to the start of the compilation of the data set in early 2015, the fishing year 2013/14 marks the endpoint.

The contribution of this manuscript to the overall project was the comprehensive introduction of resilience: the paper gives insight to the different development paths of the fishing communities. It allows for an assessment of all three fields that define sustainability and resilience: socio-economics, demography and the overall development of the local fishing sector. For the analysing the data, cluster and correlation analyses were applied.

The results and trends are certainly alarming, despite the fact that the overall fishing industry is performing rather well in macro-economic terms. Centralisation and efficiency has taken its toll. The total number of fishing villages has been decreasing and the majority of the remaining villages is in a vulnerable state. A few regional centres can be defined as stable, however. The same can be said about the demographic situation in most villages. For both fisheries and demographics, a trajectory downwards – from a well-performing to a vulnerable community – is a more likely development path than the other way round. Some kind of an upward-moving barrier was thus detected.

The correlation analysis has revealed that the socio-economic performance of villages is still closely connected to the fisheries sector. Negative demographic trajectories did not correlate with the overall fisheries in general. However, with a specific focus on small places, in population terms, the situation is different. Places with fewer than 1000 inhabitants face major demographic challenges and those with less than 300 are severely threatened. Besides size, the remoteness, here measured in distance to the capital, was a major issue.

In the results, the critical assessment of regional quotas and the coastal fisheries management scheme was verified. They did not help to overcome adverse effects that accompanied the loss of fishing rights. The paper ends with specific policy recommendations.

6.4 Paper III

Kokorsch, M. (2017). The Tides they are a Changin': Resources, Regulation, and Resilience in an Icelandic Coastal Community. *Journal of Rural and Community Development*, 12(2-3).

From abstract numbers and a general overview of different paths of community development, the centre of attention shifted to the very local level, and to local narratives. In other words, the research itself changed from a top down approach, to a bottom-up perspective.

Two places were selected for two case studies that lasted ten weeks in total and resulted in two papers. Paper III deals with the first case study, conducted in Skagaströnd, Northwest Iceland.

As indicated in the previous chapter, the village was chosen because of the local strategies to cope with the ongoing changes in the fishing industry and the preparation for an

eventual loss of the remaining extractive fisheries. The diversification of the labour market, the shift to quality orientation and research in fisheries made this place distinct. Different forms of innovation were found on the small scale. Women made use of the – almost forgotten – local tradition of sewing. Young entrepreneurs from the outside were attracted to the community and given space for establishing a business. Most interesting were a research-and-development company in town and a local artist residency that offered space to some twelve artists. In short, the inhabitants were aiming for alternative pathways instead of feverishly fighting for quotas.

That successful community development needs to be understood in more complex terms than classic economic and geographical thinking presumes is not a novel finding at all, but it was exemplified in this case study. In other terms, the idea of merely 'counting heads' and using economic key variables for an assessment of community development is by no means sufficient. On the contrary, results support the notion of multiple equilibria and possible stable states. The case of Skagaströnd shows clearly that the success of a place cannot be judged only by the number of people. Engagement, participation in local social systems, identification with the community and an overall commitment are in this case a promising foundation that cannot be put in numbers. Neither can the contribution of the visiting artists to local culture be measured. The community has shifted its label from 'extractive' to 'attractive' through the incorporation of the international creative class in a community that has hitherto been embedded in traditional resource industries. With the transformation of a former fish factory into a cultural facility, Skagaströnd is, literally, a good example of culture-based 'creative destruction' in a rural setting.

Although this overall conclusion sounds positive – almost enthusiastic – some shortcomings were detected. The main weakness is the dependence on a few leaders and a well-established political network.

6.5 Paper IV

Kokorsch, M. & Benediktsson, K. (forthcoming). Where have all the People gone? The Limits of Resilience in Coastal Communities. *Norsk Geografisk Tidsskrift – Norwegian Journal of Geography.*

The place was chosen, among other reasons, because of a special political scheme aimed at assisting suffering communities – in terms of population loss and the economic structure. This scheme was well received and certainly it had had several positive effects. However, during fieldwork it became obvious that this was more of a last-resort action and not a proactive move. It was an action without an economic foundation that could make a substantial difference. It was also designed for a period of only five years. Lacking finances and being implemented over a rather short timeframe – in terms of regional development – the flaws of the project exceeded the benefits. Nobody, neither from within the community, nor any expert from the outside, was able to suggest a promising long-term strategy once the project was over. Resilience building and regional development are open-ended processes and should not be constrained by a rigid time frame. As much as the move towards deliberation, devolution and decentralisation are welcomed by ACM proponents, neither of it should come as a last resort action. Thus Raufarhöfn and the special scheme show what ACM should not be.

More than in the previous article, the focus in this paper was on the adaptive cycles and three possible responses during the last phase of it. All four phases of an adaptive cycle were identified in both places, yet with striking differences in the fourth one. A phase of accumulation and growth (phase 1) was identified in both places, that were followed by stagnation, rigidity and lock-in (phase 2). An unstable ecological environment and gradual population decline marked the third phase. It was further complicated by changes in fisheries management. The local actors had to react to those adverse effects through re-organisation and/or renewal, which are characteristic for the fourth phase. Possible reactions in the fourth phase are renewal, minor or major reorientation. A modicum of reorientation was found in the two places.

Endogenous and exogenous strategies are another dichotomy of importance. The paper concludes that it seems unadvisable to focus too narrowly on endogenous and bottom up strategies. Exogenous factors, including both the details of resource management systems and the broader political economy, need to be critically addressed. Here the political dimension of resilience comes into action. Without such a balance, resilience theory has limited potential for guiding community development policy and practice.

A general critique of the rather apolitical character of theories about social and community resilience leads to another point, which has so far not sufficiently addressed. How should those communities be dealt with, where neither endogenous nor exogenous strategies have helped to overcome adverse effects of structural change? What can be done in places where the adaptive cycle does ends up in a continuous downward spiral? Would it be more advisable to search for socially acceptable ways to ‘dismantle’ such a community? Raising such a question may seem almost ‘politically incorrect’ – in an alleged welfare state. On the other hand, grappling with it is unavoidable: the predicament of this place is not unique – neither in Iceland nor in comparable settings in the peripheral north.

7 Discussion and conclusion: Towards a 'top-led, bottom-fed' approach

In this last chapter I want to focus on two themes. First I want to turn to some conclusive remarks regarding the Icelandic version of structural change. The concepts that were introduced in the second and third chapter of this thesis – and which were not covered in the papers directly – will be the foundation of this first part. This will be followed by a discussion of resilience theory and the concept of adaptive co-management. I will also provide some suggestions for further research and recommendations for action, mainly addressing policy makers.

7.1 Structural change in Iceland

One of the aims of my research project was the assessment of the resilience of Icelandic fisheries communities to the structural changes in the fishing industry. Another aim was to explain the causes of dissimilar development trajectories of different communities since 1990. Before I turn to these two questions, it is important to recall the first article of the Icelandic Fisheries Management Act:

> The exploitable marine stocks of the Icelandic fishing banks are the common property of the Icelandic nation. The objective of this Act is to promote their conservation and efficient utilisation, thereby ensuring stable employment and settlement throughout Iceland. The allocation of harvest rights provided for by this Act neither endows individual parties with the right of ownership nor irrevocable control over harvest rights (Alþingi, 2018).

Each of these sentences can be discussed at length, and indeed much of the article has been subject to heated debates (Einarsson, 2011, 2015; Eythórsson, 2003; see also paper II and IV and appendix A). For the aims of my studies it is of major interest to reconsider the objectives – *de jure* – and their realisation – *de facto*.

The quotation shows the combination of economic goals (efficiency), ecological objectives (conservation) and social aspects (stable settlement and employment). I consider these aims quite ambitious bearing the means for achieving it in mind: a market-based solution. Conflicting interests were predictable and have arguably emerged. One can argue that the economic and ecological end goals were given priority (see paper I and appendix A). Maybe this has been the intention right from the start: the social aspects are seen as an outcome of 'conservation and efficient utilisation', indicated through the phrasing "thereby ensuring" – the social, one can argue, is thereby from the outset relegated to a 'passive' role rather than an active concern. As mentioned earlier in the thesis, the political framework and Zeitgeist are important for an analysis of changes of this kind. It may sound like a standard phrase, but it is nonetheless important to remember that the Icelandic quota management for all major fisheries was introduced in the mid-1980s – an era shaped by neoliberal ideologies and the privatisation and commodification of the social and economic sphere.

The adoption of market-based fisheries management changed socio-cultural, political and economic structures. The access to the means of production as well as the distribution of

economic and political power were fundamentally altered and restructured (see paper I, II and IV). In general, it can be concluded that centralisation has taken place since 1990 in every respect – geographically, politically and economically (Agnarsson, Matthiasson, & Giry, 2016; Durrenberger & Pálsson, 2015; see also paper II in this thesis). The processes arguably set in earlier, however, and it would be wrong to consider the ITQ system as the *only* causal variable in the complex processes of centralisation.

7.1.1 Structural change – individual and community aspects

Societies and places are constantly going through changes, but in the case of Icelandic coastal communities, change was propelled by the de facto privatisation of fishing rights. For some places it was thus more of a transformation shock than a structural change (see below). Most fishing communities found themselves in economic difficulties in the 1990s, to a large extent caused by overinvestments in local fisheries; market mechanisms were certainly at work as well, and fishing communities were faced with a complex melange of problems. Some municipalities decided to become active players on the quota market and purchased quotas to secure the future of local fisheries. Being independent from quota holders outside the communities' border however left a financial burden to the communities' budgets. Other communities decided to sell out quotas and reinvest the proceeds in various new industrial sectors. With this move, the communities, and thus the individuals within them, have been made objects of action and have experienced a specific form of disenfranchisement. It was no longer locally-embedded companies that decided over the fate of the communities' fisheries, but market forces and private quota holders that were driven more by aspects of profit maximisation, capital accumulation and efficiency than place attachment.

The decisions of quota holders have affected the entire fishing communities, from the crews to the processing workers, not to forget all those actors and services that are indirectly connected with the fishing industry. Hence, constraints of all sorts on the individuals' capacity to act can be identified. The subsequent decision, for those involved in extractive fisheries, was then to either invest in quotas or leave the business. This may sound like a rather simple choice, yet it is not. For some people, fishing has been more than just a profession: it was their families' tradition; the communities' way of life passed down from generation to generation. In addition, leaving an industry in a community with a one-sided economic structure does not allow for many local alternatives. Aggregated individual decisions to leave (the fishing industry and/or the community) eventually necessitated political responses – both at the local but also the national level.

Two aspects are of importance in this regard. There are fewer and fewer new entrants to the fishing industry and the number of fishermen (or women) has been declining since 1990. However, there is disagreement about whether it is the profession itself or the economic constraints that have come with the ITQs that have hindered new entrants to the fishing industry (Bjarnason, 2014; Bjarnason & Thorlindsson, 2006; Kokorsch et al., 2015; Seyfrit, Bjarnason, & Olafsson, 2010; see also papers I and IV).

No matter the reasons for the lack of newcomers to the fishing industry, the promises of an appealing lifestyle and the possibilities for realising highly individual life-scripts are reasons frequently mentioned in connection with the rural population loss. Individual mobility has affected the social stratification of Iceland too, and a former homogenous social/community structure has become significantly more heterogeneous.

What complicates the situation for most settlements along the shore is the political and economic setting. Iceland meets several criteria of a neoliberal state. Certainly this applies to the time before the economic meltdown in 2008 (Huijbens & Þorsteinsson, 2017; Ólafsson, 2013), when free-market fundamentalism led to the displacement of welfare provisions and state regulation through policies of privatisation and deregulation (Barnett, 2010; Huijbens & Þorsteinsson, 2017; Lee, 2010). Again, the turn towards neoliberalism was not uncommon in a global context (Harvey, 2006; Lee, 2010) and it came with a blindness towards spatial disparities (cf. Gyuris, 2016; cf. Schliephake & Schenk, 2009). A dismantled welfare state, however, adds stress to communities, particularly the smaller ones (Hovgaard, Eythórsson, & Fellman, 2004).

All in all, I can very much agree with the findings of the 'Special Investigation Commission' (see chapter 3) that identified "weak social structures and [weak] political institutions" (cf. Árnason, 2010; Árnason, 2013, p. 329) as a major problem in Iceland. Even though this committee referred to the period around 2008 and the financial meltdown, the weak structures and weak political institutions were arguably the result of radical market based politics and unregulated speculation (cf. Durrenberger & Pálsson, 2015). I combined some abstract theories in chapters 2 and 3 to approach the Icelandic situation. Social norms and individual values are certainly important. This counts especially for small and close-knit societies whose livelihood depends on natural resources. The changing of access rights to such resources disrupts established rules and patterns. Iceland is not an exception in this regard.

The way the privatisation of fishing rights has taken place violates certain justice principles that I discussed earlier. Especially inter- and intragenerational justice has been affected. Taking a closer look at the quota allocation process through the theories in chapter 2 and 3, and with a reference to Parsons' pattern variables, the allocation of quotas could take place through either achievement or ascription. For the Icelandic case, I would talk of first generation achievements, followed by ascription. The first generation of quota holders received their share based on achievement – the catch history of their vessel. The distribution of quotas to this closed group brought the quota holders into a situation, where they had to decide between particularism and universalism – the second set of pattern variables that I identified as crucial (Parsons 1991, see chapter 3). The individual quota holder is in the situation to decide whether or not to sell or lease the share; to fish his quota himself or to let others fish it. It is in his or her particular scope of action whether to follow personal interests or to consider possible consequences for the community at large. This is coupled with the dilemma of private and collective interests. This pattern variable distinguishes between collectivity orientation and self-orientation.

The reference to pattern variables is just one (rather individual-oriented) possible way to explain changes. The assessment of justice and fairness can further be linked to the arguments of Rawls and Pareto. The decision making process for quotas certainly did not take place behind a 'veil of ignorance' – back-room politics might be the better metaphor in this regard. Building a fisheries management system based on quotas derived from catch history is inherently unfair in many regards: first, some actors (vessel owners) were very well aware of the fact that a good catch history would eventually result in economic benefits. Furthermore, those actors did have a considerably better starting position due their asset base, property, or at least access to credit. Second, exactly those who had contributed most to overcapitalization and overfishing, were eventually rewarded for this behaviour – not those vessel owners that had acted responsibly. This is indeed a perverted

form of the 'tragedy of the commons' (cf. Jentoft, 2000a). Third, aspects of intra- and intergenerational justice have been neglected. Regarding intergenerational justice, it is unfair as generations after 1990 have of course not been able to influence the catch history on which the initial allocation was based. Neither has the catch history ever been rewritten since. On the other hand, nepotism and inheritance – *carpent tua poma nepotes* – have been enabled; I also referred to 'transitional gains trap' in this regard (Copes, 1996; Flaaten, 2010; Tullock, 1975; see also paper I)).

But my findings also fit the observation made by Jentoft:

> Management systems, particularly if they are based on purchasing and selling of quotas, are also changing the social relations among fishermen much in the same way as Georg Simmel described in his classic treatise on money; they depersonalize relationships between social agents. People start to regard each other in terms of concepts of rational calculation and utility (Jentoft, 2000a, p. 54).

Changing relationships affect solidarity and, agreeing with Simmel, I want to add the ideas of Weber and Durkheim. Not only are relationships depersonalized; they have also shifted from traditional open to rational closed relationships (cf. Gane, 2005; Schluchter, 2000; Weber, 1984). Access to the group (here the fisheries) is limited and subject to restrictive preconditions. Due to the deliberate setting of those restrictions – quotas – this process fits the criteria of appropriation (Weber, 1922). Furthermore has value rationality been substituted by instrumental rationality (cf. D'Agostino, 2011; Gane, 2005). And I think it can be argued that a shift from mechanical to organic solidarity has taken place. Organic solidarity is common in functionally differentiated societies and comes with the transition to modernity8. This shift is not *per se* negative or positive. However, the changing of property rights and the restriction of access is a threat to the social cohesion, solidarity and perceived justice within a community and nation. With the centralisation process and selling of quotas out of fisheries-dependent communities, place-based solidarity has been eroded through processes of alienation and detachment (cf. Bennett, 2010; Degnbol et al., 2006; Gibson-Graham, 2008; Jentoft, 2000a; Price, 2013).

The previously described processes fit the process of commodification and juridification, that were discussed in chapter 2 (Habermas, 1981; Scott, 2012): ITQs carry the fingerprint of economic control mechanisms, bureaucratic and technocratic administration, with the underlying end-goal of efficiency matching utilitarian criteria. With the process of commodification, new classes have evolved (Chambers, 2016; Pálsson & Helgason, 1996). This process has affected social actions and relationships.

7.1.2 Structural change – spatial aspects

With the social and community-related aspects of structural change in mind, I want to clarify now whether Iceland meets the criteria of structural change, a transformation shock, or both. On the one hand it is a transformation shock, due to the fact that it was a political and economic modification that propelled the processes of local and regional change. In addition, the closing of a common-pool resource through restricted resource access and

[8] I deliberately avoided the discussion around modernity as shown in chapter III.

entitlements to the resource is a drastic regime shift, which is one of the main characteristics of a transformation shock.

However, 'transformation' describes a rather sudden change, while 'structural change' is a slow and gradual process. Some communities have lost their fishing rights, landings and processing facilities literally overnight. In that case, I consider transformation shock as the better description. Yet, for the majority of places the pace of change was slower. Furthermore, structural change is a continuous and open-ended process in which social, spatial and economic polarisation (and/or centralisation as I called it previously) takes place. In paper II, and partly in paper IV, these processes were identified. Thus I tend to define the processes of the Icelandic regional development as structural change, with local examples of transformation shocks. Structural change takes places in old industrial regions and is characterised by one-sided economic structures, dependence on single companies, structural unemployment, out-migration coupled with social erosion, industrial fallows and brownfields, and a low potential for innovation (Hamm & Wienert, 1990; Läpple, 1991; López, 2014; Maier, 2009). All these characteristics can be identified along the coast of Iceland. The question, then, is whether the Icelandic version of a structural change has been benign or perverse (see chapter 2, and López 2014).

Iceland carries characteristics mainly of the perverse version: the depletion and degradation of rural natural assets and/or the disenfranchisement of the rural population[9] pushes the local population into migration processes. The absence of investments or productivity improvements usually accelerates this process (López, 2014).

Structural change is intertwined with aspects of path dependency, embeddedness and lock-ins, as I exemplified in papers III and IV. The two case studies were archetypical for the positive and negative effects of each of these aspects and, looking to the results of the quantitative studies, it can be assumed that neither locality is unique in this regard. On the contrary, embeddedness can be determined in the majority of fishing villages. Embeddedness can be perceived as an obstructing or constructive phenomenon and examples for both can be found. Where the negative effects of embeddedness occur, inflexibility and (institutional) closeness are the results. Eventually the threat of 'over-embeddedness' and 'structural embeddedness', which is coupled to historical conditions, can appear. But examples of 'territorial embeddedness' were also found. In addition, shifting economic structures – particularly the processes of centralisation and the increased 'footlooseness' of the fisheries – have caused 'disembedding mechanisms'.

The strategies for responding to the different sorts of embeddedness are connected to lock-ins. Places in a lock-in situation, where the initial strengths within old industrial areas can eventually obstruct innovation and development, can be detected in Iceland. Lock-ins can be categorised as functional, cognitive, organisational and/or political (Arbuthnott, 2011; Bathelt & Glückler, 2003; Grabher, 1993; Hassink, 2010). Functional lock-ins are characterised by hierarchical networks, political ties and networks, as well as set structures. Alternative development paths are difficult to realise in such a setting. On the contrary, the adherence to classic planning instruments and economies of scale is still the predominant response to structural changes. Large industrial projects based on the harnessing of

[9] In the original sense López (2014) speaks of the rural poor, a terminology that I do not consider appropriate in the Icelandic context.

renewable energy and run by international companies are one example. This comes with rigidity to changes and a hesitance towards adjustments, modifications and new technologies (López, 2014; Martin & Sunley, 2014).

Both places that I visited for the case studies can fit this description. On the one hand, not many ideas apart from continuing to rely on traditional fisheries were presented in Raufarhöfn (see paper IV). In Skagaströnd, a number of small scale ideas were envisaged and some had partly been realised already with remarkable success (see paper III). Yet, the biggest hopes among policy and decision makers in each place were still bound to a heavy industry project. Interestingly enough, this project was not perceived in a positive way by the local youth. The research question "*Which future scenarios are envisaged by local people – particularly adolescents?"* can thus be answered[10], but it reveals a cleavage between generations. This can be linked to cognitive lock-ins, in which homogenous world-views – in this case of the administrative bodies – hinder innovative imagination. Organisational lock-ins are linked to cognitive lock-ins and describe the overreliance on local networks and ties, but also to institutional inertia (Arbuthnott, 2011; Underthun et al., 2014; cf. Wilson, 2013a).

I consider political lock-ins as main hindrance for the development of Icelandic communities and regions. They appear when strong institutional ties aim for the preservation of traditional structures and industries. This is nothing wrong *per se*, and it can certainly be helpful to advocate long-standing industries and enterprises. However, the adverse effect is the hindering of necessary reorientations and developments (Hassink, 2010, p. 453). In the Icelandic context, the sum of lock-ins is a 'self-sustaining coalition', which can be extended by 'mutual stiffness' (Hassink, 2005; Johansson, 2014).

Over-embeddedness and lock-ins are constraining processes of innovation and diversification. The third aspect, path dependency, complicates it further. The identity of a place and the dominant form of work are the distinctive characteristics of path dependency. In almost all coastal communities this has been the fishing industry, and in all fishing villages the tradition is kept alive to a certain extent – may it only be through the annual celebration of the 'Seamen's Day'.

Creating a new path is bound to the institutional setting and the enabling factors that come with it. How problematic that is can be seen in papers III and IV. In addition to path creation, path plasticity is an important concept. It describes the range of possibilities for the development of innovation within a dominant path. For the Icelandic fishing villages it can be interpreted as a shift towards quality orientation and specialisation in the fishing sector. Some places have indeed managed to widen the path and to experiment with its plasticity (an example is presented in paper III). Yet, the initiating of such shifts can be connected to the abovementioned enabling factors. In this regard I consider qualified workers, a sound economic basis in tandem with ambitious community-leaders, as most important factors.

Whether successful strategies can be applied in all fishing villages – over 30 of which have been identified as vulnerable (see paper II) and thus needing to either find new paths or widening old ones – can be doubted. To what extent municipality amalgamations have

[10] More about the answering of this research question can be found in chapters III and IV.

been a blessing or curse for community development in this regard needs to be critically scrutinized by Icelandic policy makers. For the two case study sites it was a crucial point. For Raufarhöfn it might have been one of the major turning points and for this particular place I identify a sort of 'double-disenfranchisement' – of both political and natural resources.

7.2 Resilience and adaptive co-management

7.2.1 Resilience and adaptive co-management in Iceland

While I was conducting my research, two weaknesses of resilience in practice and theory became an increasing concern of mine. One of these, the lack of attention to power relations, was discovered in the literature review for the articles. The other limitation came to my mind during the qualitative part of the PhD project and concerns the handling of non-resilient places. Like other researchers before me (Biermann, Hillmer-Pegram, Knapp, & Hum, 2016; Olsson, Jerneck, Thoren, Persson, & O'Byrne, 2015) I have come to the conclusion, that the pursuit of resilience is not universally applicable but provides good analytical tools and research methods (see for example paper III and IV).

In the social sciences, resilience is a normative concept, while in the original, ecologically-rooted sense it has been used in a descriptive manner (Brand & Jax, 2007; Olsson et al., 2015). No matter whether it is normative or descriptive, I have been more interested in the question of whether or how political and critical the resilience concept is – or needs to be. This is an issue that has received increasing attention recently (Hall & Lamont, 2013; Reid, 2013; Simon & Randalls, 2016). Concluding from two current and thorough review articles, one can identify two main cleavages in the resilience discourse, based on different schools of thought (Biermann et al., 2016; Olsson et al., 2015): non-critical vs. critical theory and non-conflict vs. conflict theory. Resilience is thus not per se apolitical; it depends rather on the interpretation of the concept. I would also conclude that those dealing with resilience in theory and practice cannot avoid a critical evaluation of the political framework; in other words, an apolitical interpretation of resilience will result in, or confirm, injustice and inequality (Biermann et al., 2016). The political level has too often be neglected in its role as possible stressor for regional development.

In addition, I agree with Biermann et al. (2016) that resilience theory is approaching a critical turn: the critical reflection on resilience is gaining importance. The non-critical – some would say malleable – connotation of (social) resilience is at the same time diminishing. Resilience, according to some recent publications (Biermann et al., 2016; Hornborg, 2013) can be used as countermeasure against the adverse effects of neoliberal politics (with a focus on common property regimes see also Cretney & Bond, 2014; Nelson, 2014). The question is then: *how* exactly can it be used, and to what extent can it be linked to my studies and the Icelandic case?

I would like to introduce another qualifier that is based on the discussion of criticality and conflicts: *perverse resilience*, or "resilience within a system that is undesirable to the extent that it is socially unjust, inconsistent with ecosystem health or threatens overall system viability" (Phelan, Henderson-Sellers, & Taplin, 2013, p. 204). Leaving the aspects of the ecosystem aside – a topic I have not dealt with explicitly in my research – this definition can be connected to the thoughts of some other researchers (Joseph, 2013; Platts-Fowler & Robinson, 2016). They have not used the term perverse resilience; yet I think

their conclusions fit my interpretation very well. For communities in times of austerity, in this case Northern England, Platts-Fowler and Robinson conclude:

> It is important to recognise the limits of what might be achieved; resilience might serve as a strategy for helping communities to cope with adversity, but does not represent a means of overturning structural inequalities. Recognising this fact helps avoid the subtle elision of resilience thinking and the neoliberal focus on self-reliance, which can result in communities struggling in the face of adversity being blamed for their predicament because of a lack of collective resources and cooperative participation (Platts-Fowler and Robinson, 2016, p. 26).

This quotation mirrors my thoughts regarding the second case study locality. The remaining inhabitants were given the responsibility, through a seemingly bottom-up approach, for reversing, or at least stopping, the accelerating downward spiral (see also paper IV and the discussion of paper II). After decades of disenfranchisement, austerity measures and the loss of the main – some might say the only – viable resource, this is not at all a resilience building strategy. In this very respect, and I think my assumption finds verification in several other localities in a comparable situation, resilience can be characterized as neoliberalism in disguise – or as perverted epitome of it. I argue in the same vein as Joseph (2013), who criticises the overemphasis on individual responsibility and adaptability, thus meeting the normative neoliberal mantra.

Building on this harsh criticism, one needs to focus on the profiteers of perverted resilience, as "one person's resilience may be another person's vulnerability" (Olsson et al., 2015, p.6; cf. Alexander, 2013). This can be linked to the question of resilience 'for whom and what' (Cote & Nightingale, 2012; Cretney, 2014; Meerow & Newell, 2016). So far, I consider all measures that can be somehow interpreted as resilience building strategies (in particular the amendments to the fisheries management act and the programme 'fragile communities' that are discussed in papers II, III, IV and appendix A), as a manifestation of the current neoliberal system and its power structures. But building 'Potemkin villages'[11] is more of a short-term pop-up recovery and not a long-term strategy, and it eventually does not overturn an inherently unjust system.

But not only did the second case study location symbolise the negative impacts of ITQs and the subsequent amendments to the Fisheries Management Act. The quantitative studies also revealed some major flaws (see papers I for the power imbalances and paper II for demographic and socio-economic consequences). With the statistical analysis, spatial divides and social gradients became evident. One can also conclude that small communities – that with less than 500 people – have tremendous difficulties in reversing the downward spiral, once it has been set in motion. As long as political and economic structures are not critically questioned and transformed, the adverse effects of the Icelandic structural change can hardly be mitigated or reversed.

[11] Interestingly enough, one of the first things happening in the second case study location was the painting of houses. This is certainly a good move for changing the (first) impression of a village. However, this can only be one out many little steps towards a liveable community.

7.2.2 Recommendations for action

Iceland is not only facing a perverse version of structural change (see above), but also a perverse form of resilience as I have set out above. The question what resilience should *not* be has been critically addressed. However, I think a positive variant of resilience is still possible; albeit requiring drastic measures and transformations[12]. Adaptive co-management could be a first step. But, like resilience, it has to be implemented consequently, i.e. allow for 'triple-loop-learning' (see chapter 4). Thus changes of governance norms and protocols and fundamental rearrangement of the 'paradigmatic structure' of the system of governance, might be the consequences (Armitage et al., 2009; Blackmore, 2007; Gunderson, 2015).

Devolution, decentralisation and delegation are the main components of ACM and they can be linked to resilience building strategies. Yet, I consider it dangerous to assume that simply shifting towards decentralised bottom-up strategies automatically brings about good politics and liveable communities. To recall, in both case study locations it was decisions by democratically elected municipality governments that ultimately lead to the loss of fisheries and thus the economic mainstay. Also local social dynamics and strong political ties can enable nepotism or result in all sorts of lock-ins (see previous section and papers III and IV). But it would be even worse to conclude from the examples in Iceland that bottom-up strategies and more participation are *per se* prone to wrong decisions.

Place-protective behaviour that is framed by tunnel visions and routine-blindness is most likely the common problem in bottom-up strategies. This is why I want to suggest the changing of the bottom-up versus top-down dichotomy to a less rigid 'top-led bottom-fed' approach (see paper IV). For some places I think that expertise and guidance from the outside is needed for successful and sustainable community development – but in a well-balanced manner. As the literature on ACM shows, legitimacy increases when decisions and strategies are arrived at mutually between different actors: the 'top' has to act respectfully and accept input from the 'bottom'. In return, the 'bottom' has to accept restrictions and limitations[13]. Legitimate guidance from the outside can be mutually beneficial in the long run and I think, despite the critique addressed towards the project "Fragile Communities", that this attempt was aiming in the right direction (see paper IV). The idea to bring in an outside expert from the regional development institute was a good move for bridging different levels of policy, agency and interests. However, without any serious financial foundation even the best ideas – no matter whether they stem from the bottom or the top – will end up as pipe dreams. Moreover, the temporal limitation of five years casts doubt on whether any real empowerment could be achieved by the project. This is a major flaw. For some places, outside expertise is certainly needed for the realisation of projects, for bridging actors from different places and for mastering bureaucratic obstacles. A possible description of the 'top-led bottom-fed approach would be a balancing of expertise from the top – here interpreted as governmental institutions or agencies – with the highest amount of local input and consideration of those who have to implement changes.

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[12] Which will indeed become a transformational shock for some people.

[13] This is in a way regrettable given all the amazing ideas I came across during the case studies – particularly the ideas of local youngsters and the visiting artists in Skagaströnd were quite impressive and promising (see paper III and IV).

For such an approach I would argue for a radical restructuring of the political landscape through municipality reform. As I have discussed in two papers (III and IV), amalgamations of municipalities are in most cases based on a dilemma situation. Economic constraints lead to a limited capacity to act, while amalgamations with other communities might result in loss of political power and infrastructure. All in all, Iceland has some 74 municipalities and 51 fishing villages (paper II, Statistics Iceland 2017). At least for the fishing villages I think one can argue that each community is fighting on its own in an almost Hobbesian sense, searching for the one strategy, the next big thing or investor to attract people into the arbitrarily drawn border of their village (cf. Hobbes, 1970). Since I have talked much about solidarity and justice, some sort of 'intercommunal solidarity' would be more advisable than maintaining the present structure, in which (local) politicians are more concerned with maintaining his or her power and pushing his or her municipality forward in a setting of pork-barrel-politics. Certainly it is not fair to write local politics off as a dystopian power play without any form of solidarity and collaboration. However, I think one can argue that the majority – if not all – places have been forced into an environment of (neoliberal) competition. Politics of local development often lapse into some sort of place marketing and zero-sum competition.

A call for a municipality reform might look odd in the first instance. It might be interpreted as lowering the degree of democracy and local policy making[14]. With the call for a reform, I would like to see a rethinking of municipality boundaries as well as democratic structures. Iceland, with its two-tiered system and a comparatively small population, should be able to implement new forms of direct democracy easily. It once had over 200 municipalities, and 74 municipalities are still too many for a flexible and holistic local development policy that wants to be more than just a crisis management, spreading insufficient financial resources thinly. I think it is necessary to reform the municipality structure and perhaps even abandon the idea of municipalities completely. Yet, instead of handing all power over to the national government, inter- and intracommunal groups could join for initiatives and less formal regional councils that are open to each and every citizen across parties and boundaries.

Leaving community development aside, fisheries management and stakeholder involvement were important aspects of my research. I want to refer to my first article (paper I) and the viewpoint article I wrote with a colleague (appendix A) in this regard. Broad policy making, data gathering and analysis, and harvest allocation decisions, are the three main fields in which stakeholders in fisheries want to see more involvement. Three steps are important and can be easily accomplished. First of all, a dedicated social science advisory body needs to be set up. This body would consist of anthropologists, sociologists, and geographers, to provide the best social scientific information available. Second, a social impact assessment of fisheries management policies needs to be conducted and made mandatory when those policies are changed. Such an assessment needs to make use of both quantitative and qualitative data. In particular, local narratives are all too often neglected. Neither of these steps is novel at all. Use can be made of examples from other countries (Jepson & Colburn, 2013; Norman, Holland, & Kasperski, 2012; Pollnac et al., 2006). Third, and this is a direct consequence of step 2, participatory tools and collective

[14] I avoid the formulation 'independent municipality' at this stage, due to the fact that I consider none of the current municipalities as really independent, least of all in financial terms.

research methods for truly comprehensive data gathering, mapping and monitoring need to be installed (St Martin & Hall-Arber, 2008; St Martin et al., 2007).

With all this in mind – ACM and participatory approaches for community and fisheries management – the stage could be set for a truly comprehensive local empowerment, as many progressive and critical geographers and other social scientists (Felber, 2014; Gibson-Graham, 2008; Gibson-Graham, Cameron, & Healy, 2013) have argued for.

7.2.3 The endpoint of resilience-building measures

Combining ACM and critical resilience thinking can also open up for the last remaining question that I came across and have not yet found an answer to: the discussion of an 'endpoint' in resilience thinking. This is necessary because it is safe to assume that even if sustainable solutions for regional development are found in the near future, some places will continue to lose inhabitants. And, unless it is due to purely economic stress, there is nothing wrong with it. The Icelandic settlement map looked different some 50 or 100 years ago. While many places grew as a result of the industrialisation of the fisheries and their centralisation in the early 1900s, they are now shrinking due to the continuation of this process. I do not want to go too deep into the discussion of the 'function' of certain places and 'community Darwinism'. However, it would be naïve to think that each and every place will remain on the map in its present form. People continue to 'vote with their feet'. The question is thus how much the central state can and should do to halt a seemingly pervasive urbanisation process. And even with such strategies, it is unlikely that concentration of settlement will stop in the future. The question thus should be about how to deal with places that are already too much weakened for turning unfavourable demographic development around; places in which the 'adaptive cycle' has been so profoundly disturbed that any sort of equilibrium is beyond reach. In this regard I agree with the critique of those who have argued that the resilience approach is too focused on positive adaptation (Endress, 2015; Kolar, 2011; Wilson, 2012).

While in ecology it seems to be acceptable that only the 'fittest' survive, this way of thinking seems to be inappropriate in the regional development discourse. This might be due to the fact that such a question is inappropriate in welfare states and it does not fit the idea of free choice of residence. I deliberately want to prise open this Pandora's Box, raising the question, whether or not there is a socially acceptable way of dismantling a community and how to set an end-point in resilience. This certainly is a delicate social issue, as it involves human beings that have invested in property locally and that are part of a community with a strong rooting and relation to a locality. The question goes beyond monetary considerations: it is inherently political. Hence, finding a solution for those places should by no means be left to neoliberal think tanks nor scientific bodies within academic ivory towers. Unfortunately I have neither come across any progressive solution to the problem nor has any article been written – to my knowledge – about this topic. Critical resilience thinking has to find a way for this for being a truly comprehensive theory. I think that the solution can be found in participatory and inclusive settings.

7.3 Conclusive remarks

In autumn 2013 I started this PhD project, not sure what to expect. When I had a first talk with my supervisors, searching for a suitable topic, I was quite hesitant to go into social aspects of fisheries management – carrying coal to the Ruhrgebiet was my first thought.

Somewhat naïve, I was certain that a fishing nation such as Iceland would have covered this field extensively. I was proven wrong quite soon. Some five years later, I am about to finish this project with mixed feelings. On the one hand, I am glad to see that there are some good people trying to push social sciences into fisheries management. And I am quite sure to have answered a fair share of my research questions. On the other hand, I have to admit that I end this project with some essential questions remaining unanswered. As an excuse, some questions can hardly be answered unless we make simplistic assumptions about direct and one-way causal relationships. Besides, social science and fisheries can be frustrating. Walking through villages where you see no children at play[15], no life at the docks and plenty of abandoned houses, knowing that some people in their ivory tower, their eyes and conclusions fixed on macro-economic numbers, praise the efficiency of the ITQ system – well, that is not only frustrating but easily leads to cynicism. Sitting in interviews where participants are full of negative emotions while talking about the history of 'their' town is just sad. The system of individual transferable quotas has certainly created wealth (Árnason, 2008; Gunnlaugsson & Saevaldsson, 2016). The question is for whom and at whose expense.

[15] Not because of the weather, I might add.

PART TWO

PAPERS

I Improving or overturning the ITQ system? Views of stakeholders in Icelandic fisheries

Abstract

Icelandic fisheries have gone through tremendous changes since the 1980s and the gradual implementation of individual transferable quotas. The paper investigates to what extent the power of different stakeholders in in the fisheries management system has changed, and examines whether and in which fields enhanced participation is favoured by relevant stakeholder groups. Strengths and weaknesses of participation within the system are scrutinized and alternatives assessed. The analytical framework stems from the concept of adaptive co-management, whereas the empirical data derives from a survey on Icelandic fisheries management among important stakeholder groups. This survey showed that the critique of individual transferable quotas is not homogeneous. Regional differences are present regarding the evaluation of the current regime, but also of proposed alternative management instruments. Overall, more stakeholder participation, especially in data gathering and decision making, is demanded. This has in fact decreased over time. The authors suggest that the perceived shortcomings of the quota system in general and the lack of stakeholder participation in particular, can be addressed by adopting certain elements of adaptive co-management.

Keywords: Fisheries management, Adaptive co-management, ITQs, Stakeholder participation, Iceland

Introduction

Fisheries throughout the world are in a serious decline. Transition to a more sustainable situation needs a comprehensive approach that manages to include the partly conflicting disciplines of ecology, economics and social sciences. This is due to threats facing both the biomass and also the livelihood of coastal and fisheries dependent communities. It is therefore necessary to rethink fisheries management and policy instruments.

Fisheries management is a challenging task. Uncertainty and complexity, coupled with the opposite interests of various stakeholder groups, transform it into a veritable Gordian knot. In most cases, fisheries management is the task of nation states or supranational institutions, including, for example, the European Union and its Common Fisheries Policy. The generally rigid top-down approaches of these institutions show several shortcomings, mainly but not exclusively regarding social aspects (Berkes 2009; Grafton 2005; Jentoft 2007; Olson 2011). An assessment of alternatives is therefore advisable. Statements affirming that essential changes cannot take place without enhanced stakeholder consultation have become more prominent over the past decades. That participatory

approaches are not only theoretical constructs of social scientists can be illustrated with examples from various fisheries management regimes throughout the world. Changes, however, require not only political will, but, following the maxim of co-management, also stakeholders' commitment (Berkes 2007, 2010). Thus the impetus for enhanced stakeholder involvement in bottom-up strategies has to come from the the stakeholders themselves. Increased stakeholder involvement in numerous fields of fisheries management, such as data gathering, knowledge utilisation, and stock assessment, is advocated by academia (Jentoft and Mikalsen 2014; Rettig et al. 1989; Soliman 2014a; St Martin et al. 2007) as well as stakeholders themselves (Folke et al. 2005).

Iceland has been looked upon as a laboratory for fisheries management. Particularly in the field of quota-based management, Iceland was a pioneer, introducing a system of vessel-based quotas in 1984 and later adding transferability. Until 1984, a mixture of methods was used, including the quota management of certain species (e.g. herring) and effort restrictions in the demersal fisheries (Matthiasson and Agnarsson 2009; Pálsson and Helgason 1995). However, problems of overcapacity became more and more apparent. Following some years of steadily decreasing catches that did not even reach the recommended Total Allowable Catch (TAC) by the Marine Research Institute (Matthiasson 2003), individual vessel quotas were implemented in the demersal fisheries. Based on the catch history for the previous three years, each vessel was allocated a share of the annually set TAC. In this transitional phase, fishermen had the choice between the quota system and the former system based on restricting effort (Eythórsson 2000).

The switch to the current individual transferable quota (ITQ) system took place in 1990. Transferability of quotas turned a former common pool resource de facto into a collection of important tradable assets (Benediktsson 2014; Benediktsson and Karlsdóttir 2011). This was thus a market-based solution that was meant to contribute to a decrease in fleet size and hence both the conservation of fish stocks and improved economics of the fishing sector. Just to what extent these goals have been achieved is fiercely debated, as was the case with the earlier management regimes also. The ITQ system, however, did not grapple at all with the question of social equity (Carothers and Chambers 2012; Holm et al. 2015; Soliman 2014b).

Nonetheless, the latest amendments of the Fisheries Management Act show that questions concerning regional development have been taken seriously to some extent. Two instruments have been introduced to support the small-scale sector and/or assist regions that were negatively affected by the introduction of ITQs. Community quotas (Icel. byggðakvótar) were introduced in 2002/03. The main purpose was to mitigate the impacts of quota transfers from small and vulnerable communities. Coastal fisheries (Icel. strandveiðar) were added in 2009. This scheme aims to enable small-scale operators access to the fisheries without having to buy quotas. Also, catch fees (Icel. veiðigjöld) have been gradually taken up, in response to concerns about the lack of resource rent payments from the industry to society at large (see: (Matthiasson 2008; Matthiasson and Agnarsson 2009).

The Icelandic system has been promoted worldwide as an example of an economically efficient and ecologically sustainable fisheries management system (Árnason 2012; Christensen et al. 2009a; Leal 2005). Yet, despite the fact that Icelandic fisheries have been analysed rather thoroughly, participatory aspects have not been prominent in the discussion, neither on a scientific nor on a policy level. Whereas many other fisheries management systems have placed considerable emphasis on implementing bottom-up and

participatory methods (Aranda and Christensen 2009; Evans et al. 2011; Trimble and Berkes 2013), such mechanisms are still absent in Iceland. Various instruments of fisheries management have been utilised during the past 40–50 years. However, those who have had to apply these instruments and adjust their work routines were barely involved in the decision and policy making process during the implementation of the most significant reforms. In fact, stakeholder involvement seems to have decreased over time (Christensen et al. 2009b; Eythórsson 2000).

An important question that arises is how far enhanced participation is favoured by the most affected stakeholder groups in Iceland – those whose livelihood depends directly on the fisheries. This is the basic question of this paper. Having gained popularity in literature and practice during the past few decades, the concept of adaptive co-management (ACM) provides the theoretical framework. After the introduction, a general discussion of adaptive co-management in resource management is presented, followed by an analysis of the power structure in the Icelandic fisheries policy making. This is a necessary and preparatory step for a thorough discussion of the stakeholders' statements. The paper concludes with some reflections about the possibilities for introducing adaptive co-management to Icelandic fisheries.

Based on empirical data from a comprehensive survey conducted within a European research project on 'results-based management' (EcoFishMan), the article examines relevant questions about stakeholder involvement, knowledge utilisation and the overall assessment of the recent management regime. Data from the survey will be analysed in the light of regional and occupational differences. The analysis and discussion is intended to contribute to an ongoing national and international debate about appropriate fisheries management systems.

Adaptive Co-Management and fisheries

One possible avenue for the rethinking of fisheries management is enhanced stakeholder participation (Berkes 2010; Wilson et al. 2009). International examples show that stakeholder involvement is not bound to a particular political system, place or development trajectory, but applicable in each and every resource management system (Berkes 2010; Wilson et al. 2003). Certain components of co-management occur at least in 130 fisheries worldwide (Gutiérrez et al. 2011).

Participatory methods echo the call of Basurto and Nenadovic (2012), who aim for a fisheries management system that recognises fisheries as 'complex adaptive systems' and considers all disciplines involved as equal. Several methods are available for the management of a given natural resource. One of the most prominent approaches, when it comes to the reduction of conflicts through participatory methods, is adaptive co-management (Armitage et al. 2007a; Berkes 2010). It encompasses four compatible elements: learning-by-doing, multiple knowledge systems, flexible management structures, and advanced collaboration through power sharing (Folke et al. 2005; Plummer and FitzGibbon 2007).

A strong argument for the growing popularity of adaptive co-management is the demonstrated potential to mitigate the negative consequences of two characteristics of conventional top-down resource management: non-linearity and unpredictability (Armitage

et al. 2007b). These are features that lead to increased complexity in natural resource management (Berkes 2007; Folke et al. 2005).

The approach itself combines two elements, namely the participatory emphasis of co-management and the importance of learning-by-doing within the adaptive management framework (Armitage et al. 2007b). In addition, ACM includes and enhances tasks such as data gathering and both logistical and allocative decision making, and generally leads to a more inclusive decision making process. Based on dialogue, interaction, and collaboration, this process is embedded in an interdisciplinary setting (Armitage et al. 2007a). This interdisciplinary aspiration becomes apparent when aspects of knowledge formation are discussed.

Knowledge is therefore an essential component, yet often defined in different terms. It is sometimes referred to either as indigenous knowledge (Berkes 2009), local knowledge (Armitage et al. 2008), traditional ecological knowledge (Berkes et al. 2000), fishers' ecological knowledge (Johnsen et al. 2014), or with reference to Iceland, as practical knowledge (Pálsson 1998a). Apart from the variation of these terms, there is a general consensus that the multiple epistemologies found within fisheries need to be included and considered (Berkes 2009; Carlsson and Berkes 2005; Pálsson 1998a). Symes and Phillipson (2009: 2) also highlight the importance of a more inclusive kind of knowledge gathering, defining fishery communities as "reservoirs of knowledge, experience and understanding of local fisheries that cannot be replicated in any other form."

Apart from the knowledge-generating pillar, ACM is based on three additional elements: delegation, devolution and/or decentralisation. Delegation can be understood as the handing over of management responsibilities and authority across the institutional or policy levels (Jentoft et al. 1998; Pomeroy 2000). Devolution also an essential part of ACM (Plummer et al. 2013). It can be considered "as a kind of governance reform, a mechanism to bring citizens, local groups and organizations into the policy and decision-making process" (Berkes 2010: 491). Devolution should not be interpreted as merely an increase of participants without effectively sharing power. This will not result in an improved policy-making process, and can work as a placebo rather than a real remedy for the perceived flaws of the management system. In addition, the number of participants is not so much of importance as is the quality of methods applied and a clearly formulated objective (Reed 2008). Besides, the more participants and stakeholder groups involved, the harder will efficient consensual decision making become (Pomeroy et al. 2001; Symes 1997). Thus a balance between efficiency, accountability and legitimacy has to be found (Jentoft and McCay 1995; Yandle 2007). Also devolution can result in a 'participation paradox': de Vivero et al. (2008) point out that including more stakeholders eventually decreases the importance of the single actor. Thus, "greater devolution does not necessarily result in greater participation" (de Vivero et al. 2008: 320). Decentralisation is tied to the two previous elements and can vary in form and intensity. A suitable definition that is useful for the further discussion of the Icelandic case is provided by Pomeroy (2000: 135): "Decentralization refers to the systematic and rational dispersal of power, authority and responsibility from the central government to lower or local level institutions […] and then further down to regional and local governments, or even to community associations." However it is important to find the right balance in the decentralization process. Too much decentralization can have counterproductive effects, such as the consolidation of power amongst local elites (Berkes 2009; Folke et al. 2005).

The misuse of power locally is just one example of the possible criticisms levelled against co-management regimes. Others that are mentioned frequently concern the costly and time-consuming processes that co-management can entail (Aranda and Christensen 2009) and also that inclusiveness may not be as comprehensive as originally intended (Yandle 2003). The latter is a complex problem, but largely a semantic one, concerning how to define precisely the term 'stakeholder' (Eythórsson 2003; Mikalsen and Jentoft 2001; Soliman 2014b). This semantic problem will be discussed in detail later. Regarding the aforementioned issue of complexity, it is essential to bear in mind that there is no 'one-size-fits-all solution' for resource management, or a guaranteed blueprint emerging from the scientific laboratory. Hence, failure is always a possible outcome (Berkes 2009). It should be kept in mind that ACM is a long-term scheme, and not a short term crisis remedy (Armitage et al. 2007b).

Stakeholder involvement in Icelandic fisheries

Much has been published on Icelandic fisheries management and ITQs. However, no comprehensive analysis of stakeholder involvement over the entire period of ITQ management has been done, and in general the focus has not been on participatory concepts. This is somewhat surprising, given that the development in the Icelandic fisheries shifted from a broad consensus in the 1970s to the "most-dividing and conflict-laden issue of Icelandic politics" in the 1990s (Eythórsson 2000: 484). For McCay and Acheson (1987), the early stages of quota management were not only shaped by consensus but even defined as co-management, fulfilling the attributes of openness and flexibility alongside a trusted state. However, they relativized this conclusion in a way which has since been verified, stating that the acceptance of the system and the trust in state authorities can only be granted as long as the "continuation of the ideology of equal, or equitable, access" is enabled (McCay and Acheson 1987: 33). Whether these conditions have been met is questionable, since the subsequent financialisation of fishing rights soon led to a substantial concentration of power (Benediktsson and Karlsdóttir 2011).

For a better understanding of the development of the Icelandic system, different stakeholder groups will be identified in this section and the influence or power of those groups in policy making will be assessed through a review of the relevant literature. For the sake of simplification, the choice of stakeholders follows the general criteria of Mitchell et al. (1997). According to these authors, three main variables define a stakeholder: power, legitimacy and urgency. Stakeholders are then subcategorized as definitive, expectant or latent. Based on this, Mikalsen and Jentoft's (2001) identification of groups of relevant stakeholders in Norwegian fisheries management will now be modified and applied to the Icelandic case. While the latent stakeholders are excluded in the following, the definitive and expectant groups will now be more closely defined and their degree of power further discussed.

Definitive stakeholders are those that reach medium or high degrees in power, legitimacy and urgency. According to Mikalsen and Jentoft (2001), this applies for fishers, fish processors, bureaucrats, enforcement agencies, scientists and fish workers. As a category, 'fishers' is too vague considering the Icelandic circumstances. A division into quota holders and crew members is more appropriate. Expectant stakeholders are those who possess medium or high degrees in at least two of the three variables or have received increased recognition. This applies to indigenous people, environmental groups and local

communities. Since ‘indigenous’ groups have a certain stake in Norwegian fisheries, but are not present in Iceland, this group can be left aside. Also environmental groups have not really participated in the fisheries management discourse. Of the expectant stakeholders therefore, only local communities will be discussed in the description that follows. We identify eight groups of stakeholders. It should be pointed out that these groups are not mutually exclusive: a single person can belong to two or more groups, e.g. ‘quota holders’ and ‘local community’ members.

Quota holders arguably constitute the most powerful group, since the quotas are attached to vessels, and thus to their owners. This group is now represented by the association Fisheries Iceland (Samtök fyrirtækja í sjávarútvegi, or SFS), established in 2014 by the merger of the Federation of Icelandic Fishing Vessel Owners (Landssamband íslenskra útvegsmanna, or LÍÚ) with the Federation of Icelandic Fish Processing Plants (Samtök fiskvinnslustöðva, or SF) (http://www.sfs.is). The LÍÚ, de facto an association of quota holders, was for a long time a highly influential interest group. Their influence has been frequently and fiercely debated. Among scientists there is a broad consensus that this stakeholder group has been very influential, even the leading one (Eythórsson 2000, 2003; Karlsdóttir 2008). The crucial support of LÍÚ during the policy making process prior to the introduction of quota management underlines this theory (Gissurarson 2005; Matthiasson 2003). Matthiasson (2003) considers Icelandic fisheries management as a ‘closed-shop policy’ with the governmental institutions remaining in a passive role, leaving the field to LÍÚ. Their power reaches into political decision making. LÍÚ has at times wielded its influence so as to thwart proposals for changes to the system (Thorhallsson and Kattel 2013; Benediktsson and Karlsdóttir 2011).

Crew members belong to a group that is considerably less powerful, and which has lost influence significantly since the introduction of the ITQ system (Eythórsson 1996). The division between crew members and vessel owners defines one of the main conflict lines among stakeholder groups that have “dominated the ITQ-debate in Iceland for many years”(Eythórsson 2000: 489). Instead of a unified lobbying group such as LÍÚ has been, crew members are represented by several different unions. Their representatives do not have the same influence in the policy-making process as quota holders have traditionally had. Crew members have been labelled as disenfranchised and dependent (Carothers and Chambers 2012; Eythórsson 1996, 2000). This group has had to accept changes initiated by more powerful institutions, since the only alternative in most cases is to leave the sector. In other terms, the crew has a weakened bargaining position under ITQs, but has to carry the burden of negative impacts within the system (Carothers and Chambers 2012; Olson 2011).

Fish processors: This stakeholder group consists of the owners of fish processing companies, whereas their employees are subcategorised as fish workers. Speaking of Norway, Mikalsen and Jentoft (2001) think that plant owners are very powerful within the fisheries production chain. The reason for this is the development of the sector, characterised by centralisation and integration. This can also be said about Iceland. With regard to power, integration is of importance since most of the processing is owned by vertically integrated companies that include fishing, fish processing and exporting. This secures those companies a strong representation in the political system, increased market power, and improved bargaining positions (Eythórsson 2000; Knútsson et al. 2008; Pálsson 1998b).

The power imbalance, especially between the vertically integrated companies and fish workers, can have momentous consequences. Recent examples include the decision of a company to close three out of four processing plants in remote areas, concentrating the operations at its home base in the southwest of Iceland. This is just one recent example of the general trend from community-attached firms to a footloose industry (Eythórsson 1996, 2000; Karlsdóttir 2008). In general this trend has "contributed to a polarization in terms of affluence and survival favouring the new global businessman above the locally oriented processor" (Karlsdóttir 2008: 9).

Fish workers are a stakeholder group consisting of employees in onshore processing plants. They occupy the lowest rung in the fisheries' power hierarchy, not only since this group "has been least involved in decision making and policy design in the fisheries" (Eythórsson 2000: 485), but also because of their often uncertain employment. Their power is mainly dependent on the responsible union. But even strong unions cannot prevent the permanent threat to those workplaces. This is not only due to centralisation processes in the sector, but also technological changes. After 1984 the fleet of factory trawlers grew steadily (Eythórsson 2000), making parts of the land-based processing redundant. This had noticeable consequences on the distribution of processing plants. While 50 municipalities had such plants in 1992, only 35 did in 2005 (Karlsdóttir 2008). This number has decreased even more since. This case illustrates quite well that those working in the processing plants are pawns in the hands of the powerful, facing the choice of staying and looking for other work in their home region or to follow the company south-westwards.

The stakeholder group identified as bureaucrats mainly consists of employees of governmental bodies, such as state authorities (differing from enforcement agencies) and ministries. Classified in general as "principal authors of management laws and rules", this group was powerful before 1990 and during the initial stage of the quota implementation (Mikalsen and Jentoft 2001: 285).

Since ITQs are a form of privatization, it is to be expected that the influence of the central government decreases over time. However, the fisheries minister still "has the power to make ITQs worthless by the stroke of a pen without compensating the ITQ holders" (Matthiasson 2003: 16). Also the state makes decisions about TACs for the various species, which in itself is a source of considerable power.

Scientists: The assessment of power is difficult for this group and varies between the scientific branches. On the one hand, the group of scientists appears in a consultative capacity to the bureaucrats (Mikalsen and Jentoft 2001) and fisheries management has to comply with best scientific advice (Holm et al. 2015). On the other hand, the scientific community is not represented equally. Most important is the state run Marine Research Institute (Hafrannsóknastofnun, or Hafró) that provides recommendations and advice to the government bases on stock assessment and stock projections. The advisory function includes also possible closures of fishing grounds and catch restrictions, including the TAC. Hence, this scientific actor has, theoretically, a very high degree of power with far reaching consequences. In practice, the recommendations from Hafró have not always been followed (Woods et al. 2015).

Hafró, and the general scientific discourse, has been dominated by economists and marine biologists (Benediktsson 2014; Eythórsson 2000; Karlsdóttir 2008; Matthiasson 1997;

Pálsson 1998a). Social scientists other than economists are largely excluded from this stakeholder group, which has been criticised.

Enforcement agencies: This group is represented mainly by the Directorate of Fisheries (Fiskistofa). The role of this agency is surveillance, monitoring and the delivery of data on landings that are considered when the TAC is determined. The TAC itself is allotted by Fiskistofa. Furthermore, all commercial fishing operations are subject to a permit from the agency. With the surveillance, monitoring and possible sanctioning, Fiskistofa has mainly executive power.

Just as with the governmental bureaucrats, the influence of local communities is challenged in a privatised quota market. Historically, municipalities were quite influential stakeholders, sometimes even the owners or shareholders, of vessels, plants and cooperatives (Matthiasson 1997). Over time, their influence has been decreasing, which is partly self-imposed. Municipalities had and still have the chance to buy back quotas that were or are about to be transferred out of the municipality. However, this option was not often exercised during the first years of quota management, as it left the municipality with significant financial burdens (Eythórsson 1996; Matthiasson 1997). On the whole, the fisheries sector has become 'deterritorialized' as most fishing villages have lost influence on the decision-making about even those fish that are found in local waters (Benediktsson and Skaptadóttir 2002).

Figure 4[16] illustrates schematically the development of power in Icelandic fisheries policy making before and after 1990, based on the preceding identification of eight stakeholder groups. The figure 0 marks no power at all, whereas 5 indicates the maximum power possible. As stated at the beginning of this section, before the quota management was initiated, the fisheries sector was characterised by a consensus-based policy making process much more than later became the case. Therefore an equal rating of moderate power for all stakeholder groups is assumed, with one exception: the bureaucrats stand out due to the governmental power in the final decision. The development after 1990 provides a different picture. Four groups have gained significant power, leaving another three groups in an inferior position while one group remained unchanged.

[16] It is figure 1 in the published paper. In this and the following papers, tables and figures are renumbered.

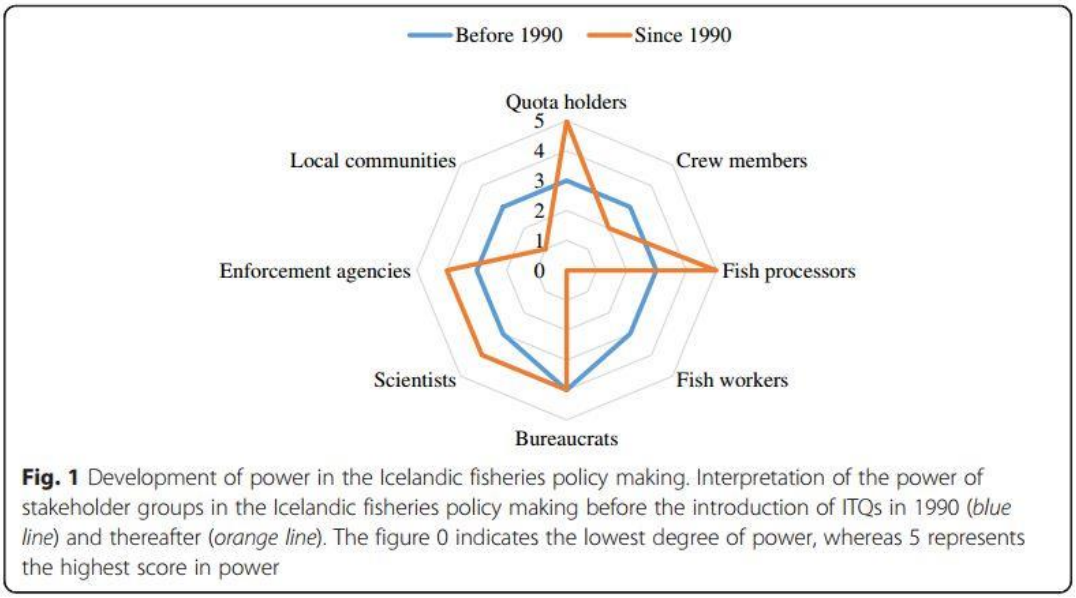

Fig. 1 Development of power in the Icelandic fisheries policy making. Interpretation of the power of stakeholder groups in the Icelandic fisheries policy making before the introduction of ITQs in 1990 (*blue line*) and thereafter (*orange line*). The figure 0 indicates the lowest degree of power, whereas 5 represents the highest score in power

Figure 4 Development of power in the Icelandic fisheries policy making.

Analysing the trajectories of power (im)balances in the Icelandic fisheries management, a paradoxical observation can be made: the more complex fisheries management has got, the less stakeholder involvement has been granted from the policy makers. Formulating and executing the fisheries management policy soon became the endeavour of a chosen few and of the political class (Eythórsson 2000, 2003; Matthiasson 2003; Pálsson 1998a). This may be understandable from an efficiency-seeking perspective that is based on the assumption that the fewer the stakeholders, the less complicated the policy making is. This runs the risk, however, of overlooking some valuable knowledge that is found within the various stakeholder groups.

The overall trend outlined in this section echoes in particular the diagnoses of the rapid implementation of neoliberal politics in Iceland offered by Benediktsson (2014). These politics that were enabled by sectoral corporatism that generally defines Icelandic governmental decision making (Thorhallsson and Kattel 2013). In addition, the democratic system has been described as adverse, conflictual, and non-consensual, not seeking compromise or consultation (Jónsson 2014; Thorhallsson 2013). This is rather atypical in the Nordic context (Thorhallsson and Kattel 2013; Jónsson 2014). Sectoral corporatism in the context of Icelandic democracy has been heavily influenced by the fishing industry (Kristjánsson 2004; Thorhallsson 2013; Thorhallsson and Kattel 2013). This has been enabled by informal and flexible decision making, with close personal connections and strong ties between politics and economics that eventually weakened the system of checks and balances (Vaiman et al. 2011). Thereby "substantial emphasis on political favouritism rather than general policy-making" (Thorhallsson and Kattel 2013: 10) can be identified. We might recall the remark of Hersoug et al. (2000: 328) on ITQs in general, that "the political reality is that a closing of a commons is not only an economic transaction, it is even more a transfer of political power."

The survey

The empirical results for this paper stem from a survey that was conducted between March and June 2014. The survey was part of the EU FP7 project EcoFishMan (http://www.ecofishman.com), that analysed results-based management in European fisheries with the view of contributing to reforms of the Common Fisheries Policy of the European Commission (Nielsen et al. 2015). A central concern of the project was the assessment of stakeholder views on fisheries policy and aspects of participation in the policy making process. For this, a survey was designed jointly by the University of Iceland and the research company Matís. The survey was intended to reach a balanced group of participants. It did not, however, attempt to include all the groups identified as stakeholders above (Fig. 1), but was aiming mainly for those stakeholders that are directly involved in fisheries and whose daily livelihood is dependent on this resource.

The questionnaire was distributed in two phases. Field trips to selected municipalities with fisheries and fisheries-related industries were the foundation of the first phase. The communities themselves were located all around the country, including remote regions, such as the Northeast. The idea behind these field trips was not only to distribute the survey, but also to gain a sense of the atmosphere, problems and concerns of the respondents. Therefore dozens of informal interviews were conducted before the survey was distributed.

Two difficulties were faced during these field trips. First, a language barrier was evident in the processing plants, where many workers were not of Icelandic origin. Even though some were familiar with Icelandic, many technical terms were unfamiliar and the necessary background information was not always provided. Second, certain localities were relatively underrepresented, especially in the East. Following the fieldtrips, a second phase was initiated with the generation of an unaltered online version of the survey. This was distributed to many stakeholders in the fisheries, including companies and institutions that had valid email addresses, with a request to participate and to further distribute the link (snowball sampling) to colleagues.

The survey itself consisted of 40 questions subdivided into four categories: The assessment of stakeholder participation; an evaluation of fisheries management; alternative management regimes; and aspects of trust and monitoring. In the following chapters the focus will be on analysing those questions that are related to participatory management approaches.

Overview of participants

The total number of respondents in the survey was 392 (153 from the first phase, 239 from the second phase). When asked about occupation, a total of 144 respondents identified themselves as ‘fishers’ and 80 as ‘processing workers’. In addition, the survey included 81 people from various service industries that are directly fisheries-related, such as net-mending or repairs, and another 79 participants that selected ‘other’ as occupation (e.g. office workers at fisheries firms). Eight respondents did not answer this question. In addition to the broad occupational classes, the respondents were asked to identify whether they were quota holders or not. Some 55 (14%) turned out to be quota holders. Thus five out of the eight categories of stakeholders identified above (Fig. 1) are represented in the survey. Those not represented are scientists, bureaucrats and enforcement agency staff –

people who relate more indirectly to the fisheries sector per se. The age and gender distribution is rather skewed. Almost 50% of the participants were aged over 50, with the cohorts of 15–30 years old contributing only 10% of the total number. The questions were thus answered mostly by respondents with considerable experience of the fisheries sector. An overwhelming majority of the respondents were male, or 85%.

The map (Fig.2) shows the distribution of the respondents. Most answers were obtained in the Capital Region, which is not surprising since approximately 60% of the population of Iceland reside in this region. The field trips to the South and Northeast led to relatively high numbers of participants from these regions. Also the online version of the survey invited the opportunity to increase the number of answers from the remote Westfjords and the East. Reykjanes and the West have a fair number of respondents, whereas the Northwest is underrepresented and thus not included in the analysis of regional differences. However, this region is not much of a fisheries-dependent region anymore. Four per cent of the respondents did not indicate their residence.

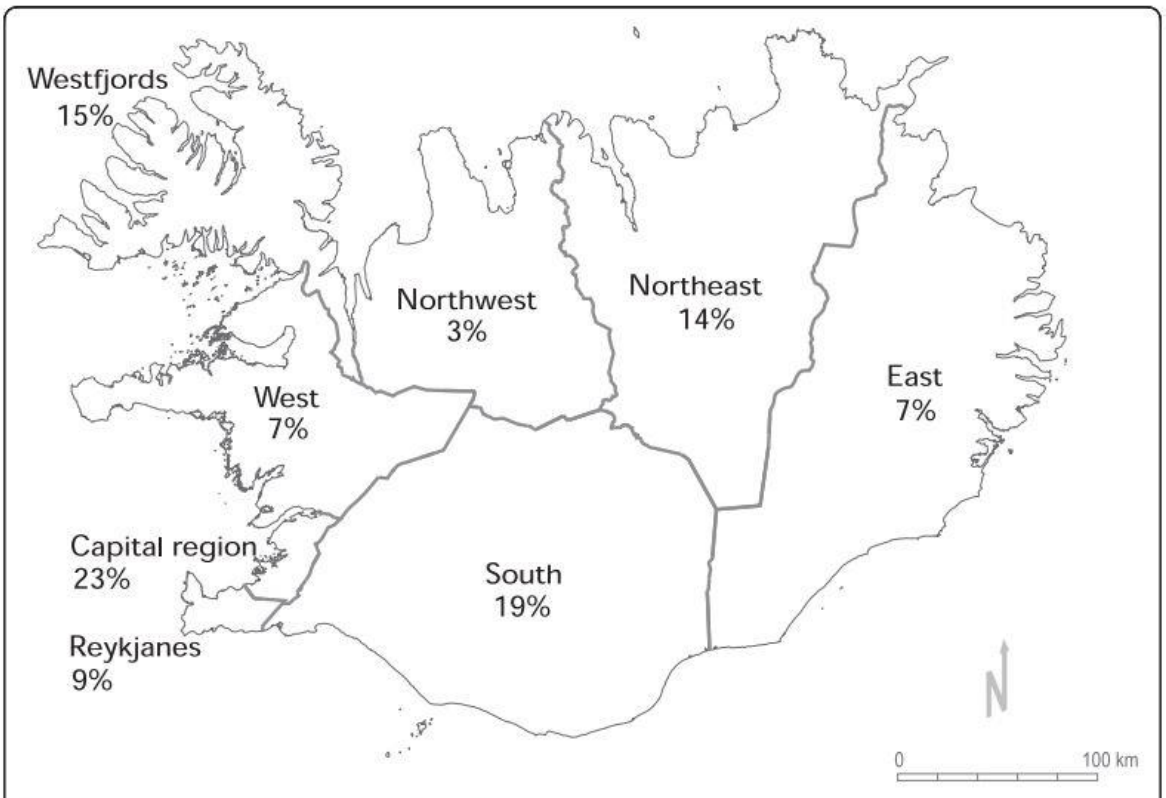

Fig. 2 Regional distribution of participants (in %)

In the discussion of the results, the respondents were divided into subgroups by three variables. Given the concerns with geographically uneven impacts of the ITQ system, the initial focus was on the region of residence. Differences relating to occupational background and the variable of quota holding were then also examined.

General perceptions of ITQs and alternative fisheries management systems

The survey results indicate that, after some 25 years in place, opinions about the Icelandic ITQ system are still quite divergent among stakeholders. Moreover, possible alternatives or modifications that were presented in the survey receive different levels of support.

Figure 5 shows how specific fields of effectiveness related to the current management regime were rated. The participants were asked to state in simple yes/no terms whether they saw the ITQ system as being effective in achieving ecological, economic and social/societal goals. Clear differences can be detected. Some 69% see the current management system as having been effective when it comes to the conservation of fish stocks. Achievement of other goals is much more sceptically evaluated. A little more than half the respondents think the ITQ system does not contribute to a stable business environment. Almost three-fifths answer negatively the question about whether a fair resource rent accrues to society at large, and more than two-thirds think that the regime is ineffective concerning the fulfilment of social/community responsibility. A sharp difference in judgements of ecological vis-a-vis social effectiveness can thus be detected.

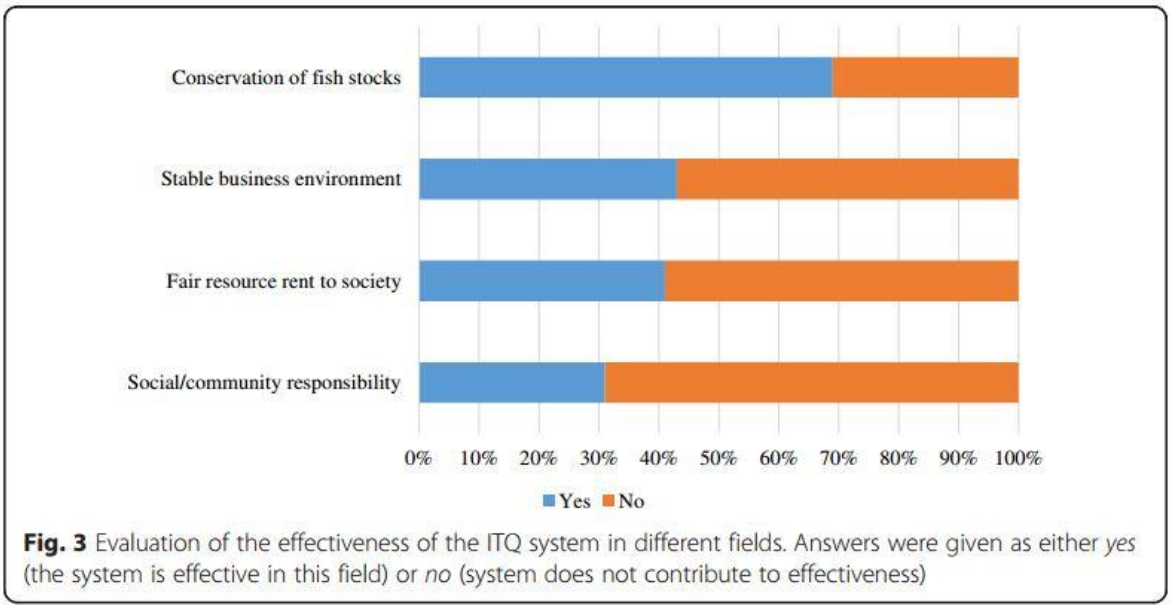

Fig. 3 Evaluation of the effectiveness of the ITQ system in different fields. Answers were given as either *yes* (the system is effective in this field) or *no* (system does not contribute to effectiveness)

Figure 5 Evaluation of the effectiveness of the ITQ system in different fields.

Certain regional differences in the assessment of ITQ effectiveness are evident. Respondents from the Westfjords especially show a high degree of scepticism about the system. Just over one third thinks that resource rent accruing to society at large is fair (interestingly enough, the Capital Region has even stronger negative opinion about this) and only 13% feel that goals of social responsibility are achieved by the management system. Quite different results come from Reykjanes, the region showing the highest rate of approval. Even the generally negative appraisals elsewhere of the system's performance regarding resource rent and social responsibility are not backed up in this region.

Analysing the results of these questions while differentiating between quota holders and non-holders reveals two findings worth mentioning. While the general critique of a lack of

social responsibility is shared by the majority of quota holders (69%: equal to average), this group regards the resource rent to society criterion as achieved according to 55%.

Differing views are also present when it comes to opinions about other management regimes and possible alternatives or amendments to the ITQ-system. Respondents were asked to state their opinions about several management regimes on a five-item Likert-scale (Fig. 4). Despite the fact that overall the ITQ system is rated critically with respect to many of the goals which a fisheries management system is intended to fulfil, this system receives the best rating, with a broad majority rating the recent regime either good or very good. It is the only system that elicits a positive response from over 50% of the respondents. This applies to every region except the Westfjords and the Northeast. These two regions are the only ones to choose a system other than the ITQ system as the most preferable, namely coastal fisheries. Both regions have indeed lost a great deal of quotas since the 1990s. The East and Reykjanes are the regions that rate ITQs best. The former has fared rather well under the quota system in terms of processing, while Reykjanes has some expanding fishing companies, most notably in the town of Grindavík.

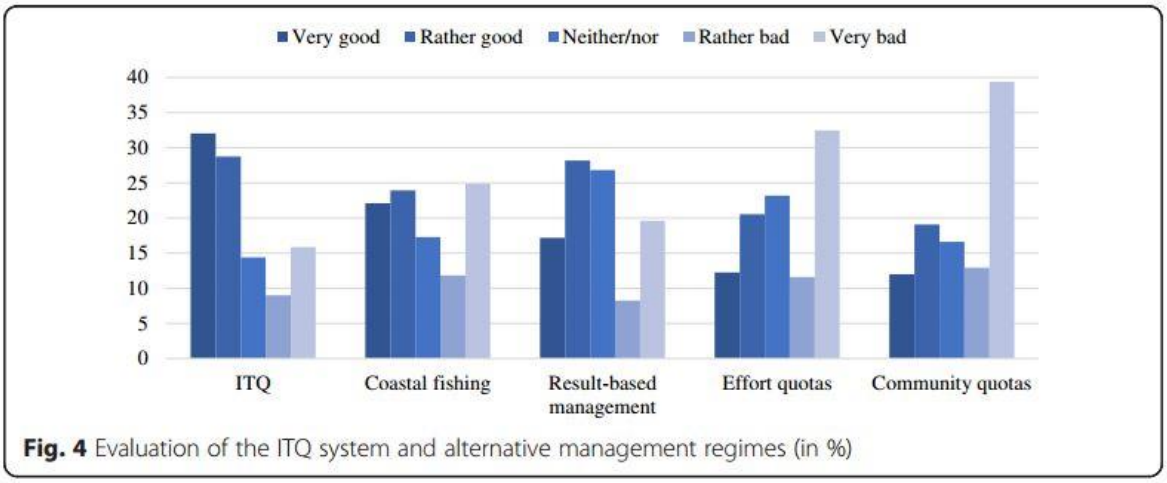

Fig. 4 Evaluation of the ITQ system and alternative management regimes (in %)

Community quotas (byggðakvótar), introduced in the fishing year 2002/03 in order to increase the "social robustness" of suffering smaller coastal communities (Christensen et al. 2009b), are considered the worst of the alternative systems. In all regions, negative evaluations surpass the positive range, which does not happen with any other alternative system. The West is most sceptical with 72% in the negative range, followed by Reykjanes (60%). The Westfjords are the only region where the positive range (42%) is about to reach the negative evaluation (47%).

Some hopes regarding new employment opportunities and the revitalization of coastal communities rose during the introduction in 2009 of a separate coastal fishing scheme for small boats (Carothers and Chambers 2012). It is seen as the second best option to ITQs. However, there are clear regional differences in the interpretation. Whereas the Westfjords, Northeast, East, and Capital Region have a majority on the positive side, Reykjanes and the South evaluate it rather negatively.

The alternative called here 'results-based management' was one of the core concepts of the EcoFishMan project. In the context of the survey, it was defined and presented with an example, since the concept has not been used much in discussions of Icelandic fisheries. Results-based management was defined as shaped by cooperation and stakeholder

involvement; management plans that are mutually agreed upon by various stakeholder groups; and new defined indicators to measure the success of those management plans. These elements are in line with basic ideas of adaptive co-management. Therefore the results from this question are of special interest with regard to the theoretical issues discussed in the previous section, as well as for further discussion.

Overall this management idea received moderate ratings. Together with the ITQs, this is the option which is least often evaluated negatively. Since the concept of results-based management has hardly been articulated in Iceland, it is not surprising that 27% choose the neither/nor option. From a regional perspective, it is only the West and the East that have a majority on the negative side. The largest shares of proponents are found in the Capital region and Reykjanes.

It is evident that the main point of criticism of the ITQ system concerns the transferability of quotas, which is in line with the general debate around ITQs (Carothers and Chambers 2012; Copes 1996; Pinkerton and Edwards 2009). When asked about possible alternatives, non-transferable quotas scored highest (Figure 6). However, it is somewhat striking that even though there was no restriction on answers, none of the opportunities listed got the approval of more than a third of the respondents. According to the survey, it is mainly people in the Capital Region and the Westfjords who want to curtail transferability, whereas the East shows the lowest support for the idea of non-transferability (only 4%).

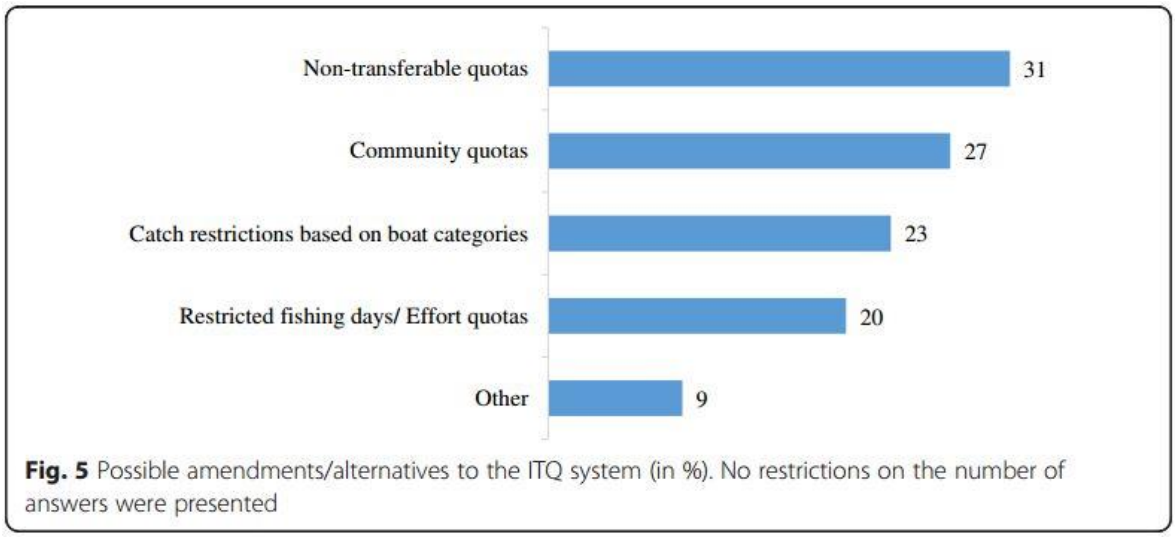

Fig. 5 Possible amendments/alternatives to the ITQ system (in %). No restrictions on the number of answers were presented

Figure 6 Possible amendments/alternatives to the ITQ system

Community quotas receive different approval among localities. While once again the Capital Region and the Westfjords show the highest support, it is a very unpopular idea in Reykjanes. When it comes to effort quotas, only the Westfjords show support significantly above the average, whereas the South is very unlikely to support the idea. Catch restrictions based on boat categories are most favoured alternative management option in the East, while being opposed most strongly in the South.

Stakeholder involvement and collaboration

As explained before, one part of the survey dealt with the assessment of stakeholder participation, which is also a key element in the discussion of co-management. Before the functions of co-management can be discussed it is essential to highlight that, according to the survey, a majority of 79% considers more involvement of fishers and vessel owners in the implementation of fisheries management as a necessary step. Against prior expectations, it was the workers from fish processing (70%), the group that was declared least powerful in section 3 above, who are least likely to demand more involvement. Stating this in basic yes/no terms, the subsequent questions offered more differentiated response options: Three questions dealt with the consideration of certain interests of stakeholders and the knowledge utilisation, whereas another open question aimed for a fuller investigation of the particular fields in which enhanced stakeholder involvement was thought to be necessary.

Three questions with a Likert-scale answer range aimed for an assessment of stakeholder participation (Figure 7). The general impression is that a lack of stakeholder representation is sensed by the participants. Some 52% feel that the interests of stakeholders in fisheries are taken rather little or very little into account in the policy making. The question whether the views of fishers and vessel owners are considered in practical arrangements, such as gear restrictions, certain closures or boat sizes was not only answered more negative, it was also the question that got the least answers in the positive range. Most negative were the views on the (non-)utilisation of the fishers and vessel-owners knowledge in management practices.

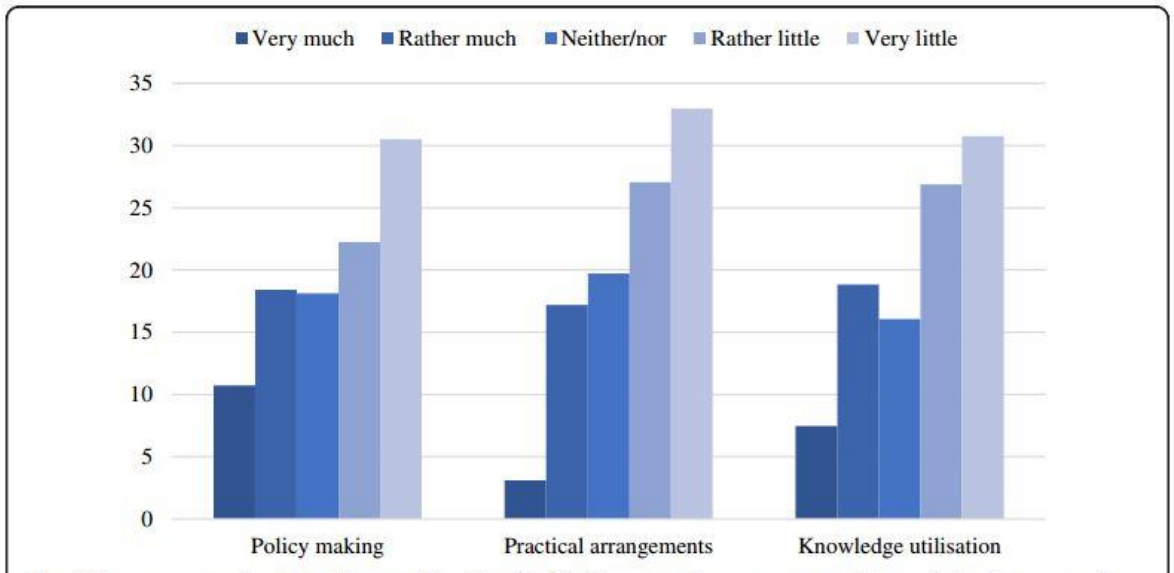

Fig. 6 Assessment of stakeholder participation (in %). The questions were stated thus: a) Are interests of stakeholders in the fisheries taken into account in policy making? b) Are the views of fishers and vessel owners considered in practical arrangements? c) Is the knowledge of fishers and vessel owners utilised in management practice?

Figure 7 Assessment of stakeholder participation

All three questions received significantly different answers by respondents considering occupational backgrounds and the question of quota-holding. In all aspects of stakeholder

participation, it is the fishers who are most negative about the current state, peaking in the consideration of practical arrangements (72%). Enhanced participation in the policy making is least demanded by employees from the service industries (35%). This is the only group that shows a slightly higher rate of agreement than disagreement. When it comes to the utilisation of knowledge, the workers from processing plants are less negative (47%) than the other occupations.

Strong differences can also be detected between quota-holders and non-quota holders. In all three questions it is the holders being more negative and show much more tendency to select the "very little" option with the strongest results on practical arrangements (56%). The differences between these groups are striking and show a gap up to 19 percentage points.

The results of the open question were interpreted and grouped with an analytic tool designed by Pinkerton (Pinkerton 1989), which was slightly modified. Pinkerton identifies seven fields in which enhanced involvement finds application (Fig. 7).

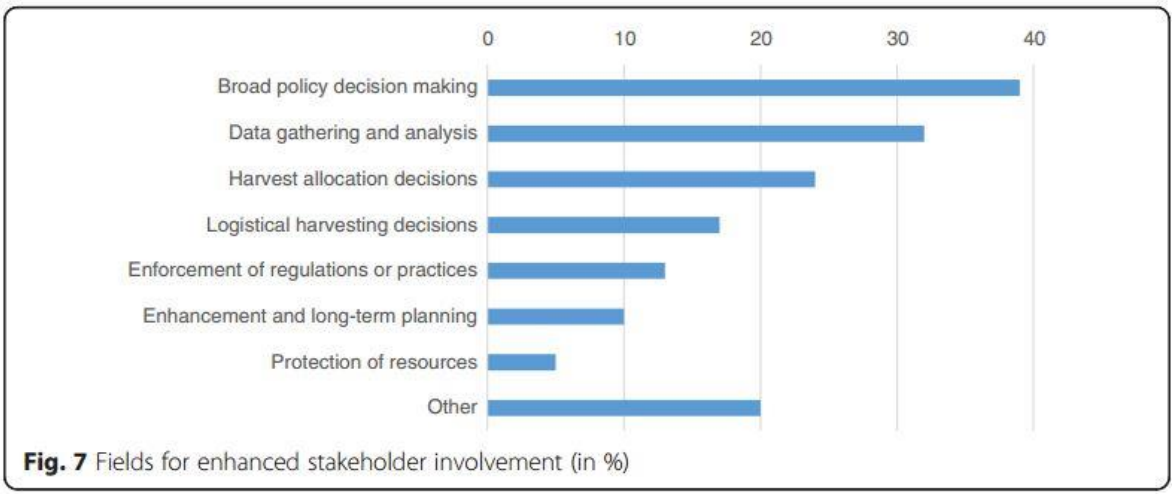

Fig. 7 Fields for enhanced stakeholder involvement (in %)

The most desired field of increased stakeholder involvement is broad policy- and decision making. This can be linked to a remark by Berkes (2010) about devolution and basic democratic principles. He argues that those who are affected in their well-being should have a say in the decision-making process. Even though more inclusive decision making scores highest, it is seen quite differently by the various groups of respondents. Only some 27% of employees from the service industries emphasise this, with 52% of those stakeholders defined as 'other' being most positive about it. The numbers for the fishers and processing workers are 44% and 29% respectively. The average is 39%.

That data gathering is considered as a field that needs enhanced stakeholder involvement is not surprising, since a certain mistrust towards the responsible institutions was sensed during the interviews that were conducted. Also, strong statements in response to the open question indicate a severe disbelief in official figures regarding fish stocks. It is mainly fishers (33%) and the employees from the service sector (38%) who demand a say in this regard.

Harvest allocation decisions focus on quantitative regulations, for example the annual TAC. Logistical harvesting decisions differ as they focus on who can fish, when to fish and

where to fish. Despite the discussion around initial allocations and the unequal distributions of quotas, concluding from the answers given here, the question who can fish is not as prominent as quantitative concerns. With regard to the before mentioned mistrust in official figures that are crucial for the TAC, this result is a logical consequence.

An interesting result is the very low demand for involvement in the protection of resources. On the one hand, it can be interpreted as just another positive evaluation of the overall effectiveness regarding ecological concerns. On the other hand it is surprising that, considering the mistrust in official data and the demand for enhanced participation in quantitative regulations, this field scores the lowest. This leads to the assumption that the stakeholders want to get involved in the delivery of data, but not in its interpretation.

Discussion

Results regarding ITQs

As stated in the previous section, the critique of the ITQ system itself is not homogeneous. Rather the system is criticised on many fronts and from different angles. In this survey we have identified four categories of critique (Figure 3), but excluding one trenchantly criticised aspect: The initial quota allocation process. This was due to the fact that the categories were not asking about particular shortcomings but, in this case, social/societal concerns in general.

Throughout the survey it became apparent that ecological concerns were the least controversial. These results reflect the assumptions of ITQ proponents regarding the ecological success of such a system (Árnason 2005). Conversely, this aspect is the only one related to effectiveness that is answered positively among the majority of respondents. The feeling that the current management regime does not contribute effectively to the stability of the business environment according to the majority, is astonishing in a country that is not only dependent on fisheries but where the fisheries seem to be in a reasonably healthy state. This is perhaps just another sign of the profound uncertainty that prevails in the sector, but might also be the result of the recent financial crisis (see discussion below; see also (Durrenberger and Pálsson 2014). For the sake of fairness it is important to underline that the stability of fisheries businesses depends on at least two major variables (or complicating factors) in addition to the political setting: sustainable and stable fish stocks, and a stable economy. Economic stability is partly a domestic issue, but also dependent on international conditions. While the domestic issue is characterised by debates about instruments such as resource fees, international concerns are shaped by severe currency fluctuations that affect this important export sector.

It is not surprising that the question of whether fair resource rent accrues to society at large is a central point of criticism (Christensen et al. 2009b; Gissurarson 2005; Hannesson 2003). Árnason (2005: 255) postulates that "estimates of the actual economic rents generated by the system as well as analysis of quota values strongly indicate that very substantial economic benefits are already being generated by this management system." Whether or not this statement is correct, one question should be raised at this point: Exactly to whom do those benefits accrue, since the majority of stakeholders feel that the distribution of benefits is lacking in fairness? The palpable tension surrounding this discussion is a central theme among scientists (Copes 1996; Hannesson 2003; Holm et al. 2015; Matthiasson and Agnarsson 2009; Soliman 2014b). A conflict-reducing economic

measure that has been discussed alongside quotas was the introduction of resource fees. However, there is no evidence that the introduction of a catch fee in 2002, which was "an effort aimed at reducing the tension caused by free allotment of quotas" (Matthiasson and Agnarsson 2009: 303), has lowered the existing discontent.

That a stable majority of respondents senses a lack of social responsibility and fair resource rent to the society at large substantiates the observations of several scientists. For Pálsson (1998b: 280) this is the consequence of the prerogative of economic efficiency that dominates the discourse: "social issues are pushed to the periphery, perceived as mere distractions from the objective and essentially technical undertaking of promoting efficient production." Overall the quota system has thus "instituted a new level of social inequality" (Pálsson 1998b: 285). This statement from the late 1990s is still valid. Benediktsson and Karlsdóttir (2011) state that the question of social equity has been sidestepped entirely. Holm et al. (2015) even argue that the 'social contract' has been violated, due to a lack of emphasis on the coastal livelihood. For Matthiasson & Agnarsson (2009), the social shortcomings within the current regime can be connected to discussions about the initial allocation that enabled the generation of windfall profits for a few quota-holders, while former fisheries communities saw quotas transferred away. Even though most critiques addressed moral and ethical issues regarding the allocation process, there were critical, albeit unheard, voices that saw Iceland falling into a generational conflict such as the transitional gains trap (Copes 1996; Olson 2011; Tullock 1975). Receiving quotas, and thus a marketable asset, for free, gives the first generation of quota holders an economic advantage that the following generations have to compensate.

Building on this critique, Eythórsson (2000: 489) goes even further when he speaks of marginalised communities that "are left without many options for coping with the situation [the quota loss]". This is of special concern since a number of these communities, referred to as 'single-enterprise communities' (Eythórsson 2000) or 'one-company towns' (Karlsdóttir 2008), were heavily dependent on fisheries and related industries. Hence it is not surprising that respondents from those communities and regions which have shown negative tendencies since the 1990s in terms of overall socioeconomic development and fisheries in particular, evaluated the current regime worst with regard to effectiveness.

Discussions about a stable business environment, social responsibility or a fair resource rent cannot be concluded without considering the financial crisis that hit Iceland in 2008. The extent to which this crisis can be linked to the introduction of ITQs has already been discussed by several authors (Maguire 2014; Benediktsson 2014; Benediktsson and Karlsdóttir 2011). Quotas were used extensively as collateral and mortgageable for speculative investment strategies. How far the crisis has influenced responces in this survey cannot be conclusively assessed. The devaluation of the Icelandic currency that accompanied the crisis led to a great increase in the value of exported marine products (Maguire 2014; Statistic Iceland 2014). Most fisheries-dependent regions have proven more resistant to the shocks that the crisis entailed, but then it should be kept in mind that they never benefitted from the economic boom that preceded it to the same extent as the capital region (Benediktsson and Karlsdóttir 2011).

Aspects of participation

As discussed in section 2, knowledge acquisition is a central theme in fisheries (co)management. As the subsequent discussion has shown, however, there are is no clear

agenda within the Icelandic management system on how to integrate different forms of knowledge. This current sentiment recalls the view of Pálsson (1998a: 50) who contended that "the inclusion of fishermen's knowledge was 'gradually subdued' since ITQs got introduced." Or, with reference to Carlsson and Berkes (2005), there is no 'epistemic community' based on the close cooperation of fishermen, scientists and the administration. Hence, the aspect of representation and collaboration needs to be taken up for discussion again. In general not much seems to have changed since the assertion by Eythórsson (2000: 490), that "the practice of working out the fisheries management policy by broad debates and consensus in the Fisheries Assembly and by preparing new legislation by task forces with broad representation from different stakeholder groups is now abandoned".

That the fishers are demanding more inclusiveness is not surprising. Almost two decades ago, Pálsson (1998a) considered that more inclusiveness could help to overcome the conflict-laden discourse between scientists and fishermen. This discourse is long-lasting and still ongoing, despite the fact that Iceland has experimented with an instrument to join the partly opposing types of knowledge. In the year 1985 the togararall (trawling rally) was introduced to the Icelandic fisheries. Some skippers therefore collected data in collaboration with biologists on previously defined paths. This was a 'diplomatic endeavour' with the aspiration to lower the gap between scientific and practical knowledge while collecting ecological data collaboratively at sea (Pálsson 1998a). However, judging from the feelings of fishermen uttered in the open questions and the atmosphere during informal interviews during the fieldtrips, this endeavour has failed to solve knowledge-based conflicts, 30 years after its implementation. This conclusion is supported by the survey.

From an adaptive co-management perspective, the results from the question on different fields of participation can be discussed from various angles. A general consensus about the need for a broader decision making process can be detected; however, this needs to be defined more precisely. That stakeholders are not aiming for the enhancement and long-term planning (only 10% are in this category) is in this regard surprising. Being one of the unique characteristics that differentiate ACM strategies from conventional policy making processes, a clear call for more inclusiveness in the long-term planning cannot be detected. On the other hand, if this particular field of participation includes the question "where to concentrate management effort and what future is desired" (Pinkerton 1989: 6), it is easier to understand this low ranking: previous discussions in this section have shown that alternative systems or amendments to the ITQ system are indeed requested but also debated. An optimal system for the future is not unanimously agreed upon. Furthermore, the fields of involvement vary between the stakeholder groups, and so this particular call for specific enhancement ranks much lower than the more general one for broad decision making.

Conclusion

Are the Icelandic fisheries at a crossroads? Seen as a whole, the country's fisheries sector is flourishing economically. However, continuing down the same path runs the risk of negative socioeconomic challenges – already visible in a number of former fishing communities around the country – becoming irresolvable. A return to an open-access regime can be regarded as an untenable. It would not result in a sustainable fishery. Therefore the question arises whether an intermediate way might be found. Increased

participation of certain stakeholder groups could play a part in developing the fisheries management system towards a more holistic approach.

The instruments of adaptive co-management could offer possibilities for a more inclusive policy. The stakeholders' will to introduce certain features of this approach is evident, as shown by the relevant survey questions discussed above. However, the will and commitment of the affected stakeholder groups is only one side of the story. Necessary policy changes have to come from governmental institutions as well. The political will for introducing more participatory processes is not present at this stage. One reason for that is the asymmetric power distribution among stakeholder groups. Furthermore, the socio-spatial disparities mentioned above tend to be overshadowed by the macro-economic benefits that have come with consolidation of quotas and economies of scale in the fisheries. The transferability of quotas is vehemently criticised and discussed, however. It is seen as not only dangerous for the coastal communities, but also contrary to prevailing ideas of fairness and justice. Despite the power imbalances and the numerous critiques that can be found within the the survey, the ITQ system as such is not to be overturned but to be improved.

In addition to the policy and decision making level, ACM does have a potential to improve processes of knowledge generation and utilisation in Icelandic fisheries. Statements about a cleavage between scientific knowledge and the practical knowledge of fishers were abundant in the survey. ACM strategies can help to join these two (not necessarily opposing) strands of knowledge. Trust in the institutions, especially Hafró and its scientific assessment of fish stocks, is now lacking among the fishers and other stakeholders. The need for a change of methodologies towards more collaborative data gathering is clear.

Fisheries management is a complex task, but it is not impossible. ITQs are one management option, but one that is flawed in some fundamental respects. Iceland needs to learn from experiences elsewhere in order to adapt successfully to demands for a more inclusive and just arrangement. Inclusiveness, however, cannot only be about quantitative improvements, but has to be in compliance with an effective devolution of power. The devolution process has to consider aspects of efficiency, legitimacy and accountability. As mentioned at the beginning of this article, the Icelandic fisheries seem to be dealing with something of a Gordian knot – one tied together by its stakeholders, but one that can (only) be untangled through their effective collaboration.

II Prosper or perish? The development of Icelandic fishing villages after the privatisation of fishing rights

Abstract

Icelandic fish stocks underwent privatisation in 1990, when existing fishing quotas were made fully transferable. The country's system of individual transferable quotas has since been held up as a paragon of virtue for sustainable fisheries. This might be valid for ecological and most economic concerns, but for a truly sustainable fisheries management system the question of social impacts has to be addressed as well. This paper evaluates the performance of Icelandic fisheries management from a spatial and social point of view. The theoretical framing stems from the concepts of resilience and vulnerability. Through cluster and correlation analyses, different development trajectories of Icelandic fishing communities since 1990 are revealed. The results are presented on maps. Even though it is no longer the country's largest economic sector, the livelihood of many small and remote settlements is strongly connected to the fisheries. Consolidation has taken place in the fisheries and rural-to-urban migration has continued. The majority of coastal communities can be classified as vulnerable, regarding the status of the local fishing industry in 2014. Regarding demographic development, the number of vulnerable communities was significantly higher in 2014 than it was at the early 1990s.

Keywords: Fisheries management, sustainability, resilience, vulnerability, ITQ, Iceland, fishing communities

Introduction

Natural resource management is a complex endeavour, as it involves stakeholder groups with opposing interests. Fisheries management is no exception. In Iceland, the quasi-privatisation of fishing rights through individual transferable quotas (ITQs), that was completed in the early 1990s, did not go uncontested. It left deep social, economic and political rifts (Eythórsson 2003). Antagonistic perceptions can be detected not only among academics who have analysed this, but also within the fisheries sector, where small-scale fishermen demand access to the same resource as large-scale, vertically integrated, companies (Chambers and Carothers 2017, Mariat-Roy 2014). Although the state of the marine resources was the major justification for introducing ITQs (Matthiasson 2003), economic goals were no less central, driven by overarching objectives of efficiency and centralisation (Árnason 1998, 2012, Eythórsson 2000). Those are substantial arguments, and arguably the system in use before was unsustainable in every aspect (Haraldsson and Carey 2011). But thorny socio-political issues remain unresolved. According to the first article of the Fisheries Management Act, "the exploitable marine stocks of the Icelandic fishing banks are the common property of the Icelandic nation. The objective of this Act is to promote their conservation and efficient utilisation, thereby ensuring stable employment

and settlement throughout Iceland“ (Icelandic Ministry of Fisheries and Agriculture 2006; italization by authors).

The experience of Iceland with ITQs has been repeatedly presented as an economic success story (Árnason 2008, Danielsson 1997, Hannesson 2003). Economic concerns, however, are just one aspect of fisheries management. At least two academic strands other than economics demand consideration, namely ecology and social sciences. The input of ecology is manifested in this case through the setting of an annual total allowable catch (TAC), scientific advice and monitoring. Icelandic fisheries perform comparatively well also in this regard, and have indeed recovered from severely depleted fish stocks in the 1970s (Haraldsson and Carey 2011, Eythórsson 2000). The third dimension however, that of the social sciences (other than economics), has been rather weakly addressed. Social scientists have struggled to make their voices heard (for an overview of the state of social sciences in Icelandic fisheries see:Chambers and Kokorsch 2017).

Premonitions and critiques regarding negative effects of ITQs for fishing communities have been frequent, accompanied by questions of equity and social responsibility (Karlsdóttir 2008, Pálsson and Helgason 1995, 1996, Eythórsson 1996, 2000, 2003, Holm et al. 2015). Since the “direct subject of fisheries management is not fish, but people who are embedded in existing social, political and economic institutions” (Campling, Havice, and Penny McCall 2012, 181), a more thorough investigation of the human perspective in fisheries management is necessary.

Several coastal communities in Iceland have found themselves in demographic and socio-economic difficulties, which is a blot on a supposedly sustainable management scheme: “Sustainable development is a three legged stool embodying environmental, economic and social sustainability; dangers arise when one of these legs is weakened by neglect” (Symes and Phillipson 2009, 1). But to what extent can the fisheries sector in general, and transferable quotas in particular, be held responsible for local development trajectories? Almost three decades after the implementation of ITQs, a comprehensive analysis of the quota-management regime appears well overdue: how have Icelandic fishing communities fared under the regime? Or more specifically: is there a connection between the development of the fisheries sector and socio-economic and demographic developments at the local level? This, in a nutshell, is the focus of this article.

In dynamic and complex socio-ecological systems, such as fisheries, usually more than just one decisive causal variable can be detected (Folke 2006, Johnsen 2017, Ostrom 2009). The questions above can therefore only be partially answered here. In vulnerable systems, however, “even small disturbances may cause dramatic social consequences” (Folke 2006, 253). Thus the assumption that the ongoing process of centralisation in the fisheries sector has had tremendous impacts on the local level might be warranted (Agnarsson, Matthiasson, and Giry 2016, Eythórsson 2000). In the paper, socio-economic, demographic and fisheries data from three different points in time will be evaluated through cluster analysis. In a second step, correlation analysis is used to reveal possible connections between fisheries, demographic development and the socio-economic performance at the local community scale. This analysis provides a retrospective evaluation of the social and regional impacts that have evolved after the policy change.

The results are important for two main reasons. First, they provide an empirically backed-up warning about negative social impacts of ITQs, which should be of value for

international and domestic policy makers. Second, the results shed light on the heated debate about to what extent transferable quotas have resulted in a truly sustainable fisheries management system.

Resilience and vulnerability

The theoretical framework for this study stems from the concept of resilience, which has become pervasive in natural resource management and social sciences during the past decade (Clay and Olson 2008, Lorenz 2013, Nelson, Adger, and Brown 2007, Benson and Garmestani 2011, Welsh 2014). This includes also discussions on appropriate fisheries management (Olson 2011, White 2015, Symes, Phillipson, and Salmi 2015, Pauwelussen 2016).

In a general sense, resilience centres on potential responses to a sudden shock or disturbance, in terms of renewal, regeneration, or reorganisation (Folke 2006). This includes the capacity, potential and ability of ecological, social and/or economic systems to adapt and manage changes in both reactive and proactive ways. Social resilience is defined as "the ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change" (Speranza, Wiesmann, and Rist 2014, 110).

Vulnerability is often understood as the opposite of resilience (Obrist, Pfeiffer, and Henley 2010, Scoones 1998, Turner 2014, Adger 2000). For Adger (2006, 269), vulnerability determines the "degree to which a system is susceptible to and is unable to cope with adverse effects". Blount et al. (2015, 2) define vulnerability as "the lack of an ability to withstand destabilizing changes". Building on this, the key parameters of vulnerability are the stress to which a system is exposed, its sensitivity, and its adaptive capacity (Carpenter and Brock 2008, Folke et al. 2002). In addition, 'buffer capacity' marks the thin line between a resilient and a vulnerable system. It can be defined as the "amount of change (disturbance) a system can undergo (absorb) and still retain the same structure, function, identity and feedbacks on function and structure" (Speranza, Wiesmann, and Rist 2014, 112). Buffer capacity is directly influenced by endowments and entitlements. Endowments determine the resources owned by an actor, while entitlements refer to an actor's access to resources (Speranza, Wiesmann, and Rist 2014, Ozkan and Schott 2013). Hence, buffer capacity, endowments and entitlements are important aspects for local resilience, particularly for communities with limited economic resources that are dependent on individual decisions regarding the trading of such entitlements (Dale and Newman 2006).

Endowments and entitlements are subject to the underlying management regime and changes can have profound effects at the local scale. The loss of entitlements to a resource, for example through privatisation and changing ownership structures, affects the socio-economic capacity and control over local resources (Ozkan and Schott 2013). The result of such changes can be disenfranchised communities with limited capabilities for continued existence.

Icelandic fisheries management and fishing communities

A brief outline of major events and general periods of growth, stagnation and decline in the national fisheries since 1900 (figure 8) is appropriate for recapitulating the turbulent history and to understand the reasons that eventually led to the introduction of an ITQ system.

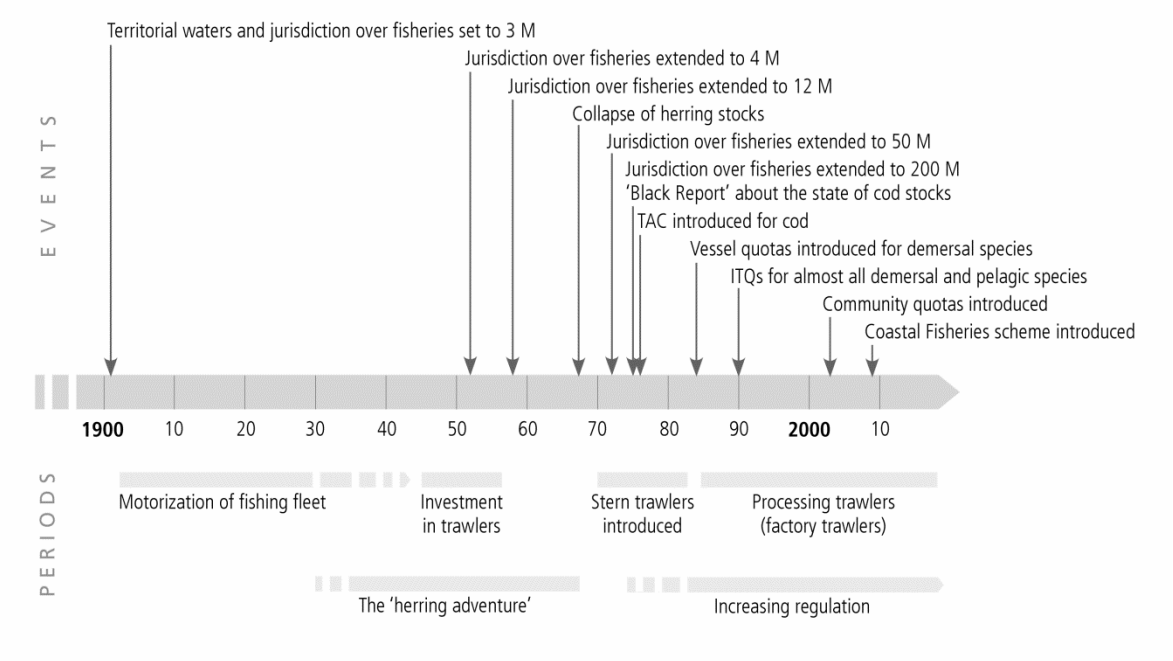

Figure 8 Major events and general periods of growth, stagnation and decline in the Icelandic fisheries since 1900

Fisheries were a key industry in Iceland throughout the 20th century and they still have a central role, even though tourism and heavy industries now compete for the leading position in the country's economy (Jóhannesson 2016). Several communities owe their emergence to their proximity to rich fishing grounds and some towns were not even 'on the map' before fisheries became economically significant in the early 20th century. Fisheries were an attractive pull-factor and people relocated from scattered farmsteads and temporary settlements to the shore (Valsson, Ulfarsson, and Gardarsson 2013). Another economic boom came with the herring fisheries. The era from 1930 to 1968 is presented in the nation's history books as the 'herring adventure' (Icel. síldarævintýrið) (Hamilton et al. 2004). The ups and downs – not only for the national economy, but also many settlements in Northern Iceland – were bound to this species. Overfishing put a sudden end to this adventure.

Diversification of target species and improvements of the fishing fleet led to a rapid recovery and 'one-company-villages' were still common (Eythórsson 1996, Matthiasson 2003, cf. Halseth and Sullivan 2004). Reliance on one economic sector left most communities vulnerable to structural and technological changes that set in after the 1970s.

History repeats itself. Overfishing became a serious threat again in the 1980s. The central government had to intervene and initiated quota management for all species in 1984. Then, in 1990, the quotas were made fully transferable. While ITQs have contributed to increased economic efficiency and centralisation, quota sales have left numerous coastal communities in trouble (Gunnlaugsson and Saevaldsson 2016). Unsurprisingly, critiques of ITQ management have centred on social/regional aspects (see below) and questions of justice and equity (Soliman 2014, Holm et al. 2015, McCay 1995, Olson 2011, Benediktsson and Karlsdóttir 2011). Previously locally-embedded companies changed ownership and the fisheries gradually became a 'footloose industry', where location did not matter much anymore (Eythórsson 2000). The enclosure of the sea and new ownership structures invited comparisons to feudalism (Pálsson 1998). Research has revealed general discontent among stakeholder groups regarding social responsibility and regional development (Kokorsch, Karlsdóttir, and Benediktsson 2015, Chambers and Carothers 2017). The effects of quota sales at the local scale have been researched by several authors (Chambers 2016, Kokorsch 2017). Even though connections between fisheries, socio-economic and demographic performance have been traced for several communities, no universal conclusion has been possible yet.

That negative local and regional consequences are recognised by policy makers can be seen in the few amendments that have been made to the Fisheries Management Act. Community quotas and a coastal fisheries scheme have been introduced (see figure 1) (for an overview over the schemes see: Chambers and Carothers 2017, Þórðarson and Viðarsson 2014). Community quotas are of particular interest here. According to article 10 in the Icelandic Fisheries Management Act, up to 12,000 tonnes (ungutted weight) of demersal fish can be allocated to communities that

> are facing difficulties due to downturns in fisheries and which are dependent upon demersal fishing or processing [and/or] to communities which have suffered unexpected cutbacks in the total catch quotas of fishing vessels operating from and landing their catch in the communities in question, which has had a substantial impact on the employment situation in these communities. (Icelandic Ministry of Fisheries and Agriculture 2006)

The success of these instruments can be debated (Chambers 2016, Kokorsch 2017). Employment in fisheries, including jobs in both the primary and secondary sectors (fishing and fish processing), has been declining despite those modifications. Since 1990 some 5100 jobs (or 36%) were lost from the sectors (Statistics Iceland 2015a, b). The numbers are more drastic for rural Iceland (38%) than for the capital region (27%). Jobs in processing have been decreasing faster than those in the harvesting sector (41% versus 29% decrease).

Methodology

Defining fishing communities

Defining a 'fishing village' or 'fishing community' is a difficult task (for an extensive discussion on this terminology see Clay and Olson 2008). It is defined here simply as a spatial unit demarcated by geographical and/or administrative boundaries, where fishing and/or fish processing takes place. Four steps were used to identify fishing communities, building on comparable studies in the US fisheries (Jacob and Jepson 2000, Colburn and

Jepson 2012, Jepson and Colburn 2013). The data were provided by the Directorate of Fisheries and Statistics Iceland and the key variables used were harbour, quota, fishing activity and fisheries dependency.

Places with a designated harbour were selected in the first round. In a second step, it was examined whether or not quotas were allocated to boats registered at those harbours. Even though quotas are allotted to boat owners and not the harbour itself, this is a first indication. Quotas, due to their transferability, can be classified as a 'footloose' commodity. Accordingly, the absence of quotas does not necessarily result in the absence of fishing activities. Fishing activity indicates the presence of harvesting, processing and fisheries-related industries. In case of little activity, or low fisheries dependency, the harbour and its attached community were not considered for further examination. The procedure to define dependency follows the analytical framework provided by Colburn and Jepson (2012), who measured landing per capita. According to these criteria, 57 communities were identified for the fishing year 1991/92 (see figure 9). These were analysed further. The number decreased to 53 in 2002 and 51 in 2014.

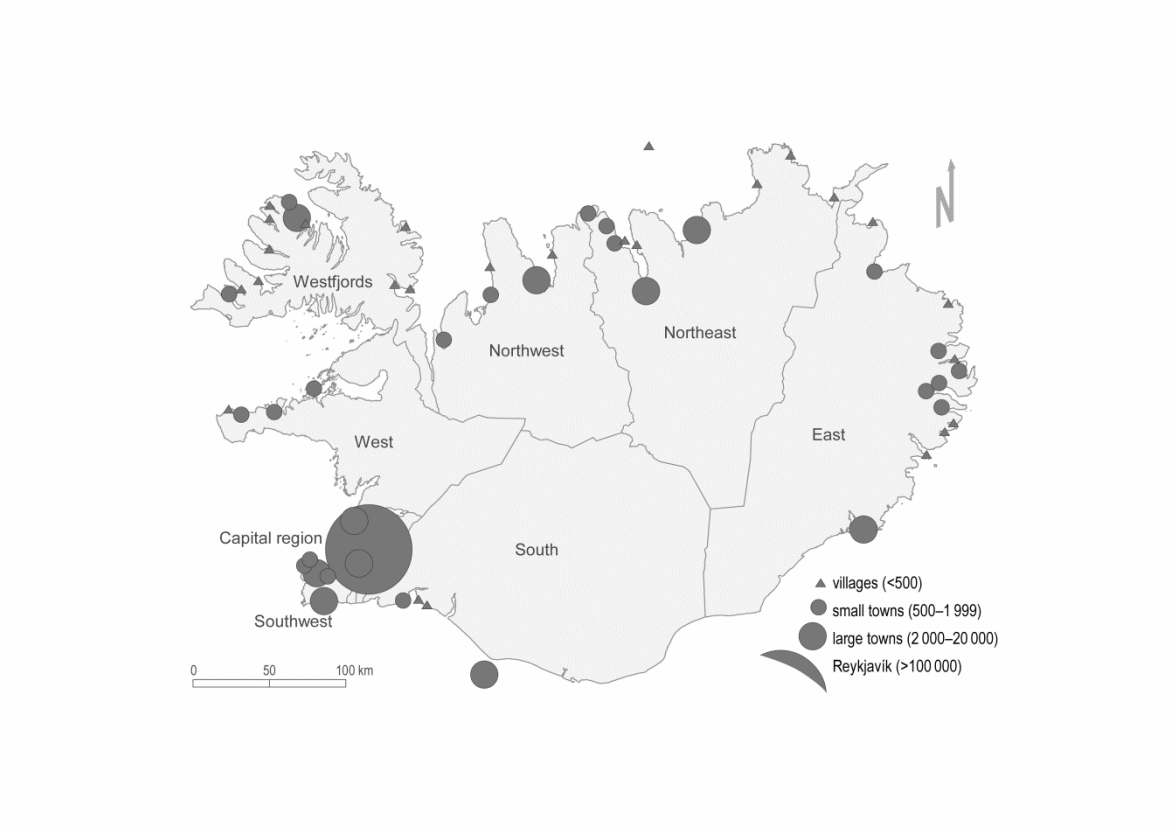

Figure 9 Fishing communities in Iceland in the fishing year 1991/92

Data collection

As the spatial, temporal and economic dimensions cannot be assessed in isolation in a resilience framework, all three dimensions are considered (Adger 2000, Clay and Olson 2008, Obrist, Pfeiffer, and Henley 2010, Turner et al. 2003). Regarding data compilation, several aspects need to be considered: neither should the number of variables be too high, as this might lead to confusion, nor should the assumption of mono-causality be suggested

by choosing too few variables (Holling 2001). Furthermore, the analysis follows the rationale to reduce complex data into a workable amount of information and proxy measures (Nymand Larsen, Fondahl, and Schweitzer 2010).

Several theoretical and methodological discussions for the comprehensive assessment of ecological, economic and social goals at the local scale are at hand (Cox and Hamlen 2015, Reed, Fraser, and Dougill 2006). Regarding the choice of variables for the community level, Cutter et al. (2008) recommend six dimensions, of which three are included in this Iceland-specific analysis (ecological, economic and social), while the other three (institutional, infrastructure and community competence) are not quantifiable at the local scale in Iceland with official data. Lee et al. (2014) suggest 'integrated factors of social vulnerability' of which the demographic and socio-economic characteristics find entrance here. These authors discuss how to interpret the either positive or negative effects of each variable on the resilience-building process. In addition, the 'Arctic Social Indicators' serve as a reference for assessing different development paths in places located in the arctic region (Nymand Larsen, Fondahl, and Schweitzer 2010).

Regarding fishing communities in particular, comparable studies on fisheries dependency and the political framing as well as the interplay of natural and human factors (Nayak, Oliveira, and Berkes 2014, Morzaria-Luna, Turk-Boyer, and Moreno-Baez 2014) were considered in the data compilation. Most important were the 'Fishery Performance Indicator', developed by Anderson et al. (2014) and the 'social indicators' for an analysis of resilience and vulnerability in fishing communities of the USA (Colburn and Jepson 2012, Jepson and Colburn 2013, Blount et al. 2015).

The fishing year 1991/92 serves as the starting point or reference year. This was the first year after the fishing quotas had been made been fully transferable and also the first for which an extensive amount of digital data is available. The fishing year 2001/02 was chosen as a milestone for the analysis due to two aspects. Before community quotas were introduced in 2003, no major changes had been made to the Fisheries Management Act. Thus 2002 is the last year of a more or less unaltered regulatory system. Besides, the first decade of ITQs has been labelled as a 'consolidation phase' and it is appropriate to analyse the consolidation effects at the local level (Eythórsson 2000, Gunnlaugsson and Saevaldsson 2016). That the fishing year 2013/14 serves as endpoint and not a more recent one has two main reasons: the compilation of the data set and its analysis took more time than anticipated, and some data were not available until 2016.

The variables that were eventually chosen for the data set are listed below (table 8). Several other variables were considered, but the data were not accessible (see below). The number of variables has increased over the years due to two reasons. First, not only were numbers of the chosen years processed, but also changes between years were calculated. This makes the data more robust, as it is less likely that chance, for example unusually good or bad fishing years, influences the results. Second, the amount of available data has increased since 1992.

Table 8 Variables included in the analysis

Variable	Unit/ explanation	Sources[c]
Demographic data		
Average age		SI
young population	share of population aged 0-15	oc
pensioners	share of population older than 65	oc
Gender	Percentage of male/female population	SI
Gender migration	Outmigration of male/female population	oc
Population		
Population development[a]	Relative population development	SI, oc
Socio-economic data		
Debts	Debts per capita	SI
Innovationa	New registered companies per capita	SI
Long-term unemployment	Unemployment rate over six month	DL
Municipality tax	Municipality tax per capita	DIR
Net income	Net income per capita	DIR
Property tax	Property tax per capita	DIR
Property value[b]	Index for property value	RI, pc
Salaries	Salaries per capita	DIR
Short-term unemploymenta	Unemployment rate under six month	DL
Social payments	Social benefits paid per capita	DIR
Unemployment	Unemployment rate	DL, pc
Unemployed fish worker[a]	Share of unemployed fish worker	DL
Fisheries-related data		
Allocated Quota	Quotas per capita	DF
Community Quotas[b]	Community quotas per capita	DF
Fleet	Number of boats registered	DF, SI
Fleet diversity	Composition of fleet	oc
Homeport landings	Ratio of fish landed by local/outside fleet	oc
Landings	Landed fish per capita	DF, SI
Landed Value	Value of landed fish per capita	DF, SI
Landed processed	Value of fish landed processed per capita	DF, SI
Landed for processing	Value of fish for local processing per capita	DF, SI
Large vessel share	Share of large vessels (over 100GT)	DF, SI
Licensed companies	Companies with processing license	IFVA, IRDI, pc
Processing	Processed fish per capita	DF, SI
Processed Value	Value of processed fish per capita	DF, SI
Quota/ boat size	Division of quota between boat sizes	DF, SI
Small scale ratio	Share of small scale fisheries	DF, SI
Share CFE	Share per capita based on Cod Fish Equivalent	DF
Total Catch	Total catch per capita	DF, SI
Additional data		
Distance to capital	Distance by road kilometres to Reykjavík	IRCA
Community size	Absolute population	SI
Trawler	Trawler part of community	DF, SI

[a] Data for 2002 and 2014.

[b] Data only for 2014.

[c] Abbreviations of sources: SI = Statistics Iceland, DL = Directorate of Labour, DIR = Directorate of Internal Revenue, RI = Registers Iceland, DF = Directorate of Fisheries, IFVA = Icelandic Food and Veterinary Authority, oc = own calculation, pc = personal communication/requested data, IRDI = Icelandic Regional Development Institute, IRCA = Icelandic Road and Coastal Administration.

Conducting quantitative research at the local scale over a time-span of 25 years is not an uncomplicated endeavour in Iceland. In particular, municipality amalgamations have made it difficult to assemble a coherent database of socio-economic variables. Most variables were calculated per capita. Due to a range from around 24 inhabitants in the smallest community to well over 120,000 in the largest one, outliers were to be expected. Since the capital, Reykjavík, is by far the largest community and thus in a class of its own, it was considered to not include it in the analysis. One could also argue of course that Reykjavík does not represent a typical fishing community, especially in terms of employment and dependency. However, it matches the set criteria explained above and leaving the locality, which ranks amongst the highest in terms of absolute quota allocations, processing and landings, out of such an analysis seemed odd.

While numbers for fisheries-related employment in the primary and secondary sector were available at the local level, figures for the tertiary sector were not. Apart from this, figures regarding the economic performance of the fishing industry, revenues and tax payments of fishing companies, were not made accessible by the relevant institutions. Following the examples from the aforementioned studies, data on the educational level in the communities were requested from the responsible institution. Considering the small size of some villages this was not possible, however, due to privacy considerations. The tracing of return migrants to the communities was not possible either.

Cluster and correlation analyses

Different tools for processing and evaluating the collected data were considered. Factor analysis and cluster analysis are arguably the most suitable choices for an assessment of the sort that that this study aimed for (Finch 2005, Murtagh and Contreras 2012). Cluster analysis has been applied recently in comparable research in the US (Pollnac et al. 2015) and was eventually chosen for a number of reasons: the number of communities under study is very small (n=57) and especially in comparison to the large number of variables, factor analysis was not feasible. In addition, cluster analysis is more reliable regarding the identification of patterns of similarity or dissimilarity (Powell and Barrientos 2004, Pollnac et al. 2015). Another reason is the aim of finding mutually exclusive groups in a way which maximised differences between groups that were themselves as homogenous as possible (Fonseca 2013). Besides, cluster analysis offers different subcategories to tailor it to a specific case. The method used here is hierarchical agglomerative clustering and centroid measurement (Karypis, Han, and Kumar 1999, Bouguettaya et al. 2015). Some alternatives, such as the Ward method, were also tested. All methods came up with similar results, but the centroid method is in general less sensitive to outliers (Berkhin 2006).

The collected data were assigned to one of the three main dimensions – fisheries, socio-economics or demographics. After that, cluster analysis was conducted twice: First, an analysis of each of the single variables was run, to allow for a subsequent analysis of individual variables, and then for each of the three dimensions. The number of clusters was set to five for all years, in order to facilitate the temporal analysis. In a given year, every community was identified as belonging to one of these five clusters, which spanned the range from ‘very vulnerable’ to ‘very stable’. Different trajectories of communities through time could thus be identified.

This was followed by an analysis of correlation between the three main dimensions, using the Pearson correlation coefficient. In addition, the associations of single variables with each other were tested. The rationale for this is that even though correlations between three main dimensions might not be detected, it is still possible that single variables show correlations.

Results

Cluster analysis

As stated before, 57 places matched the 'fishing community' definition in 1992. That fewer communities are identified in later years is a first result and indication of the development in itself. Considering the ongoing centralisation and closure of processing sites, it does not come as a surprise. Communities which had to be taken out were within the vulnerable fisheries cluster in 1992.

Figure 10 visualises the number of communities in the vulnerable (red) and stable (green) clusters, as well as the movement of fishing communities between the clusters from the beginning to the end of the study period. For an easier comparison, the two vulnerable clusters and the two stable clusters have been combined, whereas the 'in-between' category is omitted in the figure. Regarding fisheries, the number of communities in the vulnerable cluster is much higher than that in the stable one. Out of 31 fishing communities that were vulnerable in 1992, only three can be classified as stable in 2014. Another six – indicated by the dashed arrow in figure 3 – had moved in an opposite direction and did not even match the criteria of a fishing village after 1992. Some 58% remained vulnerable. In addition, the economic and ecological conditions need to be considered: while the TAC in 2013/14 was much lower than it had been in the fishing years 1991/1992 and 2001/2002, the net profits in the fisheries had increased from the early 1990s to 2014 (Statistics Iceland 2016, Directorate of Fisheries 2015). In other terms: While less fish was caught, the profits increased, albeit not in every community.

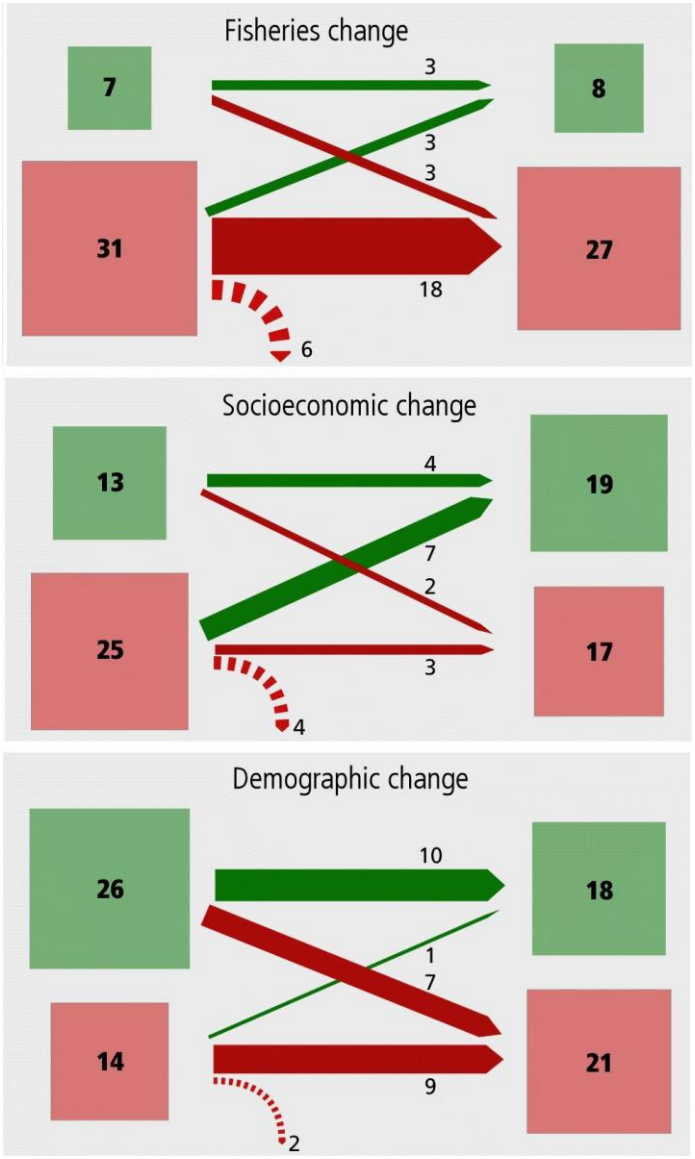

Figure 10 Distribution of villages in the vulnerable and stable clusters in 1991/92 (left) and 2013/14 (right) as well as the movement of fishing villages between the clusters (indicated with arrows). The dashed arrow shows the number of villages that did not match the definition of a 'fishing village' in 2014

Regarding demographics, the number of communities in the stable segment decreased, while the number of vulnerable communities increased by one third (see figure 3). Just one town made it over to the stable category over time while seven fell from that category to the vulnerable one. For both fisheries and demographics, the way down – from a well-performing to a vulnerable community – is a more likely development path than the other way round. Some kind of an upward-moving barrier was thus detected.

While the development in fisheries and demographics is quite alarming, the overall socio-economic performance looks slightly better, even though some 17 communities were still classified as vulnerable in 2014. One reason for the comparable better development could be municipality reforms including amalgamations of towns, particularly after 2005; some

economic burden was thus taken away from heavily indebted localities (Eythórsson, Gløersen, and Karlsson 2014, Kokorsch 2017).

The map (figure 11) shows the spatial distribution of the cluster analysis for 2013/14 regarding the performance in fisheries. Considering the population size and location, some striking observations can be made. None of the communities in the Westfjords, Northwest and Northeast ends up in the stable category. Three out of four communities in the Westfjords are in the vulnerable cluster and the situation in the Northeast (seven out of twelve) is not much better. On the other hand, the majority of communities in the positive category can be found in the South/Southwest, including the capital, Reykjavík.

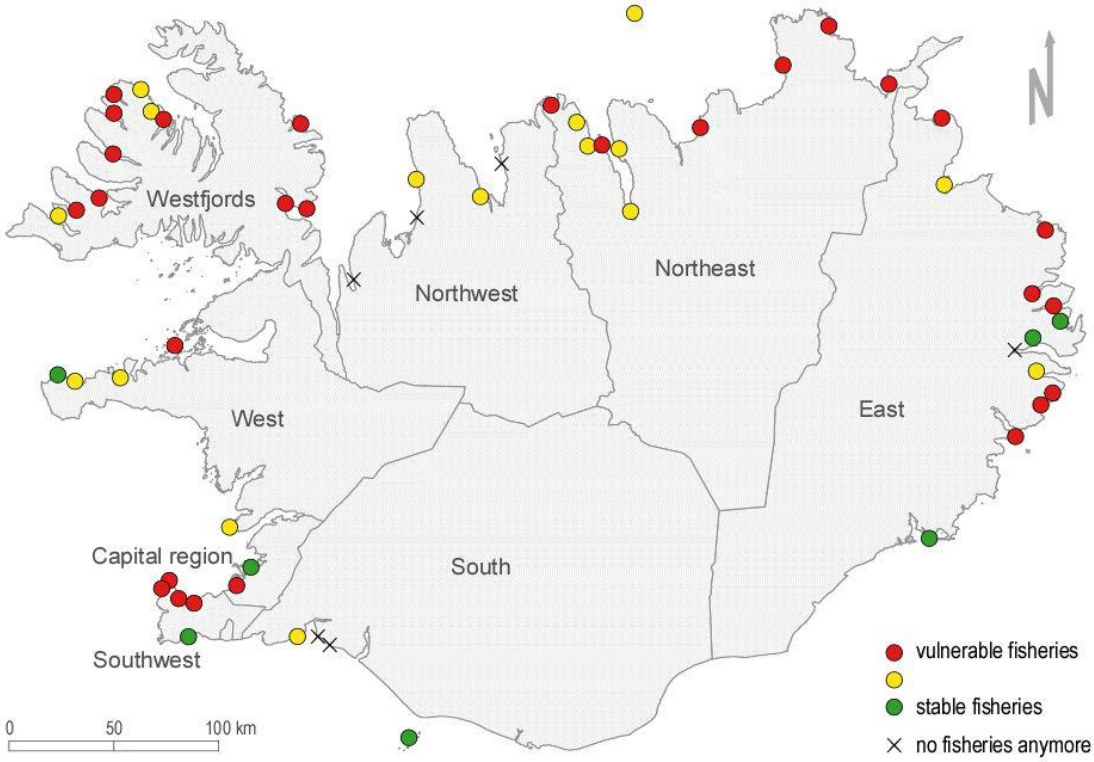

Figure 11 Spatial distribution of clusters in fisheries in 2014

Dependence on a single company or quota holder and an undiversified fleet leaves some seemingly well performing communities ending up in the vulnerable category. The sheer number of boats and quantity of landed fish is not an identifier of a resilient fishing community. Examples have indeed shown that the sudden loss of a trawler or processing facility can have tremendous effects, not only for the fishing industry but the entire community (Kokorsch 2017, Eythórsson 1996).

Remoteness, here measured in road distance to the capital, is not an explanation for this development. Some remote communities have been performing well due to the vicinity to fishing grounds and strategic decisions by the quota-holding companies: most of the bigger vertically integrated companies have been running processing plants in different regions of the country. However, recent examples have shown that local decision makers and fish workers cannot count on a footloose fishing industry. Several communities face difficulties

regarding their economic foundation and employment opportunities due to decisions made by quota holders, that value the advantages of centralisation in the southwestern corner of Iceland higher than running a fish factory in remote localities.

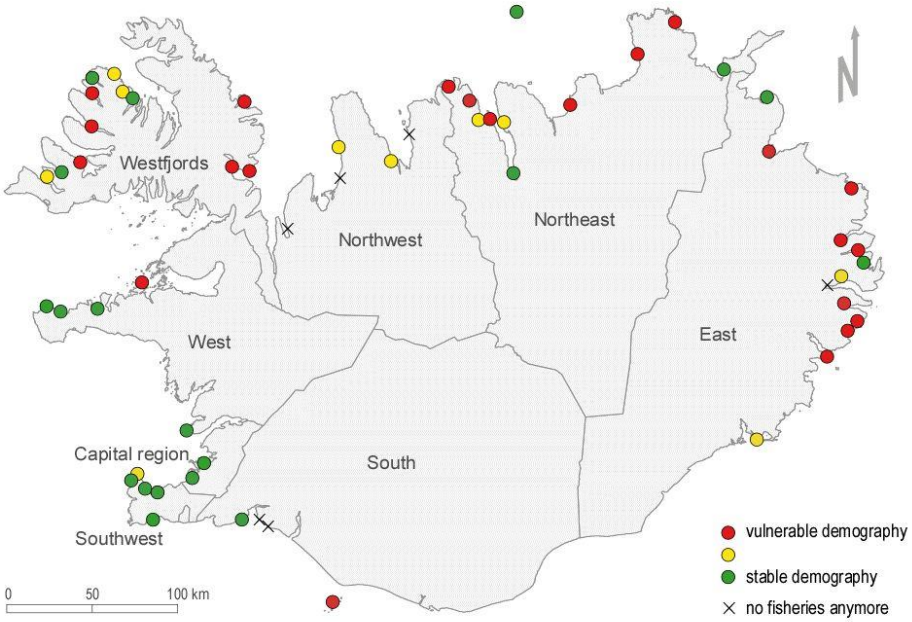

Figure 12 Spatial distribution of clusters in demography in 2014

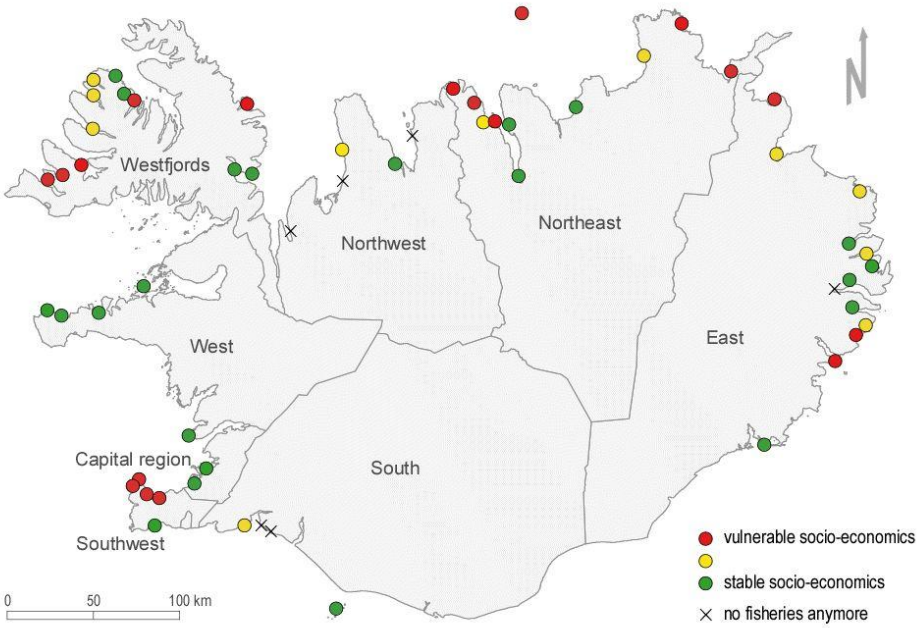

Figure 13 Spatial distribution of clusters in socio-economy in 2014

Figure 12 shows the results of the demographic performance in 2014. While some results were as expected, particularly in the Southwest, others might be surprising at first sight, but again it is more than the sheer number of people that counts: gender balance and average age have also been included in the assessment.

The East is a very problematic region, with some eight communities being severely threatened in demographic terms. In general, remoteness is a significant variable for the demographic development (see correlations below).

In figure 13 the socio-economic performance of each village is presented. The picture is very mixed. A firm pattern is not observable, neither in terms of regions nor according to community size.

Correlation analysis

The correlations of the three main fields reveal some trends. Figure 14 shows the correlations between the three dimensions at different points in time. While positive correlations between all three main fields were found in 1992 and 2002, only one – between fisheries and socio-economics – remained in 2014.

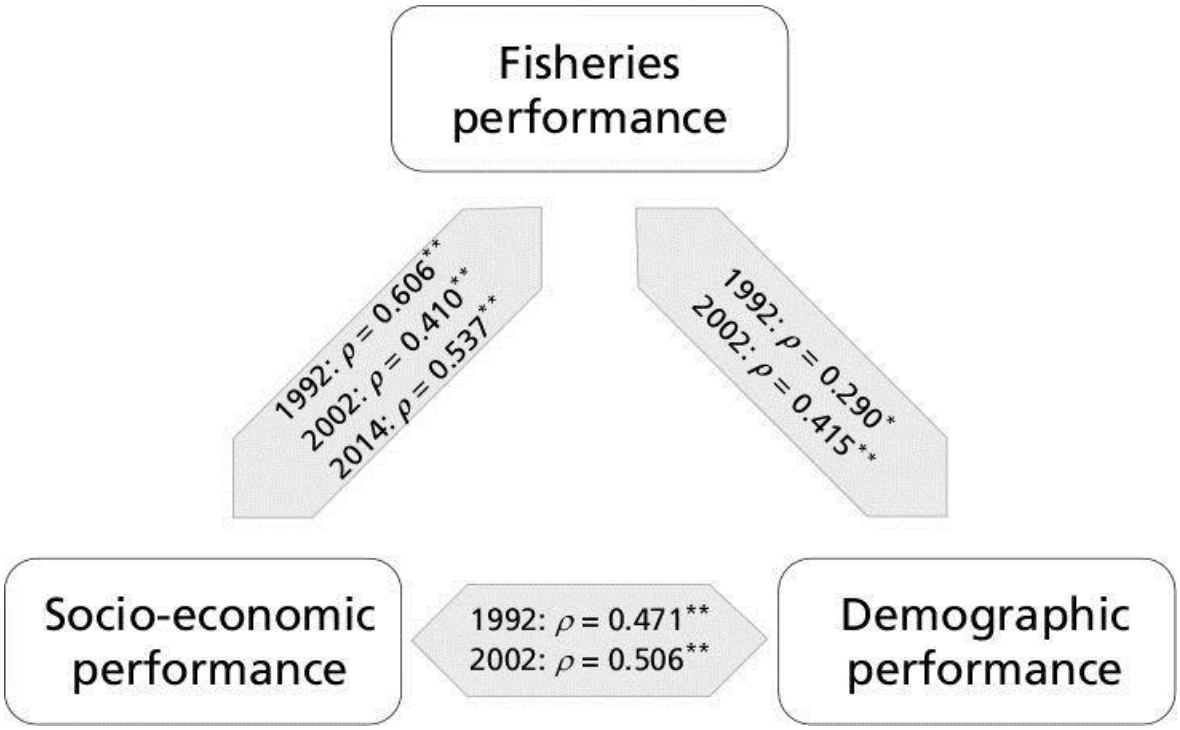

Figure 14 Correlations between the three dimensions in the different points in time

Table 9 shows the strongest correlations between the three main fields and single variables in other fields over the years. Some negative correlations can be identified, but the one between fisheries and community debts in 1992 and 2002 is particularly noteworthy: has the aforementioned 'consolidation phase' in terms of quotas lead to some indebted communities? Indeed, some municipalities took on a heavy financial burden to keep quotas and processing locally (Eythórsson 1996, Willson and Gunnlaugsdóttir 2015, cf.Maguire 2015, cf.Pinkerton 2015).

Table 9 Correlations of three main categories with individual variables from other categories.

Category	Correlations with	Pearson's r		
		1992	**2002**	**2014**
Fisheries (F)	Debts (S)	–.458**	–.422**	--
	Income (S)	.569**	--	--
	Municipality tax (S)	.445**	.505**	.432**
	Profits (S)	--	.436**	--
	Property value (S)	--	.588**	.511**
	Salaries (S)	.611**	.418**	.422**
Socio-economics (S)	Landed value (F)	--	.457**	.498**
	Landed quantity (F)	--	--	.530
	Processing plants (F)	--	--	.343*
	Processed value (F)	.448**	.339**	--
	Quota (F)	--	--	.582**
	Share CFE (F)	.449**	--	--
	Total Catch (F)	.416**	.373**	.362*
Demographics (D)	Debts (S)	–.415**	--	--
	Fleet diversity (F)	--	.358**	--
	Income (S)	.569**	--	--
	Municipality tax (S)	.565**	--	--
	Processing plants (F)	--	.383**	.473**
	Processed value (F)	--	.339*	--
	Property value (S)	--	.452**	.481**
	Quota (F)	--	.295*	.298*
	Salaries (S)	.543**	.560**	--

Significance of r*:* * $p < 0.05$; ** $p < 0.01$; -- = no significant correlation.

Quotas (still) matter for local economies: the more fishing quota per capita, the stronger the socio-economic performance of the community. They also correlated positively with demographics in 2002 and 2014. In addition, the overall socio-economic performance correlated with the total catch per capita in all three years. Apart from quotas, the quantity and the value of landings per capita also correlate with socio-economics in 2002 and 2014. Furthermore, the number of processing companies in the community correlated with the overall socio-economics in 2014 and with the demographic performance in 2014.

Indirectly connected with quotas is the question of scale, here indicated by the relative importance of the small- and large-scale fleets. The large-scale sector shows strong correlations with some economic variables, such as municipality taxes and general income levels in 2002 and 2014. This is particularly interesting when the size of community is considered: while four communities with less than 300 inhabitants had a trawler in their fleet in 2002, none did in 2014. Apart from that, it can be stated for all three years that the stronger the fisheries sector was in a community, the higher were the average salaries.

The aforementioned observations regarding community size and distance were also reflected in the correlation analysis. While the road distance to the capital correlates with demographics only ($\rho = 0.458$**), community size correlates with all three fields in 2014.

The strongest correlation can be found with fisheries (ρ = 0.592**), followed by socio-economics (ρ = 0.500**) and demographics (ρ = 0.406**).

Discussion and conclusion

Changes in communities and settlement patterns are inevitable. They can disrupt the existing order, at best leading to a 'creative destruction' (Kivimaa and Kern 2016, Chaffin and Gunderson 2016, Fainstein 2015). Changes become worrisome when they occur too rapidly for the community to adjust to them, particularly when they hit already vulnerable systems. They become a political and social issue when they are foreseeable and avoidable.

Icelandic fishing communities have gone through substantial demographic and socio-economic changes, not least during the period that has been examined in this analysis. The loss of a main industry, such as fisheries, is a change that has far-reaching consequences for undiversified local economies. While the ending of open access halted overfishing, fisheries-dependent localities had to face immediate challenges regarding their future viability. Not all communities have been able to adjust to the new circumstances, either because of economic constraints or the shortage of entrepreneurial people with fresh ideas. Small and remote settlements have been particularly strongly affected. Most 'one company' villages were trapped between two hard choices: either to use municipal funds to invest in quotas, with the threat of being saddled with debt, or risk the selling out of quotas and remaining in comparatively stable economic waters.

To what extent demographic and socio-economic changes since 1991/92 have paralleled the development in the fisheries sector was one of the main questions in this paper. To start with, the general importance of fisheries for the majority of villages and towns has been decreasing. Yet there are still numerous individual communities where a negative development of the local fishing industry is mirrored by adverse demographic and socio-economic trajectories. This counts particularly for small communities that are distant from Reykjavík. Remoteness and size are two barriers that cannot be overcome easily.

Barriers can also be detected on another level: Carothers and Chambers (2012, 49) state that "the changing nature of fishing relationships in many ITQ fisheries has substantially decreased upward labour mobility, often creating impassable class divisions". Labour mobility is one issue that can be linked to the problem of finding new entrants to the industry. The quota issue is still pointed out by stakeholders in fisheries as the main reason for the lack of recruitment (Kokorsch, Karlsdóttir, and Benediktsson 2015). It is difficult for potential newcomers to establish a business, and high quota leasing prices are a hindrance (Chambers and Carothers 2017). One cannot judge how many people would potentially like to work in this industry these days, however. Nonetheless, correlations were found between demographics and the overall fisheries in 1992, which is not surprising considering the rather undiversified economic structure of rural Iceland at this point in time. Employment opportunities and educational possibilities have changed considerably since then.

Demographic challenges and changes cannot be explained solely by quota loss. The question of keeping processing companies and landings in a community or not is at least of equal importance. Indirectly this is very much affected by quotas, due to the vertical integration of companies (Benediktsson and Karlsdóttir 2011, Carothers and Chambers

2012, Eythórsson 2000). Communities that experienced quota loss through sales to companies from outside the community are disenfranchised and dependent on the new quota holders. It is no longer up to those communities whether or not their harbour and existing processing facilities are used for processing and landing. That only a few companies can decide where to land and process fish is an alarming development that should raise concern among policy makers and regional developers. Recent examples have confronted local and national policy makers with this inconvenient fact (RUV 2014, Stundin 2017, Hólmkelsdóttir and Hilmarsdóttir 2017).

The success of community quotas as a long-term support scheme for suffering communities can be questioned. The numbers here do not warrant a positive evaluation, especially with respect to the increase of communities in the vulnerable fisheries segment since 2002. With 27 communities in this state, it is questionable whether a small amount of quota can make much of a difference. That almost all of the fishing communities listed here receive quotas from that scheme suggests that these quotas are not only too thinly spread, but also end up in communities where the need is not that great; several communities that host large fishing companies are included. Some community quotas even end up on large factory trawlers. This is somewhat odd and contradictory, as the scheme was meant to support suffering communities. If such an instrument is expected to be successful, it should run on a long-term basis, with a few dedicated communities which can build on a reliable amount and at best enable new entrants to the industry. This seems difficult, as any increase in the community quota allocation meets with disapproval from the large-scale industry and their political allies. Besides, all communities will demand quotas from such a scheme, which makes clear and unambiguous criteria for the allocation of community quotas necessary.

Dependency in terms of employment should be one criterion for such a transitional community quota scheme, which is meant to aid communities undergoing rapid change. The number of fisheries-related jobs on shore has been decreasing steadily. Tailoring regional and community development to a future without fisheries in the primary and secondary sector thus seems more advisable. But as long as humans are part of the fishing industry, and processing and landings are essential for local economies, they need strong consideration in a truly sustainable fisheries management.

Fisheries-related jobs, particularly in processing, have lost attractiveness for young adolescents, many of whom intend to leave smaller settlements (Bjarnason 2014a, Bjarnason and Thorlindsson 2006, Þorgrímsdóttir et al. 2012). Mobility and highly individualised life scripts are common, not only in Iceland. A downward spiral caused by the loss of youngsters can be set in motion, which in return can negatively affect the social fabric and social cohesion of a community (Dale and Newman 2006, Duhaime et al. 2004, Ozkan and Schott 2013, Chan, To, and Chan 2006, Adger 2000). For Hovgaard et al. (2004), one of the reasons for extended outmigration in Nordic villages is changing social values. For Iceland this is of relevance, since most fishing villages have been characterised by kinship and a close-knit society (Skaptadóttir 2003, 1996). The demographic situation in some communities would look a lot worse without the influx of a migrant workforce that works in processing sites (Skaptadóttir 2004, 1996, 2003, Skaptadóttir and Wojtynska 2008, Júlíusdóttir, Skaptadóttir, and Karlsdóttir 2013).

Some communities have lost almost half their population since the early 1990s, resulting in a generation gap: the number of 20–39 year olds has decreased by up to 40%

(Þorgrímsdóttir et al. 2012). One of the key findings here is that in the small places, whose livelihood depends on fisheries, the loss of both people and fish is felt more acutely. The number of vulnerable demographic communities has increased over time. Communities with fewer than 1000 inhabitants face major demographic challenges and those with less than 300 are severely threatened.

Whether or not regional policies and changes to the fisheries management are successful, some communities will most likely lose out as the inhabitants continue 'voting with their feet'. Some might face abandonment eventually. Depopulation, occasionally resulting in abandoned places, has not been uncommon in Iceland (Bjarnason 2014b, Thorarinsson 1961, Huijbens 2012, Valsson, Ulfarsson, and Gardarsson 2013). To what extent fisheries management can be made responsible for demographic development cannot be answered; yet it has been discussed frequently (Carothers and Chambers 2012). One could also consider the abandonment of places as part of a broader evolutionary trend, with small settlements being a 'collateral damage' of urbanisation.

Whether or not demographic difficulties were triggered by the fisheries management, the era of 'one-company villages' is arguably over. However, the diversification of local economies and their labour markets can hardly take place without innovative capacity and economic capital. Communities with quota holders and a solid fishing industry thus have a considerable advantage. Previous work has discussed the significance of different boat and quota classes extensively (Chambers and Carothers 2017, Mariat-Roy 2014). The results here show that the presence of the large-scale sector, and particularly a trawler, makes a substantial difference for local economies.

As resilience analysis should always come up with some dynamic and prescriptive solution (Holling 2001), a first step to make up for the adverse effects of privatised profits and socialised follow-up costs could be a redistribution of the generated wealth (Olson 2011, Pinkerton and Edwards 2009). This will not be easy under fully privatised fisheries, yet not impossible. It seems odd at least that the state does not take more note of its own clear assertion of the importance of the social aspect of fisheries management, found in Article 1 of the Fisheries Management Act that was quoted at the beginning of this paper.

Transferable quotas are entitlements that deliberately enabled and created a footloose industry – but one that certainly leaves a 'footprint' wherever it has tread. Stable employment and settlement, which are presented as sort of ultimate aim in the Fisheries Management Act, can barely be reached with a fully market based solution. Ostensibly designed to avoid an Icelandic version of the 'tragedy of the commons' (Árnason 2012, Benediktsson 2014, Carothers and Chambers 2012), the ITQ regime has generated the prosperity of a few and largely ignored social aspects. To compensate for the social costs and adverse effects, redistribution of revenues, for example through a solidarity fund, seems to be more plausible than waiting for the realisation of the mirage of trickle-down effects. Such a redistribution could be used to spur innovative regional development and improve the conditions for realising the aspiration of stability. Almost three decades after 'quota kings' (Pálsson & Helgason, 1996) started to reign and economists claimed that 'new wealth' had somehow been created (Árnason 2008) flexible tailor-made solutions, based on general rules, fair principles and the ideal of social justice – for both fisheries and regional development – would be more appropriate for a truly sustainable and comprehensive fisheries management than dogmatic market-based solutions.

III The tides they are a changin': Resources, regulation, and resilience in an Icelandic coastal community

Abstract

Icelandic coastal communities face major socio-economic and demographic challenges. Multiple reasons can be identified, among them restricted access to fishing grounds with de facto privatisation through the introduction of individual transferable quotas in 1990, which caused substantial stress to the economic structure of numerous fisheries-dependent towns and villages. The aim of this case study is to reveal the coping strategies of one such place that once was a thriving fishing village. The underlying theoretical framework is that of social resilience, here understood as the ability of a system to adapt to changes and disturbances. The case study is based on a mixed methodology approach, including structured interviews with key informants and workshops with various groups, including young adolescents, entrepreneurs and the general public. The chosen case study site is a place that has lost almost all land-based jobs in fisheries, but where the former fish processing facilities have been transformed into places of cultural activity and for research and development. It therefore provides a good example of a shift from extractive industries towards creative and knowledge-based industries. This does not only invite the emergence of innovative pathways, but also increases the ability to attract young talent from outside, and to keep educated and skilled people in the community. Potentials and capacities for further increasing the social robustness of the community are identified in the paper.

Key words: Iceland, social resilience, coping strategies, fisheries, ITQs

Introduction

Icelandic coastal communities have experienced profound changes since the early 1900s, when industrial-scale harvesting and processing of fish began. Most settlements along the coast owe their existence to this natural resource. As time passed, overexploitation, overcapacity and inefficient regulatory frameworks made changes towards a more sustainable management system inevitable. Iceland chose a market-based solution: individual transferable quotas (ITQs). The success of this solution has been judged in very different ways, depending as much on ideological as analytical approaches (Árnason, 2008; Carothers & Chambers, 2012; Durrenberger & Pálsson, 2014; Kokorsch, Karlsdóttir, & Benediktsson, 2015). Undisputed is the fact that several towns with a one-sided economic structure have had to cope with the loss of their main industry. The still-ongoing centralisation of fishing rights has led to considerable socio-economic and demographic stress (Agnarsson, Matthiasson, & Giry, 2016). Whereas some towns feverishly struggle to maintain the traditional fisheries, others endeavour to find new pathways for coping. This is achieved either through shifting to a different kind of engagement with the fisheries sector—e.g. research and development, or the 'blue economy'—or to entirely new fields of economic activity.

The central question of the research presented here is how resilient fishing villages are, in the face of such a radical policy change regarding entitlements to resources. The case study represents a community that has followed a gradual shift, detaching from the traditional extractive industries and moving towards creative and knowledge-based activities.

The development of coastal villages during the past 30 years illustrates the general importance of thoroughly reviewing the local social consequences of the privatization of natural resources. In particular, the importance of diversified local economies as a coping strategy for a future without traditional fisheries is of interest. The main focus of this paper will be on this aspect, as a general discussion of social consequences of privatization would be beyond the scope of this case study.

Theory

The theoretical foundation for the case study derives from the concept of social resilience. With regard to communities, it is understood as the ability "to adaptively respond to change rather than simply returning to a pre-existing state" (Maguire & Cartwright, 2008, p. ii). Social resilience is defined as the ability of a group or community to cope with shocks that may be caused by social, political, or environmental changes outside the community (Speranza, Wiesmann, & Rist, 2014, p. 110). Resilience thus implies a clearly defined external stressor and subject (Carpenter, Walker, Anderies, & Abel, 2001). In this case study, the introduction of the ITQ system is the identified cause of stress, to which the local community is subjected.

Resilience encompasses the concept of coping, or coping strategies. Originally used to describe personal responses of individuals to stress, or for analysing responses to natural hazards, the application of these concepts to communities in transitions stresses the importance of innovation and the formation of identity (Adger, Brooks, Bentham, Agnew, & Eriksen, 2004; Cutter et al., 2008; Keck & Sakdapolrak, 2013). Coping strategies are "active and intentional practices as they include modern reflexive use of knowledge, and the formation of social identity" (Bærenholdt & Aarsæther, 1998, p. 33). The concept has not been systematically used to analyse resilience in the face of policy changes, which is attempted in this article.

Along with coping, adaptive capacities and fate control are frequently mentioned in association with resilience (Lorenz, 2013; Speranza et al., 2014). Adaptive capacities are the inherent "resources and abilities of a community to cope with change" (Maguire & Cartwright, 2008, p. ii). Fate control refers mainly to the question whether or not a community is in charge of its own destiny (Ozkan & Schott, 2013). The question of destiny in this particular case study is based primarily on the economic situation of the community and political dependency. Even though a policy change—the de facto privatization of fishing rights—is the main stressor identified, it needs to be added that resource-dependent communities are prone to undesirable ecological development.

Ross, Cuthill, Maclean, Jansen and Witt (2010, p. 108ff) defined six key parameters for community and social resilience and applied them for a case study in Australia (see also Berkes & Ross, 2013). Those parameters were included in the analytical toolbox for the case study and are listed and briefly explained below:

- People–place connections: The identification of place attachment among locals is the main idea behind this variable. Does the village stimulate a feeling of belonging, of being at home? How do the people perceive the surrounding nature and its resources? A strong identification with a place can be interpreted as a solid foundation for resilience building.

- Knowledge, skills, and learning: Driving change requires certain expertise and the willingness of both the general population and the local authorities. An assessment of the educational level among the locals is therefore necessary. In addition, it needs to be analysed to what extent the municipality encourages educational programs.

- Community networks: Fluctuation of the population and extreme migration processes can add stress to small and close-knit communities. It is of importance to determine how demographic changes have affected the residents. A stable work environment and social and cultural activities within the community can be a strong pull-factor for newcomers, but can also work as a motivation to stay.

- Engaged governance: The approachability of political leaders and authorities within the community is of significance for local businesses and entrepreneurs. Representation and trust are central themes. Apart from that, networking abilities and ties between the local policy makers and those at the state level can help to foster investments and employment.

- Diverse and innovative economy: Diversification is a key factor for resilient communities. The main focus here is on different development paths and the support of the locals. This opens up the question whether projects are of a bottom-up and endogenous nature and embedded in the municipal environment, or if the stimulus comes from the outside.

- Community infrastructure: Here the main focus is on the assessment of existing infrastructure and to what extent it is under stress in times of demographic challenges. Locational factors, such as energy supply and transport distances, are also considered.

With reference to Walker, Holling, Carpenter, and Kinzig (2004), this list can be extended by transformability, defined as "the capacity to create untried beginnings from which to evolve a new way of living" (p. 7).

The location

The location for the case study was chosen based on the researcher's previous quantitative research on socio-economic and demographic changes in coastal communities since 1990. The village is located in the north of Iceland. Distance by road to the capital Reykjavík is about 260 km, and there are 160 km to the next regional centre, Akureyri (see Figure 15). Within the region, the town is the smallest of three that are within commuting distance from each other (Sauðárkrókur 52 km, 2,500 inhabitants and Blönduós 23 km, 800 inhabitants).

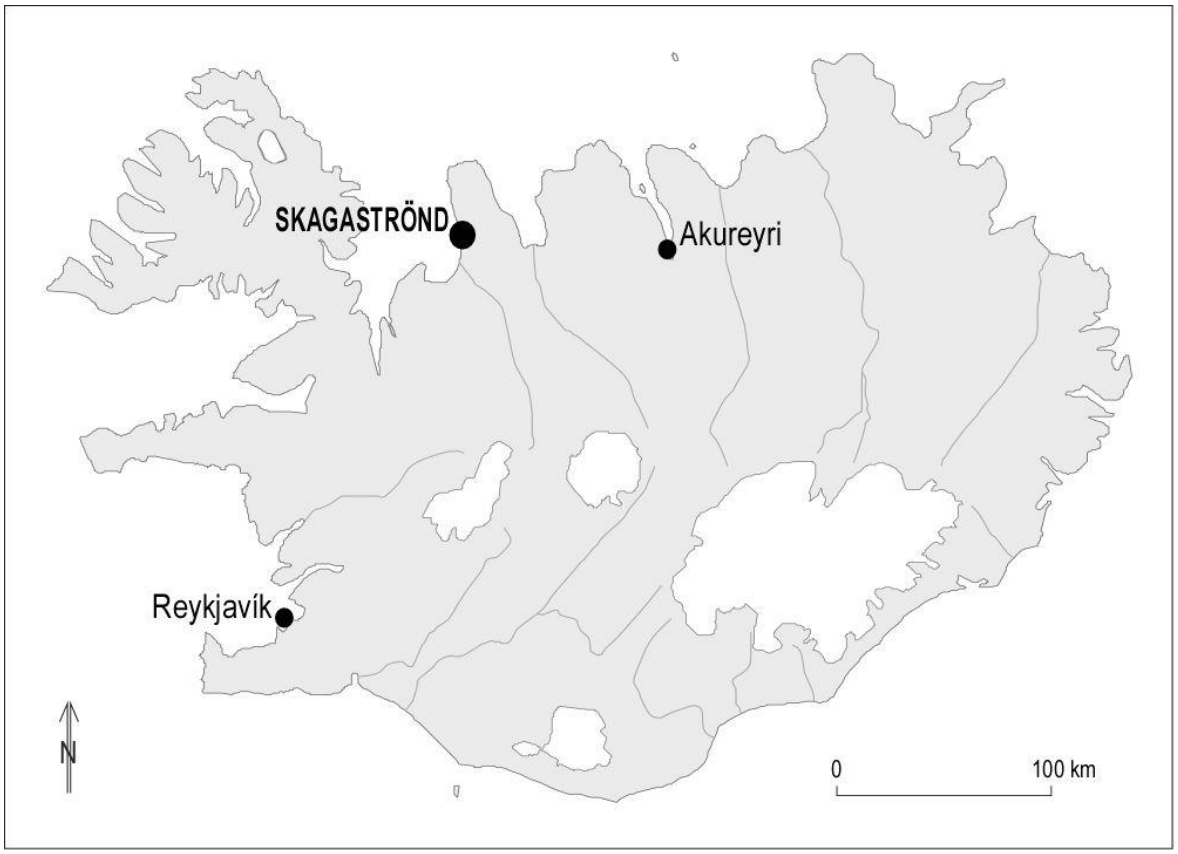

Figure 15 Location of Skagaströnd

One of the main challenges has been outmigration. The net loss of people during the past 20 years is around 200, with well under 500 inhabitants remaining. As indicated in Figure 2, the population development has shown constant fluctuations, seemingly caused by particular economic and ecological events. Despite the fact that the population had not reached one hundred before the early 20th century, the place was already of regional importance. Chosen as one of the country's main merchant stations of the Danish colonialists, Skagaströnd received its key function in the 18th century and kept it into the beginnings of the 20th century. With the advent of the 'Icelandic industrial revolution' and advancing fishing technology, the place experienced the first wave of in-migration. People from the scattered farmsteads in the district settled in the town, with its improved harbour conditions. With a doubling of population in the 1940s, based solely on immense landings of herring, the place was designated as a future 'capital' of the North. A master plan, somewhat similar to socialist city planning, envisaged up to 5,000 inhabitants (Morgunblaðið, 1946). This utopian construct ended abruptly in the late 1960s, as the herring altered its migrating behaviour. This fate was not uncommon for localities in the north of Iceland during this period. Skagaströnd recovered from this economic and demographic setback through a change towards demersal fish and crustaceans, notably shrimp, instead of herring. Also, a local fishing company was founded with some hundred shareholders from within the community. Until the early 1990s therefore, alternating phases of growth and stability characterised the development of the village.

In conjunction with an overall migration tendency within rural Iceland towards the capital region, several partly interrelated events have taken place, coinciding with severe population decline since the early 1990s. Following the privatization of the fisheries

through ITQs, the municipality-owned company was gradually taken over by shareholders from the outside, culminating in a hostile takeover. One of the two trawlers delivering fish for the local processing plant was moved to the neighbouring community of Sauðárkrókur. The freezing plant was closed. Moreover, the local shrimp factory had to shut down as the stocks in the bay had been overexploited and catches collapsed. The closure of the two plants affected employment opportunities within the community, particularly for women, and the loss of the trawler has taken a heavy toll of tax revenues and has affected the service facilities within the harbour and the community as a whole.

Several attempts have been made to mitigate the consequences and eventually reverse the trend. After the closure of the shrimp factory, three projects which intended to make use of the cultural heritage of the community—textile, sewing and fortune telling—, received some funding. All were initiated by women. The sewing workshop is still running, and the museum of a fortune teller attracts several thousand visitors per year. In 2007, a research-and-development company centred on marine biotechnology started its operation and the state-run unemployment office opened a regional office in the town. Furthermore, an artist residency was opened in 2008 which transformed the former fish factory into an open studio. In 2012 a start-up company was established, where three non-local newcomer professionals manufacture high-quality loudspeakers.

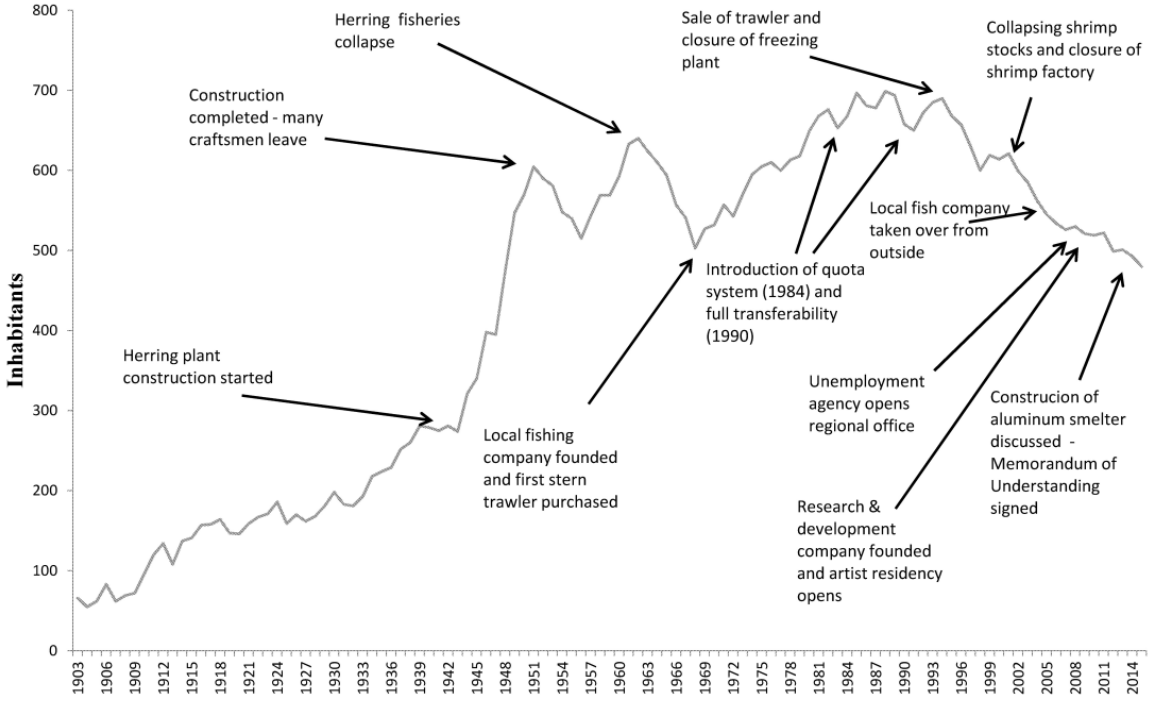

Figure 16 Population Development of Skagaströnd and Main Events Regarding Fisheries and Employment. Adapted from Chambers, 2016.

Methodology

The case study was carried out in early 2015, using a mixed methodology approach that included five partly overlapping phases. Throughout the five weeks stay, the researcher took the role of a participant observer and took part in numerous social activities. Some 23

semi-structured interviews were also conducted and another 40 people were interviewed informally, approached on the street, in public places or in their work-environment.

The first phase consisted of desk work and archival research. Together with a key informant, historic documents and photographs of the town were examined and discussed, while the researcher used online sources for establishing a newspaper article collection about Skagaströnd. Having acquired this background information, the next phase was started, consisting mainly of interviews and informal group discussions. Apart from locals who have spent most of their lives in the municipality, three artists from the local art residency were interviewed, as well as some four newcomers.

Participants in both the informal and formal interviews were asked the same starting question: 'What are the first three words that come to your mind when you think of Skagaströnd?' This question was used as a lead into a discussion, but also to gain insight into the connection between people and place. The last question was also similar, asking about a favourite spot in town, as well as a place that symbolised deterioration or stimulated a feeling of melancholy. Both places were identified on a map. The semi-structured interviews centred on a set of standardized questions, based on the participant's role within the community.

A strong focus was on the adolescents of the community, who were approached through the graduating class of the local school with students aged around 15. Two workshops were held during the third phase, applying the scenario method; a popular didactic tool in education for sustainable development. The workshops centred on three ideas: first, an identification of the willingness to stay within the community, or to move back after completing further education; second, place-based problems—and positive attributes—were revealed by the future generation; and third, possible solutions were eventually developed in a collective brainstorming-and-discussion round. A best-case scenario was developed and necessary steps for a realisation discussed.

The researcher then left the community for a short break. When he returned, the results from the workshops were presented to the public together with the researcher's own preliminary interpretation of the interviews and field notes. People that had been interviewed joined in, especially policy makers and entrepreneurs, and the results and future scenarios were examined. The preliminary results of the case study—individual interpretation—were thus taken back to the participants who got the chance to (re)evaluate them—mutual interpretation. After this last phase of collective evaluation, the interviews were transcribed and interpreted with the qualitative analysis software ATLAS.ti.

Findings

Fisheries

Having been an archetypical Icelandic fishing community for decades, one of the main questions asked in Skagaströnd was about the past, present and future of the fishing industry. That traditional fisheries—in the form of classical resource extraction combined with Fordist processing onshore—are not part of the community's future, has been a common belief. Nonetheless, this form of labour and the industrial heritage related to the fisheries has been consistently glorified and romanticized:

> I connect the past with the fishing industry, I think of what we are now in is kind of stable time, not so much action. New things are there, like [R&D company] Biopol [and] the unemployment office, that are not based on fishery, which is what we want. (Man, 65)

The past is meaningful and—traditional—fisheries still serve as an identity-establishing sector. This finds clear expression in the local pub, which is almost like a museum with its artefacts and photographs of the boom times. Furthermore, like in all Icelandic coastal villages, the Seamens' Day (Sjómannadagurinn) is celebrated annually.

When it comes to the current self-perception, Skagaströnd is not really a fishing community anymore. That it once was is on daily display, as both ends of town are framed by almost monumental remains (see Figures 17 and 18). Especially the old herring factory with its still-standing chimney is frequently referred to and arouses conflicting sentiments, particularly among those who experienced the 'golden age'. Not without irony, the chimney towers over the second highest building, namely the church:

> …the large chimney…was part of the herring factory—the big dream. [It is] a symbol of broken hopes. I want to stress that I am very positive for it to remain forever. In my mind it is a symbol for big dreams and broken hopes. (Man, 65)

> And, there was another [chimney], that spilled bad, foul stench down here. People called it the stench of money. (Man, 45)

Even though most of the older respondents mentioned some fish-related items that came to their mind first, none of the adolescents did so and only one of the newcomers perceived Skagaströnd as a fishing community. This is not surprising, as there are currently barely more than two small boats landing each day on average, while the remaining trawler lands every third week. The fish itself is invisible to the public, as it is taken out of town immediately for processing elsewhere. Often, the interviewees commented on the absence of fish processing:

> There is no factory to work the fish. You know, every fish that comes here, all you see is the big trailer going down [points to the road behind us]. Everything goes away. It is not good to see it. (Man, 40).

> Modern forms of natural resource use, other than industrialised fishing and processing, have been identified as one of the possible future opportunities of the community instead. This includes forms of the 'blue economy' and tourism. The latter is one of the main bearers of hope and has experienced a steady increase all over Iceland during the last years. At this stage, this sector is lacking the know-how and infrastructure in Skagaströnd. In combination with tourism, new opportunities for the almost invisible small scale fleet could evolve in connection with local food markets (cf. Smith and Chambers, 2015). Marine angling trips to the ocean, as well as Arctic charr fishing in the freshwater lakes in the hinterland, are pointed out as potential attractions. Especially the pristine fresh water lakes could become an attraction for niche tourism, offering solitude which has become rare with the advent of mass tourism, particularly in southwest Iceland.

Figure 17 The village of Skagaströnd with the chimney and harbour in the centre and right

Figure 18 The Chimney of the Abandoned Herring Factory. Mural by a Visiting Artist, Guido van Helten

Although in a transitional phase out of traditional fishing, the town still has a certain reliance on fisheries. Especially in terms of tax revenues, harbour fees and the ability to run certain services to the fishing industry—such as net-mending—, Skagaströnd is heavily dependent on the periodic landings from the trawler. Apart from this is the fact that it is the biggest private employer in town, giving work to some 40 men directly. The arrival of this floating factory turns the village back into a fishing community for a while and gives a feeling of what it must have been before. Days in advance, people start talking about the imminent arrival, the trawler being almost a Zeitgeber for an otherwise sleepy community to wake up. On the day of the arrival people can be seen driving to the harbour constantly, and the local rúntur—car cruising circuit—(cf. Collin-Lange & Benediktsson, 2011) in the evening is extended to the trawler. Teenagers from the local school earn some money by sorting boxes that clearly identify the export purpose (Figure 19). Several trucks wait to take the fish out of town. Within not even 36 hours, this short-lived revitalization is over.

Figure 19 The trawler "Arnar", landing in Skagaströnd but operating for a company (FISK) from a neighbouring town. Youngsters from the local school help to pack the boxes.

Even if the trawler is out of sight for most of the time, it still occupies a central place in the locals' mind-set. Both trawlers that the local company once owned are still referred to by their names, Arnar and Örvar, and in each official building photographs of them can be found. To the researcher, it felt almost as if Arnar and Örvar were family members—two lost sons, of which one at least still comes for a regular visit. An interviewee who had moved to Skagaströnd felt the same:

> When I first came and they were planning a meeting for the parents at school, they said they would have to wait until Arnar was in land, in dock (…) and I thought, OK, who is this Arnar? And that was 40 persons. (Man, 30)

Land-based fish processing jobs barely exist and apart from the summer months the small-scale fisheries sector is economically insignificant. Engagement with fisheries is, moreover, gendered: apart from the female harbourmaster, it is an entirely male business. Employment opportunities for women are rare and severe setbacks occurred with the closures of the processing plant and the prawn factory.

Regional quotas—*byggðakvótar*—were introduced in 2003 to support struggling communities. This was perceived by the people of Skagaströnd as an insufficient response. A quota of this kind had been allocated to the town, but a large part of it was eventually allocated to the trawler, thus not helping employment in the community at all. Instead, the interviewees saw this as primarily benefiting the neighbouring community of Sauðárkrókur, where the company that now owns the freezing trawler is located, but w.hich is basically not eligible for this scheme.

The aforementioned small-scale sector was supposed to receive a boost through recent policy reforms that included the creation of a new category of small-scale fishing in the summer months—coastal fisheries, or strandveiðar—, that is open to new entrants. However, the inflexibility of this new scheme and the limited catches allowed has been a hindrance for potential new participants. Only some former fishermen have reactivated their businesses through the scheme. Coastal fisheries are not enough to making a living on an annual basis (see Chambers, 2016) and do not at all make up for what has been lost:

> It is like a bandage on a wound. It is not quite healing the wound. It just temporarily protects the wound (Man, 55).

> It has done some good. But it is not changing the evolution in this business. Not at all. It is all too small (Man, 63).

Skagaströnd seems rather well prepared, however, for ‘post-quota development’, or in other words a strategic transition in times of precarious resource entitlements towards an economy not based on extractive fisheries. The focus on the quantity of fish has given way to an emphasis on qualitative improvement and making more full use of the catch. Since the opening of research and development facilities, the establishment has constantly grown and its directors hope that it will be able to launch some prototypes for production in the near future. In case of a successful development, the intention is to create opportunities for people with various educational backgrounds. Apart from that, the company has the potential to be the starting point for a business cluster.

Social resilience

The aforementioned qualitative shift in fisheries is one of the factors leading to increased diversification of the socio-economic structure of the community. This is partly due to a stable combination of public and private employment. Even though the research company attracts newcomers and educated back-movers, more variation is needed. Education plays a key role. It has hitherto been more of a push- than a pull-factor. Adolescents have either left for higher education, or young men have started a career as fishermen, lacking the

incentive to pursue further education due to attractive salaries as crew members. Whereas those who have gained higher education have found limited job opportunities in Skagaströnd, fishermen have faced the problem of finding suitable jobs for their partners.

Particular interest is shown in improving the already existing distance learning facilities. At this stage, the community has a research library connected to a small research centre set up in 2009 by the University of Iceland, and facilities for distance education classes. In addition, a curricular change is intended, intensifying the cooperation of the local school with the research centre. The individual interest for continuous education seems to be there. A presentation of regional and national institutions regarding educational opportunities, held during the author's stay, was well attended.

That the municipality has been able to attract and host those research and education opportunities can be linked to its political independence and the networking abilities that have been kept alive. This is mainly due to the comparatively stable economic situation, as the community has neither taken any ad hoc decisions regarding investments after the loss of the fisheries nor were any quotas purchased to keep this sector running on a large scale. Economic stability is one possible explanation for a strong resentment that is felt towards a proposal for amalgamation with neighbouring municipalities. In 2004 over 90% of voters in Skagaströnd voted against a proposed merger.

This topic was taken up again and debated intensively with the participants in the last phase of fieldwork. While the necessity of collaboration was seen after some debate, the willingness was not. This could be taken as an example of economic, cultural and social 'othering'. But more significantly, there is a shared fear of losing certain important facilities in the case of an amalgamation, first and foremost the local school.

> So, it would be very obvious to start shutting down this school…. If there is no school, there is no community (Man, 45).

> It will be a terrible day when we close our school…. In a small community like this, the school is the heart of the town (Man, 65).

Taking the size of the municipality into account, the level of entrepreneurship can be considered high. People are constantly seeking new opportunities and ideas. In addition, the political will to support innovative ideas is there. Examples for this is are the start-up company and the foundation of the artist residency. The opening of the residency was met with scepticism during the initial stage, but is now generally perceived as very valuable to the community in all respects. Up to 12 artists, mainly non-Icelandic, stay there for up to three months each. This has enhanced the cultural participation and understanding of the local population. Regular open houses, workshops and the use of public space show the interactive aspiration (see Figure 20). The majority of artists try to include local features, both natural and human, into their work. It should not be underestimated how important it is for such a remote community to be on the art world's map: this is a sector where word of mouth is significant. To what extent the self-perception and formation of identity of the local population has received a boost cannot be evaluated in a precise way, but the people of the community were open and welcoming in their attitude to the artists in residence.

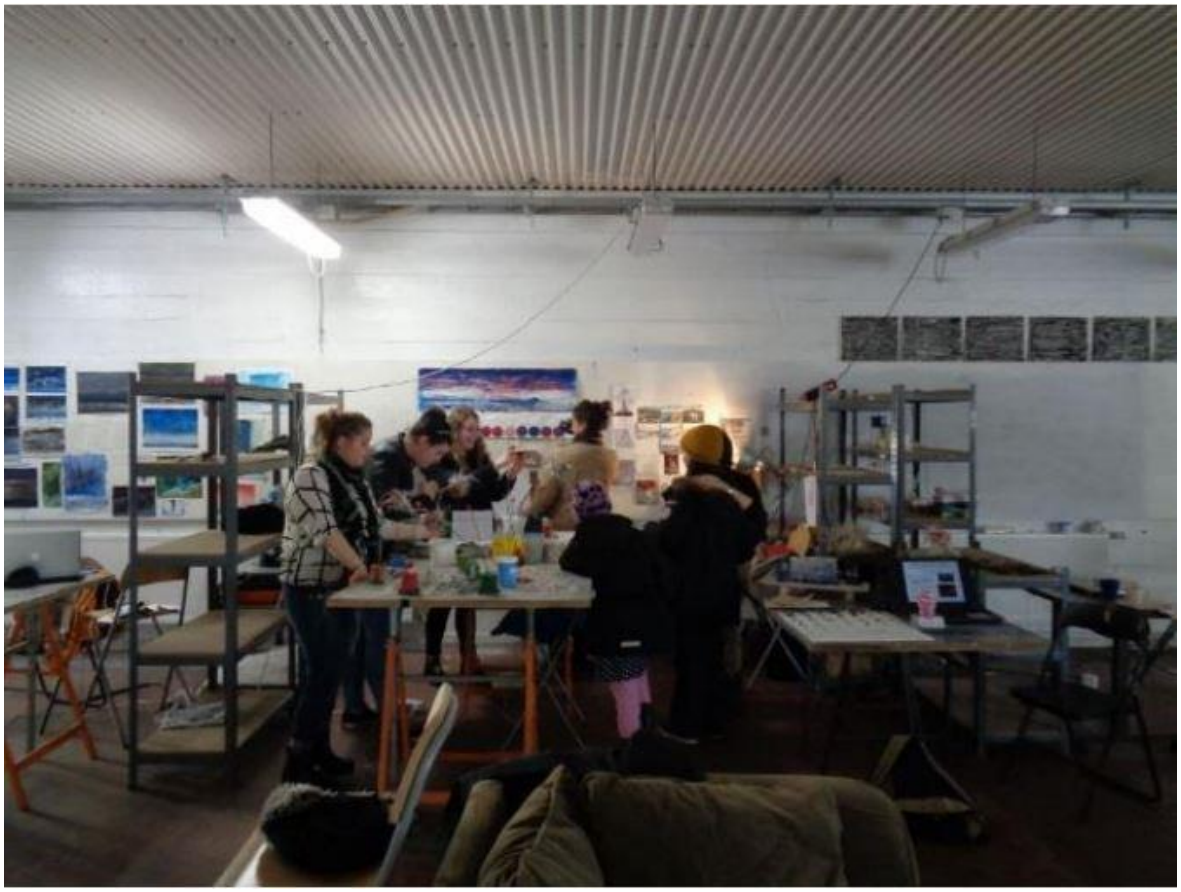

Figure 20 School class interacting with artists in residence at the studio.

Despite the positive evaluation of the community's resilience, the number of inhabitants has been decreasing and only two children were born in 2015. In general, communities that have fallen under the threshold of 500 inhabitants have been unable to turn the downward trend around. It is necessary to attract young families to the community, which has been the Achilles' heel in previous years. One possible solution to this is a proposal to locate an aluminium smelter in the region. This large-scale remedy has been applied in another location of Iceland as a solution to declining fisheries and depopulation, with debatable success (Benediktsson, 2009). Among the locals, this possibility has been seen in a somewhat positive way, yet with reservations. It is more accurate perhaps to say that locals see it as not 'wanted' but perhaps 'needed':

> Beggars can´t be choosers (Man, 60).

With regard to innovative potential and new job opportunities, gender issues in the community were addressed. It has been primarily women that have suffered from unemployment throughout the decades, starting with the arrival of the freezing trawler and the gradual loss of land-based processing. And even if processing facilities were present, it can be doubted that women—especially young and educated ones—would like to start a career at an assembly line. The potential to grow in the existing alternatives is limited, however, and more opportunities need to be offered to stop the still higher outmigration tendencies among women.

Discussion and conclusion

In times of unsteady resources and changing regulatory environments, the development of new socio-economic paths for resource dependent localities is ineluctable. Even though a tailor-made solution is not at hand, some results from Skagaströnd might serve as examples and could be transferred to other localities. Table 10 summarizes the parameters identified above for gauging social and community resilience, and identifies possible obstacles and threats to an increased resilience building capacity.

Table 10 Parameters for a community resilience assessment and findings. The level of resilience was evaluated as low, medium or high.

Parameters	**Level of resilience**	**Obstacles & Threats**
Natural Resources	Low	Fisheries regulation, technology, attractiveness
People-place connection	High	Loss of trawler
Knowledge, skills and learning	High	Loss of local school, lack of funding for research; failing research, educational level
Community networks	Medium	Outmigration
Engaged governance	High	Municipality amalgamation
Diverse and innovative economy	Medium/ High	Scale, funding opportunities
Community infrastructure	Medium/ High	Municipality amalgamation
Transformability	High	Continuous outmigration

The research question centred on the level of resilience in the face of resource privatisation though transferable quotas. When it comes to the natural resource itself—the fish in the sea—and access to it by local inhabitants, the level of resilience can be deemed as low. Skagaströnd is a community that has experienced most of the negative side-effects of centralization and vertical integration in an efficiency-driven management regime. Amendments to the regulations have not proven to be beneficial for this place. Apart from that, neither traditional nor modern forms of fisheries seem to be particularly attractive to the younger generation (cf. Bjarnason, 2014).

Social resilience and the concept of coping have been interpreted as active, intentional and bottom-up approaches for communities in transition. This requires a strong people–place connection and the general will of the local population to walk a hitherto unbeaten development path—transformability. Both can be found within the community. In particular, local policy makers show general support for innovative and unconventional ideas—engaged governance. A possible threat to this is municipality amalgamation, which is also perceived as one of the biggest threats to the community's infrastructure. To an outsider, the merging of municipalities seems economically reasonable. However, one

should not underestimate the significance of independence and the importance of an active local school for a lively community.

Social resilience is also about responding to an—external—shock. The shock or stressor for this community has been the loss of quotas. Instead of keeping this sector running at any cost, like many other fishing villages have tried, new forms of employment are aimed for. So far, it has been a fruitful strategy to shift from labour-intensive fisheries with a strong focus on quantity to a qualitative, research-based, trajectory. This has turned the former fishing village into a prototype of post-quota development. The community is not in full control of its fate regarding resource use. Fundamental decisions about this are made by the central government. A change of the regulation that really enables and attracts new entries to the fisheries is advisable. Regional quotas need to be directed more at new entries into the fisheries and/or local job creation by existing or new companies, instead of ending up in the hands of external companies. Apart from that, regulatory changes regarding the requirement to land the catch locally could enable local food markets, fresh fish consumption and trade opportunities within communities (Smith & Chambers, 2015).

As explained at the beginning of the paper, coping strategies are centred on the reflexive use of knowledge and the formation of social identity. In Skagaströnd, one of the main drivers regarding identity is the artist residency and the constant cultural exchange created through the inflow of artists. This stimulates a local-global identity establishment. Culture and research define the main coping strategies, but are still dependent on the funding situation. Particularly the research and development company is reliant on successful research in the long run.

The overall economic situation is another aspect of fate control and influences the inherent capacity for a diverse and innovative economy. Not all projects are of a bottom-up and endogenous nature, embedded in the municipal environment, nor can all ideas be realised without external partners. For some projects, the stimulus comes from the outside, here in the form of the central government or an investor. Most interviewees referred to the latter almost like a deus ex machina. Even if such an investor appeared one day, conflicts might occur. This becomes apparent when the possibility of a large-scale industrial project is discussed. Here it is advisable to learn from the past. Previous large-scale plans have not lead to diversification and independence, but have caused exactly the opposite, leaving the municipality in the current situation. A large industrial project might work against the locally-developed, small-and medium-scale coping strategies. It might be a solution that would bolster the local economy in the immediate future and would lead to a population increase; yet there are certain imponderabilities. The main question is to what extent such a large project would eventually help to diversify the local economy, instead of just overheating it temporarily.

In this paper, the concept of coping strategies has been used to analyse local resilience when faced with policy changes. Has the former fishing village of Skagaströnd shown resilience in the face of changed regulation? This was the main research question of this study. In general terms, the community seems to have shown considerable resilience, even though its population has not increased yet. On the other hand, just like with the fisheries, it is not merely the quantity—the sheer number of heads—that defines a robust and flourishing community.

Acknowledgements

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IV Where have all the People gone? The Limits of Resilience in Coastal Communities

Abstract

The concept of resilience has been used to assess community development and its prospects in natural resource-based localities. The objectives of the article are to evaluate the resilience of two Icelandic coastal communities, and to reflect on the possible shortcomings of the resilience concept for providing policy guidance. Mixed qualitative methods were used, with several weeks of fieldwork in each location. The results showed that the two case communities have had to adjust to a radical change in the fisheries management, with the loss of resource entitlements. Additionally, substantial differences were found in their level of resilience. One community was undergoing a transition towards a non-fisheries-based existence through several innovative new initiatives, while the other was struggling to adjust and seemed to have reached its limits of resilience, as witnessed by continuing outmigration and declining services. A state-sponsored programme to rekindle the local economy has had limited success so far. The authors conclude by identifying some of the limitations of the focus on endogenous strategies in much of the resilience literature, which does not pay much attention to the broader political economy.

Keywords: Regional development, community resilience, Iceland, fisheries management

Introduction

The concept of resilience has been enlisted to explain the development trajectories of rural and remote communities that face socio-economic and demographic threats (Berkes & Ross 2013; Besser 2013). Communities that are dependent upon natural resources are of particular concern (Himes-Cornell & Hoelting 2015); they are confronted with uncertainties that either stem from the resource itself or are triggered by external forces. Responding to threats and stress is an essential part of resilience. For community development, the concept offers an approach that is not solely about ‘counting heads’ or that is fixed on other quantifiable, mainly economic, variables, but also about bottom-up approaches, endogenous strategies, and local empowerment (Wilson 2012; Bosworth et al. 2015).

Resilience is closely related to discussions of vulnerability (Adger 2000). This means that a severe threat, pressure, or stress needs to be present, against which a subject can be resilient (Carpenter et al. 2001). The causes of vulnerability are diverse. Natural hazards

and climate change are prominent topics in the resilience literature, while policy changes have long received little attention (Keck & Sakdapolrak 2013; Brown & Williams 2015). This article focuses on the local responses to one such policy change and their significance for understanding whether and how resilience processes unfold.

Icelandic coastal communities have faced rapid changes following radical shifts in fisheries management. The fisheries have been transformed through the introduction of quotas, in place since 1984 in the demersal fisheries and freely transferable since 1990 (Matthiasson 2003). Considerable centralisation of fishing rights has occurred (Pálsson & Helgason 1995; Agnarsson et al. 2016) and the effects on the Icelandic fishing community landscape have been discussed from various perspectives (Eythórsson 1997; 2000; Olson 2011; Kokorsch et al. 2015). Inhabitants of fishing villages, some of which were centred on a single local company, saw a formerly common property turned into an asset, about which they no longer had any say, and this is a good example of how sectoral policy and market-based solutions can add stress to rural development (Marsden 1999; Besser 2013).

In this article, we examine the effects of the regime shift at the local level. Using a case study approach, we analyse the development of two coastal communities in the north of Iceland, Skagaströnd and Raufarhöfn (Fig. 21). One of the case studies clearly reveals a vulnerable community that may already have exceeded the limits of its resilience. Hence, parts of this article focus on what happens when 'the magnitude of disturbance is too high to tolerate' (Keck & Sakdapolrak 2013, 6). Resilience theory, when applied to community development, tends to be rather silent on this issue. We ask whether the strong focus on endogenous capacities that often accompanies resilience thinking may limit its efficacy as policy guidance in such cases.

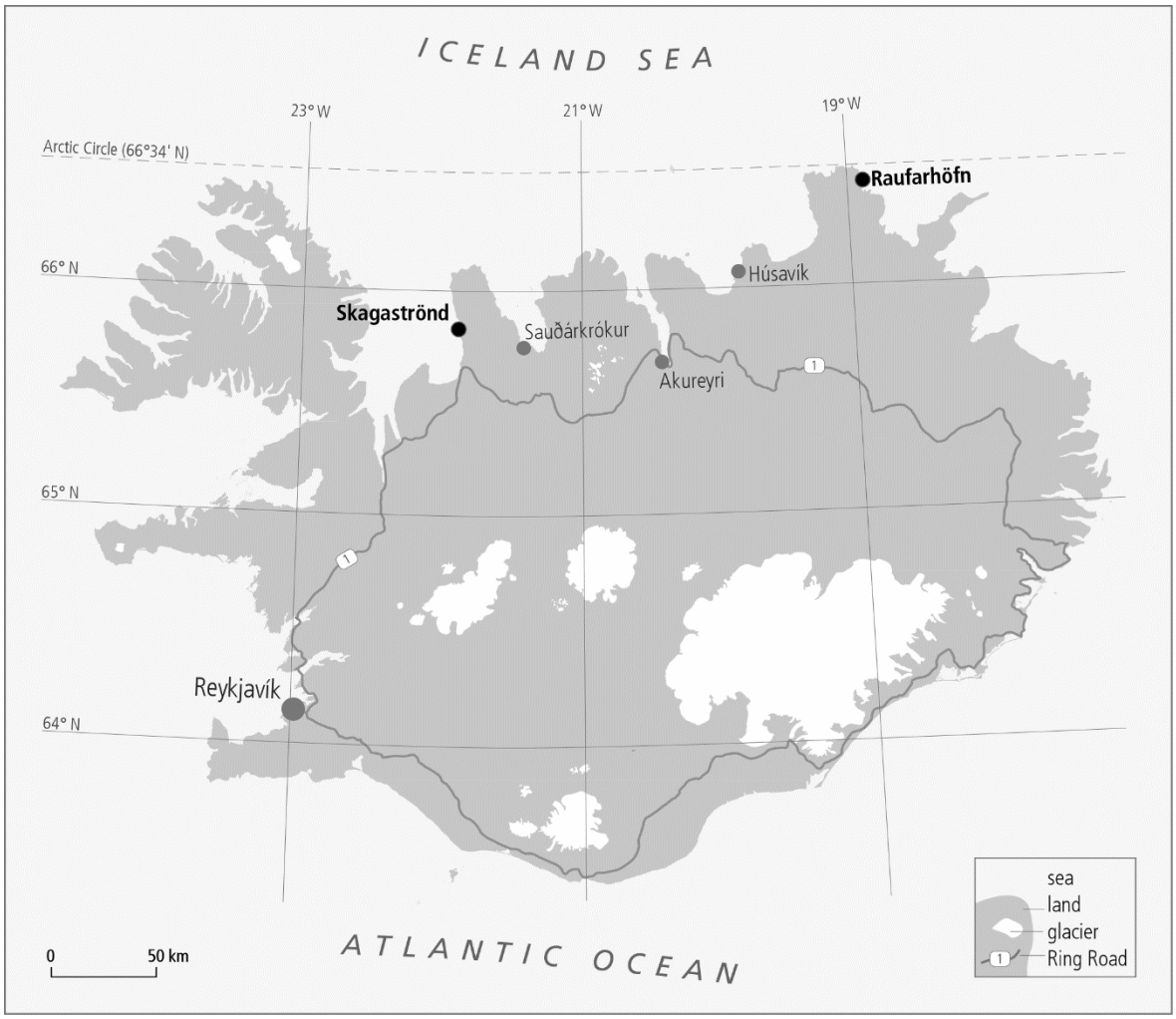

Figure 21 The case study locations and other important centres. The country's main road ('Ring Road') is also shown.

Assessing community resilience: theoretical underpinnings

The core of resilience

In its original meaning, resilience 'determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist' (Holling 1973, 17). Rooted in ecology, the concept has gradually been adopted by other disciplines and has gained much popularity in social sciences (Keck & Sakdapolrak 2013; Lorenz 2013; Symes et al. 2015; Meerow et al. 2016). Several changes and modifications to the initial definition can be detected (Norris et al. 2008). The study of resilience in socio-ecological systems, which bridges the fields of social sciences and ecology, has underlined the interdisciplinary aspirations of the proponents of the concept (Adger 2000; Berkes et al. 2008; Cote & Nightingale 2012).

An essential part of socio-ecological systems and resilience building are ‘adaptive cycles’ that shape the pathways in which such systems evolve (Holling 2001; Walker et al. 2004; Keck & Sakdapolrak 2013). The cycles consist of four consecutive phases. The first phase, is defined by the accumulation and exploitation of resources, and is characterised by growth. This is followed by ‘stagnation, rigidity and lock-in’ – the second phase, which eventually causes a sudden collapse – the third phase (Keck & Sakdapolrak 2013, 7). Such a collapse brings about the fourth and final phase that involves reorganisation and renewal. This cycle seems very appropriate for the study of resource-dependent communities and the identification of historic trajectories and present states. However, changes in a resource, particularly in its management, do not necessarily trigger a sudden collapse, but can rather be the cause of gradual decline. The histories of places in Europe other than Iceland serve as examples of such developments (Hudson 2005; Heinze & Hoose 2013; Carlsson et al. 2014; Underthun et al. 2014).pments (Hudson 2005; Heinze & Hoose 2013; Carlsson et al. 2014; Underthun et al. 2014).

Defining community resilience

In transcending disciplinary boundaries, the resilience concept has been included in numerous community and case studies of interdependent systems spanning the ecological and social spectrum (Christopherson et al. 2010; Pike et al. 2010; Amundsen 2012; Berkes & Ross 2013; Roberts & Townsend 2016). Although community resilience has been studied frequently, the resilience of communities to policy changes is still under-researched, both in theory and in practice (Wilson 2012; 2013). One problem lies in the term ‘community’ itself. To avoid any confusion, in this article ‘community’ is understood as a geographical entity and synonymous with ‘village’ (for a good discussion of the term ‘community resilience’ and its different notions, see Wilson 2012).

A suitable definition of community resilience is provided by Amundsen (2012, 46): ‘Community resilience is the ability of a community to cope and adjust to stresses caused by social, political, and environmental change and to engage community resources to overcome adversity and take advantage of opportunities in response to change’. This definition derives from case studies in a setting comparable to Iceland, namely Northern Norway, and suits our analysis of Icelandic fishing villages. These villages have been exposed to various forms of stress, starting with the threat of overfishing as an environmental stressor during the second half of the 20th century (Matthiasson & Agnarsson 2010). The threat has seemingly been overcome through changes in resource governance. Those changes added yet another form of stress to resource-dependent communities that saw their economic mainstay being threatened by neoliberal market forces and centralisation processes (Benediktsson 2014; cf. Langdon 2015). In addition, technological advancements and changes in the attractiveness of jobs in the fisheries sector, particularly land-based ones, eventually left several fishing communities in a socio-economically and demographically vulnerable position (Bjarnason & Thorlindsson 2006).

Responding to stress

Understanding the response to stress is an essential part of evaluating resilience. It can take place through adaptation and coping (Nelson et al. 2007; Keck & Sakdapolrak 2013; Meerow et al. 2016), both of which terms are sometimes used synonymously, but the main difference between them relates to the time and scale of the underlying processes (Smit & Wandel 2006; Nelson et al. 2007; Lorenz 2013; Underthun et al. 2014). Adaptation

describes the spontaneous structural reorganisation of a system, either in response to an external upsetting event or to a critical internal one, which enhances a system's ability to cope with those external or internal stresses (Bristow & Healy 2014a). Adaptive capacity is thus a measure of a system's potential for reducing vulnerability (Holand et al. 2011; O'Connell et al. 2015). By contrast, coping describes 'initial emergency actions to mitigate the immediate impact of the disturbance' (Symes et al. 2015, 248).

However, not every form of adaptation and coping can be automatically defined as 'resilience'. Resilience entails a conscious, endogenous, anticipatory, and proactive effort (Steiner & Markantoni 2014; Brown & Williams 2015; Steiner & Atterton 2015). Although resilience is supposed to be an endogenous process – one that has to come from within the community and should not be initiated artificially – the importance of the political and institutional setting in which resilience building takes place needs to be considered (Clay & Olson 2008; Dawley et al. 2010; Walsh 2012; Carlsson et al. 2014). Social and community resilience is always part of the 'exogenous policy corridor' that either narrows or widens the potential development path (Wilson 2012; 2013).

In line with the political and institutional setting, the dichotomy of bottom-up and top-down approaches is frequently brought up (Smit & Wandel 2006; Crescenzi & Rodríguez-Pose 2011; Measham et al. 2012; Carlsson et al. 2014). Marsden (1999) highlights the question of to what extent the local population exhibits agency in the development process. Strategies that are solely of a top-down nature tend to end in a 'dependency culture' (Steiner & Markantoni 2014). A flexible reading of resilience for the two case studies is advisable in this regard: whereas endogenous strategies are undoubtedly an important part of resilience building, certain vital factors that contribute to both the vulnerability and the resilience of a community are nested in regulatory frameworks and political settings. Enabling factors, such as investments in infrastructure and the provision of know-how and economic support, particularly in communities with comparatively small populations, have to come from external institutions (Karlsen & Dale 2014).

Lock-in and path dependency

Two essential notions for the explanation of regional disparities and different local development trajectories, in combination with either endogenous or exogenous strategies, are 'lock-in' and 'path dependence' (Hassink 2005; 2010a; 2010b; Martin & Sunley 2010). Path dependence describes how choices that were made in the past – mainly in terms of industrial and innovation strategies or technology – influence choices made thereafter. It does not denote a strictly predetermined course, but rather 'a road map in which an established direction leads more easily one way than another – and wholesale reversals are difficult' (Martin & Sunley 2010, 62). Lock-in relates to this understanding, as it describes processes 'in which initial strengths based on geography and networks, such as industrial atmosphere, highly specialized infrastructure, close inter-firm relations and strong support by regional institutions, [turn] into barriers to innovation' (Hassink 2010a, 450).

Key components for resilience building

For an assessment of resilience at the community level, numerous tools and methods have been suggested. As there is no one-fits-all solution for identifying resilience-building

strategies, different key components have been extracted from resilience theory and case studies in settings comparable to those described here. Table 11 summarises those components that can be considered applicable for Icelandic communities.

Table 11 Components for the identification and evaluation of resilience-building strategies

Component	Description/Definition	Source
Adaptive capacity	Adjustment in a system's behaviour and characteristics that enhance its ability to cope with external stresses; ability to modify or change to cope with stress.	Adger et al. 2004, Berkes and Ross 2013, Roberts and Townsend 2015
Coping strategy	Innovation, networking and formation of identity; new solutions to local problems.	Bærenholdt and Aarsæther 2002, Norris et al. 2008, Wilson 2013
Community capacity	Connectedness and political networking.	Bristow and Healy 2014, Dawley et al. 2010, Norris et al. 2008, Wilson 2013
Local agency/ fate control	Destiny in own hand; Ability to shape own future.	Marsden, 1999; Measham, Darbas, Williams, & Taylor, 2012
Place attachment/ Sense of belonging	Emotional ties; being open and welcoming; encouraging participation in community.	Amundsen 2012, Looker 2014, Roberts and Townsend 2015, Steiner and Atterton 2015
Civic engagement	(Political) involvement; working together in problem solving measures.	Besser 2013, Norris et al. 2008
Collective and/or self- efficacy	Belief that change can be achieved by the community;	Berkes and Ross 2013, Roberts and Townsend 2015
Transformation	Ability to create new pathways and enhance functioning.	Dawley et al. 2010, Keck and Sakdapolrak 2013, Walker et al. 2004
Community infrastructure	Services provided, to people and industries.	Amundsen 2012, Christopherson et al. 2010, Park 2016
Innovation & education	A skilled, innovative and entrepreneurial work-force	Christopherson et al. 2010
Driver of change	Public or private	Steiner and Atterton 2015
Diversified economy	No over-reliance on a single industry	Christopherson et al. 2010, Steiner and Atterton 2015

Limitations of resilience

The resilience idea has been discussed intensively, and critiques centre particularly on the malleability, or vagueness, of the concept (Christopherson et al. 2010; Brown 2014; Turner 2014; Endress 2015). Moreover, Walsh (2012) discusses whether the use of resilience can be considered as a depoliticising move, as it addresses primarily the effects and not the

causes of stress. Hence, in tandem with a resilience-building process, the political-economic context has to be critically scrutinised.

Regional policy in Iceland and the question of small villages

During the 20th century, Iceland underwent radical and rapid social and economic changes. As a consequence, the total population grew from c.78,000 in the early 1900s to over 330,000 in 2016 (Statistics Iceland n.d. b). As the century progressed, internal migration patterns became an increasing cause for concern. Uneven development eventually led to the formation of regional policies, which increasingly have centred on maintaining a 'balance' in the settlement pattern and ensuring the viability of the small towns and villages (Jóhannesson 2003). In 2017, 71 localities had a population between 50 and 1000, totalling some 6.3% of the whole population (Statistics Iceland n.d. a). By contrast, in 2016, well over 60% of the country's population lived in a single urban area centred on Reykjavík (Statistics Iceland n.d. a).

The political system in Iceland is two-tiered: the national government and the municipalities. In the late 20th century, an effort was made to amalgamate numerous municipalities (Eythórsson et al. 2014). This coincided with the transfer of some tasks and obligations from the central state to the local level (Sverrisson & Hannesson n.d.). The fiscal basis for providing these services consists of a portion of the income tax collected by the state and well as property taxes and several other sources of revenue. The welfare tasks have been increasingly moved to the municipal level, and are now by far the most demanding in terms of expenditure (Sverrisson & Hannesson n.d.). Further strengthening of the municipal level through amalgamations is intended, but the state has tried to achieve this aim not through coercion but consensus among the inhabitants of the communities to be merged.

Regional policy efforts have by and large been rather weak and ineffective (Huijbens & Þorsteinsson 2017). However, one period stands out: the 1970s (Jóhannesson 2003), when a left-of-centre government, following a broadly Keynesian policy agenda, implemented a comprehensive infrastructure and investment programme around the country. During that decade, most coastal towns were allocated at least one large stern trawler, and modern freezing plants providing land-based employment were established (Matthiasson 1997). Towards the end of the 20th century, procedures and practices in regional development changed, partly influenced by neoliberal ideology but also by ideals of bottom-up planning (Benediktsson 2014; Huijbens & Þorsteinsson 2017). Additionally, increased emphasis was put on endogenous growth, cultural activities (Júlíusdóttir 2010), and the formation of local 'clusters' – a concept that became extremely popular in the discourse (Huijbens et al. 2014). Following the financial collapse in 2008, a new left-leaning government made a new attempt at bottom-up regional development planning, whereby the people of each region collectively defined their goals.

However, the means allocated by the state for putting these ideas into practice have not been significant enough to counteract other processes at work. Financial support has been spread rather thinly on many projects that are geographically dispersed (Ministry of Industries and Innovation 2016). Indeed, regional policies have never convincingly tackled the basic spatial question as to whether to concentrate regional development efforts on the

larger towns or to strive to maintain either most or all small settlements (Jóhannesson 2003). While individual municipal plans have discussed spatial development in each municipality, no overall spatial plan or policy has been in place until recently. A newly adopted national planning strategy lays down some general aims for the development of settlement pattern, but does not specify which regions or settlements should be deliberately strengthened (National Planning Agency 2016). On top of this, there have been some specific large-scale industrial investments, the siting of which has had more to do with classical industrial location factors – and industrious lobbyists – than with coherent planning (Benediktsson 2009).

The most important of the sectoral developments that have affected coastal communities has been the introduction of Individual Transferable Quotas (ITQs) in the fisheries. The history of the Icelandic quota system and the rationale for its introduction has been repeatedly told (Matthiasson 2003; Christensen et al. 2009) and is not recounted here in detail. However, it is important to keep in mind that prior to the introduction of quota-based management, the Icelandic fisheries were in a crisis. Fish stocks were overexploited and the fishing industry suffered from overcapacity and inefficiency (Matthiasson, 2003). What is of interest for the case studies reported below is the way in which the transferability of fishing quotas, fully implemented in 1990, has impacted the resilience of coastal towns and villages. Right from the beginning, the potential negative implications of the system have been clear and its social injustices have been trenchantly criticised (Pálsson & Helgason 1996; Eythórsson 2000). Measures to soften the blow for those fishing communities at the quota-losing end have partly focused on temporary 'fire-fighting' efforts, including the use of regional development funds for shoring up fish processing companies that have lost out in the race.

Some partially more radical countermeasures have been introduced to mitigate the negative implications of the ITQ system. (Chambers & Carothers 2017). One such instrument was put in place in 2003, when the Icelandic government introduced the allocation of 'community quotas' (*byggðakvóti*). Another change was the introduction in 2009 of a 'coastal fisheries' scheme (*strandveiðar*), running from May until September each year. The scheme is intended for small boats and jigging only, and is not based on ITQs but allows for 'open access' within strict temporal and spatial limitations. This has brought increased life to several small villages for a short period of the year. However, an assessment of the relative importance of the two schemes concludes that the community quotas have had more significance than the coastal fisheries in terms of providing employment for coastal villages (Karlsson & Jóhannesson 2016).

Lastly, and of special interest to one of the case studies described below, the programme Fragile Communities (Brothættar byggðir) was launched by the Icelandic Regional Development Institute in 2012, with the main objective to halt depopulation and attract educated people to communities defined as particularly 'fragile' (Icelandic Regional Development Institute 2016). The programme centres on the provision of expertise and guidance. Local workshops are held to identify the most pressing issues and reveal inherent capacities, strengths, and ideas in a bottom-up manner. The results are then communicated to state authorities. However, with only some ISK 50–100 million (approximately EUR 450,000–900,000) distributed annually between all communities that take part (currently six, most of which are coastal communities), the financial scope for the realisation of radical ideas is limited (Frímannsdóttir 2015; Icelandic Regional Development Institute 2016).

Study locations

The two case studies were conducted between February and May 2015 over the course of c.11 weeks. A mixed methodology approach was applied, in which the researcher took the role of a participant observer. The villages of Skagaströnd in the Northwestern Region of Iceland and Raufarhöfn in the Northeastern Region (Fig. 21) were selected on the basis of the authors' previous research into development trajectories of Icelandic fishing villages (Kokorsch & Benediktsson in press). Demographically, these two places are not unique cases in the Icelandic community landscape. In many communities, outmigration, an aging population, and considerable gender imbalance are common phenomena. Nevertheless, these particular places serve as good examples because their demographic rise and fall can bemore or less directly linked to events in Iceland's fisheries (Fig. 22). With rapidly growing populations after 1920, the peak population in both villages occurred in the 1980s.

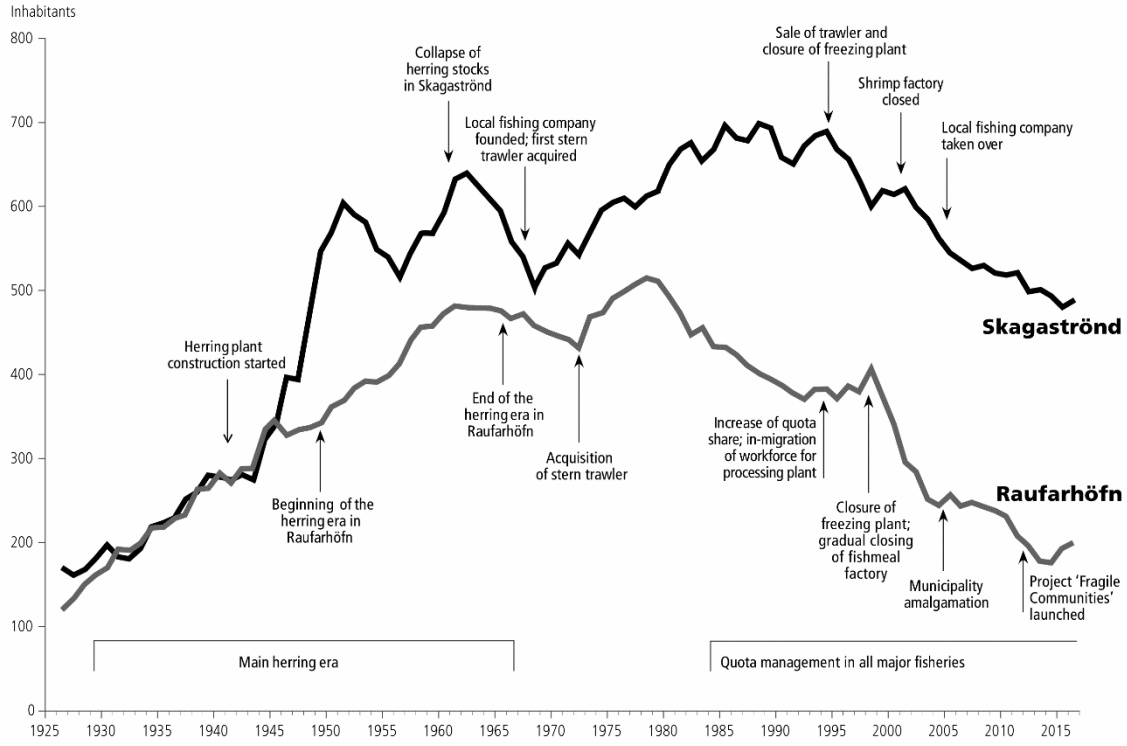

Figure 22 Population development in the case study localities. Major local events and turning points identified by interviewees are added above (Skagaströnd, black line) or below (Raufarhöfn, grey line). Important periods for fisheries in general are also identified.

In particular, the period of herring fisheries in northern Iceland (between 1930 and 1967, cf. Hamilton, Jónsson, Ögmundardóttir, & Belkin, 2004) was important. Following the disappearance of the herring, actors in both places tried to reorient their fisheries and obtained trawlers in 1967 (Skagaströnd) and 1974 (Raufarhöfn), with positive results during the first years. Both places were home to processing plants of considerable size, owned by local shareholders and/or the municipality. The introduction of quota

transferability in 1990 hit both villages hard, albeit with a time lag. Even though the places show similarities until 1990, differences regarding post-quota development and resilience building strategies are striking, however.

Skagaströnd

The first case study was conducted in this village in February-March 2016 (Kokorsch 2017). Distances by road are 266 km to the capital, Reykjavík, and some 52 km to the next regional centre, Sauðárkrókur. The post-quota history of the village has been somewhat chequered (Figure 2). The first years after the introduction of quotas were rather positive and the municipality invested in quotas. In the mid-1990s one of the two trawlers was sold and a processing plant closed. This loss of approximately 50 jobs resulted in considerable outmigration. After a short period of recovery, another two events resulted in further outmigration. The collapse of shrimp stocks in the bay in 2001 led to the closure of the shrimp factory. Even more important was the (hostile) takeover of the local fishing company by an outside firm not long after this, resulting in significant quota loss and the transfer of ownership of the remaining trawler. To compensate for the loss, a significant amount of community quota has been allocated to this community in recent years.

Different strategies have been developed by public and private actors after 2001. Instead of investing in fisheries, the municipality decided to transform most of the former fish processing premises into places of research, small-scale industries and creative activities. The former herring factory and processing plant host the offices and laboratory of a marine research and development company, a university centre, library, distance learning facilities and a sewing workshop. In the former freezing plant, an artist residency was opened in 2008. An open studio provides twelve places for artists who can stay in residency for up to three months. The shrimp factory is used by an entrepreneur who runs a one-man laboratory in food design. A regional branch of the unemployment agency of Iceland was also transferred to the village in 2007, giving employment to some 15–20 people. Recently three economic in-migrants opened a start-up company that manufactures loudspeakers. Apart from all this, plans to build a small hotel have been finalised.

Fisheries are still present, however. A few small boat owners operate from here and a branch of a fish auction market attracts landings of small boats from elsewhere in the region. The trawler continues to land its catch at Skagaströnd, and is manned by locals. The landing fees, taxes and salaries of the 15–20 crew members are important sources of municipal income.

Although the municipality is trying to diversify opportunities for employment, the outmigration has not been stopped (Fig. 2), leaving the community with some 490 inhabitants in 2016 (658 in 1990) (Hagstofa Islands n.d. a). The main challenge at present is to attract educated people and increase the range of employment opportunities.

Raufarhöfn

The second case study site is located in NE Iceland. Distances to the capital by road are 610 km, to the next regional centre Húsavík 130 km, and 222 km to Akureyri. Here things have been even more volatile and two waves of outmigration can be detected (Figure 2). The first one set in at the end of the 1970s (515 inhabitants in 1978) and lasted until 1992, when the population had declined by 144 people. Interestingly enough, a modicum of

stability followed, both in terms of fisheries and population, for almost a decade after the introduction of ITQs. Quotas were purchased by the municipality and improvements of local vessels and harbour facilities took place. Until 1999 the population had increased to over 400 again. The municipality had invested in school and sport facilities. But eventually things took a turn for the worse, which triggered the second wave of outmigration. The public investments in the early 1990s had left a heavy financial burden for the community and its fishing company. In 1998 the municipality was forced to sell the quotas to a non-local company, which promised to continue landing and processing in the community. This promise was not kept and most land-based jobs were lost. More centralisation took place in the following years, affecting the local fish meal factory – one of the biggest employers.

With the loss of the freezing plant, the fishmeal factory, and most of the quotas, there was little room to manoeuvre economically. The capital from quota sales was reinvested on the stock market and had to be written off in the early 2000s. In the mid-2000s, a further 50 jobs were lost in the fisheries sector. Calls for external help became louder. However, the community was not allocated any community quotas at the beginning of the scheme in 2003. State-run initiatives, such as a call centre for state institutions, were closed down again within two years.

The village of Raufarhöfn lost no fewer than 60% of its inhabitants between 1999 and 2014 when the second wave of outmigration occurred. Due to the economic constraints and the alarming outmigration, amalgamation with neighbouring communities to form a new municipality was proposed. This proposition was contested, and with a majority of 56% resulting from the local plebiscite for the proposal in 2005, the decision to merge was a tight call. The administrative and policymaking body is now located c.130 km distant in Húsavík (Fig. 1), which by far the largest service centre of the geographically large municipality. Services have been gradually cut down to a minimum in Raufarhöfn, although the local school is still open. In the 1990s, the primary school had c.100 pupils counted, but in 2016 there were only 7 pupils and 9 children were registered in the kindergarten. Net migration has been slightly positive since 2014, but the community remains among those with the highest average age and the most skewed gender distribution, with far more men than women. The main challenges are the outmigration and lack of employment opportunities other than jobs in public services or in fish processing.

However, some new projects have been initiated in Raufarhöfn. In 2008, local enthusiasts started the construction of Heimskautsgerðið (The Arctic Henge). Based on Stonehenge and pagan mythology, this ambitious project makes use of the location almost at the Arctic Circle. The project received funding from the state and was meant to become a tourist attraction, giving employment to c.20–30 people. It has not yet been finished and is lacking a substantial economic foundation.

In 2013, the Fragile Communities programme (see the section ‘Regional policy in Iceland and the question of small villages’ above) was launched in Raufarhöfn. The most pressing issues have been identified and addressed to some extent. One result is the opening of a research centre, the Rif Field Station, which provides employment for one person and is open to visiting scientists. Any further increase in the number of employees will depend on success in attracting third-party funds. Additionally, special community fishing quotas permitting c.400 tons of fish to be caught have been allocated for each fishing year, with the aim to stabilise employment in fisheries. Two processing companies are still operating in the community. Some hope is also pinned on a ‘trickle-down’ effect from a large-scale

industrial investment that is taking place at Húsavík, but that seems rather unlikely given the distance.

Methods

The initial phase of fieldwork in each place included an analysis of the history of the study village. Online archival data and informal talks with key informants, during which the first author of this article was shown documents, photographs, and artefacts, were used to gain a good sense of the developments that had occurred since the early 1900s. This was followed by semi-structured interviews, supplemented with several informal interviews held randomly with people in the street, in shops, or attending festivities. The interview questions were kept as similar as possible for both places, to allow for comparisons. However, some questions were adjusted to the specific location and the position or role of the interviewee. Starting with questions about personal memories, the focus gradually shifted from the individual level to the community level. This usually initiated a general conversation about the Icelandic fisheries management system and the future of fisheries on the local scale. Leaving the fisheries aside, the participants were then asked about conceivable alternatives and future opportunities regarding their village. A total of 45 interviews were conducted, varying between 30 minutes and 3 hours in length. All were transcribed and analysed with ATLAS.ti, primarily using the list of components for resilience as codes (cf. Table 11).

Apart from the aforementioned informants, special attention was paid to the adolescents in the two communities. As neither village has an upper secondary school, youths usually leave at the age of 16 years to seek further education elsewhere. Our intention was to identify the general willingness of young people, who were approaching this important transition in life, to move back to the village once they had finished their education. Our intention was to identify the general willingness of young people, who were approaching this important transition in life, to move back to the village once they had finished their education. Instead of individual interviews, workshops were held for collective evaluation and interactive discussions. They were held at the local school with adolescents around the age of 15 years. Several scenarios and development paths for the village were discussed, and shortcomings regarding both job opportunities and leisure activities were identified. Furthermore, the participants were asked where they could imagine themselves, geographically speaking, in 2, 5, 10, and 25 years. Based on the answers, the participants debated how to attract returnees and discussed ways to improve Skagaströnd's attractiveness for new inmigrants (for a detailed description of the workshops, see Kokorsch 2017). While the three workshops held in the same village led to fruitful discussions, it was impossible to repeat this in the other village: the last six pupils of the relevant age group had left the local school in 2013. Thus, just two youths were interviewed individually and some others were approached informally via social networks. The basic questions were similar to those posed at the workshops.

Components of resilience in the study communities

The case studies yielded important insights into the resilience of the two communities. The aforementioned four phases of an adaptive cycle can be identified in both places, albeit with a clear discrepancy in the last phase. The localities experienced different phases of accumulation and growth (phase 1), followed by stagnation, rigidity and lock-in (phase 2). An unstable ecological environment and gradual population decline marked the third phase, which was further complicated by changes in fisheries management. The places had to react to those adverse effects through re-organisation and/or renewal (phase 4).

Being in the fourth phase of an adaptive cycle, strategies of resilience-building can propel the process of renewal and reorganisation. The main components of resilience building (cf. Table 11) will now be elaborated, starting with the individual level and then shifting the focus to the political setting and endogenous community factors. The components are italicised in the text.

The individual level

Inhabitants in both Skagaströnd and Raufarhöfn showed a strong sense of *place attachment and sense of belonging*, coupled with strong feelings of home and belonging. This is a necessary starting point, as the identification with a place increases the likelihood of community-oriented activities. Locals mentioned several reasons for living in each of the villages and enthusiastically described the surrounding nature and how they used it for various recreational activities. The identification with and rootedness in a place can be linked to the raison d´être for its existence. Both villages were quintessential fishing villages throughout the 20th century, with cycles of booms and busts. The present role of fisheries is perceived differently. Whereas locals in Skagaströnd seem to have accepted that traditional fisheries are a thing of the past, the inhabitants of Raufarhöfn still attribute a key role to this industry. The differences are evident in the following quotes (reproduced verbatim):

> It is necessary to try to prepare for the future with not thinking that fishery is the alpha and omega, because it cannot be. Fishing villages in Iceland are too many (…) and there must be fewer that base their living on that. We were hoping to be one of those that survived as a fishing village, as we wanted to be a fishing village. But we did not succeed in that. We lost in the fight. We were sold out in a way. So we had to find other ways. (Man, Skagaströnd)

> We do not have anything else. That kind of makes us different from other places. We are a fishing village. (Man, Raufarhöfn)

Identifying with a place and being aware of its identity and meanings are factors that can stimulate civic engagement. This component cannot be evaluated as strong in both places, though. Even if solid political leadership and ties can be discerned in Skagaströnd, it has mostly been the same handful of people that are behind most initiatives. In Raufarhöfn, there is no strong political leader or policy maker. This has multiple reasons that will be described later in this section. That civic engagement has nonetheless received a push during the past few years is a positive result of the project 'Fragile Communities'. The

locals show initiative to improve the appearance of the village through voluntary work. Meetings and workshops have been well attended and the project leader has been integrated in community actions.

The above-mentioned two components are interrelated with the *collective and/or self-efficacy*. This component is defined as 'the belief that change can be achieved by the community' (Roberts & Townsend 2016, 5), and can be evaluated as somewhat positive in both Skagaströnd and Raufarhöfn. While the mentality of the locals in Raufarhöfn was described during the informal and formal interviews as having been very pessimistic prior to the launch of the Fragile Communities programme, the interviewees expressed cautious optimism regarding the village's future. In Skagaströnd, the majority of people were positive regarding the recent development, although some voiced scepticism about rising population figures: despite a general belief that further depopulation could be halted, they doubted that the population would grow to 700 as in the 1980s, unless a big project, such as an aluminium smelter, were to be located in the area.

Political framework

Regarding the political framework in which resilience building takes place, municipality amalgamations are one of the most important aspects in both communities. This is understandable in the context of a two-tiered system, in which municipalities have significant power. In this respect, the two case communities show dissimilar experiences. Comparisons regarding the impact on *community capacity*, *local agency* and *fate control* are thus possible. While Skagaströnd has strongly opposed merging with neighbouring municipalities, Raufarhöfn has been part of a bigger municipality since 2005. Discussions in both places have centred on the potential and actual threats to local services, investment opportunities, independent decision-making, and the loss of political ties.

That the fear of losing independence is warranted can be observed in Raufarhöfn. This community is exceedingly dependent on decisions made in the municipal council, with the nerve centre of the municipality located some 130 km away. Not having any representative expressing local concerns in the municipality council is a considerable political and strategic disadvantage (cf. Kühn 2015). As there is no willingness among locals to run for any political office, the representation gap will remain. The main reason is ascribed to distance. Concerns regarding the distance, both political and geographical, clearly identify a divide between 'us' and 'them':

> A disadvantage is that people who run Norðurþing seldom come here. And now they want to close the swimming pool next winter. They do not understand how much that means to us, to have it open all year around. They just look at statistics. They are quite invisible. When we had our own [mayor], people just went there and talked to him. Now people really do not know whom to talk to, they don't get hold of the people who are in charge. (Woman, Raufarhöfn)

> It is like we are second-class citizens. (Woman, Raufarhöfn)

In interviews with representatives from the municipal government about a possible devolution of political power or decisions to the locals in Raufarhöfn, it became clear that this was not envisaged. It became even more obvious that Raufarhöfn is not a priority

regarding investments and projects in the near future. Having discussed the reasons for the amalgamation in 2005, some of the answers from locals were as follows:

> I am not sure that we could have the ability to run the municipality, because it is expensive, the harbour is expensive, the school, salaries, and to fix everything. Maybe we did not have the ability to do all this. (Woman, Raufarhöfn)

The amalgamation was contested and the decision has left a divided community. In retrospective, the merger can be explained by economic and practical constraints. It can be interpreted as a typical dilemma situation, in which a choice between two bad options had to be made: the municipality either being declared insolvent but with decision-making power remaining in the town, or becoming politically dependent but in relatively stable economic waters.

This dilemma is evident when looking at the next component, *community infrastructure*. Provision of services and maintenance of the infrastructure can be linked to amalgamation and political networking. Few municipalities in Iceland have the economic means to meet their legally defined obligations and thus most are dependent on governmental support. Both Skagaströnd and Raufarhöfn have comparatively good harbour facilities and schools. Regarding other locational factors and infrastructure, the differences are striking. Most of Iceland's communities, households and industries have access to geothermal water. Skagaströnd and Raufarhöfn have been an exception to this. In 2013, Skagaströnd was able to access warm water from geothermal sources, which cut energy costs noticeably. Raufarhöfn is not so lucky. It is one of the few places in Iceland that is still considered 'cold', which results in substantially higher energy costs. This adds to the already problematic remote location (cf. Kühn 2015).

Apart from this, one of the most important location factors nowadays for remote communities is digital connectedness (Roberts & Townsend 2016; Park 2017). As the internet connection is slow and unreliable in Raufarhöfn, this subject was mentioned by the locals as one of the most pressing ones:

> One of the things that hinder development in new kinds of business is the lack of fibre-optic connection. I often say: this is the road system of this century, as the asphalt road was the road system of the last century. (…) And it is not enough to say it will be [here] in four years, because in four years we will have some other situation in the main areas, [Raufarhöfn] will always be left behind, when it comes to the competitiveness. (Man, Raufarhöfn)

The place suffers from distance in every respect: with political participation and networking being already problematic, the 'digital divide' issue distances the community even further (Park 2017). Apart from the bad internet connection and the lack of access to geothermal water, transportation costs are a heavy burden. The domestic market is entirely out of reach and local markets do not exist due to the sparse population. Those deficits regarding essential locational factors create a difficult environment for attracting private investors and business.

All in all, Raufarhöfn is heavily dependent on external aid and an enabling political framework in order to overcome the structural deficits. As one local said:

> So maybe improving the roads, improving our internet connection, these are factors that have to come from the government, but it will not do it, unless they actually decide very courageously to say 'we want to save these smaller places'. (Woman, Raufarhöfn)

Endogenous strategies

Diversification

The disadvantageous community infrastructure and the location were frequently mentioned hindrances for *a diversified economy*. As demonstrated above, enabling factors depend on the impulse from external bodies, but the stimulus for diversification strategies needs to come from the locals themselves. In Skagaströnd, some promising projects have been conceptualised and realised in a fruitful combination of external and locally driven initiatives. In Raufarhöfn, a telling silence followed the question about opportunities other than fisheries and tourism. The community is in a state that fits the definitions of 'path dependence' and 'lock-in', which makes adaptation and renewal difficult (Hassink 2010b). As one local precisely summarised:

> One of the things is the tradition of a specific work environment in this place. (…) this is a fishing village and it has always been. That is why we need to keep these traditions here in place – that is what people think. But why necessarily? Is that what people want to do when they are here? Of course you need to have these kinds of stable jobs that are there, but you need to think a little bit out of the box. So I think the people here are just kind of stuck in this mindset. (Woman, Raufarhöfn)

If the diversification of the local economy is not feasible, specialisation within the main industry could provide an alternative pathway (Dawley et al. 2010). A shift towards specialisation in the fishing industry, such as quality niche production, has not been envisaged yet. The focus clearly remains on quantity-driven resource extraction and a Fordist work environment onshore. That this form of fisheries is the only realistic option has been illustrated in discussions around the project 'Fragile Communities', which has opted for bottom-up strategies and diversification. Being in place for several years, the only result on a scale that matters, both economically and in terms of population, is requesting an extra allocation of community quotas ('special community quotas'). This special quota has had some positive effects. It has helped to stabilise approximately 30 full-time jobs in one of the fish factories. The rationale for the extra allocation reads like this:

> We never had the illusion that we could turn history back and make Raufarhöfn some kind of great herring village again. But we had to secure some basic access. I think it has a lot of influence on the self-esteem of the people, being used to have access to the fishing grounds and if they were completely blocked, it would, we could say, harm them mentally. (Man, Raufarhöfn)

Although jobs have been secured, no newcomers have been attracted to the industry, whether new fishermen or women fishers, and no returnees or locals found employment through the scheme. Instead, the jobs have been filled by mobile workers from outside the

municipality or even outside Iceland, which has added to the ongoing fluctuation of population in the community. A mobile workforce and a lack of newcomers is not a place-specific phenomenon, but a characteristic of various places along the shore (Skaptadóttir 2004; Júlíusdóttir et al. 2013).

Fishing quotas of all types and for all purposes seemed to engender criticism. The special quotas for Raufarhöfn were allocated to an outside company from Húsavík, free of charge. A company rooted in the community itself was left without quotas from this scheme, even though that company's policy was to attract and employ local workers. The special community quotas for the community have thus been criticised:

> The special quota is not working for the community, for this town. It has been given to one [company] out of two. This is not going to unite people. What about the other [company] that works in the fishery that does not get any? It is favouritism. And that is not good for the morale in any town. (Woman, Raufarhöfn)

Apart from the tension the shortcomings have caused within the community, we sensed there were a further two shortcomings regarding the special quota. Trying to diversify the local economy and make it less dependent on fisheries while simultaneously allocating extra quotas to the community is inherently contradictory. It rather reinforces the dependency on a single resource and state support. The well-intentioned effort to stabilise the economy adds another substantial stress factor to the community (i.e. Raufarhöfn): What will happen once the project, to which the quotas are attached, is terminated? To allocate those quotas in perpetuity to the place itself would not be possible due to the regulatory framework, and even if there were a chance, a permanent reallocation would certainly cause animosity in society at large, particularly in those fishing communities that were to find themselves in a comparable situation.

As long-term security is not possible unless the quota system is fundamentally reformed by the central government, the need to diversify local economies is evident. However, no long-term strategy has been developed. One local policymaker said:

> If the [special] quota was taken away, [this town] would just be done. (Woman, Raufarhöfn)

Additionally, a person who ran a small fishing company said:

> At the moment I would say there is not a plan B. But I think there will be a plan B when the time comes. (Man, Raufarhöfn)

Education and innovation

The potential to diversify the local economy depends on the innovative and educational level and the entrepreneurial spirit within the community. Particularly the educational level caused concerns in both towns. As mentioned before, the majority of adolescents leaves for higher education and there are barely any jobs to attract those who would want to return, or well educated newcomers. Increasing the educational level is thus difficult, or as locals in both communities said:

> I think one of the weaknesses of the rural or small villages is that people have been drained out of them for 30, 40 years. And it is not random who left first and who was left behind. (Man, Raufarhöfn)

> I often say, "við menntum börnin okkar í burtu frá okkur", we educate our children away from us. (Woman, Raufarhöfn)

> I would say it is maybe better to have 170 happy people somewhere than 400 unhappy with low education standard. (Woman, Raufarhöfn)

The importance of education and a variety of employment opportunities was emphasised in Skagaströnd. Having a university centre, distance learning facilities and a research and development company is a solid foundation for enhancing the educational level. Especially the marine biotechnology company has been increasingly attracting educated people and families. Assuming a positive development, the company intends to employ more people with different educational backgrounds. The establishment of the start-up company shows the general possibility to attract young and innovative newcomers to the community. The location might eventually become an advantage as Skagaströnd is just three hours drive from the capital, where premises for start-ups become less and less affordable. The sewing workshop, an independent firm established by the initiative of two women, also enabled a person who had moved out of the community to return.

The role of culture in a small, remote community should not be underestimated (Roberts & Townsend 2016). The artist residency facilitates interaction between artists of all ages and cultural backgrounds and locals in a formerly close-knit society. Other positive effects resulting from cultural and creative activities can be observed in Skagaströnd, as artists incorporate the surrounding nature, culture, and history into their work, and interact actively with locals. The overall positive feedback helps to increase the sense of place attachment, self-perception, and local identity (described above in the section *'The individual level'*).

In general, adolescents in both places have a very positive attitude towards their communities. Flexibility, mobility and the abilities to gain further education outside of the community, sometimes even out of Iceland, were certainly attractive options for them. In the workshops and individual interviews, the youngsters almost unanimously expressed the will to leave for a certain period of time to broaden the educational, social and cultural horizons. But as much as there was the will to leave and experience more than the sometimes 'claustrophobic' and 'narrow-minded' (statements by youngsters) atmosphere, the general rootedness in the community was also evident. In addition, the workshops unearthed numerous ideas about how to improve the localities, both endogenous and with external input, and which future these young people envisage. Having presented these results to regional planners and local authorities afterwards, the optimism of the youngsters was dampened as none of their ideas was considered feasible. Ironically, it seems that much more use is made of outside 'experts' than of the local entrepreneurial spirit.

Overall assessment

The components mentioned in the preceding sections have had an impact on the *adaptive capacity*, the *coping strategies*, and the overall ability to *transform* in the two case communities. Skagaströnd has come up with some modifications and changes that clearly

indicate preparedness for a future without dependence on a single resource. In Raufarhöfn, neither the existing stress has been tackled, nor has there been any form of anticipatory stress mitigation. As already mentioned (in the section *'Diversification'*), the main strategy is still connected to special fishing quotas. As such allocations are temporal, continued stress is inevitable.

The evaluation of adaptive capacity matches the results of coping strategies. Those encompass three main dimensions, namely innovation, networking and formation of identity (Bærenholdt & Aarsæther 2002). Each of the three components has been discussed in the previous paragraphs.

Transformation is problematic in places in which the key function and identity, is defined by a single industry. While in Skagaströnd the will to forge a new economic path is evident, Raufarhöfn seems to be trapped in a typical lock-in situation (Tödtling & Trippl 2005; Underthun et al. 2014). Drivers of change are not found within the community and thus the stimulus needs to come from outside. Continuing on the traditional path – extractive fisheries – is hardly possible and such jobs are not prioritised by young educated people.

As mentioned in the beginning of this section, both localities are in the phase of renewal and reorganisation within an adaptive cycle. Table 12 provides an overview over the results, regarding the assessment of components for resilience building.

Table 12 Assessment of resilience-building components in the case study locations.

Component	Skagaströnd	Raufarhöfn
Place attachment/ Sense of belonging	Strong	Strong
Civic engagement	Medium	Medium/ low
Collective and/or self- efficacy	Given	Improving
Community capacity	Strong ties and high level of networking	Weak ties or networking
Local Agency & fate control	Self-sufficient	Fully dependent
Community Infrastructure	Good	Limited, threatened
Diversified Economy	Improving	Single resource-dependency
Innovation & education	Level of entrepreneurship and education improving	Limited entrepreneurship and low educational level
Driver of change	Diverse	External
Adaptive Capacity	Potential for adaptation	Capacity lacking
Coping Strategy	Adjusting	Adjustment problematic
Transformation	New pathways found	Lock-in
Overall assessment	Resilient	Non-resilient

Discussion

The two case studies reveal contrasts in the results of resilience-building strategies. In one of the villages, several strategies have been developed – with a modicum of success – to overcome the dependency on a single resource. The other village has clearly shifted trajectories from an adaptive cycle to an accelerating downward spiral, and must therefore be considered as vulnerable. The following discussion centres on the question of how such a village can be managed by the actors involved, both local and non-local.

Even though there is no one-size-fits-all solution for successful community development and resilience building, some strategies from places elsewhere can serve as examples (Tödtling & Trippl 2005; Shucksmith 2010). With regards to regional and community development in Norway, three different, yet not mutually exclusive, development paths can be identified (cf. Bristow & Healy 2014b; Jakobsen & Høvig 2014; Karlsen & Dale 2014; Underthun et al. 2014)

a) Renewal – upgrading existing industries to make the community more competitive

b) Minor reorientation – diversification into new but related industries

c) Major reorientation – diversification into unrelated/novel industries

Renewal

Renewal and upgrading in the Icelandic context encompasses the strengthening of the local fishing industry. Building on this, Symes et al. (2015) ask to what extent fisheries policy can help to build, rebuild or even erode resilience. Examples of all three impacts can be found along the coast of Iceland. The analysis of Raufarhöfn presented here points to a place of eroded resilience.

For improving local resilience in fisheries-dependent communities, some changes to the management regime are inevitable, yet this seems hardly feasible in a de facto privatised industry. De jure, the fish is still common property of the Icelandic nation (Benediktsson & Karlsdóttir 2011). Legal wrangling aside, it has been conclusively shown that further changes to the fisheries management are needed and demanded, particularly regarding social and regional aspects (Kokorsch et al. 2015; Chambers & Carothers 2017). The current regime fits the diagnosis of Phillipson & Symes (2015, 345) regarding failures of fisheries management systems that are characterised by a 'command and control structure, remote decision making and science, insensitivity to spatial and local community effects, and (…) structural and geographical concentration at the expense of small scale fisheries'. How social considerations, including both spatial and community effects, can be secured attention within fisheries management systems has been frequently discussed (Pinkerton 2013; Urquhart et al. 2014; Langdon 2015; Chambers & Kokorsch 2017). That change is possible, even if conducted in a top-down and bureaucratic way, has been shown with the amendments to the Icelandic Fisheries Management Act, namely the coastal fisheries scheme and community quotas already described.

Community quotas are one instrument used by the government to mitigate the adverse effects of the general quota system; they are an attempt to help communities in need, without 'rocking the boat' seriously and upsetting quota holders. The scheme can be criticised on many fronts and is indeed not very popular among stakeholders in fisheries (Kokorsch et al. 2015). In neither of the study communities has the quantity allocated in this way been sufficient for establishing a stable business environment. And with only around 2% of the total allowable catch being distributed annually among some 50 coastal communities (for the fisheries year 2015/16)(Directorate of Fisheries 2017), it can be assumed that the same applies to other places. To the authors, the validity of this scheme is somewhat doubtful. That communities in an unstable economic situation – largely caused by quota loss – receive a minor extra quota to make up for their loss seems almost cynical. However well-intended, community quotas at best hold negative development at bay for a certain time, while postponing a more fundamental strategic turn that may be necessary and inevitable (Carlsson et al. 2014).

Our critique echoes the general maxim of Christopherson et al. (2010, 4), who state that regional resilience should not be about a 'short-term pop-up recovery' but a long-term strategy. Handing back quotas for a short period is neither a progressive nor strategic recovery programme. For becoming a tool that could really make a difference and propel local economies forward, the quantity involved would need to be increased significantly and coupled more firmly to local employment strategies. Allocations would need to be stable over a set time period, not subject to uncertain year-by-year decisions. More long-term stability could contribute to the establishment of new companies and the attraction of new entrants to the industry, which has so far not taken place at a scale that can make a difference.

The reasoning presented above may seem contradictory, given earlier in this article (in the section *'Diversification'*) we have argued that fisheries and processing sectors are lacking new entrants. However, the question is about the causes of this, and the difficult entry and a heavy initial financial burden do not enhance the attractiveness of the industry. Those who have an interest should not be discouraged by economic hindrances to enter an already difficult terrain.

Minor reorientation

Minor reorientation, or 'adaptive restructuring' in the Icelandic context would mean a diversification within the fishing industry (Underthun et al. 2014). The importance of utilising the knowledge and culture of traditional fishing communities is usually underestimated. Various examples of 'smart specialisation', innovation, research and development, linked to the old industrial branches, are at hand (Tödtling & Trippl 2005; Vanthillo & Verhetsel 2012; Gallizioli 2014; Salmi 2015). Skagaströnd delivers a good model for a promising transition towards research and development in Iceland. A 'start-up subsidy system', similar to that in Finland (Salmi 2015), might increase the attractiveness for the fishing industry. Also 'local food clusters' are an idea that seems to work in comparable settings (Lee et al. 2015; Lee et al. 2016). This idea has also gained considerable attention in Iceland, in connection with 'culinary tourism' and regional growth agreements (Huijbens et al. 2014; Smith & Chambers 2016).

Major reorientation

Food clusters and tourism can bridge old and new industries as part of a major orientation. The Icelandic experiences of major reorientation, particularly regarding broader regional development schemes, have been primarily based on heavy industries. Tourism might not fit the definition of a 'novel' industry, although mass tourism is a rather new phenomenon in Iceland. Outside the high season it is mainly limited to certain regions though. An overall plan to stimulate a more equal distribution of tourism and to use this industry for community revitalisation in remote settings is not at hand. The accessibility of remote settlements in the Northeast could be improved through infrastructure investments. Yet tourism needs anchor points also. People in Raufarhöfn have tried to turn its very remoteness into an advantage with the construction of an 'Arctic Henge'. The finalisation of this project would be important for creating a landmark in every respect: it would be of tremendous symbolic importance for a community that has experienced more destruction than creation.

A positive form of destruction could be a creative one, in form of 'deep restructuring' and the renewal of old industrial sites through culture (Underthun et al. 2014). How culture and the creative sector can help to overcome adverse effects of structural change and transform places of declining (old) industries has been shown elsewhere (Heinze & Hoose 2013; Roberts & Townsend 2016). Skagaströnd has indeed shown that revitalisation through culture is possible in small and remote settings in Iceland and some other communities have tried to follow this path recently.

The progress of culture-led development depends on financial support and expertise, like most of the other possible modifications and changes discussed here. This is further limited by regulatory frameworks and can only be done through endogenous initiatives to a certain degree. Some of these initiatives can certainly not be run by locals alone, given the size,

location and capacity of the community (Tödtling & Trippl 2005; Kühn 2015). Comparing cases of regional development in Iceland to successful cases in Norwegian regional development (Jakobsen & Høvig 2014) – development that is in general based on the 'political goal of maintaining a dispersed pattern of settlement' (Karlsen & Dale 2014, 75), the importance of adequate financial resources becomes obvious.

A general critique of Icelandic regional development efforts can be offered with reference to the 'Fragile Communities' programme. The terminology itself can be criticised: labelling a village – and thus implicitly the inhabitants – as fragile implies a kind of semantic marginalisation. It is not conducive to a feeling of local empowerment to start a programme with the aim to increase robustness by naming it 'fragile'. The approach itself is context-specific and tries to include endogenous assets and knowledge in a bottom-up setting. One important factor for the success of such a programme is that it 'should be aimed at institutional building and strengthening, improving accessibility to goods, services and information and to promote innovation and entrepreneurship' (Vanthillo & Verhetsel 2012, 4).

The idea of empowering small and vulnerable communities and respond to local needs is progressive in itself, but the way it has been put into practice in this case is half-hearted, as there is no solid financial foundation. It seems ironic – even cynical – that communities first lost the access right to local resources, followed by the threat and actual closure of local services; yet they are now being made responsible for developing their own future strategies. The responsibility is thus handed back to those who have already been disenfranchised. The idea of devolution and decentralisation in policy making and strategy building should not be realised as a last-resort action or used as a depoliticising move that draws attention from underlying political-economic structures and processes.

Conclusion

Socio-ecological systems are complex constructs. Reasons for negative ecological and/or socio-economic development are usually multi-causal. In the case of Icelandic coastal communities, one essential cause is the privatisation of fishing rights and the ongoing centralisation of both entitlements to the resource and processing sites. This has gradually turned a sector that had strong local anchoring into a footloose industry.

Applying the concept of resilience has to consider both cause and effect; stressor and stressed. As centralisation processes in fisheries have added considerable stress to communities, it would be advisable for policy makers to address the questions of social justice when thinking about future fisheries management. The persistent feeling of injustice and exclusion is the skeleton that has been rattling in the closet of the Icelandic ITQ system all along – and it must be dealt with.

The case of Skagaströnd shows that resilient community development in general is possible in Iceland, and some other communities have tried to develop their own (resilient) strategies for adjustment or renewal. But this also shows clear preconditions: a well-working inter- and intra-communal network; sufficient financial resources; and an innovative and keen local population. As the financial resources are the missing link in most communities, it is arguably the role of a welfare state to help communities manoeuvre

through difficult economic terrain by providing capital that can really make a difference (Huijbens & Þorsteinsson 2017). Particularly this is the case in communities where people show the determination to stay but are victims of a policy that has transformed a public right into a private good. The fate of communities has been left to individual quota holders' decisions to sell out or not.

More effective bottom-up and flexible tailor-made solutions, based on general rules and fair principles – for both fisheries and regional development – are certainly possible in a two-tiered system and a country of this size. Importantly, the focus on endogenous strategies needs to be balanced, however, by awareness of exogenous factors, including both the details of resource management systems and the broader political economy. Without such a balance, resilience theory has limited potential for guiding community development policy and practice. Resilience building is thus a difficult task, but not impossible.

References

Acheson, J. (2006). Institutional failure in resource management. *Annual Review of Anthropology, 35*, 117-134.

Acheson, J., Begossi, A., Berge, E., Eggertsson, T., Haller, T., Hann, C., Lesorogol, C., McGinnis, M., Pinkerton, E., & Smith, E. (2015). Private land and common oceans: analysis of the development of property regimes. *Current Anthropology, 56*(1), 28-55.

Adger, W. (2000). Social and ecological resilience: are they related? *Progress in Human Geography, 24*(3), 347-364.

Adger, W. (2006). Vulnerability. *Global Environmental Change, 16*(3), 268-281.

Adger, W. (2014). Ecological and social resilience. In G. Atkinson, S. Dietz, E. Neumayer & M. Agarwala (Eds.), *Handbook of sustainable development* (pp. 78-90). Cheltenham: Edward Elgar Publishing.

Adger, W., Brooks, N., Bentham, G., Agnew, M., & Eriksen, S. (2004). *New indicators of vulnerability and adaptive capacity*. Norwich: Tyndall Centre.

Aldermann, D., & Inwood, J. (2013). Landscapes of Memory and Socially Just Futures. In N. Johnson, R. Schein & J. Winders (Eds.), *The Wiley-Blackwell Companion to Cultural Geography* (pp. 186-197). Chichester: John Wiley & Sons Ltd.

Alexander, D. (2013). Resilience and disaster risk reduction: an etymological journey. *Natural Hazards and Earth System Sciences, 13*(11), 2707-2716.

Allan, K. (2006). *Contemporary Social and Sociological Theory*. Thousand Oaks, CA: Pine Forge Press.

Allen, C., & Garmestani, A. (2015a). Adaptive Management. In C. Allen & A. Garmestani (Eds.), *Adaptive Management* (pp. 1-11). Dordrecht: Springer Science + Business Media.

Allen, C., & Garmestani, A. (2015b). *Adaptive Management*. Dordrecht: Springer Science + Business Media.

Allison, E. H., & Ellis, F. (2001). The livelihoods approach and management of small-scale fisheries. *Marine Policy, 25*(5), 377-388.

Alþingi (2018). Lög um stjórn fiskveiða. https://www.althingi.is/lagas/nuna/2006116.html (accessed 1 March 2018).

Amundsen, H. (2012). Illusions of resilience? An analysis of community responses to change in northern Norway. *Ecology and Society, 17*(4), 46.

Anderson, B. (2006). *Imagined communities: Reflections on the origin and spread of nationalism*. London: Verso Books.

Anderson, J., Anderson, C., Chu, J., Meredith, J., Asche, F., Sylvia, G., Smith, M., Anggraeni, D., Arthur, R., & Guttormsen, A. (2014). The Fishery Performance Indicators: A Management Tool for Triple Bottom Line Outcomes. *PloS one, 10*(5), e0122809.

Ando, A., & Baylis, K. (2014). Spatial Environmental and Natural Resource Economics. In M. Fischer & P. Nijkamp (Eds.), *Handbook of regional science* (pp. 1029-1048). Berlin Heidelberg: Springer.

Arbuthnott, A. (2011). Regional Cooperative and Competitive Forces Driving Industry Cluster Development and Renewal in the Swedish Peripheryi. *Journal of Rural and Community Development, 6*(1), 22-48.

Armitage, D., Alexander, S., Andrachuk, M., Berdej, S., Dyck, T., Nayak, P., Pittman, J., & Rathwell, K. (2015). Emerging Concepts in Adaptive Management. In C. Allen & A. Garmestani (Eds.), *Adaptive management* (pp. 235-254). Dordrecht: Springer Science + Business Media.

Armitage, D., Berkes, F., & Doubleday, N. (2007a). *Adaptive co-management: collaboration, learning and multi-level governance*. Vancouver, BC: UBC Press.

Armitage, D., Berkes, F., & Doubleday, N. (2007b). Introduction: Moving beyond Co-management. In D. Armitage, F. Berkes & N. Doubleday (Eds.), *Adaptive Co-Management* (pp. 1-14). Vancouver, BC: UBC Press.

Armitage, D., Marschke, M., & Plummer, R. (2008). Adaptive co-management and the paradox of learning. *Global Environmental Change, 18*(1), 86-98.

Armitage, D., Plummer, R., Berkes, F., Arthur, R., Charles, A., Davidson-Hunt, I., Diduck, A., Doubleday, N., Johnson, D., & Marschke, M. (2009). Adaptive co-management for social–ecological complexity. *Frontiers in Ecology and the Environment, 7*(2), 95-102.

Árnason, R. (1998). Ecological fisheries management using individual transferable share quotas. *Ecological Applications, 8*(1), 151-159.

Árnason, R. (2005). Property rights in fisheries: Iceland's experience with ITQs. *Reviews in Fish Biology and Fisheries, 15*(3), 243-264.
Árnason, R. (2007). Fisheries self-management under ITQs. *Marine Resource Economics, 22*(4), 373-390.
Árnason, R. (2008). Iceland's ITQ system creates new wealth. *The Electronic Journal of Sustainable Development, 1*(2), 35-41.
Árnason, R. (2012). Property rights in fisheries: How much can Individual Transferable Quotas accomplish? *Review of Environmental Economics and Policy, 6*(2), 217-236.
Árnason, V. (2010). Moral Analysis of an Economic Collapse – An Exercise in Practical Ethics. *Etikk i Praksis, 4*(1), 101–123.
Árnason, V. (2013). Financial collapse and democratic reconstruction in Iceland. In G. Jónsson & K. Stefánsson (Eds.), *Retrenchment or renewal? Welfare states in times of economic crisis* (Vol. 6, pp. 329-346). Helsinki: The Nordic Centre of Excellence.
Atkinson, G., Dietz, S., Neumayer, E., & Agarwala, M. (2014). *Handbook of sustainable development*. Cheltenham: Edward Elgar Publishing.
Ayles, B., Bell, R., & Hoyt, A. (2007). Adaptive fisheries co-management in the western Canadian Arctic. In D. Armitage, F. Berkes & N. Doubleday (Eds.), *Adaptive co-management: Collaboration, learning, and multi-level governance* (pp. 125-150).
Baehr, P. (2001). The "iron cage" and the "shell as hard as steel": Parsons, Weber, and the Stahlhartes Gehäuse metaphor in the Protestant ethic and the spirit of capitalism. *History and Theory, 40*(2), 153-169.
Bærenholdt, J., & Aarsæther, N. (2002). Coping strategies, social capital and space. *European Urban and Regional Studies, 9*(2), 151-165.
Barnett, C. (2010). Publics and Markets: What's Wrong with Neoliberalism? In J. Smith, R. Pain, S. Marston & J. Jones III (Eds.), *The SAGE Handbook of Social Geographies* (pp. 269-295). London: SAGE.
Barrett, G. (2015). Deconstructing community. *Sociologia Ruralis, 55*(2), 182-204.
Basurto, X., & Nenadovic, M. (2012a). A Systematic Approach to Studying Fisheries Governance. *Global Policy*.
Basurto, X., & Nenadovic, M. (2012b). A Systematic Approach to Studying Fisheries Governance. *Global Policy, 3*(2), 222-230.
Bathelt, H., & Glückler, J. (2003). *Wirtschaftsgeographie - Ökonomische Beziehungen in räumlicher Perspektive* (2 ed.). Stuttgart: Eugen Ulmer.
Bathelt, H., & Li, P. (2014). Evolutionary Economic Geography and Relational Geography. In M. Fischer & P. Nijkamp (Eds.), *Handbook of regional science* (pp. 591-609). Berlin Heidelberg: Springer.
Bayertz, K. (1998). Begriff und Problem der Solidarität. In K. Bayertz (Ed.), *Solidarität* (pp. 11-53). Frankfurt am Main: Suhrkamp.
Beck, U., Giddens, A., & Lash, S. (2014). *Reflexive Modernisierung: Eine Kontroverse* (6 ed.). Frankfurt am Main.
Benediktsson, K. (2014). Nature in the 'neoliberal laboratory'. *Dialogues in Human Geography, 4*(2), 141-146.
Benediktsson, K., & Karlsdóttir, A. (2011). Iceland crisis and regional development–Thanks for all the fish? *European Urban and Regional Studies, 18*(2), 228-235.
Bennett, P. (2010). Geographies of Financial Risk and Exclusion. In J. Smith, R. Pain, S. Marston & J. Jones III (Eds.), *The SAGE Handbook of Social Geographies* (pp. 222-236). London: SAGE.
Benson, M., & Garmestani, A. (2011). Can we manage for resilience? The integration of resilience thinking into natural resource management in the United States. *Environmental Management, 48*(3), 392-399.
Benson, M., & Schultz, C. (2015). Adaptive Management and Law. In C. Allen & A. Garmestani (Eds.), *Adaptive Management* (pp. 39-60). Dordrecht: Springer Science + Business Media.
Berg, B. (2007). *Qualitative Research Methods for Social Sciences*. Boston: Pearson.
Berger, P., & Luckmann, T. (1991). *The social construction of reality: A treatise in the sociology of knowledge*: Penguin UK.
Berghöfer, A., Wittmer, H., & Rauschmayer, F. (2008). Stakeholder participation in ecosystem-based approaches to fisheries management: A synthesis from European research projects. *Marine Policy, 32*(2), 243-253.
Bergman, M. (2008). Combining Different Types of Data for Quantitative Analysis. In P. Alasuutari, L. Bickman & J. Brannen (Eds.), *The SAGE Handbook of Social Research Methods* (pp. 585-602). Londong: SAGE.
Berkes, F. (2006). From community-based resource management to complex systems: the scale issue and marine commons. *Ecology and Society, 11*(1), 45.

Berkes, F. (2007a). Adaptive co-management and complexity: Exploring the many faces of co-management. In D. Armitage, Berkes, F., Doubleday, N. (Ed.), *Adaptive Co-Management: collaboration, learning and multi-level governance* (pp. 19-37). Vancouver, BC: UBC Press.

Berkes, F. (2007b). Understanding uncertainty and reducing vulnerability: lessons from resilience thinking. *Natural Hazards, 41*(2), 283-295. doi: 10.1007/s11069-006-9036-7

Berkes, F. (2009). Evolution of co-management: role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management, 90*(5), 1692-1702.

Berkes, F. (2010). Shifting perspectives on resource management: resilience and the reconceptualization of 'natural resources' and 'management'. *Maritime Studies, 9*(1), 13-40.

Berkes, F., Armitage, D., & Doubleday, N. (2007). Synthesis: Adapting, Innovating, Evolving. In D. Armitage, F. Berkes & N. Doubleday (Eds.), *Adaptive Co-Management: collaboration, learning and multi-level governance* (pp. 308-327). Vancouver, BC: UBC Press.

Berkes, F., Feeny, D., McCay, B., & Acheson, J. (1989). The benefits of the commons. *Nature, 340*(6229), 91-93.

Berkes, F., & Ross, H. (2013a). Community resilience: Toward an integrated approach. *Society & Natural Resources, 26*(1), 5-20.

Berkes, F., & Ross, H. (2013b). Community Resilience: Toward an Integrated Approach. *Society & Natural Resources*, 1-16. doi: 10.1080/08941920.2012.736605

Bierhoff, H., & Küpper, B. (1998). Sozialpsychologie der Solidarität. In K. Bayertz (Ed.), *Solidarität* (pp. 263-296). Frankfurt am Main: Suhrkamp.

Biermann, M., Hillmer-Pegram, K., Knapp, C., & Hum, R. (2016). Approaching a critical turn? A content analysis of the politics of resilience in key bodies of resilience literature. *Resilience, 4*(2), 59-78.

Bjarnason, T. (2014). Adolescent migration intentions and population change: a 20-year follow-up of Icelandic communities. *Sociologia Ruralis, 54*(4), 500-515.

Bjarnason, T., & Thorlindsson, T. (2006). Should I stay or should I go? Migration expectations among youth in Icelandic fishing and farming communities. *Journal of Rural Studies, 22*(3), 290-300.

Blackmore, C. (2007). What kinds of knowledge, knowing and learning are required for addressing resource dilemmas?: a theoretical overview. *Environmental Science & Policy, 10*(6), 512-525.

Blaikie, N. (2003). *Analyzing Quantitative Data*. London: SAGE.

Blau, P. (1994). *Structural contexts of opportunities*. Chicago: University of Chicago Press.

Bock, B. (2016). Rural marginalisation and the role of social innovation; a turn towards nexogenous development and rural reconnection. *Sociologia Ruralis, 56*(4), 552-573.

Bolton, E., Brennan, M., Pracht, D., & Terry, B. (2010). Action research helps citizens prepare Madison County, Florida vision 2020. *Journal of Rural and Community Development, 5*(3), 71-77.

Boschma, R., & Martin, R. (2010). *The Handbook of Evolutionary Economic Geography*. Cheltenham, UK: Edward Elgar.

Brand, F., & Jax, K. (2007). Focusing the meaning (s) of resilience: resilience as a descriptive concept and a boundary object. *Ecology and Society, 12*(1).

Brandt, S. (2005). The equity debate: distributional impacts of individual transferable quotas. *Ocean & Coastal Management, 48*(1), 15-30.

Bristow, G., & Healy, A. (2014). Regional resilience: an agency perspective. *Regional Studies, 48*(5), 923-935.

Bromley, D. (2009). Abdicating responsibility: the deceits of fisheries policy. *Fisheries, 34*(6), 280-290.

Brown, D., & Schucksmith, M. (2015). A New Lens for Examining Rural Change. *European Countryside, 8*(2), 183.

Brown, E., & Williams, B. (2015). Resilience and resource management. *Environmental Management, 56*(6), 1416-1427.

Brown, K., & Westaway, E. (2011). Agency, Capacity, and Resilience to Environmental Change: Lessons from Human Development, Well-Being, and Disasters. In A. Gadgil & D. M. Liverman (Eds.), *Annual Review of Environment and Resources, Vol 36* (Vol. 36, pp. 321-342).

Brunk, C., & Dunham, S. (2000). Ecosystem Justice in the Canadian Fisheries. In H. Coward, R. Ommer & T. Pitcher (Eds.), *Just Fish - Ethics and Canadian Marine Fisheries* (pp. 9-32). St. John's, NF: Institute of Social and Economic Research.

Budzich-Tabor, U. (2014). Area-based Local Development—A New Opportunity for European Fisheries Areas. In J. Urquhart, T. Acott, D. Symes & M. Zhao (Eds.), *Social issues in sustainable fisheries management* (pp. 183-198). Dordrecht: Springer.

Cammack, D. (2015). Plato and Athenian justice. *History of Political Thought, 36*(4), 611-642.

Campling, L., Havice, E., & Penny McCall, H. (2012). The political economy and ecology of capture fisheries: market dynamics, resource access and relations of exploitation and resistance. *Journal of Agrarian Change, 12*(2-3), 177-203.
Carlsson, L., & Berkes, F. (2005). Co-management: concepts and methodological implications. *Journal of Environmental Management, 75*(1), 65-76.
Carothers, C., & Chambers, C. (2012). Fisheries privatization and the remaking of fishery systems. *Environment and Society: Advances in Research, 3*(1), 39-59.
Castle, E. (1993). A pluralistic, pragmatic and evolutionary approach to natural resource management. *Forest Ecology and Management, 56*(1-4), 279-295.
Castro, F. (2012). Between Cooperation and Conflict: The Implementation of Agro-Extractive Settlements in the Lower Amazon Floodplain. In E. Brondízio & E. Moran (Eds.), *Human-Environment Interactions: Current and Future Directions* (pp. 213-234). Dordrecht: Springer Science + Business Media.
Chambers, C. (2016). *Fisheries management and fisheries livelihoods in Iceland.* (Doctoral dissertation).
Chambers, C., & Carothers, C. (2017). Thirty years after privatization: A survey of Icelandic small-boat fishermen. *Marine Policy, 80*, 69-80.
Chambers, C., & Kokorsch, M. (2017). The Social Dimension in Icelandic Fisheries Governance. *Coastal Management, 45*(4), 330-337.
Chambers, S. (2006). The politics of equality: Rawls on the barricades. *Perspectives on Politics, 4*(1), 81-89.
Chriss, J. (2007). The functions of the social bond. *The Sociological Quarterly, 48*(4), 689-712.
Christopherson, S., Michie, J., & Tyler, P. (2010). Regional resilience: theoretical and empirical perspectives. *Cambridge journal of regions, economy and society, 3*(1), 3-10.
Chuenpagdee, R., & Jentoft, S. (2013). Assessing Governability – What's Next. In M. Bavinck, R. Chuenpagdee, S. Jentoft & J. Kooiman (Eds.), *Governability of fisheries and aquaculture: Theory and applications* (pp. 335-350). Dordrecht: Springer. MARE Publication Series.
Chuenpagdee, R., & Mahon, R. (2013). Approaches and Tools for Examining Governability. In M. Bavinck, R. Chuenpagdee, S. Jentoft & J. Kooiman (Eds.), *Governability of fisheries and aquaculture: Theory and applications* (pp. 265-278). Dordrecht: Springer.
Cinner, J., Daw, T., McClanahan, T., Muthiga, N., Abunge, C., Hamed, S., Mwaka, B., Rabearisoa, A., Wamukota, A., & Fisher, E. (2012). Transitions toward co-management: The process of marine resource management devolution in three east African countries. *Global Environmental Change, 22*(3), 651-658.
Clark, C. (2010). Challenges in Marine Capture Fisheries. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 638-645). New York: Oxford University Press.
Clark, G. (1986). Making Moral Landscapes: John Rawls' original position. *Political Geography Quarterly, 5*(4), 147-162.
Clarke, D. (2014). Postmodern geographies and the ruins of modernity. In S. Aitken & G. Valentine (Eds.), *Approaches to Human Geography: Philosophies, Theories, People and Practices* (pp. 107-121). London: SAGE.
Clarke, N. (2009). In what sense 'spaces of neoliberalism'? The new localism, the new politics of scale, and town twinning. *Political Geography, 28*(8), 496-507.
Clavel, D. (2014). *Knowledge and rural development: dialogue at the heart of innovation*. Dordrecht: Springer.
Clay, P., Kitts, A., & da Silva, P. P. (2014). Measuring the social and economic performance of catch share programs: Definition of metrics and application to the US Northeast Region groundfish fishery. *Marine Policy, 44*, 27-36.
Clay, P., & Olson, J. (2008). Defining``Fishing Communities": Vulnerability and the Magnuson-Stevens Fishery Conservation and Management Act. *Human Ecology Review, 15*(2), 143-160.
Cloke, P. (2013). Rural Landscapes. In N. Johnson, R. Schein & J. Winders (Eds.), *The Wiley-Blackwell Companion to Cultural Geography* (pp. 225-237). Chichester: John Wiley & Sons Ltd.
Coleman, J. (1990). *Foundations of Social Theory*. Cambridge, MA: The Belknap Press of Havard University Press.
Connin, L. (1985). On DiQuattro,"Rawls and Left Criticism". *Political Theory, 13*(1), 138-141.
Conybeare, J. A. (2007). Efficiency, entitlements and deservingness: Perspectives on international distributive justice. *Review of International Political Economy, 14*(3), 389-411.
Cooke, P., Clifton, N., & Oleaga, M. (2005). Social capital, firm embeddedness and regional development. *Regional Studies, 39*(8), 1065-1077.

Copes, P. (1996). Social impacts of fisheries management regimes based on individual quotas. In G. Pálsson & G. Petursdóttir (Eds.), *Social implications of Quotas Systems in Fisheries* (pp. 61-90). Copenhagen: Nordic Council of Ministers.

Costanza, R. (1987). Social traps and environmental policy. *BioScience, 37*(6), 407-412.

Cote, M., & Nightingale, A. (2012). Resilience thinking meets social theory situating social change in socio-ecological systems (SES) research. *Progress in Human Geography, 36*(4), 475-489.

Cox, A., & Sumaila, U. (2010). A Review of Fisheries Subsidies: Quantification, Impacts, and Reform. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 99-111): New York: Oxford University Press.

Cox, R., & Hamlen, M. (2015). Community disaster resilience and the rural resilience index. *American Behavioral Scientist, 59*(2), 220-237.

Creswell, J., & Clark, V. (2007). *Designing and conducting mixed methods research* (2 ed.). Thousand Oaks, CA: SAGE.

Cretney, R. (2014). Resilience for Whom? Emerging Critical Geographies of Socio-ecological Resilience. *Geography Compass, 8*(9), 627-640.

Cretney, R., & Bond, S. (2014). 'Bouncing back'to capitalism? Grass-roots autonomous activism in shaping discourses of resilience and transformation following disaster. *Resilience, 2*(1), 18-31.

Crilly, R., & Esteban, A. (2013). Small versus large-scale, multi-fleet fisheries: The case for economic, social and environmental access criteria in European fisheries. *Marine Policy, 37*, 20-27.

Cumming, G. (2014). Theoretical Frameworks for the Analysis of Social–Ecological Systems. In S. Sakai & C. Umetsu (Eds.), *Social-ecological Systems in Transition* (pp. 3-25). Tokyo: Springer Japan.

Cutter, S. L., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E., & Webb, J. (2008). A place-based model for understanding community resilience to natural disasters. *Global Environmental Change, 18*(4), 598-606.

D'Agostino. (2011). Rational Agency. In I. Jarvie & J. Zamora-Bonilla (Eds.), *The SAGE Handbook of the Philosophy of Social Sciences* (pp. 182-198). Thousand Oaks, CA: SAGE.

Dahl, A. (2015). Putting the Individual at the Center of Development: Indicators of Well-Being for a New Social Contract. In F. Mancebo & I. Sachs (Eds.), *Transitions to Sustainability* (pp. 83-104). Dordrecht: Springer.

Dahl, M., Ostergaard, C., & Dalum, B. (2010). Emergence of regional clusters: the role of spinoffs in the early growth process. In R. Boschma & R. Martin (Eds.), *The Handbook of Evolutionary Economic Geography* (pp. 205-220). Cheltenham, UK: Edward Elgar.

Davidson, D. J. (2010). The Applicability of the Concept of Resilience to Social Systems: Some Sources of Optimism and Nagging Doubts. *Society & Natural Resources, 23*(12), 1135-1149. doi: 10.1080/08941921003652940

Davis, A., & Bailey, C. (1996). Common in custom, uncommon in advantage: common property, local elites, and alternative approaches to fisheries management. *Society & Natural Resources, 9*(3), 251-265.

de Oliveira, L. P. (2013). Fishers as advocates of marine protected areas: a case study from Galicia (NW Spain). *Marine Policy, 41*, 95-102.

Degnbol, P., Gislason, H., Hanna, S., Jentoft, S., Raakjær Nielsen, J., & Sverdrup-Jensen, S. C. W., D. (2006). Painting the floor with a hammer: technical fixes in fisheries management. *Marine Policy, 30*(5), 534-543.

Degnbol, P., & McCay, B. (2007). Unintended and perverse consequences of ignoring linkages in fisheries systems. *ICES Journal of Marine Science: Journal du Conseil, 64*(4), 793-797.

DiQuattro, A. (1983). Rawls and left criticism. *Political Theory, 11*(1), 53-78.

Djanibekov, U. (2016). A Co-evolutionary Perspective on the Adoption of Sustainable Land Use Practices: The Case of the Amu Darya River Lowlands, Uzbekistan. In R. Beunen, K. Van Assche & M. Duineveld (Eds.), *Evolutionary Governance Theory* (pp. 233-246). Cham: Springer.

Drew, N. (2013). Living and Learning Together: Principled Practice for Engagement and Social Transformation in the East Kimberley Region of Western Australia. In R. Rinehart, K. Barbour & C. Pope (Eds.), *Ethnographic Worldviews* (pp. 77-92). Dordrecht: Springer.

Durkheim, E. (1984a). *The division of labor in society*. London: The Macmillan Press.

Durkheim, E. (1984b). *The Division of Labour in Society*. London: Macmillan.

Durrenberger, E., & Pálsson, G. (2015). *Gambling debt: Iceland's rise and fall in the global economy*. Boulder: University Press of Colorado.

Dyer, W. (2011). Mapping pathways. In M. Williams & W. Vogt (Eds.), *The SAGE Handbook of Innovation in Social Research Methods* (pp. 120-138). London: SAGE.

Einarsson, N. (2011). Fisheries Governance and Social Discourse in Post-Crisis Iceland: Responses to the UN Human Rights Committee's Views in Case 1306/2004. In N. Einarsson (Ed.), *Culture, Conflict*

and Crises in the Icelandic Fisheries: An Anthropological Study of People, Policy and Marine Resources in the North Atlantic Arctic (48 ed., pp. 107-142). Uppsala: Uppsala University.
Einarsson, N. (2015). When fishing rights go up against human rights. In E. Durrenberger & G. Pálsson (Eds.), *Gambling Debt: Iceland's Rise and Fall in the Global Economy*: University Press of Colorado.
Elbakidze, M., Angelstam, P., Sandström, C., & Axelsson, R. (2010). Multi-stakeholder collaboration in Russian and Swedish model forest initiatives: adaptive governance toward sustainable forest management? *Ecology and Society, 15*(2), 14.
Endress, M. (2015). The Social Constructedness of Resilience. *Social Sciences, 4*(3), 533-545.
Enengel, B., Penker, M., & Muhar, A. (2014). Landscape co-management in Austria: The stakeholder's perspective on efforts, benefits and risks. *Journal of Rural Studies, 34*, 223-234.
Engelhardt Jr, H. (1998). Solidarität: postmoderne Perspektiven. In K. Bayertz (Ed.), *Solidarität* (pp. 430-452). Frankfurt am Main: Suhrkamp.
Evans, J., & Jones, P. (2011). The walking interview: Methodology, mobility and place. *Applied Geography, 31*(2), 849-858.
Eythórsson, E. (1996). Theory and practice of ITQs in Iceland. Privatization of common fishing rights. *Marine Policy, 20*(3), 269-281.
Eythórsson, E. (2000). A decade of ITQ-management in Icelandic fisheries: consolidation without consensus. *Marine Policy, 24*(6), 483-492.
Eythórsson, E. (2003). Stakeholders, courts, and communities: Individual transferable quotas in Icelandic fisheries, 1991-2001. In N. Dolšak & E. Ostrom (Eds.), *The commons in the new millennium: challenges and adaptations* (pp. 129-167): MIT Press.
Fabricius, C., & Currie, B. (2015). Adaptive co-management *Adaptive Management of Social-Ecological Systems* (pp. 147-179). Dordrecht: Springer.
Feeny, D., Berkes, F., McCay, B., & Acheson, J. (1990). The tragedy of the commons: twenty-two years later. *Human Ecology, 18*(1), 1-19.
Feeny, D., Hanna, S., & McEvoy, A. F. (1996). Questioning the assumptions of the" tragedy of the commons" model of fisheries. *Land economics, 72*(2), 187-205.
Felber, C. (2014). *Gemeinwohlökonomie*. Wien: Deuticke.
Fielding, J., & Fielding, N. (2008). Synergy and Synthesis: Integrating Qualtiative and Quantitative Data. In P. Alasuutari, L. Bickman & J. Brannen (Eds.), *The SAGE Handbook of Social Research Methods* (pp. 555-571). London: SAGE.
Fischer, M., & Nijkamp, P. (2014). *Handbook of regional science*. Berlin Heidelberg: Springer.
Fisher, C., & Anushko, A. (2008). Research Ethics in Social Science. In P. Alasuutari, L. Bickman & J. Brannen (Eds.), *The SAGE Handbook of Social Research Methods* (pp. 95-109). London: SAGE.
Fiskistofa. (2015). *Úthlutað aflamark*. Retrieved from http://www.fiskistofa.is/aflamarkheimildir/uthlutadaflamark/fyrriar/
Fitzpatrick, M. (2014). From Boom and Bust to Local Stewardship: A Governance Benchmark for Celtic Sea Fisheries Management. In J. Urquhart, T. Acott, D. Symes & M. Zhao (Eds.), *Social issues in sustainable fisheries management* (pp. 43-64). Dordrecht: Springer.
Flaaten, O. (2010). Fisheries rent creation and distribution—the imaginary case of Codland. *Marine Policy, 34*(6), 1268-1272.
Folke, C., Carpenter, S., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience thinking: integrating resilience, adaptability and transformability. *Ecology and Society, 15*(4), 20.
Follesdal, A. (2014). John Rawls' Theory of Justice as Fairness. In G. Fløistad (Ed.), *Philosophy of Justice* (Vol. 12, pp. 311-327): Springer.
Frangoudes, K., Marugán-Pintos, B., & Pascual-Fernandez, J. (2013). Gender in Galician Shell-Fisheries: Transforming for Governability. In M. Bavinck, R. Chuenpagdee, S. Jentoft & J. Kooiman (Eds.), *Governability of fisheries and aquaculture: Theory and applications* (pp. 241-263). Dordrecht: Springer.
Franzen, N., Hahne, U., Hartz, A., Kühne, O., Schafranski, F., Spellerberg, A., & Zeck, H. (2008). Herausforderung Vielfalt-Ländliche Räume im Struktur-und Politikwandel. In A. f. R. u. Landesplanung (Ed.). Hannover.
Freeman, S. (2014). The Basic Structure of Society as the Primary Subject of Justice. In J. Mandle & D. Reidy (Eds.), *A Companion to Rawls* (pp. 88-111). Chichester: John Wiley & Sons.
Frost, H. (2010). European Union Fisheries Management. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 471-485). New York: Oxford University Press.

Fulton, E. A., Smith, A. D., Smith, D. C., & van Putten, I. E. (2011). Human behaviour: the key source of uncertainty in fisheries management. *Fish and Fisheries, 12*(1), 2-17.
Gallizioli, G. (2014). The social dimensions of the Common Fisheries Policy: a review of current measures. In J. Urquhart, T. Acott, D. Symes & M. Zhao (Eds.), *Social Issues in Sustainable Fisheries Management* (pp. 65-78). Dordrecht: Springer.
Gane, N. (2005). Max Weber as Social Theorist: 'Class, Status, Party'. *European Journal of Social Theory, 8*(2), 211-226.
Garcia, S. (2010). Governance, Science, and Society: The Ecosystem Approach to Fisheries. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 87-98). New York: Oxford University Press.
Gerth, H., & Wright Mills, C. (1946). *From Max Weber*. New York: Oxford University Press.
Gibson-Graham, J. (1996). *The End of Capitalism (as we knew it): A Feminist Critique of Political Economy*. Oxford UK and Cambridge USA: Blackwell Publishers.
Gibson-Graham, J. (2008). Diverse economies: performative practices for other worlds'. *Progress in Human Geography, 32*(5), 613-632.
Gibson-Graham, J., Cameron, J., & Healy, S. (2013). *Take back the economy: An ethical guide for transforming our communities*: University of Minnesota Press.
Giddens, A. (1976). *New Rules of Sociological Method*. London: Hutchinson.
Giddens, A. (1990). *The consequences of modernity*. Stanford, CA: Stanford University Press.
Giddens, A. (2000). *The third way and its critics*. Cambridge: Polity Press.
Giddens, A. (2014). Leben in einer posttraditionalen Gesellschaft. In U. Beck, A. Giddens & S. Lash (Eds.), *Reflexive Modernisierung: Eine Kontroverse* (Vol. 6, pp. 113-193). Frankfurt am Main.
Giddens, A., & Sutton, P. (2017). *Essential concepts in sociology* (2 ed.). Malden, MA: Polity Press.
Glassman, J. (2006). Primitive accumulation, accumulation by dispossession, accumulation by 'extra-economic'means. *Progress in Human Geography, 30*(5), 608-625.
Göbel, A., & Pankoke, E. (1998). Grenzen der Solidarität. Solidaritätsformeln und Solidaritätsformen im Wandel. In K. Bayertz (Ed.), *Solidarität* (pp. 463-494). Frankfurt am Main: Suhrkamp.
Gordon, H. (1954). The economic theory of a common property resource: The fishery. *Journal of Political Economy, 62*, 124–142.
Grabher, G. (1993). The weakness of strong ties; the lock-in of regional development in the Ruhr area. In G. Grabher (Ed.), *The Embedded Firm: on the Socioeconomics of Industrial Networks* (pp. 255–277). London: Routledge.
Grafton, R., Arnason, R., Bjørndal, T., Campbell, D., Campbell, H., Clark, C., Connor, R., Dupont, D., Hannesson, R., & Hilborn, R. (2006). Incentive-based approaches to sustainable fisheries. *Canadian Journal of Fisheries and Aquatic Sciences, 63*(3), 699-710.
Grafton, R., Hilborn, R., Squires, D., Tait, M., & Williams, M. (2010). *Handbook of marine fisheries conservation and management*. New York: Oxford University Press.
Grafton, R., Squires, D., & Fox, K. (2000). Private property and economic efficiency: a study of a common-pool resource. *The Journal of Law and Economics, 43*(2), 679-714.
Graham, N. A., Bellwood, D. R., Cinner, J. E., Hughes, T. P., Norström, A. V., & Nyström, M. (2013). Managing resilience to reverse phase shifts in coral reefs. *Frontiers in Ecology and the Environment, 11*(10), 541-548.
Granovetter, M. (1985). Economic action and social structure: the problem of embeddedness. *American journal of sociology*, 481-510.
Granovetter, M. (2005). The impact of social structure on economic outcomes. *Journal of economic perspectives*, 33-50.
Griffin, L. (2010). The limits to good governance and the state of exception: A case study of North Sea fisheries. *Geoforum, 41*(2), 282-292.
Guillemin, M., & Gillam, L. (2004). Ethics, reflexivity, and "ethically important moments" in research. *Qualitative inquiry, 10*(2), 261-280.
Gunderson, L. (2015). Lessons from Adaptive Management: Obstacles and Outcomes. In C. Allen & A. Garmestani (Eds.), *Adaptive Management* (pp. 27-38). Dordrecht: Springer Science + Business Media.
Gunderson, L., & Holling, C. (2001). *Panarchy: understanding transformations in human and natural systems*. Washington DC: Island Press.
Gunderson, L., & Light, S. (2006). Adaptive management and adaptive governance in the everglades ecosystem. *Policy Sciences, 39*(4), 323-334.
Gunderson, L. H., Allen, C. R., & Holling, C. S. (Eds.). (2010). *Foundations of Ecological Resilience*. Washington: Island Press.

Gunnlaugsson, S. B., & Saevaldsson, H. (2016). The Icelandic fishing industry: Its development and financial performance under a uniform individual quota system. *Marine Policy, 71*, 73-81.
Gustafson, P. (2001). Roots and routes: Exploring the relationship between place attachment and mobility. *Environment and behavior, 33*(5), 667-686.
Gutiérrez, N., Hilborn, R., & Defeo, O. (2011). Leadership, social capital and incentives promote successful fisheries. *Nature, 470*(7334), 386-389.
Guyader, O., & Thébaud, O. (2001). Distributional issues in the operation of rights-based fisheries management systems. *Marine Policy, 25*(2), 103-112.
Gyuris, F. (2016). *Political Discourse of Spatial Disparities*. Cham: Springer.
Haas, P. (2015). Issue Linkage and the Prospects for SDGs' Contribution to Sustainability. In F. Mancebo & I. Sachs (Eds.), *Transitions to Sustainability* (pp. 77-82). Dordrecht: Springer.
Habermas, J. (1981). *Theorie des kommunikativen Handelns* (Vol. 1). Frankfurt am Main: Suhrkamp.
Habermas, J. (1986). Gerechtigkeit und Solidarität. Eine Stellungnahme zur Diskussion über Stufe 6. In W. Edelstein & G. Nunner-Winkler (Eds.), *Zur Bestimmung der Moral*. Frankfurt am Main: Suhrkamp.
Habermas, J. (1996). *Die Einbeziehung des Anderen. Studien zur politischen Theorie*. Frankfurt am Main: Suhrkamp.
Habermas, J. (1998). *Die postnationale Konstellation. Politische Essays*. Frankfurt am Main: Suhrkamp.
Habermas, J. (2015). *Legitimationsprobleme im Spätkapitalismus* (13 ed.): Suhrkamp.
Habrich, W., & Hoppe, W. (2001). *Strukturwandel im Ruhrgebiet - Perspektiven und Prozesse*. Dortmund: Dortmunder Vertrieb für Bau- und Planungsliteratur.
Hahne, U. (2016). Resilienz als normative Herausforderung lokaler Transformationsprozesse. In U. Hahne & H. Kegler (Eds.), *Resilienz. Stadt und Region - Reallabore der resilienzorientierten Transformation* (pp. 61-80). Frankfurt am Main: Internationaler Verlag der Wissenschaften.
Halbwachs, M. (1992). *The Social Framework of Memory*. Chicago: University of Chicago Press.
Hale, S. (2010). The communitarian 'philosophy' of New Labour Sarah Hale. In S. Hale, W. Leggett & L. Martell (Eds.), *The third way and beyond: Criticisms, futures and alternatives* (pp. 87-107). Manchester: Manchester University Press.
Hale, S., Leggett, W., & Martell, L. (2010). *The third way and beyond: Criticisms, futures and alternatives*. Manchester: Manchester University Press.
Hall, P., & Lamont, M. (2013). *Social resilience in the neoliberal era*: Cambridge University Press.
Halseth, G., & Sullivan, L. (2003). From Kitimat to Tumbler Ridge: A crucial lesson not learned in resource-town planning. *Western Geography, 13/14*, 132-160.
Hamm, R., & Wienert, H. (1990). Strukturelle Anpassung altindustrieller Regionen im internationalen Vergleich. *Schriftenreihe des Rheinisch-Westfälischen Instituts für Wirtschaftsforschung, 48*.
Hardin, G. (1968). The tragedy of the commons. *Science, 162*(3859), 1243-1248.
Hardin, G. (1998). Extensions of "the tragedy of the commons". *Science, 280*(5364), 682-683.
Hardin, G. (2007). The tragedy of the unmanaged commons. In D. Penn & I. Mysterud (Eds.), *Evolutionary perspectives on environmental problems* (pp. 105-107). Piscataway, NJ: Transaction.
Harrison, P. (2014). Poststructuralist Theories. In S. Aitken & G. Valentine (Eds.), *Approaches to Human Geography: Philosophies, Theories, People and Practices* (pp. 122-135). London: SAGE.
Harvey, D. (1989). *The Condition of Postmodernity*. Oxford: Basil Blackwell.
Harvey, D. (2001). *Spaces of capital: Towards a critical geography*. Edinburgh: Edingburgh University Press.
Harvey, D. (2006). Neo-liberalism as creative destruction. *Geografiska Annaler, 88 B*(2), 145-158.
Harvey, D. (2007). *A brief history of neoliberalism*. New York: Oxford University Press.
Hassink, R. (2005). How to unlock regional economies from path dependency? From learning region to learning cluster. *European Planning Studies, 13*(4), 521-535.
Hassink, R. (2010). Locked in decline? On the role of regional lock-ins in old industrial areas. In R. Boschma & R. Martin (Eds.), *The Handbook of Evolutionary Economic Geography* (pp. 450-469). Cheltenham: Edward Elgar.
Hauck, M., & Sowman, M. (2001). Coastal and fisheries co-management in South Africa: an overview and analysis. *Marine Policy, 25*(3), 173-185.
Hay, S. (1959). *Conservation and The Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920*. Cambridge, MA: Harvard University Press.
Heal, G., & Kriström, B. (2014). Distribution, sustainability and environmental policy. In G. Atkinson, S. Dietz, E. Neumayer & M. Agarwala (Eds.), *Handbook of sustainable development* (pp. 155-170). Cheltenham: Edward Elgar Publishing.
Hegland, T., & Wilson, D. (2009). Participatory modelling in EU fisheries management: western horse mackerel and the pelagic RAC. *Maritime Studies, 8*(1), 75-96.

Helfrich, S. (2014). *Commons: Für eine neue Politik jenseits von Markt und Staat* (2 ed.). Bielefeld: transcript Verlag.
Helgason, A., & Pálsson, G. (1997). Contested commodities: the moral landscape of modernist regimes. *Journal of the Royal Anthropological Institute, 3*(3), 451-471.
Hermans, F., & Knippenberg, L. (2006). A principle-based approach for the evaluation of sustainable development. *Journal of Environmental Assessment Policy and Management, 8*(3), 299-319.
Hersoug, B., Holm, P., & Rånes, S. (2000). The missing T. Path dependency within an individual vessel quota system—The case of Norwegian cod fisheries. *Marine Policy, 24*(4), 319-330.
Hilborn, R. (2007). Defining success in fisheries and conflicts in objectives. *Marine Policy, 31*(2), 153-158.
Hillier, J. (2016). Performances and Performativities of Resilience. In R. Beunen, K. Van Assche & M. Duineveld (Eds.), *Evolutionary Governance Theory* (pp. 167-184). Cham: Springer.
Hobbes, T. (1970). *Leviathan*. Stuttgart: Reclam.
Hodgson, D., McDonald, J., & Hosken, D. (2015). What do you mean,'resilient'? *Trends in Ecology & Evolution, 30*(9), 503-506.
Hoffmann-Lange, U. (2008). Studying Elite vs. Mass Opinion. In W. Donsbach & M. Traugott (Eds.), *The SAGE Handbook of Public Opinion Research* (pp. 53-63). London: SAGE.
Holling, C. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4*, 1-23.
Holling, C. (2001). Understanding the complexity of economic, ecological, and social systems. *Ecosystems, 4*(5), 390-405.
Holling, C., & Sundstrom, S. (2015). Adaptive Management, a Personal History. In C. Allen & A. Garmestani (Eds.), *Adaptive management* (pp. 11-26). Dordrecht: Springer Science + Business Media.
Holm, P., Raakjær, J., Jacobsen, R., & Henriksen, E. (2015). Contesting the social contracts underpinning fisheries—Lessons from Norway, Iceland and Greenland. *Marine Policy, 55*, 64-72.
Hopf, C. (2004). Research ethics and qualitative research. In F. Flick, E. Kardorff & I. Steinke (Eds.), *A companion to qualitative research* (pp. 334-339). London: SAGE.
Horn, C., & Scarano, N. (2002). *Philosophie der Gerechtigkeit*. Frankfurt am Main: Suhrkamp.
Hornborg, A. (2013). Revelations of resilience: From the ideological disarmament of disaster to the revolutionary implications of (p) anarchy. *Resilience, 1*(2), 116-129.
Høst, J. (2015). *Market-Based Fisheries Management - Private fish and captains of finance*. Dordrecht: Springer.
Hovgaard, G., Eythórsson, G. T., & Fellman, K. (2004). *Future Challenges to Small Municipalities: The Cases of Iceland, Faroe Islands and Åland Islands*: Nordregio, Nordic Centre for Spatial Development.
Hubbard, P. (2014). Mass Democracy in a Postfactual Market Society: Citizens United and the Role of Corporate Political Speech. In A. Cudd & S. Scholz (Eds.), *Philosophical perspectives on democracy in the 21st century* (pp. 147-157). Cham: Springer.
Hughes, J., & Sharrock, W. (2007). *Theory and Methods in Sociology*. New York: Palgrave Macmillian.
Huijbens, E., & Þorsteinsson, H. (2017). Maintaining welfare in the wake of collapse–the case of Iceland. *ACME: An International Journal for Critical Geographies, 16*(1), 112-137.
Hussein, A. (2015). The use of triangulation in social sciences research: Can qualitative and quantitative methods be combined? *Journal of Comparative Social Work, 4*(1).
Icelandic Fisheries. (2006). The Fisheries Management Act. Retrieved 10.10., 2015, from http://www.fisheries.is/management/fisheries-management/the-fisheries-management-act/
Ignatieff, M. (1984). *The Needs of Strangers*. London: Chatto and Windus.
Irwin, R. (2007). The neoliberal state, environmental pragmatism, and its discontents. *Environmental Politics, 16*(4), 643-658.
Jahoda, M., Lazarsfeld, P., & Zeisel, H. (1978). *Die Arbeitslosen von Marienthal. Ein soziographischer Versuch über die Wirkungen langandauernder Arbeitslosigkeit*. Frankfurt am Main: Suhrkamp.
Jentoft, S. (2000a). The community: a missing link of fisheries management. *Marine Policy, 24*(1), 53-60.
Jentoft, S. (2000b). Legitimacy and disappointment in fisheries management. *Marine Policy, 24*(2), 141-148.
Jentoft, S. (2007). Limits of governability: Institutional implications for fisheries and coastal governance. *Marine Policy, 31*(4), 360-370.
Jentoft, S. (2013a). Governing tenure in Norwegian and Sami small-scale fisheries: from common pool to common property? *Land Tenure Journal, 1*(13), 91-115.
Jentoft, S. (2013b). Social Justice in the Context of Fisheries – A Governability Challenge. In M. Bavinck, R. Chuenpagdee, S. Jentoft & J. Kooiman (Eds.), *Governability of fisheries and aquaculture: Theory and applications* (Vol. 7, pp. 45 - 65). Dordrecht: Springer.

Jentoft, S., & Chuenpagdee, R. (2009). Fisheries and coastal governance as a wicked problem. *Marine Policy, 33*(4), 553-560.
Jentoft, S., & Chuenpagdee, R. (2015). *Interactive governance for small-scale fisheries*. Dordrecht: Springer. MARE Publication Series.
Jentoft, S., & Johnsen, J. (2015). The Dynamics of Small-Scale Fisheries in Norway: From Adaptamentality to Governability. In S. Jentoft & R. Chuenpagdee (Eds.), *Interactive governance for small-scale fisheries - Global Reflections* (pp. 705-725). Dordrecht: Springer. MARE Publication Series.
Jentoft, S., McCay, B., & Wilson, D. (1998). Social theory and fisheries co-management. *Marine Policy, 22*(4), 423-436.
Jentoft, S., McCay, B., & Wilson, D. (2010). Fisheries co-management: improving fisheries governance through stakeholder participation. In R. Grafton (Ed.), *Handbook of Marine Fisheries Conservation and Management* (pp. 675-686). New York: Oxford University Press.
Jentoft, S., & Mikalsen, K. (2014). Do national resources have to be centrally managed? Vested interests and institutional reform in Norwegian fisheries governance. *Maritime Studies, 13*(1), 5.
Jepson, M., & Colburn, L. (2013). Development of Social Indicators of Fishing Community Vulnerability and Resilience in the US Southeast and Northeast Regions. *NOAA Technical Memorandum NMFS-F/SPO-129 (US Dept Commerce, 2013)*.
Johansson, B. (2014). Generation and Diffusion of Innovation. In M. Fischer & P. Nijkamp (Eds.), *Handbook of regional science* (pp. 391-412). Berlin Heidelberg: Springer.
Johnson, D. (2013). Livelihoods in the Context of Fisheries – A Governability Challenge. In M. Bavinck, R. Chuenpagdee, S. Jentoft & J. Kooiman (Eds.), *Governability of fisheries and aquaculture: Theory and applications* (pp. 67-87). Dordrecht: Springer. MARE Publication Series.
Johnson, F., & Williams, B. (2015). A Decision-Analytic Approach to Adaptive Resource Management. In C. Allen & A. Garmestani (Eds.), *Adaptive Management* (pp. 61-84). Dordrecht: Springer Science + Business Media.
Joseph, J. (2013). Resilience as embedded neoliberalism: a governmentality approach. *Resilience, 1*(1), 38-52.
Kalberg, S. (1980). Max Weber's types of rationality: Cornerstones for the analysis of rationalization processes in history. *American journal of sociology, 85*(5), 1145-1179.
Karlsen, G. (2001). Can formalisation help? The introduction of fisheries co-management in the inshore fisheries of Dingle, Co. Kerry, Ireland. *Marine Policy, 25*(1), 83-89.
Keck, M., & Sakdapolrak, P. (2013). What is social resilience? Lessons learned and ways forward. *Erdkunde, 67*(1), 5-19.
Kemper, F. (2009). Sozialgeographie. In W. Schenk & K. Schliephake (Eds.), *Allgemeine Anthropogeographie* (Vol. 1, pp. 145-211). Gotha: Klett-Perthes.
Kent, M. (2009). The Presence of Others. In H. Blumberg, A. Hare, M. Kent & M. Davies (Eds.), *Small Group Research* (pp. 115-144). Bern: Peter Lang.
Khushf, G. (1998). Solidarität als moralischer und politischer Begriff. Jenseits der Sackgasse von Liberalismus und Kommunitarismus. In K. Bayertz (Ed.), *Solidarität* (pp. 111-145). Frankfurt am Main: Suhrkamp.
Kibler, E., Fink, M., Lang, R., & Muñoz, P. (2015). Place attachment and social legitimacy: Revisiting the sustainable entrepreneurship journey. *Journal of Business Venturing Insights, 3*, 24-29.
Kimchi, J., Polivka, B., & Stevenson, J. (1991). Triangulation: operational definitions. *Nursing research, 40*(6), 364-366.
King, A. (2011). Functionalism and Structuralism. In I. Jarvie & J. Zamora-Bonilla (Eds.), *The SAGE Handbook of the Philosophy of Social Sciences* (pp. 429-444). Thousand Oaks, CA: SAGE.
Knobloch, C. (2014). „The Tragedy of the Commons“ – Anatomie einer Erfolgsgeschichte In F. Deus, A. Dießelmann & L. Fischer (Eds.), *Die Kultur des Neoevolutionismus. Zur diskursiven Renaturalisierung von Mensch und Gesellschaft.* (pp. 169-204). Bielefeld: transcript-Verlag.
Kofinas, G., Herman, S., & Meek, C. (2007). Novel Problems Require Novel Solutions: Innovation as an Outcome of Adaptive Co-Management. In D. Armitage, F. Berkes & N. Doubleday (Eds.), *Adaptive Co-Management: collaboration, learning and multi-level governance* (pp. 249-267). Vancouver, BC: UBC Press.
Kokorsch, M., Karlsdóttir, A., & Benediktsson, K. (2015). Improving or overturning the ITQ system? Views of stakeholders in Icelandic fisheries. *Maritime Studies, 14*(1), 1-22.
Kolar, K. (2011). Resilience: Revisiting the concept and its utility for social research. *International Journal of Mental Health and Addiction, 9*(4), 421-433.
Konow, J. (2003). Which is the fairest one of all? A positive analysis of justice theories. *Journal of economic literature, 41*(4), 1188-1239.

Krott, M., Bader, A., Schusser, C., Devkota, R., Maryudi, A., Giessen, L., & Aurenhammer, H. (2014). Actor-centred power: The driving force in decentralised community based forest governance. *Forest Policy and Economics, 49*, 34-42.

Lambooy, J. (2010). The evolution of spatial patterns over long time-horizons: the relation with technology and economic development. In R. Boschma & R. Martin (Eds.), *The Handbook of Evolutionary Economic Geography* (pp. 471-486). Cheltenham, UK: Edward Elgar.

Langdon, S. J. (2015). Foregone harvests and neoliberal policies: Creating opportunities for rural, small-scale, community-based fisheries in southern Alaskan coastal villages. *Marine Policy, 61*, 347-355.

Läpple, D. (1991). Zum Zusammenhang von ökonomisch-technologischem Strukturwandel und regionaler Entwicklung. In S. Bukold & P. Thinnes (Eds.), *Boomtown oder Gloomtown? Strukturwandel einer deutschen Metropole* (pp. 15-27). Hamburg.

Latour, B. (2012). *We have never been modern*. Cambridge, MA: Harvard University Press.

Le Floc'h, P., Murillas, A., Aranda, M., Daurès, F., Fitzpatrick, M., Guyader, O., Hatcher, A., Macher, C., & Marchal, P. (2015). The regional management of fisheries in European Western Waters. *Marine Policy, 51*, 375-384.

Lee, R. (2010). Economic Society/Social Geography. In J. Smith, R. Pain, S. Marston & J. Jones III (Eds.), *The SAGE Handbook of Social Geographies* (pp. 205-221). London: SAGE.

Leontsini, E. (2014). Justice and Moderation in the State: Aristotle and Beyond. In G. Fløistad (Ed.), *Philosophy of Justice* (Vol. 12, pp. 27-41). Dordrecht: Springer.

Linke, S., & Bruckmeier, K. (2015). Co-management in fisheries–Experiences and changing approaches in Europe. *Ocean & Coastal Management, 104*, 170-181.

Little, D. (2014). Rawls and Economics. In J. Mandle & D. Reidy (Eds.), *A Companion to Rawls* (pp. 514-525). Chichester: John Wiley & Sons.

Lopes, C. (2015). Rousseau, Rio and the Green Economy. In F. Mancebo & I. Sachs (Eds.), *Transitions to Sustainability* (pp. 65-75). Dordrecht: Springer Science+Business Media.

Lopez, M. (2012). Conservation of Natural Resources:Which Matters – Having a Regulation or the Size of the Penalty Imposed? In E. Brondízio & E. Moran (Eds.), *Human-Environment Interactions: Current and Future Directions* (pp. 235-250). Dordrecht: Springer Science & Business Media.

López, R. (2014). Structural change, poverty and natural resource degradation. In G. Atkinson, S. Dietz, E. Neumayer & M. Agarwala (Eds.), *Handbook of sustainable development* (pp. 220-239). Cheltenham: Edward Elgar Publishing.

Lorenz, D. (2013). The diversity of resilience: contributions from a social science perspective. *Natural Hazards, 67*(1), 7-24.

Mabry, L. (2008). Case Study in Social Research. In P. Alasuutari, L. Bickman & J. Brannen (Eds.), *The SAGE Handbook of Social Research Methods* (pp. 214-227). London: SAGE.

MacCallum, D., Moulaert, F., Hillier, J., & Haddock, S. (2009). *Social innovation and territorial development*. Farnham: Ashgate Publishing.

Mackenzie, I., Hanley, N., & Kornienko, T. (2008). The optimal initial allocation of pollution permits: a relative performance approach. *Environmental and Resource Economics, 39*(3), 265-282.

Mackinson, S., & Wilson, D. (2014). Building bridges among scientists and fishermen with participatory action research. In J. Urquhart, T. Acott, D. Symes & M. Zhao (Eds.), *Social issues in sustainable fisheries management* (pp. 121-139). Dordrecht: Springer.

Macleod, C. (2014). Applying Justice as Fairness to Institutions. In J. Mandle & D. Reidy (Eds.), *A Companion to Rawls* (pp. 164-184). Chichester: John Wiley & Sons.

Maguire, B., & Cartwright, S. (2008). Assessing a community's capacity to manage change: A resilience approach to social assessment. Australian Government: Bureau of Rural Sciences. Canberra.

Maier, J. (2009). Industriegeographie - Begriffe und Perspektiven. In W. Schenk & K. Schliephake (Eds.), *Allgemeine Anthropogeographie* (Vol. 1, pp. 449-499). Gotha: Klett-Perthes.

Makino, M. (2010). Japanese Coastal Fisheries. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of marine fisheries conservation and managment* (pp. 287-298). New York: Oxford University Press.

Mandle, J., & Reidy, D. (2014). *A Companion to Rawls*. Chichester: John Wiley & Sons.

Mansfield, B. (2004). Neoliberalism in the oceans:"rationalization," property rights, and the commons question. *Geoforum, 35*(3), 313-326.

Marquez, M., Ramajo, J., & Hewings, G. (2012). Assessing Regional Economic Performance: Regional Competition in Spain Under a Spatial Vector Autoregressive Approach. In R. Crescenzi & M. Percoco (Eds.), *Geography, institutions and regional economic performance* (pp. 305-330). Berlin Heidelberg: Springer Science & Business Media.

Marsden, T. (1999). Rural futures: the consumption countryside and its regulation. *Sociologia Ruralis, 39*(4), 501-526.
Martin, R., & Sunley, P. (2010). The place of path dependence in an evolutionary perspective on the economic landscape. In R. Boschma & R. Martin (Eds.), *The Handbook of Evolutionary Economic Geography* (pp. 62-92). Cheltenham: Edward Elgar.
Martin, R., & Sunley, P. (2014). On the notion of regional economic resilience: conceptualization and explanation. *Journal of Economic Geography, 15*(1), 1-42.
Martinez-Fernandez, C., Kubo, N., Noya, A., & Weyman, T. (2012). Demographic Change and Local Development: Shrinkage, Regeneration and Social Dynamics *OECD Local Economic and Employment Development (LEED) Working Paper Series*.
Massey, D. (2001). Geography on the agenda1. *Progress in Human Geography, 25*(1), 5-17.
Mather, C., Johnsen, J. P., Sonvisen, S., Sridhar, A., & Stephen, J. (2017). Introduction to the themed issue - Poststructural approaches to fisheries. *Maritime Studies, 16*(1), 20. doi: 10.1186/s40152-017-0074-4
Matos Fernandes, A. (2013). The Rurality Reinvention Discourse: Urban Demands, Expectations and Representations in the Construction of an Urban Rurality Project. In L. Silva & E. Figuereido (Eds.), *Shaping rural areas in Europe* (pp. 213-227). Dordrecht: Springer.
Matthiasson, T. (2003). Closing the open sea: Development of fishery management in four Icelandic fisheries. *Natural Resources Forum, 27*(1), 1-18.
Matthiasson, T., & Agnarsson, S. (2010). Property rights in Icelandic fisheries. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 299-309). New York: Oxford University Press.
McCay, B., & Acheson, J. (1987). Human ecology of the commons. In B. McCay, & Acheson, JM (Ed.), *The question of the commons: the culture and ecology of communal resources* (pp. 1-34). Tucson: The University of Arizona Press.
McConney, P., & Charles, A. (2010). Managing Small-Scale Fisheries: Moving Towards People-Centred Perspectives. In R. Grafton (Ed.), *Handbook of marine fisheries conservation and managment* (pp. 532-546). New York: Oxford University Press.
McConney, P., Pomeroy, R., & Mahon, R. (2003). Guidelines for coastal resource co-management in the Caribbean: communicating the concepts and conditions that favour success *Caribbean Conservation Association*. Barbados.
McDowell, L. (2013). Social Class. In N. Johnson, R. Schein & J. Winders (Eds.), *The Wiley-Blackwell Companion to Cultural Geography* (pp. 88-104). Chichester: John Wiley & Sons Ltd.
Measham, T., Darbas, T., Williams, R., & Taylor, B. (2012). Rethinking rural futures: Qualitative scenarios for reflexive regional development. *Rural Society, 21*(3), 176-189.
Medema, W., McIntosh, B., & Jeffrey, P. (2008). From premise to practice: a critical assessment of integrated water resources management and adaptive management approaches in the water sector. *Ecology and Society, 13*(2), 29.
Meerow, S., & Newell, J. P. (2016). Urban resilience for whom, what, when, where, and why? *Urban Geography*, 1-21.
Meerow, S., Newell, J. P., & Stults, M. (2016). Defining urban resilience: A review. *Landscape and urban planning, 147*, 38-49.
Mels, T., & Mitchell, D. (2013). Landscape and Justice. In N. Johnson, R. Schein & J. Winders (Eds.), *The Wiley-Blackwell Companion to Cultural Geography* (pp. 209-224). Chichester: John Wiley & Sons Ltd.
Mitchell, E. (1986). Multiple triangulation: a methodology for nursing science. *Advances in nursing science, 8*(3), 18-26.
Mitchell, T. (2008). Rethinking economy. *Geoforum, 39*(3), 1116-1121.
Moffat, I. (2014). Environmental space, material flow analysis and ecological footprinting. In G. Atkinson, S. Dietz, E. Neumayer & M. Agarwala (Eds.), *Handbook of sustainable development* (pp. 319-345). Cheltenham: Edward Elgar Publishing.
Moxnes, E. (2010). Complexities in Fisheries Management: Misperceptions and Communication. In R. Q. Grafton (Ed.), *Handbook of Marine Fisheries Conservation and Management* (pp. 595-607). New York: Oxford University Press.
Mulrennan, M. (2008). The Moral Economy of Global Forestry in Rural British Columbia. In D. Brydon & W. Coleman (Eds.), *Renegotiating Community: Interdisciplinary Perspectives, Global Contexts* (pp. 66-82). Vancouver, BC: UBC Press.
Murdoch, J. (2006). *Poststructuralist geography: A guide to relational space*. London: Sage.

Nadasdy, P. (2007). Adaptive Co-Management and the Gospel of Resilience. In D. Armitage, F. Berkes & N. Doubleday (Eds.), *Adaptive Co-Management: collaboration, learning and multi-level governance* (pp. 208-227). Vancouver, BC: UBC Press.

Neilson, A., Gabriel, R., Arroz, A., & Mendonça, E. (2014). Perspectives about the Sea in the Azores: Respecting Narratives that Sustain Inshore Fishing Communities. In J. Urquhart (Ed.), *Social issues in sustainable fisheries management* (Vol. 9, pp. 319-338): Springer Science & Business Media.

Neis, B., & Morris, M. (2000). Creative, Ecosystem, and Distributive Justice and Newfoundland's Capelin Fisheries. In H. Coward, R. Ommer & T. Pitcher (Eds.), *Just Fish - Ethics and Canadian Marine Fisheries* (pp. 174-199). St. John's, NF: Institute of Social and Economic Research.

Nelson, D., Adger, W., & Brown, K. (2007). Adaptation to Environmental Change: contributions of a resilience framework. *Annual Review of Environment and Resources, 32*, 395-419.

Nelson, S. (2014). Resilience and the neoliberal counter-revolution: from ecologies of control to production of the common. *Resilience, 2*(1), 1-17.

Newby, H. (1980). *Community*. Milton Keynes: The Open University Press.

Nielsen, K. N., & Holm, P. (2007). A brief catalogue of failures: Framing evaluation and learning in fisheries resource management. *Marine Policy, 31*(6), 669-680.

Nikolakis, W., & Grafton, R. (2014). Fairness and justice in indigenous water allocations: insights from Northern Australia. *Water Policy, 16*(2), 19-35.

Norman, K. C., Holland, D. S., & Kasperski, S. (2012). Resilient and economically viable coastal communities. *CCIEA Phase II Report*.

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology, 41*(1-2), 127-150. doi: 10.1007/s10464-007-9156-6

Ólafsson, S. (2013). Crisis and recovery in Iceland. In G. Jónsson & K. Stefánsson (Eds.), *Retrenchment or renewal? Welfare states in times of economic crisis* (Vol. 6, pp. 106-124). Helsinki: The Nordic Centre of Excellence.

Olson, J. (2011). Understanding and contextualizing social impacts from the privatization of fisheries: An overview. *Ocean & Coastal Management, 54*(5), 353-363.

Olsson, L., Jerneck, A., Thoren, H., Persson, J., & O'Byrne, D. (2015). Why resilience is unappealing to social science: Theoretical and empirical investigations of the scientific use of resilience. *Science advances, 1*(4), e1400217.

Olsson, P. (2007). The Role of Vision in Framing Adaptive Co-Management Processes: Lessons from Kristianstads Vattenrike, Southern Sweden. In D. Armitage, F. Berkes & N. Doubleday (Eds.), *Adaptive Co-Management: collaboration, learning and multi-level governance*. Vancouver, BC: UBC Press.

Olsson, P., Folke, C., & Berkes, F. (2004). Adaptive comanagement for building resilience in social–ecological systems. *Environmental Management, 34*(1), 75-90.

Olsson, P., Folke, C., & Hahn, T. (2004). Social-ecological transformation for ecosystem management: the development of adaptive co-management of a wetland landscape in southern Sweden. *Ecology and Society, 9*(4), 2.

Olsson, P., Galaz, V., & Boonstra, W. (2014). Sustainability transformations: a resilience perspective. *Ecology and Society, 19*(4), 1.

Ommer, R. (2000). The Ethical Implications of Property Concepts in a Fishery. In H. Coward, R. Ommer & T. Pitcher (Eds.), *Just Fish - Ethics and Canadian Marine Fisheries* (pp. 117-138). St. John's, NF: Institute of Social and Economic Research.

Österblom, H., Sissenwine, M., Symes, D., Kadin, M., Daw, T., & Folke, C. (2011). Incentives, social–ecological feedbacks and European fisheries. *Marine Policy, 35*(5), 568-574.

Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science, 325*(5939), 419-422.

Ostrom, E., Burger, J., Field, C., Norgaard, R., & Policansky, D. (1999). Revisiting the commons: local lessons, global challenges. *Science, 284*(5412), 278-282.

Oteros-Rozas, E., Ravera, F., & Palomo, I. (2015). Participatory scenario planning in place-based social-ecological research: insights and experiences from 23 case studies. *Ecology and Society, 20*(4), 32.

Pahl, R. (1978). Sociological Models in Geography. In R. Chorley & P. Hagget (Eds.), *Socio-Economic Models in Geography* (5 ed., pp. 217-242). London: Methuen & Co.

Pálsson, G. (1998). The virtual aquarium: Commodity fiction and cod fishing. *Ecological economics, 24*(2), 275-288.

Pálsson, G., & Helgason, A. (1995). Figuring fish and measuring men: the individual transferable quota system in the Icelandic cod fishery. *Ocean & Coastal Management, 28*(1), 117-146.

Pálsson, G., & Helgason, A. (1996). The politics of production: enclosure, equity and efficiency. In E. Durrenberger & P. G. (Eds.), *Images of contemporary Iceland: everyday lives and global contexts* (pp. 60-68).
Parsons, T. (1954). *Essays in Sociological Theory*. New York: Free Press.
Parsons, T. (1966a). *Societies, Evolutionary and Comparative Perspectives*. New Jersey: Prentice-Hall.
Parsons, T. (1966b). *The Structure of Social Action*. New York: Free Press.
Parsons, T. (1991). *The social system*: Psychology Press.
Parsons, T., Bales, R., & Shils, E. (1953). *Working Papers in the Theory of Action*. Glencoe, IL: Free Press.
Pascoe, S., & Tingley, D. (2010). Fisheries Management in the United Kingdom. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 370-381). New York: Oxford University Press.
Pasqual, J., & Souto, G. (2003). Sustainability in natural resource management. *Ecological economics, 46*(1), 47-59.
Pedersen, J. (2014). Karl Marx – A Utopian Socialist? In G. Fløistad (Ed.), *Philosophy of Justice* (pp. 275-292). Dordrecht: Springer Science+Business Media.
Peterson, G. (2000). Political ecology and ecological resilience : An integration of human and ecological dynamics. *Ecological Economics, 35*, 323-336.
Petrick, M. (2016). Between Individual Autonomy and Centralized Control: Outlining an Evolutionary Model of Neo-endogenous Rural Development. In R. Beunen, K. Van Assche & M. Duineveld (Eds.), *Evolutionary Governance Theory* (pp. 247-266). Cham: Springer.
Phelan, L., Henderson-Sellers, A., & Taplin, R. (2013). The political economy of addressing the climate crisis in the Earth system: undermining perverse resilience. *New Political Economy, 18*(2), 198-226.
Pinkerton, E. (1989). *Cooperative Management of Local Fisheries, New Directions for Improved, Management and Community Development*. Vancover: University of British Columbia Press.
Pinkerton, E. (2013). Alternatives to ITQs in equity–efficiency–effectiveness trade-offs: How the lay-up system spread effort in the BC halibut fishery. *Marine Policy, 42*, 5-13.
Pinkerton, E. (2015). Groundtruthing Individual Transferable Quotas. In E. Durrenberger & G. Pálsson (Eds.), *Gambling Debt: Iceland's Rise and Fall in the Global Economy* (pp. 109-119). Boulder: University Press of Colorado.
Pinkerton, E., & Edwards, D. (2009). The elephant in the room: the hidden costs of leasing individual transferable fishing quotas. *Marine Policy, 33*(4), 707-713.
Pirie, G. (1983). On spatial justice. *Environment and Planning A, 15*(4), 465-473.
Platts-Fowler, D., & Robinson, D. (2016). Community resilience: a policy tool for local government? *Local Government Studies, 42*(5), 762-784.
Plummer, R., Armitage, D., & De Loë, R. (2013). Adaptive comanagement and its relationship to environmental governance. *Ecology and Society, 18*(1), 21.
Plummer, R., & Baird, J. (2013). Adaptive co-management for climate change adaptation: Considerations for the Barents Region. *Sustainability, 5*(2), 629-642.
Poli, C. (2015). *Environmental Politics - New Geographical and Social Constituencies*. Cham: Springer.
Pollnac, R. B., Abbott-Jamieson, S., Smith, C., Miller, M. L., Clay, P. M., & Oles, B. (2006). Toward a model for fisheries social impact assessment. *Marine Fisheries Review, 68*(1-4), 1-18.
Pomeroy, R. (2000). Devolution and fisheries co-management. In R. Meinzen-Dick, A. Knox & M. Di Gregorio (Eds.), *Collective Action, Property Rights and Devolution of Natural Resource Management–Exchange of Knowledge and Implications for Policy* (pp. 111-146). Feldafing: Zentralstelle fur Ernährung und Landwirtschaft.
Pomeroy, R. (2007). Conditions for Successful Fisheries and Coastal Resources Co-Management: Lessons Learned in Asia, Africa, and the Wider Caribbean. In D. Armitage, F. Berkes & N. Doubleday (Eds.), *Adaptive Co-Management: collaboration, learning and multi-level governance* (pp. 172-189). Vancouver, BC: UBC Press.
Pomeroy, R., Katon, B., & Harkes, I. (2001). Conditions affecting the success of fisheries co-management: lessons from Asia. *Marine Policy, 25*(3), 197-208.
Preston, R. (2008). Twentieth-Century Transformation of Native Identity, Citizenship, Power, and Authority. In D. Brydon & W. Coleman (Eds.), *Renegotiating Community: Interdisciplinary Perspectives, Global Contexts* (pp. 47-65). Vancouver: UBC Press.
Price, P. (2013). Place. In N. Johnson, R. Schein & J. Winders (Eds.), *The Wiley-Blackwell Companion to Cultural Geography* (pp. 118-129). Chichester: John Wiley & Sons Ltd.
Punt, A. (2010). Harvest Control Rules and Fisheries Management. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 572-581). New York: Oxford University Press.

Räikkä, J. (2014). *Social justice in practice: Questions in ethics and political philosophy*. Cham: Springer.
Rawls, J. (1958). Justice as fairness. *The philosophical review*, 164-194.
Rawls, J. (1971). *A Theory of Justice*. Oxford: Oxford University Press.
Rawls, J. (1999). *A Theory of Justice, revised edition* (1 ed.). London: Oxford University Press.
Reed, M. (2008). Stakeholder participation for Environmental Management: a literature review. *Biological conservation, 141*(10), 2417-2431.
Reed, M., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Prell, C., Quinn, C., & Stringer, L. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management, 90*(5), 1933-1949.
Reid, J. (2013). Interrogating the neoliberal biopolitics of the sustainable development-resilience nexus. *International Political Sociology, 7*(4), 353-367.
Rettig, R., Berkes, F., & Pinkerton, E. (1989). The future of fisheries co-management: a multidisciplinary assessment. . In E. Pinkerton (Ed.), *Co-operative management of local fisheries: new directions for improved community management and development* (pp. 273-289). Vancouver, BC: University of British Columbia.
Ridgeway, L., & Schmidt, C. (2010). Economic Instruments in OECD Fisheries: Issues and Implementation. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 310-323). New York: Oxford University Press.
Ritzer, G. (2008). *Modern Sociological Theory* (7 ed.). New York, NY: McGraw-Hill.
Roberts, E., & Townsend, L. (2016). The contribution of the creative economy to the resilience of rural communities: exploring cultural and digital capital. *Sociologia Ruralis, 56*(2), 197-219.
Rodriguez-Pose, A., & Comptour, F. (2012). Evaluating the Role of Clusters for Innovation and Growth in Europe. In R. Crescenzi & M. Percoco (Eds.), *Geography, institutions and regional economic performance* (pp. 209-236). Berlin Heidelberg: Springer Science & Business Media.
Root, M. (2007). Community-Based Research. In W. Outhwaite & S. Turner (Eds.), *The SAGE Handbook of Social Science Methodology* (pp. 565-577). London: SAGE.
Rotherham, I. D. (2013a). Cultural Severance and the End of Tradition. In I. D. Rotherham (Ed.), *Cultural severance and the environment: the ending of traditional and customary practice on commons and landscapes managed in common* (pp. 11-29). Dordrecht: Springer Science & Business Media.
Rotherham, I. D. (2013b). *Cultural severance and the environment: the ending of traditional and customary practice on commons and landscapes managed in common*. Dordrecht: Springer Science & Business Media.
Rousseau, J. J. (1973). *The social contract and discourses*. London: Dent.
Ruseva, T., & Fischer, B. (2012). Public-Private Interactions in the Conservation of Private Forests in the United States. In E. Brondízio & E. Moran (Eds.), *Human-Environment Interactions: Current and Future Directions* (pp. 141-164). Dordrecht: Springer Science & Business Media.
Russell, W. (2008). Globalism, Primitive Accumulation, and Nishnawbe Aski Territory. In D. Brydon & W. Coleman (Eds.), *Renegotiating Community: Interdisciplinary Perspectives, Global Contexts* (pp. 31-46). Vancouver: UBC Press.
Rutten, R., & Boekema, F. (2007). Regional social capital: Embeddedness, innovation networks and regional economic development. *Technological Forecasting and Social Change, 74*(9), 1834-1846.
Salmi, P. (2005). Rural Pluriactivity as a Coping Strategy in Small-Scale Fisheries. *Sociologia Ruralis, 45*(1/2), 22-36.
Salmi, P. (2015). Constraints and Opportunities for Small-Scale Fishing Livelihoods in a Post-Productivist Coastal Setting. *Sociologia Ruralis, 55*(3), 258-274.
Satia, B., & Jallow, A. (2010). West African Coastal Capture Fisheries. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of Marine Fisheries Conservation and Management* (pp. 258-272): New York: Oxford University Press.
Schamp, E. (2010). On the notion of co-evolution in economic geography. In R. Boschma & R. Martin (Eds.), *The Handbook of Evolutionary Economic Geography* (pp. 432-449). Cheltenham, UK: Edward Elgar.
Schlager, E., & Ostrom, E. (1992). Property-rights regimes and natural resources: a conceptual analysis. *Land economics, 68*(3), 249-262.
Schliephake, K., & Schenk, T. (2009). Verkehr und Mobilität. In W. Schenk & K. Schliephake (Eds.), *Allgemeine Anthropogeographie* (Vol. 1, pp. 531-579). Gotha: Klett-Perthes.
Schluchter, W. (2000). Handlungs-und Strukturtheorie nach Max Weber. *Berliner Journal für Soziologie, 10*(1), 125-136.

Schroeder, R., St Martin, K., Wilson, B., & Sen, D. (2008). Third world environmental justice. *Society and Natural Resources, 21*(7), 547-555.
Schultz, L., Duit, A., & Folke, C. (2011). Participation, adaptive co-management, and management performance in the world network of biosphere reserves. *World development, 39*(4), 662-671.
Schwartz, R. (2009). On Ethics in Sociological Research. In D. Mertens & P. Ginsberg (Eds.), *The Handbook of Social Research Ethics* (pp. 189-197). Thousand Oaks, CA: SAGE.
Scott, J. (2012). *Sociological Theory*. Cheltenham: Edward Elgar Publishing.
Seravalli, G. (2015). *An introduction to place-based development economics and policy*. Cham: Springer.
Seyfrit, C., Bjarnason, T., & Olafsson, K. (2010). Migration Intentions of Rural Youth in Iceland: Can a Large-Scale Development Project Stem the Tide of Out-Migration? *Society and Natural Resources, 23*(12), 1201-1215.
Shucksmith, M. (2010). Disintegrated Rural Development? Neo-endogenous Rural Development, Planning and Place-Shaping in Diffused Power Contexts. *Sociologia Ruralis, 50*(1), 1-14.
Shucksmith, M. (2012). Class, power and inequality in rural areas: beyond social exclusion? *Sociologia Ruralis, 52*(4), 377-397.
Simmie, J., & Martin, R. (2010). The economic resilience of regions: towards an evolutionary approach. *Cambridge journal of regions, economy and society, 3*(1), 27-43.
Simon, S., & Randalls, S. (2016). Geography, ontological politics and the resilient future. *Dialogues in Human Geography, 6*(1), 3-18.
Slight, P., Adams, M., & Sherren, K. (2016). Policy support for rural economic development based on Holling's ecological concept of panarchy. *International Journal of Sustainable Development & World Ecology, 23*(1), 1-14.
Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change, 16*(3), 282-292.
Smithson, J. (2008). Focus Groups. In P. Alasuutari, L. Bickman & J. Brannen (Eds.), *The SAGE Handbook of Social Research Methods* (pp. 357-369). London: SAGE.
Snow, D., Zurcher, L., & Sjoberg, G. (1982). Interviewing by comment: An adjunct to the direct question. *Qualitative Sociology, 5*(4), 285-311.
Soliman, A. (2014). Using individual transferable quotas (ITQs) to achieve social policy objectives: A proposed intervention. *Marine Policy, 45*, 76-81.
St Martin, K. (2001). Making space for community resource management in fisheries. *Annals of the Association of American Geographers, 91*(1), 122-142.
St Martin, K. (2006). The impact of "community" on fisheries management in the US Northeast. *Geoforum, 37*(2), 169-184.
St Martin, K., & Hall-Arber, M. (2008). Creating a place for" Community" in New England fisheries. *Human Ecology Review*, 161-170.
St Martin, K., McCay, B., Murray, G., & Johnson, T. (2007). Communities, knowledge and fisheries of the future. *International Journal of Global Environmental Issues, 7*(2), 221-239.
Stadelbauer, J. (2000). Räumliche Transformationsprozesse und Aufgaben geographischer Transformationsforschung. *Europa regional, 8*(3/4), 60-71.
Stavins, R. (1995). Transaction costs and tradeable permits. *Journal of environmental economics and management, 29*(2), 133-148.
Steiner, A., & Atterton, J. (2015). Exploring the contribution of rural enterprises to local resilience. *Journal of Rural Studies, 40*, 30-45.
Stolz, J. (2016). Opening the Black Box. How the Study of Social Mechanisms Can Benefit from the Use of Explanatory Mixed Methods. *Analyse & Kritik, 38*(1), 257-285.
Storper, M. (1995). *The Regional World: Territorial Development in a Global Economy*. London: Guildford Press.
Strambach, S. (2010). Path dependence and path plasticity: the co-evolution of institutions and innovation - the German customized business software industry. In R. Boschma & R. Martin (Eds.), *The Handbook of Evolutionary Economic Geography* (pp. 406-431). Cheltenham, UK: Edward Elgar.
Swidler, A. (1986). Culture in action: Symbols and strategies. *American sociological review, 51*(2), 273-286.
Symes, D. (1997). Fisheries management: in search of good governance. *Fisheries research, 32*(2), 107-114.
Symes, D. (1999). *Alternative management systems for fisheries*. Paris: Fishing News Books.
Symes, D. (2014). Finding Solutions: Resilience Theory and Europe's Small-scale Fisheries. In J. Urquhart, T. Acott, D. Symes & M. Zhao (Eds.), *Social issues in sustainable fisheries management* (pp. 23-42). Dordrecht: Springer.
Symes, D., & Crean, K. (1995). Privatisation of the commons: The introduction of individual transferable quotas in developed fisheries. *Geoforum, 26*(2), 175-185.

Symes, D., & Hoefnagel, E. (2010). Fisheries policy, research and the social sciences in Europe: Challenges for the 21st century. *Marine Policy, 34*(2), 268-275.
Symes, D., & Phillipson, J. (2009). Whatever became of social objectives in fisheries policy? *Fisheries research, 95*(1), 1-5.
Symes, D., Phillipson, J., & Salmi, P. (2015). Europe's coastal fisheries: instability and the impacts of fisheries policy. *Sociologia Ruralis, 55*(3), 245-257.
Thijssen, P. (2012). From mechanical to organic solidarity, and back: With Honneth beyond Durkheim. *European Journal of Social Theory, 15*(4), 454-470.
Thome, H. (1998). Soziologie und Solidarität: Theoretische Perspektiven. In K. Bayertz (Ed.), *Solidarität* (pp. 217-262). Frankfurt am Main: Suhrkamp.
Thompson, K. (1985). *Readings from Émile Durkheim*. London: Routledge.
Thornburg, G. (2013). Embeddedness, marketness, and economic

instrumentalism in the Oklahoma Farm-to-School Program. *Journal of Rural and Community Development, 8*(3), 321-334.
Þorsteinsson, A., & Bjarnason, Þ. (2014). Staða smærri sjávarbyggða 2014. Minnisblað til Sigurðar Inga Jóhannssonar, ráðherra byggðamála. 2014, from http://www.byggdastofnun.is/is/verkefni/vidbotaraflamark/log-og-reglugerd
Tolley, B., & Hall-Arber, M. (2015). Tipping the scale away from privatization and toward community-based fisheries: Policy and market alternatives in New England. *Marine Policy, 61*, 401-409.
Tönnies, F. (1991). *Gemeinschaft und Gesellschaft. Grundbegriffe der reinen Soziologie* (Vol. 8). Darmstadt: Wissenschaftliche Buchgesellschaft.
Tonon, G. (2015). *Qualitative studies in quality of life: Methodology and practice*. Cham: Springer.
Tonts, M., Plummer, P., & Argent, N. (2014). Path dependence, resilience and the evolution of new rural economies: Perspectives from rural Western Australia. *Journal of Rural Studies, 36*, 362-375.
Treviño, A. (2005). Parsons's Action-System Requisite Model and Weber's Elective Affinity: A Convergence of Convenience. *Journal of Classical Sociology, 5*(3), 319-348.
Tullock, G. (1975). The transitional gains trap. *The Bell Journal of Economics, 6*(2), 671-678.
Underthun, A., Hildrum, J. M., Svare, H., Finsrud, H. D., & Vareide, K. (2014). The restructuring of the old industrial region of Grenland in Norway: between lock-in, adjustment, and renewal. *Norsk Geografisk Tidsskrift-Norwegian Journal of Geography, 68*(2), 121-132.
Uprichard, E. (2011). Narratives of the Future: Complexity, Time and Temporality. In M. Williams & W. Vogt (Eds.), *The SAGE Handbook of Innovation in Social Research Methods* (pp. 103-119). London: SAGE.
Urquhart, J., Acott, T., Reed, M., & Courtney, P. (2011). Setting an agenda for social science research in fisheries policy in Northern Europe. *Fisheries research, 108*(2), 240-247.
Urquhart, J., Acott, T., Symes, D., & Zhao, M. (2014a). Introduction: Social Issues in Sustainable Fisheries Management. In J. Urquhart, Acott, T., Symes, D., & Zhao, M (Ed.), *Social issues in sustainable fisheries management* (pp. 1-20). Dordrecht: Springer.
Urquhart, J., Acott, T., Symes, D., & Zhao, M. (2014b). *Social issues in sustainable fisheries management*. Dordrecht: Springer.
van den Bergh, J. (2014). Sustainable development in ecological economics. In G. Atkinson, S. Dietz, E. Neumayer & M. Agarwala (Eds.), *Handbook of sustainable development* (pp. 63-77). Cheltenham: Edward Elgar Publishing.
Vanderstoep, S., & Johnston, D. (2009). *Reseach Methods for Everyday Life: Blending Qualitative and Quantitative Approaches*. San Francisco, CA: Jossey-Bass.
Vlasova, T., & Volkov, S. (2016). Towards transdisciplinarity in Arctic sustainability knowledge co-production: Socially-Oriented Observations as a participatory integrated activity. *Polar Science, 10*, 425-432.
Waglé, U. (2013). *The Heterogeneity Link of the Welfare State and Redistribution: Ethnic Heterogeneity, Welfare State Policies, Poverty, and Inequality in High Income Countries*. Cham: Springer Science & Business Media.
Walker, B., Holling, C., Carpenter, S., & Kinzig, A. (2004). Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society, 9*(2), 5.
Walle, G., Gomes da Silva, S., O'Hara, E., & Soto, P. (2015). Achieving sustainable development of local fishing interests: the case of Pays d'Auray FLAG. *Sociologia Ruralis, 55*(3), 360-377.
Wallimann, I. (2014). *Environmental Policy is social policy–social policy is environmental policy: toward sustainability policy*. New York: Springer Science & Business Media.

Waterstone, M. (2010). Geography and Social Justice. In J. Smith, R. Pain, S. Marston & J. Jones III (Eds.), *Handbook of Social Geographies* (pp. 419-434). London: SAGE.
Weale, A. (2017). On the logic of productive cooperation: a response to critics. *Critical Review of International Social and Political Philosophy, 20*(2), 251-267.
Weber, M. (1922). *Wirtschaft und Gesellschaft. Grundriß der verstehenden Soziologie* (J. Winckelmann Ed. 5 ed.). Tübingen: Mohr.
Weber, M. (1981). Some categories of interpretive sociology. *The Sociological Quarterly, 22*(2), 151-180.
Weber, M. (1984). *Soziologische Grundbegriffe* (Vol. 6). Tübingen: UTB für Wissenschaft.
Weisberg, H. (2008). The Methodological Strengths and Weaknesses of Survey Research. In W. Donsbach & M. Traugott (Eds.), *The SAGE Handbook of Public Opinion Research* (pp. 223-231). London: SAGE.
Welsh, M. (2014). Resilience and responsibility: governing uncertainty in a complex world. *The Geographical Journal, 180*(1), 15-26.
Westley, F., Carpenter, S., & Brock, W. (2002). Why systems of people and nature are not just social and ecological systems. In L. Gunderson & C. Holling (Eds.), *Panarchy. Understanding transformations in human and natural systems* (pp. 103-120). Washington: Island Press.
White, C. (2015). *Social resilience, place and identity in the small-scale North Norfolk "Cromer Crab" fishery, UK.* (PhD), University of East Anglia.
White, R., & Williams, C. (2016). Beyond capitalocentricism: are non-capitalist work practices 'alternatives'? *Area, 48*(3), 325-331.
Wildt, A. (1998). Solidarität - Begriffsgeschichte und Definition heute. In K. Bayertz (Ed.), *Solidarität* (pp. 202-216). Frankfurt am Main: Suhrkamp.
Williams, B., & Nichols, J. (2014). Optimization in Natural Resources Conservation. In G. Guntenspergen (Ed.), *Application of threshold concepts in natural resource decision making* (pp. 45-66). Dordrecht: Springer Science & Business Media.
Williams, M., & Staples, D. (2010). Southeast Asian Fisheries. In R. Grafton, R. Hilborn, D. Squires, M. Tait & M. Williams (Eds.), *Handbook of marine fisheries conservation and managment* (pp. 243-257). New York: Oxford University Press.
Wilner, K. (2014). The Unfulfilled Promise of Integrated Management: How Policy Discourses Operate in Annapolis Basin, Canada. In J. Urquhart, T. Acott, D. Symes & M. Zhao (Eds.), *Social issues in sustainable fisheries management* (pp. 79-102). Dordrecht: Springer.
Wilson, G. (2012). Community resilience, globalization, and transitional pathways of decision-making. *Geoforum, 43*(6), 1218-1231.
Wilson, G. (2013a). Community resilience, policy corridors and the policy challenge. *Land Use Policy, 31*, 298-310.
Wilson, R. (2013b). Environmental Histories. In N. Johnson, R. Schein & J. Winders (Eds.), *The Wiley-Blackwell Companion to Cultural Geography* (pp. 355-370). Chichester: John Wiley & Sons Ltd.
Wink, R., Kirchner, L., Koch, F., & Speda, D. (2016). *Wirtschaftliche Resilienz in deutschsprachigen Regionen*. Wiesbaden: Springer Gabler.
Zimmerbauer, K., & Paasi, A. (2013). When old and new regionalism collide: Deinstitutionalization of regions and resistance identity in municipality amalgamations. *Journal of Rural Studies, 30*, 31-40.

Appendix A Viewpoint: The social dimension in Icelandic fisheries governance

How social sciences can help achieve sustainable fisheries

Catherine Chambers and Matthias Kokorsch

Abstract

Fisheries are a complex mixture of social, political, economic, and biological aspects, and often biological or economic end goals are given priority in fisheries governance. However, there is a growing trend around the world to include non-economic social objectives in fisheries management schemes, e.g., supporting rural communities, increasing opportunities for newcomers or part-time fishermen, or providing equitable access for culturally and historically important fisheries. In Iceland, fisheries management has given biological and economic goals precedence over social goals, and there is no formal inclusion of a social science advisory body or formalized direct input from all relevant stakeholders in the fisheries governance process. Non-economic social sciences such as geography, anthropology, sociology, and political science can add important information and considerations that in turn make fisheries more sustainable in the long run. In this paper, we explain the role of social science in fisheries governance, explore how social aspects are addressed in other fisheries governance schemes, and review highlights from fisheries social science research in Iceland. We hope to generate a meaningful conversation regarding the possibilities of a modern, pioneering fisheries governance process in Iceland where social, economic, and biological goals and research are given equal attention.

Keywords: Fisheries management, Iceland, social sciences, fisheries governance, sustainable fisheries

Introduction

Fisheries are a complex and ever-changing mixture of environmental, social, economic and political aspects. Sustainable fisheries management and governance17, therefore, can be

[17] "Governance" refers to the human structure of the decision-making process, e.g., who gets to make the decisions, whose expertise is valued, who is invited to participate, etc. "Management" is the specific rules or

challenging tasks due to unknown variables and complexity. This stems from both the marine resource itself and the natural environment, and the humans who are directly connected to that resource. Hence, it is not surprising that fisheries are the focus of different academic disciplines – from the wide array of natural sciences to the equally varied social sciences and humanities. However, there is an imbalance in the distribution of influence in fisheries governance between academic fields, where knowledge generated from the natural sciences is often given primacy, or is even the single type of research relied upon in the decision-making processes.

Even if it seems appropriate on first sight to make the fish themselves the center of attention, scholars argue that the human perspective should at least be considered equally (Degnbol & McCay, 2007; Fulton, Smith, Smith, & van Putten, 2011). As the Nobel Prize-winning political economist Elinor Ostrom (1990) highlighted, the specific focus of fisheries management is not fish, but people – who are part and parcel of social, economic and political institutions. Nevertheless, when social sciences are included in fisheries governance, it is most often scholarship from economics. There are many reasons for this—fisheries are an economic activity in many regards, and economic evaluations usually rely on quantitative, macro-scale data that allow for seemingly comprehensive conclusions.

Neo-classical economists favour market-based solutions, such as the popular privatization of fisheries, driven by an explicitly framed "macro" understanding of efficiency as the primary end goal of fisheries. Non-economic social science research, in contrast, deals with complex phenomena such as place attachment, identity, heritage, and culture, and is often focused on one fishing community, or one type of fishery. It therefore does not lend itself easily to drawing general broad recommendations required for fisheries management policy (Jentoft & Chuenpagdee, 2009; Pinkerton, 2015; Urquhart, Acott, Reed, & Courtney, 2011).

The most commonly cited definition of sustainability, from the United Nations' Brundtland Report (1987), explicitly states that true sustainability strikes the balance between "ecology, economy, and equity" — the "3 E's." Equity is embedded in the social aspects of heritage, culture, identity and attachment to place, and is separate from economic considerations. In this paper, the authors will refer to the non-economic social sciences. The different non-economic social sciences can contribute to fisheries management based on a diverse set of assumptions and worldviews that can, in turn, create more robust arrangements, capable of coping with external shocks as well as gradual changes that are inevitable in human-environmental systems. Despite the benefits of including social scientists (and the wide variety of other stakeholders) in the decision-making process, governance regimes tend to be of a top-down nature, in a non-reciprocal setting.

Social scientists have been calling for stronger recognition and inclusion of their discipline and research for quite some time and, in recent years, a gradual change in some fisheries management regimes can be detected in theory and practice (Jentoft et al., 1998; Symes and Phillipson, 2009; Symes 2006; Urquhart et al., 2011). In the same way that biological and economic knowledge builds over time and draws upon itself, non-economic social

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system decided upon in the governance process, e.g., ITQs, tax breaks for newcomers, no-discards rules, etc. Governance is a process, while management reflects the end goals.

science is accumulating and increasingly in conversation with policy-oriented recommendations. Not only do social scientists deliver reactive criticism (Basurto & Nenadovic, 2012b; Holm et al., 2015; Olson, 2011), but also provide proactive tools and fixes for mitigating shortcomings (Carlsson & Berkes, 2005; Gutiérrez et al., 2011; St Martin et al., 2007; Symes, 1999).

The genesis for this opinion article stemmed from the observation by the authors that Icelandic policy makers still tend to neglect the very large social science knowledge base in management decisions, and even more so in the governance process. Both authors conduct research in collaboration with the small number of non-economic social scientists focused on fisheries in Iceland. Our experience in other countries and institutions gives us a base to compare Icelandic fisheries governance with other trends around the world, where policy makers, scientists, and fishermen work together to attempt to manage truly sustainable fisheries with the "3 E's" in mind. Below, we highlight the existing maritime social science scholarship in Iceland and then explore how such information could be included in the governance process. In this article we are not debating the value of a specific management system over others, but we are instead reflecting on the decision-making process and the scientific advice given in that process.

Fisheries social science in Iceland

Iceland represents a classical example of a rigid disciplinary-bound fisheries management system where biological end-goals are made priority. The annual Total Allowable Catch (TAC) is recommended by Marine Research Institute (Hafrannsóknastofnun) biologists to address environmental sustainability, and the Individual Transferable Quotas (ITQs) are a construct of neo-classical economics seeking a market-based solution for maximum economic efficiency (Carothers and Chambers 2012). These two cornerstones clearly disintegrate the last remaining area of expertise - the non-economic social sciences - thereby ignoring the fact that a truly sustainable fisheries management system is "a three legged stool embodying environmental, economic and social sustainability: dangers arise when one of these legs is weakened by neglect" (Symes & Phillipson, 2009, p. 1). The decision-making process is equally simplified: The TAC is finalized in parliament, regulations are set by the Directorate of Fisheries (Fiskistofa) and stakeholders have little formal or equal engagement.

The Icelandic Fisheries Management Act does not require attention to social sciences or social outcomes in management goals (Icelandic Fisheries, 2006). This in in contrast to, for example, the U.S. Magnuson-Stevens Fishery Conservation and Management Act National Standard 8 which states that "Conservation and management measures shall (…) take into account the importance of fishery resources to fishing communities by utilizing economic and social data that are based upon the best scientific information available (…)" (NOAA, 2015). The word "communities" receives minor consideration in the latest version of the Icelandic Fisheries Act in relation to the community quota system (byggðakvótar). It is stated in Article 10, that those quotas can be transferred "to communities which have suffered unexpected cutbacks in the total catch quotas of fishing vessels operating from and landing their catch in the communities in question, which has had a substantial impact on the employment situation in these communities" (Icelandic Fisheries, 2006). Even

though those quotas are a well-intended instrument, the mentioned cutbacks were anything but unexpected. Numerous social scientists warned from early on about consequences at the community and regional level of the current fisheries management regime (Benediktsson & Karlsdóttir, 2011; Eythórsson, 1996; Pálsson & Helgason, 1995).

Attempts to address the negative social impacts of the quota system have also been enacted without expert advice from the social sciences. The authors suggest that the community quotas are one example - coastal fishing, strandveiðar, is another (see (Einarsson, 2011) - of a retroactive attempt to legally address issues from the quota system that non-economic social scientists could have at least spoken to had they had some real power in the original decision-making process. Unintended consequences have arisen from both systems. Community quotas are thought to benefit individuals who are already fishing and have been a source of political contention in the past regarding their allocation (Chambers 2016a). The coastal fishing system is also viewed as a step in the right direction, but one that also has large flaws. Coastal fishing is a quota free summer jig fishery that appears to benefit local businesses as a whole when more fish are landed during that time. However, the fishery is most often carried out by individuals who already are invested in fisheries so it does little to support newcomers to the fishery thereby making access to fisheries resources more equitable (Chambers and Carothers 2016, Chambers 2016b, Hjartardóttir 2016).

That fisheries are still the mainstay for communities around Iceland, despite recent developments in large-scale heavy industries and ever-growing tourism, becomes apparent in a report by the Regional Development Agency. Accordingly, dozens of places, mainly those under 500 inhabitants, show employment figures up to 87% in fisheries and its related industries (Þorsteinsson & Bjarnason, 2014). The continued importance of fisheries to rural communities exemplifies the necessity of a proactive implication of social scientists expertise in future fisheries planning in Iceland.

It is not only from a scientific perspective that a rethinking and improvement of the management and governance regime seems appropriate. There is also a general discontent with the current fisheries system by the society at large ("Næstum 50 þúsund manns…" 2015; for English news articles see "Fishing quota petition…" 2015 and "Mackerel petition fourth..." 2015). While the general public notices injustices and shortcomings in fisheries management, the scientific tools are available to study this public discourse and make policy recommendations. The absence of non-economic social science in governance and social goals in legal frameworks is not for lack of methods or a knowledge base, as summarized in Table 1. Although there are only a handful of non-economic social scientists in Iceland, knowledge on fishing communities, fishermen and their families, fish processing workers, and so on is mounting and continues to be a subject of interest outside of Iceland in the international academic, political, and fishing industry communities.

Table 1 Overview over selected publication within in the field of non-economic social sciences

Field of research	Source
Aspects of equity and morality	Karlsdóttir 2008; Pálsson and Helgason 1997, 1995; Eyþórsson 1996, 2000; Karlsdóttir, 2008
Local effects and community structure	Eyþórsson 1996; Pálsson and Helgason 1995; Karlsdóttir 2008; Kokorsch in press; Pálsson and Helgason 1995; Skaptadóttir, 2000, 2007
Gender	Júlíusdóttir, Skaptadóttir, and Karlsdóttir 2013; Willson 2014; Skaptadóttir 2004, 2003
Power-structure and stakeholder involvement	Kokorsch et al. 2015
Local food networks for fish	Smith and Chambers 2015
Rural development	Benediktsson and Karlsdóttir 2011
Legal issues and human rights	Einarsson 2015, 2011
Human-nature relationships	Carothers and Chambers 2012
Experiences of small scale fishermen	Chambers and Carothers 2016
Quotas and neoliberalization	Benediktsson 2014; Durrenberger and Pálsson, 2014
Regulatory changes	Mariat-Roy 2014

Recommendations for an updated fisheries governance system

The following recommendations are suggested as first steps to design a more robust decision making process in the existing governance structure of Icelandic fisheries.

1.) The formation of a dedicated social science advisory body.

A social science advisory body would be made up of 7-10 experts from varying disciplines and based in academic and research institutions in Iceland. This advisory body, or panel, would be tasked with reviewing fisheries management policies in order for the policies to be deemed acceptable. Depending on the nature of the policy, more or less input would be needed from the panel. For example, in the case of the yearly TAC setting, the setting of the TAC would naturally be in the hands of the Marine Research Institute and their expertise. The social science advisory panel could, however, advice on specific mechanisms of the allocation of TAC. The social science advisory panel would analyse documents prepared by social science researchers as outlined in recommendation number two.

2.) Mandatory Social Impact Assessment on fisheries management policies and indicator data collection, compilation and monitoring

Other than an advisory panel made up of experts from around Iceland, dedicated social scientist researchers should be employed to conduct new studies. The U.S.´s National Oceanographic and Atmospheric Administration (NOAA) - the equivalent of Iceland´s Marine and Freshwater Research Institute - has a social science branch made up of anthropologists, sociologists, geographers, and economists to provide the best scientific information available. The same model could be employed in Iceland. These full time researchers would be charged with the collection compilation and monitoring of social science indicator data in order to create more robust time series data that could accurately assess impacts of differing fisheries management policies. For example, a Social Impact Assessment (SIA) and social indicators are part of national U.S. fisheries analysis tools and decision-making processes (Jepson & Colburn, 2013; Norman et al., 2012; Pollnac et al., 2006). These assessments could be undertaken for Icelandic fisheries as well, and would focus social and local narrative, including qualitative data.

And stakeholder engagement?

Although this viewpoint article focuses mainly on the inclusion of data and expertise from social science in the fisheries governance process, direct input from stakeholders as an update to Icelandic fisheries governance must also be addressed. Co-management, adaptive management, stakeholder engagement, and good governance are all common topics in fisheries social science, and therefore the inclusion of social science data and experts alongside of direct stakeholder input are two separate but complementary ways to add resilience to a fisheries governance system. The devolution, delegation and decentralisation in the decision-making process to create greater stakeholder inclusion is a growing trend in fisheries management and governance systems of all sizes, fish species, and cultures, i.e. Canada (DFO, 2015) and the EU (Griffin, 2010; EC, 2015). One study in the journal Nature that evaluated 130 co-managed fisheries in countries all over the world with varying fisheries, resources, and levels of development, concluded that "co-management, the only realistic solution for the majority of the world's fisheries, can solve many of the problems facing global fisheries" (Gutiérrez et al., 2011).

The latest research by the authors suggests that the inclusion of non-economic social science and a focus on social goals is a desired development for certain stakeholders in Icelandic fisheries management (Chambers & Carothers, 2017; Kokorsch et al., 2015). As outlined above, one way for Iceland to move forward in fisheries governance is to formalize input from non-economic social sciences. Another would be to formalize input directly from stakeholders in an equitable way. Iceland would be an excellent laboratory for trying a new and progressive fisheries management system: it has a comparatively small population, it has huge exclusive fishing grounds and rather stable macro-economic figures of the fisheries sector. The political foundation is that of a two-tiered system, including the central government and the municipalities, so that a certain flexibility in the decision- and policy making can be expected. When even more complex fisheries systems, such as those of the EU and the U.S., with their advisory bodies, manage to include a diverse set of stakeholders, the considerably smaller and flexible Iceland should be able to follow this path. Decisions made in a broad arrangement of industry stakeholders with representation on local or regional councils would increase the legitimacy of the governance system.

Conclusion

A robust fishery cannot rely on an inflexible and limited decision-making process. Given the growing body of literature regarding the many social aspects of fisheries and fisheries management, and also the practical implications of social scientific expertise, the authors find it surprising that Iceland has not adjusted to this shift. Iceland's fisheries are touted as sustainable; in regards to macro-economic and environmental end goals, popular discourse from fisheries managers and certain sections of the industry suggests that Iceland's fisheries are certainly performing well. However, the third "E," equity, is still elusive in both the governance of Icelandic fisheries and its management end goals.

A truly sustainable fisheries system with equal representation of the 3 E's would therefore be a more robust, resilient, flexible fisheries management scheme. We envision an inclusive and holistic environment in terms of stakeholder involvement and scientific advice that would then discuss social, economic, and biological end goals in a transparent and democratic process. We suggest politicians, both local and national, begin to discuss options for how non-economic social science research and direct voices of fishermen can be meaningfully considered in fisheries decisions. Iceland has long been considered an important fishing nation and is the perfect place to set an international example of good, truly sustainable fisheries governance and management.