

Abstract

This thesis is dedicated to study the main challenges that occurs when a new resource is to be made manageable, in accordance with the Norwegian principles of fisheries management and international obligations and agreements. The research object of this thesis is the snow crab (*Chionoecetes opilio*), and its current establishment in the Barents Sea. The study is based on theory of governability and interactive governance. In order to assess the snow crab fishery, and to identify the most pressing conflicts and those factors that are decelerating the degree of governability, an analysis of the fishery was conducted based on a governability assessment matrix. The analysis showed that the most intricate conflicts involved international agreements on utilization in the Svalbard area and disagreements on the current status of the snow crab as a sedentary species.

Key-words: snow crab, governability assessment framework, Svalbard Treaty, Svalbard fisheries protection zone, SFPZ, sedentary species, Barents Sea

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TABLE OF CONTENTS

ABSTRACT	I
ACKNOWLEDGEMENTS	II
ABBREVIATIONS	IV
1 INTRODUCTION	1
1.1 BACKGROUND	1
1.2 PROBLEM STATEMENT	3
1.3 RESEARCH QUESTIONS AND RELEVANCE	4
2 THEORETICAL FRAMEWORK	5
2.1 GOVERNANCE AND GOVERNABILITY	5
2.2 GOVERNABILITY AND THE WICKED PROBLEMS	6
2.2.1 <i>Assessing governability and wicked problems</i>	7
3 METHODOLOGY	10
3.1 LITERATURE REVIEW AND DOCUMENT STUDIES	10
3.1.1 <i>Document and data collection</i>	11
3.2 LIMITATIONS	12
4 ASSESSING THE SNOW CRAB FISHERY IN THE BARENTS	13
4.1 BACKGROUND	13
4.2 GOVERNABILITY ASSESSMENT	15
4.2.1 <i>Current management</i>	15
4.2.2 <i>Assessing actors involved</i>	18
4.2.3 <i>The Ecosystem and how the snow crab will affect it</i>	21
4.2.4 <i>Svalbard and the Svalbard Treaty</i>	23
4.2.5 <i>Continental shelf rights and management of sedentary species</i>	26
4.2.6 <i>1st case: The Latvian vessel Juras Vilkas caught catching snow crab in the Loophole</i>	28
4.2.7 <i>2nd case: The Latvian vessel Senator caught catching snow crab in the Norwegian EEZ and SFPZ</i> 30	
5 DISCUSSION	34
5.1 SUMMARY AND CONCLUDING THOUGHTS	37
REFERENCES	38

Abbreviations

EEZ	Exclusive Economic Zone
SFPZ	Svalbard Fisheries Protection Zone
GI	Governing interactions
GS	Governing system
HSE	Health, safety and environment
ICES	International Council for the Exploration of the Sea
IMR	Institute of Marine Research
JNRFC	Joint Norwegian-Russian Fisheries Commission
NAFO	Northwest Atlantic Fisheries Organization
NGOs	Non-governmental organizations
RFMO	Regional Fisheries Management Organization
SG	System-to-be-governed
TAC	Total allowable catch
UNCLOS	The United Nations Convention on the Law of the S

Introduction

1.1 Background

In accordance with increased population, the global fishing commons has shrunk and become increasingly strained in the past half century. The Food and Agriculture Organization of the United Nations (FAO) reports that there has been a declining trend in the share of stocks within biologically sustainable levels the last decades. In the period between 1974 to 2013, the percentages of fish within these levels has declined from 90 percent to 63 percent (Food and Agriculture Organization of the United Nations, 2016). In Norway, the situation is different. Fish has historically been an important resource in Norway, and both fisheries management and marine research has been conducted for more than 100 years (Fiskeri- og kystdepartementet, 2011). Two major collapses have contributed to shaping the fisheries management policies of today. After the second World War, the fisheries were characterized by open access, more and bigger boats, major leaps in the development of technical gear and a lack of national and international regulations, all leading to increased efficiency in catch rates. In the late 1960s, strengthening of the fleet's capacity contributed to overexploitation in the herring fishery and collapse in the stock population. The collapse became a turning point in fisheries management which led to a full stop in the herring fishery in 1972 and enacted the process of limiting access to Norwegian offshore fisheries. The coastal fleet, however, continued its fishing activity as previously. In 1990 the Northeast Arctic cod stock was in such bad conditions, that the Norwegian authorities decided to cease all fishing activity, including the coastal fleet. The following year, individual vessel quotas were introduced, also applying to the coastal fleet. The closing of the commons was considered a major upheaval in Norwegian fisheries policy, in a country where fish had traditionally been regarded as a human right, but it can also be considered as the real starting point of the effective Norwegian fisheries management system that is today. Further, it represented a shift away from the traditional single-species management, towards an understanding that the ecosystem is closely interlinked, and need to be considered as a whole (Armstrong, Eide, Flaaten, Heen, & Kaspersen, 2014). Today's management strategies and harvest control rules are based on the

precautionary approach and has, together with a broad enforcement regime, contributed to the rebuilding of endangered stocks (Gullestad, Aglen, Bjordal, Blom, Johansen, Krog, Misund, & Røttingen, 2014).

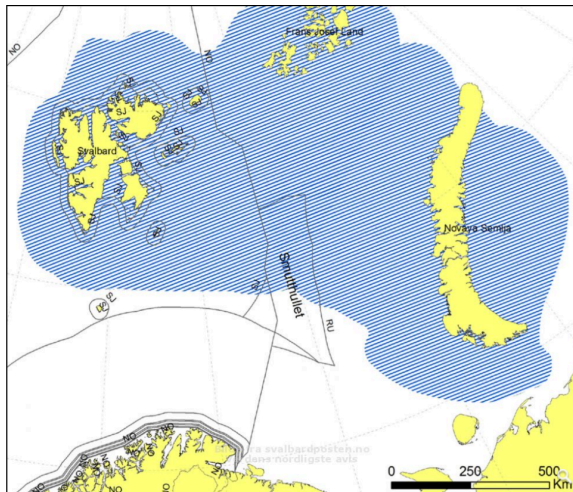


FIGURE 1: ANTICIPATED FUTURE DISTRIBUTION OF THE SNOW CRAB IN BARENTS SEA AND IN THE SVALBARD REGION (IMR, 2015)

In 1996, snow crab (*C. opilio*) was discovered for the first time in the Barents Sea. In the later years, it has become clear that the new species will continue to spread west towards the areas around Svalbard and is estimated to become of high value as an export commodity for Norway (Figure 1). In February 1920, The Svalbard Treaty was signed. The treaty establishes that Norway has sovereignty over Svalbard but provides fishing rights in territorial waters around Svalbard and hunting rights on land for the 45 nations that has ratified the agreement.

In 2015, the Norwegian and Russian government agreed upon defining the crab as a sedentary species. Based on the sedentary status, the Norwegian government argues that the crab is to be managed according to continental shelf rights, irrespective of the Svalbard Treaty or the Fishery Protection Zone in the waters surrounding Svalbard. The European Union on the other hand, who is representing the European countries party to the Svalbard Treaty, strongly maintains their position on the case: that the Svalbard Treaty also comprises the rights to catch snow crab.

In 2016 and early 2017, two Latvian vessels were caught illegally fishing for snow crab in Norwegian jurisdiction. The vessel *Juras Vilkas*, owned by the shipping company Arctic Fishing, was subject to a confiscation order of 2,500,000 NOK, after catching snow crab of the corresponding value on the Norwegian continental shelf in the Loophole. A few months later, the vessel *Senator* was detained by the Norwegian authorities after catching snow crab in the waters adjacent to Svalbard. Both vessels were operating on EU licenses. This gave rise to the increasing tension on the conflict concerning the 100-year-old Svalbard Treaty, and its disputed lack of modification to the evolvement of the law of the sea.

1.2 Problem statement

There are numerous factors involved when governing a resource, which makes it a complex task. One of the main difficulties is to identify the key challenges, often described as “wicked problems”, when managing a resource within a complex ecosystem. The governability assessment framework that is the basis of this thesis, offers a structured and stepwise procedure for identifying the different components that affects governability, governability being described as the quality of governance within a societal field such as fisheries (Kooiman & Bavinck, 2013).

The main purpose of this research project is to explore and identify the wicked problems that are connected to the governability of the snow crab (*C. Opilio*) in the Barents Sea, and to study what challenges occurs when a new resource is to be made manageable, in accordance with the Norwegian principles of fisheries management and international obligations and agreements. Collecting and describing the various factors in a systematic approach can contribute to giving decision makers a more complete picture of the current situation, making it easier to develop a management regime where all considerations are included. Another purpose of the thesis is to make empirical use of the governability assessment framework and in such way contribute to the process of development of the assessment method.

This thesis started out by investigating the establishment of the new snow crab stock in the Barents Sea, based on the governability assessment matrix (see Table 1) as it is described by Chuenpagdee and Jentoft (2009) and as described in interactive governance theory (Kooiman & Bavinck, 2013; Kooiman, Bavinck, Chuenpagdee, Mahon, & Pullin, 2008), to identify the most intricate challenges connected to governance in the snow crab fishery. Through the research conducted, it was discovered that those were related, mainly, to political disagreements between Norway, the EU and its member states on management in the Barents Sea. Thus, it was decided to devote more time to these specific areas in the assessment, as these issues constitute the “wicked problems”. This decision was also based on the limited time available and the broad scope of the governability assessment framework. Therefore, a simpler assessment looking at all factors within the GS, SG and GI is conducted and presented, while going into depth on the aspects mentioned above.

1.3 Research questions and relevance

Research questions are developed in order to construct clear boundaries and focus for the thesis. The questions are based on the research problem, and the aim of this thesis is to answer these questions. The main objective of this thesis is to identify the wicked problems that are challenging the future management of the snow crab in the Barents Sea. Based on that, the following research questions are developed:

- What are the “wicked problems” connected to the governing of the snow crab in the Barents Sea?
- Will snow crab governance challenge the existing regime in the Barents Sea and the Svalbard Fisheries Protection Zone?
- Are we moving towards a regime for snow crab governance in the Barents Sea?

The snow crab’s expansion in the Barents Sea is a matter of great interest, both nationally and internationally. There are severely conflicting interests involved, and high stakes at risk. The intention of this research is to collect and analyze the various aspects which might be a source of conflict, with emphasis on the political disagreements involved. The political challenges connected to the Svalbard Treaty, and what was once considered “terra nullius”, is highly relevant in a time where global warming is becoming a top threat to the seas and its biodiversity. This puts increased pressure on the current interpretation of the treaty.

Theoretical framework

1.4 Governance and governability

Governance has become a popular term within social science, and is increasingly referred to as a crucial steering mechanism within resource management (Kooiman et al., 2008). The definition and practice of governance has been through a change in the later years, from the traditional governance of top-down governing, towards a more modern version of governance, which is more including and interactive towards various stakeholders and networks. Governance does not have the same meaning as government, but represents a *“change in the meaning of government, referring to a new process of governing; or a changed condition of ordered rule; or the new method by which society is governed”* (Rhodes, 1996, p. 46). Jentoft (2007) describes the traditional governing as a pyramid where you have a clear hierarchy, and the decisions come from the top, while governance can be envisioned as a rose – an open system interacting with its surroundings. Governance is a network, consisting of a various number of stakeholders, who all have their own interests and goals.

Interactive governance is a theoretical perspective that highlights the importance of the governing roles of state, market and civil society. According to this theory, the interactions between these three is considered to be the key to success or failure in governance. It proceeds from the ever-increasing degree of diversity, dynamics, complexity and scale in the governance of social entities, and the need for broad participation to reach the best decisions (Kooiman & Bavinck, 2013). Interactive governance can be defined as *“the whole of interactions taken to solve societal problems and to create societal opportunities, including the formulation and application of principles guiding those interactions and care for institutions that enable them”* (Kooiman, Bavinck, Jentoft, & Pullin, 2005, p. 17).

Fisheries and coastal governance can be understood as a relationship between systems: the governing system (GS) and the system-to-be-governed (SG), and the system of governing interactions (GI) that occurs between them. Together these systems form the entire governance system. The GS is a social system, consisting of different institutions and steering mechanisms that are fabricated by human society. The SG, on the other hand, is a

combination of a natural and a social system. It consists of the ecosystem and the resources it inhabits, as well as the social system surrounding it: a variety of stakeholders who form political coalitions and institutions. Kooiman et al. (2008) defines governability as *the overall capacity for governance of any societal entity or system* and emphasizes that it is the common contribution between governors, the governed and the nature of all interactions among governors that leads to a certain degree of governability.

1.5 Governability and the wicked problems

Problems within fisheries are *wicked* in the sense that they can be perceived in different ways by different stakeholders, they are problematic to grasp and thereby define, and there are often no right or wrong solution (Chuenpagdee & Jentoft, 2013). So-called wicked problems are problems within problems, meaning that problems that arises in fisheries management might be connected to bigger problems outside the sector. One other aspect of these problems that creates even more wickedness, is the limited space for exploration around their solutions. Mistakes made when trying to solve these problems might leave traces that creates new problems, even irreversible such. The introduction of individual transferrable quotas (ITQs) is one example. Jentoft and Chuenpagdee (2009, p. 553) argues that *“limits of governability are also related to, or located within, the actual problem that the Governing Systems tries to solve [...] Limits of governability are not only about the nature of the system, but also about the nature of the problem that the system must deal with”*. Within resource systems, there seems to be distinctive problems that never have a solution and keep re-occurring. This might indicate that there are certain abilities within the resource system that makes governance more challenging. The challenges within the SG may prove to exceed the available capacity in the GS. Examples of such capacities may be the lack of necessary tools, insufficient knowledge related to e.g. ecosystem changes, or that parts of the SG do not want to be governed (Jentoft, 2007). The wicked problems differ from other problems, as they are not of a technical nature. They are difficult to describe, people often disagree upon what they are, what caused them, and thus what the solution is. They are often part of a bigger problem – they are *“problems within other problems”* (Jentoft & Chuenpagdee, 2009, p. 554).

1.5.1 Assessing governability and wicked problems

According to Chuenpagdee, Kooiman, and Pullin (2008), the qualitative evaluation of governability within a system can provide a broad understanding that is to a large degree lacking in current management discourse. Jentoft and Chuenpagdee (2009) presents a framework for locating the wicked problems within fisheries, as well as examining its governability, that is holistic in the sense that it analyses all parts of each system (see Table 1). The theory is that because governability is dynamic, and the degree of governability within a system will continue to change according to internal and external factors. It is constantly adaptive, and thus demands a holistic approach with a high degree of flexibility and the ability to learn throughout the governing process. Song, Johnsen, and Morrison (2017) points out the challenges connected to this holistic approach. Because it is impossible at all time to have complete knowledge, the conclusion would almost always be a low degree of governability. Further, Johnsen (2014) argues that the limits of governability depends rather on the society's and the fishermen's willingness to accept governance policies and adapt their activities according to them. Instead of focusing merely on the properties of the systems, we should consider how the actors in the GS and the SG jointly seek to construct the management object, because *governance creates governable fishers, and [...] governable fishers are the guarantee for governability (Johnsen, 2014, p. 441).*

TABLE 1: GOVERNABILITY ASSESSMENT MATRIX (CHUENPAGDEE & JENTOFT, 2009)

	Natural system	Socio-economic system	Governing system	Governing interactions
Diversity	What is the level of biodiversity: species, types of ecosystems or habitats, and the relative abundance and health?	Who are the stakeholders: demographics, organisation, interests, uses, norms and values, etc., and their quality of life?	What is the governing mode: topdown, co-management or bottom-up, and the formal and informal institutions, mechanisms and measures?	What are the existing forms of interactions: communication, participation, representation, etc.?
Complexity	How are species, habitats and ecosystems inter-linked, the system productivity, and external pressure?	How do stakeholders interact: conflicting, collaborating, communicating, integrating, specializing, complying, etc.?	How do the goals/visions of the governing institutions relate: differ, compete or co-operate?	How do the forms of interactions add up and relate: mutually supportive, consistent or incomplete?
Dynamics	What are the biological and physical changes that take place over time: long-term, short-term, seasonal; main internal and external drivers?	What is the change in the stakeholder composition, values and attitudes over time; main drivers and consequences?	Have there been any changes in the governing insitutions, mechanisms and measures; main drivers and consequences?	How adaptive are the forms of interactions? Do they actually transmit information, raising demands and exercising influence?
Scale	What is the size and geographical range of the ecosystem; natural boundaries, system uniqueness and functions?	What is the size and geographical range of the social system; social boundary, ethnic and class division, mobility, uniqueness and functions?	What is the size and geographical range of institutions: local, national, regional; political boundaries, history, uniqueness and functions?	How are interactions channeled within and across scales; from national, regional to local—and vice versa?

An important step in the assessment is an analysis of the four system properties; diversity, complexity, dynamics and scale in each of the systems. These are assessed by considering its system variables; components, relationships, interactions and boundaries (Figure 2). The hypothesis is that the more diverse, complex, dynamic and scale extensive these systems are, the lower degree of governability. Examples of these properties can be (Chuenpagdee & Jentoft, 2013):

- Diversity: the different *components* within the system, e.g. number and characteristics of the resource units and stakeholders. Relevant questions for this analysis would be what and who they are, to what degree they differ or relate to one another and how many of each exists within the system.
- Complexity: how system components connect and affects one another through *relationships*. Systems are rarely in equilibrium but may show signs of conflict or chaos when e.g. stakeholders are disagreeing, or when natural phenomena or species intrusion occur.
- Dynamics: how the components affect one another through *interactions*, and how these interactions lead to change in the systems. Systems are not static, but unpredictable and might change over time. Sudden alterations that are difficult to predict and might be irreversible.
- Scale: Scale is describing the different levels of how operation is conducted, either when it comes to the ecosystem, governance or in time. It relates to system *boundaries*.

These properties highly affect systems and leads to insecurity and unpredictability in the governance process, making the task challenging. However, according to Jentoft (2007) the efficiency of the relationship between these systems can be affected by structural adjustments within both systems, and the GS should respond to the structural qualities in the SG. Jentoft also states that governability in the SG appears to depend on the extent to which the GS can deliver the four essentials of the SG. Diversity in the SG demands the GS to be *sensitive*, complexity need it to be *inclusive*, dynamics leads to a need for *flexibility*, and level of scale should be met with *caution*, and these responses might increase the level of governability. Additionally, to be able to cope with the diversity, complexity and dynamics of the SG, the GS has to be equally diverse, complex and dynamic in its structure. However, to possess these qualities will also make the GS vulnerable. In worst case, the GS might end up doing nothing at all, or a high degree of caution might lead to the simplification of highly complex situations (Chuenpagdee & Jentoft, 2013).

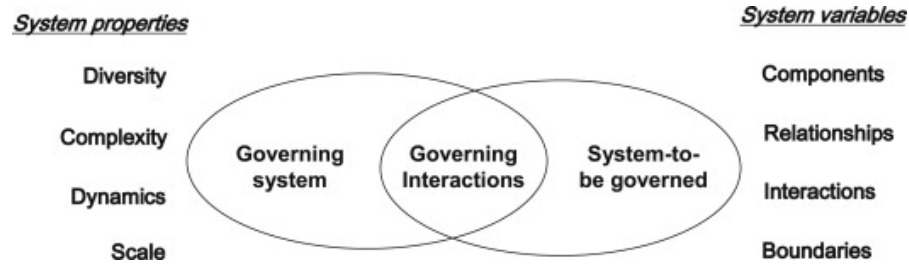


FIGURE 2: GOVERNABILITY ASSESSMENT FRAMEWORK (JENTOFT & CHUENPAGDEE, 2009)

Methodology

This thesis is an exploratory and qualitative study of the potential governability of a new species in the Barents. Explorative research aims at exploring and opening up additional areas of inquiry and does not intend to provide definite answers to research questions and existing problems. This is applicable to this work. Exploratory research can be used to identify variables that are in need of a more precise investigation, and the results often leads to a larger and more focused study on a particular topic or problem (Franceschetti, 2017). Although highly relevant the later years, the research topic of this thesis represents new challenges and puts pressure on ongoing disagreements on a highly political level. To govern the snow crab is a so-called wicked problem that are not yet, and might never be, solved. I address some of these problems through a partial application of the complex governability assessment framework (GAF) (Chuenpagdee & Jentoft, 2009, 2013; Kooiman et al., 2008). GAF is taught as a part of the training in Coastal planning and governance in the IFM program ¹.

1.6 Literature review and document studies

The material for this thesis is research literature, official documents, reports and information from media. Glaser and Strauss (1967, p. 163) argued that documents in a sociological investigation should be regarded as equivalent to *the anthropologist's informant or the sociologist's interviewee*. The findings in this thesis is based on a thorough review of available secondary and tertiary data relevant for the study field, meaning that it is predominantly a collection of relevant research previously conducted by scientists within different fields of fisheries science. The decision to choose this method is based on the purpose and scope of the thesis. It was concluded that this method is sufficient in this matter, as the governability assessment in itself instructs collecting and gathering existing knowledge in a systematic approach.

¹ JENTOFT, A.R. (2016) GOVERNABILITY ASSESSMENT OF THE NORWEGIAN SNOW CRAB (*CHIONOECETES OPILIO*) FISHERY IN THE BARENTS SEA (EXAM IN SVF-3555)

1.6.1 Document and data collection

In order to validate the result in a research project, the set of methods and procedures used in collecting and analyzing data are to be described and accounted for. The articles and publications used to conduct the assessment of the snow crab fishery was found by using relevant keywords and searching for information that answers the questions in the governability assessment matrix prepared in advance of the assessment in Table 2. Sources used to assess the ecosystem and biology of the crab are mainly published scientific articles, found through scientific databases. Relevant government documents have also been used. In addition, court documents on the two cases involving the vessels *Juras Vilkas* and *Senator* have been thoroughly read, translated and summarized in chapter 1.9.6 and 1.9.7. International Law of the Sea, the Svalbard Treaty and other relevant conventions have been investigated and interpreted to gather necessary knowledge related to the legal framework. Some news articles have also been used to get the full picture of the situation. In order to achieve validity multiple sources have been used when collecting data for the assessment (Bowen, 2009).

The governability assessment matrix has been used as a method to systematically set the framework for the data collection. The matrix is a table divided into the four systems: the GS, the system to be governed (separated into the natural- and the social system) and the system of governing interactions, and further into four structural qualities within each system: diversity, complexity, dynamics and scale. The matrix, with a total of 16 sections of questions to answer, has set the stepwise frame for the analysis.

The main objective of this thesis is *to identify the wicked problems that are challenging the future management of the snow crab in the Barents Sea*. This explorative approach defines the need for adaptiveness, as the findings and the outcome were not set when the research started. The analysis indicated that the wicked problems of the snow crab fishery in the Barents are connected to conflicts on a political level, in other words the institutional framework within the GS, and thus it constitutes a bigger part of the analysis.

1.7 Limitations

Based on the limited time and scope of the thesis, I undertook only a partial governability assessment in this thesis. The reason for this is also justified based on the extensive and holistic scope of the governability assessment, making it insurmountable. This holistic approach could in the end lead to a false negative result as it demands knowledge that might not even be available (Song et al., 2017). At least for the snow crab fishery, it would be immensely difficult to collect necessary information to conduct a full governability assessment. However, the governability assessment matrix has been a useful tool to assess the fishery in a systematic approach.

When I planned this thesis, I decided that documents were sufficient data sources for a partial governability assessment. If I were to start over and have had a longer timeframe for the thesis, I might have included interviews of potential sources, such as stakeholders and bureaucrats, to get a clearer understanding of their opinions and positions. Given the controversial character of this research and that the parties are involved in a legal battle, I considered it as difficult to contact the parties about interviews at this stage. Moreover, as the main challenge connected to the fishery are political ones and the parties' opinions are presented in documents and in press interviews, it may not have added much information of relevance to answer the research questions. For the sake of the political issues, I assume that the public sources have been sufficient to gather the information I needed to do the assessment.

Assessing the snow crab fishery in the Barents

1.8 Background

The first signs of the snow crab (*Chionoecetes opilio*) establishment in the Barents Sea came in 1996, when a few specimens were caught by trawl on the Goose Bank west of Novaya Zemlya in Russia. Since then, the invasive species has successfully established itself in the Barents Sea and has extended its geographical range and abundance. Today, its main habitat is in the northern parts of the Russian EEZ as well as in the international waters in the Loophole, and is presently expanding into the Svalbard Fisheries Protection Zone (SFPZ) around Svalbard (Kaiser, Kourantidou, & Fernandez, 2017). The crab is a benthic predator that feed on crustaceans, polychaetes and fish, mainly capelin, on muddy bottoms (Hansen, 2015; Jørgensen & Spiridonov, 2013). Studies show that the conditions and water qualities in the Barents Sea will most likely lead the stock to spread across most of the eastern, central and northern Barents Sea, including the areas surrounding Svalbard. As of today the area of distribution covers more than 34 % of the Barents Sea (Hansen, 2015; Kaiser et al., 2017).

It is expected that the fishery will become of high value, as the crab is a highly valuable harvested species in both the US, Canada and in Russia (Hansen, 2015; Pinfold, 2006). According to Norges Råfisklag (2017), the landings of snow crab in the Barents Sea developed in a rapid pace between 2012 to 2016 from 2,478 kg in 2012 to 5,405,764 kg in 2016. In 2017 there was a sharp decline to 3,067,133 kg, directly related to Russia's decision to close the access for Norwegian vessels on their continental shelf in international waters. The Institute of Marine Research (IMR) has carried out calculations which show that the fishery for snow crab has a potential of reaching between 50,000 and 150,000 tons annually in the Barents Sea from a fully developed crab stock. With a kilo price of 25 to 40 NOK, the prime value might end up between one and a half and six billion NOK, in the same order as the first-hand value of Norwegian cod fishes in the north (Carsten Hvingel, Hansen, & Holte, 2015).

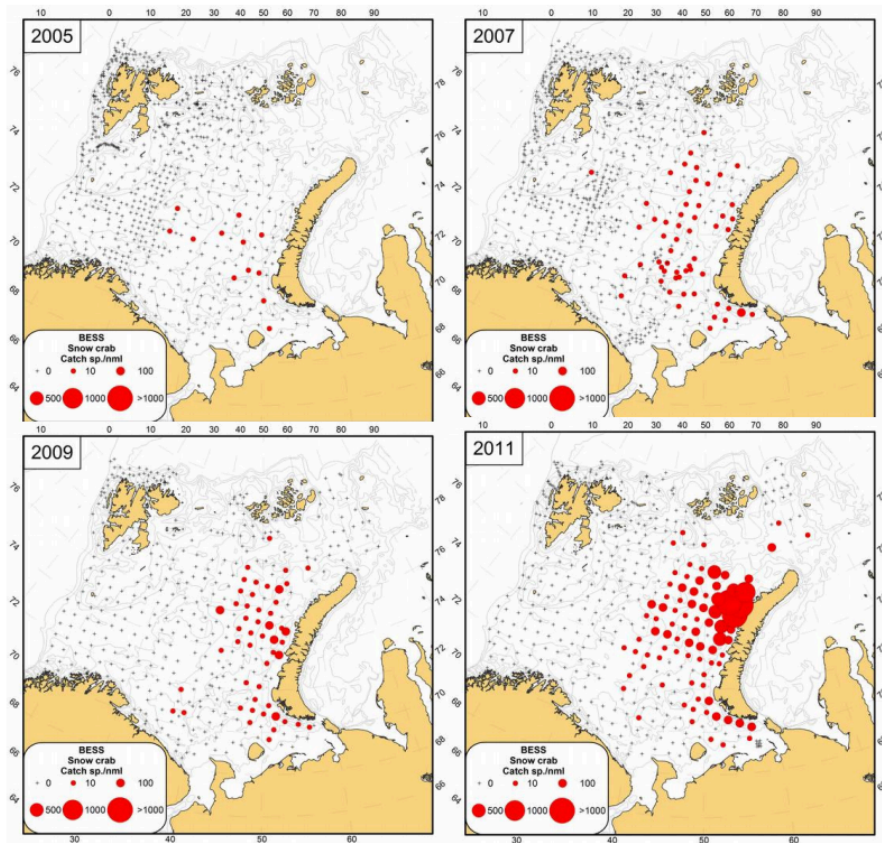


FIGURE 3: MAPS OF SNOW CRAB DISTRIBUTION IN THE PERIOD 2005-2011 (ICES, 2016)

1.9 Governability assessment

This chapter is an assessment of the snow crab fishery in the Barents. It includes all four systems, and is divided into four categories: diversity, complexity, dynamics and scale. The analysis is structured according to the questions asked in Table 2 below, which is based on the governability assessment matrix presented in Table 1.

TABLE 2: GOVERNABILITY ASSESSMENT MATRIX FOR THE SNOW CRAB FISHERY IN THE BARENTS SEA

	Natural SG	Social SG	GS	GI	
Diversity	What other important resources are connected to the snow crab fishery?	Who are the stakeholders in and connected to the fishery?	What institutions and authorities govern the fishery, and what is the structure of the system?	What are the interactions and who is taking part?	Components
Complexity	How do the resources relate to each other?	How do the stakeholders interact with each other?	What are the objectives of the governing authorities?	How do the governing interactions impact governance?	Relationships
Dynamics	What changes could affect the fishery/ecosystem biological and physical state?	How have the fishery/interactions of stakeholders changed over time?	What have been the changes in the GS?	Did the changes affect the interactions between institutions?	Interactions
Scale	What is the natural boundaries of the fishery?	What kind of boundaries are restricting the fishery?	What are boundaries of the institutions?	What is the scale of interactions between local, regional, national institutions?	Boundaries

1.9.1 Current management

As the crab is spreading across the continental shelf between Russia and Norway and towards the areas around Svalbard, it is clear that the management of the species will pose some political challenges. In 2012 open access harvesting began in the Loophole (see “Smuttullet” in Figure 4), while Norway and Russia had still to open fisheries on the species within their EEZs. In the 20th North Atlantic Fisheries Ministers’ Conference held in 2015, both countries agreed to transfer the crab status from a water column species to a sedentary species, in

accordance with the United Nations Convention on the Law of the Sea (UNCLOS) (Joint Norwegian-Russian Fisheries Commission, 2015). UNCLOS gives the coastal state privileges to manage sedentary species according to continental shelf rights and not fishing zones.



FIGURE 4: MAP OF NORWEGIAN MARITIME ZONES

Following this decision, the Norwegian Ministry of Trade, Industry and Fisheries introduced a total ban on harvest of snow crab within the Norwegian EEZ and SFPZ, as well as in international waters in the Norwegian continental shelf (Forskrift om forbud mot fangst av snøkrabbe, 2015). Vessels can, however, apply for a special dispensation from the Directorate of Fisheries.

The Norwegian Ministry of Food and Fisheries has decided on a total allowable catch (TAC) of 4000 tons for 2018 on the Norwegian continental shelf, the same as for 2017. Currently, no

individual vessel quotas (IVQ) are established, thus harvest is stopped when the total quota is fished. The TAC is based on biological recommendations made by IMR. IMR mainly bases their estimates on data from the Canadian snow crab fishery, due to the sparse data and knowledge about the crab's behavior in the Barents Sea (Carsten Hvingel, Sundet, & Hjelset, 2017). Compared to 2016, this constitute a dramatic decline in landings, and is a result of Russia's decision to close its part of the Loophole, which causes Norwegian boats to base their fishing on the Norwegian continental shelf. The density of crab in these areas are currently low, and the Norwegian Fishermen's Sales Organization has expressed concern for the profitability of those who have invested in new boats and factories (Samuelsen & Lieungh, 2017).

In 2017, The Norwegian Ministry of Trade, Industry and Fisheries decided to introduce regulations on reports of soft shell crabs in the period between 1st of June and 1st of September, and accordingly not close the fishery in July, as was previously standard practice. If a vessel catches more than 20 % of soft shell crabs in one haul, the vessel is to move its operation to a different area. Further, the current management plan for the snow crab on the Norwegian continental shelf includes the following (Forskrift om forbud mot fangst av snøkrabbe, 2015; Nærings -og fiskeridepartementet, 2017a):

- The crab is to be managed according to the primary goal of sustainable harvest that secure value creation for the society, based on the best available scientific research on how species affect one another in the ecosystem. This is to be achieved through a balance of the following:
 - Long-term maximization of yield
 - Minimize the risk of undesirable ecosystem effects
- Questions about participation in the fishery are assessed on a continuous basis
- For the sake of molting, specific reporting on catches of soft-shell crabs are mandatory the period between 1st of June and 30th of September
- In order to attend the snow crab fishery in the period 1st of June to 30th of September, the vessels are obliged to send a message to the Directorate of Fisheries about when fishing is commenced and no later than one week before it is planning to attend the fishery
- Minimum legal carapace length is set to 10 cm
- The Directorate of Fisheries may prohibit the capture of snow crab in periods and areas if biological considerations indicate that it is necessary
- The crab is to be managed equally on the entire continental shelf

There are currently no technical regulations on gear, however, the ministry have stated that the matter will be followed up together with relevant business actors and the Directorate of Fisheries in 2018 (Nærings -og fiskeridepartementet, 2017c). It is assumable that the Norwegian government will learn from the Alaskan and Canadian fisheries of Newfoundland and Labrador, where degradable twines in pots are now mandatory in the means of preventing ghost fisheries. An evaluation of the pots used in these fisheries shows that the twine used exhibited a rapid and noticeable decline in breaking strength, with a total reduction of 63 % of the initial strength over the period of the study (Winger, Legge, Batten, & Bishop, 2015).

1.9.2 Assessing actors involved

The social SG consist of fishing companies involved in the fishing of the crab, companies involved in other fisheries, possibly the oil and gas industry, political groups, fisheries organizations such as The Norwegian Fishermen's Sales Organization and The Norwegian Seafood Federation, the Sami Parliament and various non-governmental organizations (NGOs). The oil and gas industry are currently not in any conflicting areas of where the snow crab is expected to spread, but this could change in the future (Norskipetroleum.no, 2018). Currently, the amount of companies involved in the snow crab fishery is limited. Fishing behavior of the snow crab fleet might have an impact on the northern shrimp fishery's cost and productivity due to spatial overlap of crab pots and shrimp trawl, and the Norwegian shrimp fleet reported several incidents to the coast guard of costly damages (e.g. broken trawls) due to gear from the snow crab fishery left behind on the sea bottom (Kaiser et al., 2017). There are also indications that the trawl fisheries for cod and shrimp might injure the snow crab (Gjesteland, 2017). One of the main concerns among fishermen who wants to enter the fishery, seems to be connected to health, safety and environment (HSE). The snow crab lives far of the coast, in rough conditions, which makes the fishing for snow crab a dangerous job, and the participants must adhere to the Norwegian authorities' requirements to HSE. High investments are required to make the boats suitable for the conditions (Benjaminen, 2015).

The relevant governing institutions and authorities are the government, represented by the Ministry of Trade, Industry and Fisheries (the Ministry), the Directorate of Fisheries, together with the Norwegian Food Safety Authority, who provides professional advice. In addition, the

most important research institutions, providing scientifically advice, are IMR and The International Council for the Exploration of the Sea (ICES). The management of Norwegian fisheries works through “the regulatory chain” and Norwegian fisheries are today largely regulated through quotas and licensing requirements. Because most Norwegian fish stocks migrate between Norwegian and foreign seas, these stocks are managed in cooperation with neighboring countries. Fish quotas are set primarily on the basis of advice from ICES, which again is compiled on the basis of different research from the involved countries. Involvement of stakeholders in decisions are made through the Advisory Meeting for Fisheries, where representatives from fishermen's organizations, industry, labor unions, the Sami parliament, local authorities, environmental organizations and other stakeholders are present (Fiskeri- og kystdepartementet, 2011).

In the latest decade, Norway has engaged heavily in international cooperation for more sustainable fisheries. Approximately 90 percent of Norway’s harvested marine resources is shared with other states, which means that it is in Norway's interest to be involved in drafting these agreements, also because Norway as part of the global community wants to take responsibility for how the seas are exploited internationally. In Meld. St. 28, Nærings- og fiskeridepartementet (2017) states three overall goals for Norway’s participation in various negotiation processes and the international organizations for resource management: *to promote a sustainable management of living marine resources based on the best available science and an ecosystem based management, to secure a fair share of quota allocation of shared stocks, and to secure satisfying control and enforcement in those fisheries where Norway is participating.* Norway is involved in several international fisheries agreements for managing joint stocks, as required by the Convention on the Law of the Sea (UNCLOS), both when it comes to bilateral agreements, coastal state agreements and agreements in Regional Fisheries Management Organizations (RFMOs). The most comprehensive agreements are with the EU and Russia, and includes agreements on quota allocation on shared stocks, in addition to exchanging quota and fishing rights in the involved parties’ EEZ (Nærings- og fiskeridepartementet, 2014a).

The Joint Norwegian-Russian Fisheries Commission (JNRFC) was established in 1974 and ensures the efficient bilateral management of the most important shared stocks between Norway and Russia’s respective EEZs. The Commission agrees on quotas, minimum legal

harvested sizes, mesh sizes and other technical regulations based on advices from ICES, and the agreements also include equal access to harvest quotas in each other's waters (Joint Norwegian-Russian Fisheries Commission, n.d.). The North East Atlantic Fisheries Commission (NEAFC) is the RFMO for the North East Atlantic and aims to ensure sustainable and optimal utilization of the fishery resources mentioned in the Convention, which includes sedentary species. NEAFC may, by mutual agreement between the Contracting Parties, determine and distribute catch quotas between the member states within the organization's area of jurisdiction. On stocks that migrate between economic zones and international waters, NEAFC primarily has coordinating function. After the introduction of coastal states rights to create a 200-nautical mile EEZ, NEAFC's area of government was limited to international waters outside the EEZ. In 1980, Norway and EU signed a bilateral fisheries agreement following the establishment of the economic zones in 1977. The agreement gives the parties mutual permission for fishing within each jurisdiction and obliges cooperation on the management and conservation of living resources in the sea. Quotas are negotiated annually on the common stocks in the North Sea, Norwegian fishing west of the British Isles and Greenland, as well as EU fishing in the Norwegian EEZ in the Barents Sea.

The snow crab is currently abundant in the eastern parts of the Barents Sea in Russian waters. It has, however, expanded its distribution rapidly and is expected to continue to spread west- and northwards and within a short period occupy most of the northern parts of the Barents as well as all waters surrounding Svalbard (Lorentzen, Voldnes, Whitaker, Kvalvik, Vang, Gjerp Solstad, Thomassen, & Siikavuopio, 2018). At the 20th North Atlantic Fisheries Ministers' Conference in 2015, Norway and Russia decided to alter the status of the crab from a water column species to a sedentary species. Based on this, it is currently managed according to international law on continental shelf rights. In relation to the Loophole, this means that Russia and Norway have their sites based on the division of the continental shelf, respectively 85 % and 15 % each. Currently it is not certain how the two countries will manage the crab, but it could be noted that king crab have been managed separately since 2007 (Lorentzen et al., 2018).

The basic principle in Norwegian management of marine resources is sustainable harvest. The overarching goals of the Ministry is to promote profitable economic activity through sustainable and user-oriented management of marine resources and marine environment. In

order to achieve sustainability, it is first and foremost a goal to increase knowledge about the spread of the snow crab in Norwegian waters, and what significance this has for other species in the ecosystem, in addition to ensure sustainable harvest that ensures value creation in the society (Nærings -og fiskeridepartementet, 2017b). According to the Ministry, it would be unrealistic and counterproductive to have extinction as a management objective, because of the population development, size and range. Population growth has been much faster than for the king crab, and the biomass of snow crab in the Barents Sea is already estimated to be ten times as large as the biomass of king crab. Close knowledge exchange and dialogue with Russia is therefore considered important. Profitability in all parts of the industry is an important prerequisite (Nærings -og fiskeridepartementet, 2014b).

1.9.3 The Ecosystem and how the snow crab will affect it

The Barents Sea is a large marine ecosystem bordering Norway and Russia and is unique in the sense that the sea is still relatively undisturbed. Production in the sea is moderately high, and it is an important feeding area for several key species, such as cod, haddock, shrimp, herring, capelin, halibut and catfish. It also holds a variety of sea birds, coral reefs and mammals such as walruses, seals and several species of whales (McBride, Hansen, Korneev, & Titov, 2013). The Atlantic cod travels thousands of kilometers each year and is considered to be the most important species in terms of landings and economic value. The areas around Svalbard are important feeding areas for the cod, and fishing is taking place several areas of the Barents Sea (Store Norske Leksikon, 2014).

As well as being a potential gold mine, the invasion of the crab also poses known and unknown threats towards the ecosystem in the Barents Sea. Kaiser et al. (2017) argues that because it is difficult to identify the species impact on the ecosystem in the Barents, it is also easy to ignore these impacts in return for immediate economic gain. Further, that the reclassification of the crab's status to a sedentary species, and the closing of the commons, will contribute to speeding up the westward spread towards the sensitive benthic ecosystems. Sundet (2015) points out that "a species as numerous as the snow crab is expected to become, and that constitutes so much biomass, is clearly bound to affect the existing ecosystem". The Arctic Marine ecosystem consist of few species on each trophic level compared to other ecosystems, and is consequently more vulnerable to external factors, such as the introduction

of a new species. Changes on one trophic level, for instance on echinoderms or foraminifera which are known prey species and holds important roles in the ecosystem (Jørgensen & Spiridonov, 2013), might have significant effects upwards or downwards in the food web. Dvoretzky and Dvoretzky (2015) studied whether the king crab and snow crab had an effect on commercial fish species and shrimps in the Barents Sea. They documented no negative impact on any of the investigated species and concluded that the snow crab has not had a detrimental effect on major fish stocks while resulting in positive economic benefits. This study did not, however, include other parts of the ecosystem, and the scientists acknowledged that a long-term-effect can result differently. In addition, the snow crab is still increasing exponentially, and the ecosystem may not yet have adjusted to the introduction of a new species. Another diet study of the snow crab in the Barents did not identify any major ecosystem effect, but proposes that the crab has found a niche in the ecosystem not previously occupied (Hansen, 2015). ICES (2016) states that it may be assumed that acclimatization of snow crab in the northern part of the Barents Sea will be without any dramatic consequences for the Barents Sea, however, also acknowledging that the crab has not reached its full population growth in the Barents and that long-term consequences are not possible to predict at this time.

There are some indications that the crab is contributing positively to the ecosystem in different ways. Studies show that the crab will have a positive impact on commercially valuable fish, such as cod and haddock, as especially the young individuals serve as food for the fish (Carsten Hvingel et al., 2015). Increased food availability means increased growth. In addition, the cod predation on snow crab might contribute to limiting the rapid spread of the invasion (Chabot, Sainte-Marie, Briand, & Hanson, 2008; Kaiser et al., 2017). Further, it may seem that the crab is contributing to making available what would else have been lost biological energy. Large parts of buried bottom fauna eventually become dead organic matter, and together with the nutrients found in the bottom mud, it will eventually disappear into the bottom and enter into geological processes, by for example turning into oil. The crab uses its long claws to dig up biomass from the bottom fauna, making it available to other species, and so forth serving as a “biomass-recycler” (Carsten Hvingel et al., 2015).

With regards to dynamics, meaning changes in the ecosystem, the main concern today is global warming, leading to climate change. Predicting an accurate outcome of global warming

is a difficult task, but it is clear that it will have effect on ecosystems, in the sea as well as on land. In the Barents Sea changes are more rapid and produces more challenges than in any other ecosystems. Changes are expected to be greatest in the northern regions, which means areas where snow crab is predicted to spread. According to the Intergovernmental Panel on Climate Change (IPCC), the average temperature in the Arctic has so far been rising twice as fast as the temperature in the rest of the world (Anisimov, Vaughan, Callaghan, Furgal, Marchant, Prowse, Vilhjálmsón, & Walsh, 2007, p. 656). Increased temperatures will probably have a negative impact on the snow crab, which thrives in low temperatures between -1 and 3 degrees, and might lead to an extended distribution of the species towards higher latitudes, as the climate zones moves northwards (The Barents Euro-Arctic Council, n.d.). In addition, other species will move north, and species that have not previously belonged to Arctic marine environments will contribute to a change in the existing food chain and biodiversity of the Barents Sea. A study looked at how arctic food chains will change if species move north, and found that the altered food chain will have more links and lower modularity, similar to food chains farther south (Blanchard, 2015).

1.9.4 Svalbard and the Svalbard Treaty

Since the 1600's actors from several different nations has been involved in activities in the archipelago Svalbard, such as hunting, mining, tourism and research. For a long period, Svalbard did not belong to any nation, but was considered "common international land", shared between those who had any interest in activities there. As a consequence of the region not belonging to a nation there was no legal enforcement present, and no laws or regulations. As the interest in Svalbard, and especially the mining industry grew larger, the need for regulations and control emerged. Several attempts were made to settle on how Svalbard could be managed. The Union Norway and Sweden proposed a Norwegian annexation of the archipelago in 1871. Although most states had no contradictions, Russia did, and no agreement was made at that time. In 1905, Norway followed up, inviting both Russia, Sweden and other states to several conferences in Kristiania in 1910, 1912 and 1914, where the main purpose was to discuss whether it was possible to establish an international joint government over the archipelago. However, these proposals were continuously met with resistance and considered not feasible. It was not until the end of World War I that an agreement was reached. In the Versailles negotiations of 9th of February, 1920, the Svalbard Treaty was

signed, recognizing the sovereignty of Norway over the Archipelago of Spitsbergen, including Bear Island and Hope Island, in order to assure their development and peaceful utilization. Although Svalbard was not involved in any military operations during the war, and thus not really a subject of debate in the peace conferences, one of the main reasons for giving Norway the sovereignty was Norway's losses during the war despite its neutral position. The super powers believed that they were in gratitude to Norway, based on its significant loss of ships and human lives, while throughout the war securing uninterrupted communications and supply lines by sea, and also agreed that there were insurmountable difficulties in clarifying international management of Svalbard. The French parliamentary member Joseph-Barthélemy declared to the Foreign Affairs Committee at the National Assembly (Deputies Chamber) 30 July 1924: "*The [Treaty] provides a legal confirmation of the actual sovereignty that Norway has exercised over the Spitsbergen over three centuries, and as most affected states have been willing to acknowledge since 1871. [...]*" (my translation) (Fife, 2007). In addition, US Secretary of State, Robert Lansing, had previously indicated that a final clarification of sovereignty over Svalbard, in favor of Norway, would be included in the prerequisites for lasting peace in Europe (Fife, 2007). Norway's sovereignty, however, was limited in such a way that the citizens of any signatory states of the Svalbard Treaty have equal rights to pursue business activities, hunting and fishing on the islands and in their *territorial waters*. To this date more than 40 parties have acceded to the Treaty, which is open to accession (Svalbard Museum, n.d.; The Svalbard Treaty, 1920).

Almost 100 years later, the treaty is source of great disputes between Norway and some of the other signatories. The Norwegian Government is unwavering in its strict interpretation of the Svalbard Treaty, and claims that the Norwegian sovereignty over Svalbard is undisputed (Ministry of Justice and Public Security, 2015-2016). The EU, on the other hand, argues that the Treaty's provisions on equal access and non-discrimination has to adapt to the development of the international law of the sea. Article 2 of The Svalbard Treaty states that "*... all the High Contracting Parties shall enjoy equally the rights of fishing and hunting in the territories specified in Article 1 and in their territorial waters*" (The Svalbard Treaty, 1920). At the time the Treaty was negotiated, the territorial waters of Norway were 4 nautical miles. During the United Nations Conference on the Law of the Sea, held between 1973 and 1982, a broad regime of law and order in the world's oceans was agreed upon, instituting that the marine space is closely interrelated and needs to be managed and seen as a whole (United Nations, 2013). UNCLOS entered into force on the 16th of November 1984, as a result of a

cooperation between more than 150 countries from all regions of the world for more than 14 years. UNCLOS introduced several new regimes, among others the right to expand the breadth of its territorial waters up to a limit of 12 nautical miles, and the introduction of the 200-miles exclusive economic zone, giving the coastal state sovereign rights to explore, exploit, conserve and manage natural resources within this space. In 2004, Norway extended its territorial limit to 12 nautical miles, mainly to secure that international ships with dangerous and polluting cargo would sail further off the coast. In 1976 a 200-mile exclusive economic zone (EEZ) was established of the mainland coast of Norway. The year after, a temporary 200-mile non-discriminatory Fisheries Protection Zone was established of the coast of Svalbard to gain control and limit the fishing in the area to conserve resources and avoid unregulated fishing (Forskrift om fiskevernsonene ved Svalbard, 1977). Fishing rights within this zone is determined on the criterion of traditional fishing, not the Svalbard Treaty, and is non-discriminatory in the sense that Norway does not have exclusive rights for fishing within the zone.

The EU and many of its member states have protested the SFPZ and argues that the Svalbard Treaty should apply outside the territorial waters and on continental shelf, and that Norway is currently violating the equal treatment principle in the Svalbard Treaty (Fenstad, 2016; Groenning, 2017). Norwegian authorities have a different view, emphasizing that the snow crab moves on the bottom and is to be managed according to the same principles as the continental shelf in general. In Norway's view, the Svalbard Treaty and international law of the sea give Norway the right to manage resources on the continental shelf outside Svalbard. A decision to alter the Svalbard Treaty's regulations on equal access to include the continental shelf outside Svalbard could affect the right to extract oil, gas and minerals, and is by many argued to be the main source of the conflict (Bolongaro, 2017). In the newspaper Nordlys, The Norwegian Fisheries Minister and Foreign Affairs Minister states in a debate post published on April 23rd, 2018, that *“Regardless of the issue of the scope of the Svalbard Treaty, the EU and its Member States can not catch crabs based on licenses they issue themselves. It would be illegal vigilantism [...] Norway is committed to sustainable resource management and we are continuously working to fight thief fishing”*, indicating that the Norwegian Government will defend what it believes to be its rights and not back down on this issue (Sandberg & Søreide, 2018). On December 13th, 2017, the EU Fisheries Minister decided to award 20 new fishing licenses for snow crab in the SFPZ for 2018 (The European Union, 2018), which can only be understood as the EU not backing down in this matter.

1.9.5 Continental shelf rights and management of sedentary species

The EEZ provides coastal states full sovereignty to exploit the resources within the 200-miles zone. In addition, the states have further sovereign rights for some species outside the EEZ, namely the sedentary ones, in accordance with art. 77 (1) in part VI of UNCLOS: *the coastal State exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources*. All coastal states have continental shelf rights of 200 nautical miles of the coast. Some states also have a prolonged shelf in the form of a geological extension under the sea, extending beyond the 200 nautical miles. In 2009, the Commission on the Limits of the Continental Shelf accepted Norway's continental shelf documentation, which acknowledges Norway's continental shelf to include the areas up to and around Svalbard in addition to parts of the Lophole.

The natural living resources referred to in part VI of UNCLOS on continental shelf rights, is described as *living organisms belonging to sedentary species, in other words, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil* (UNCLOS art. 77 (4)). Which species that are sedentary is however disputed, and there exist no standard classification, which causes some practical difficulties. There are major variabilities within species when it comes to degree of movement. For example, one crab species might have completely different abilities to move and swim, compared to another crab species (Mossop, 2007). According to Young (1961, p. 365), *there is no simple line of demarcation between sedentary and other fish, but only a long series of gradations from the unquestionably fixed at one extreme to the unquestionably free at the other*. A strict definition would include clams and corals and those organisms that are almost fully mounted to the sea bed, and clearly fits the category. Other important species, like lobsters and crabs that are dependent of the sea bed to move, but not at all time in contact with the bottom, constitute more of a gray area.

Another reason to determining which species are in fact sedentary or not, is the question on how the species are to be exploited. According to part VI of UNCLOS, Article 77 (1-2) the coastal State has sovereign rights for exploring and exploiting the natural resources on the continental shelf, meaning that if the coastal State does not explore the continental shelf or exploit its natural resources, no one may undertake these activities without the express consent of the coastal State. On the other side, if the crab is determined not sedentary, it is to

be managed according to UNCLOS Part V as a part of the EEZ which acquire the State to keep exploited resources within sustainable levels in addition to ensuring that maximum sustainable yield is upheld, based on the best available scientific advice. Article 62 (2) states that *where the coastal State does not have the capacity to harvest the entire allowable catch it shall [...] give other States access to the surplus of the allowable catch.*

To determine whether the snow crab is, or is not, sedentary, it is useful to look at earlier disputes and the outcome of these disputes. In 1963, there was a disagreement between France and Brazil, where the French fished for lobster on the continental shelf of Brazil. In their opinion, the lobster was not sedentary species, as it is capable of swimming, and the area should therefore be open for the common as of UNCLOS part VII, Article 116², on fishing rights in the high seas. The dispute was resolved with a compromise, where the French were allowed limited fishing access to the lobsters (Mossop, 2007). The Director-General of the Directorate-General for Maritime Affairs and Fisheries in 2015, Lowri Evans, writes in a published letter that the snow crab is indeed a sedentary species, referring to a case where United States conducted snow crab-fisheries on the continental shelf of Canada. In this particular case, the European Union considered snow crab to fall under the definition of “sedentary species”, and therefore, did not protest against Canada. The Director-General further expresses that issuing licenses for fishing snow crab in the Loophole, without the consent of Norway or Russia, is a violation of Article 77 (2) of UNCLOS³, and therefore, is illegal. Further she strongly advises all member states to stop issuing fishing licenses, and to re-call vessels already licensed in the NEAFC Regulatory Area (Evans, 2015). It is noteworthy that the European Commission later authorized vessels of Lithuania, Latvia, Poland and Spain to catch snow crab in the Barents Sea under the terms of the Convention on Future Multilateral Cooperation in North-East Atlantic Fisheries (NEAFC Convention). According to Ikirodah (2005), the UK position on the matter has been expressed in this way: lobsters swim and crabs do not; therefore crabs are considered sedentary, in compliance with

² UNCLOS, ARTICLE 116: ALL STATES HAVE THE RIGHT FOR THEIR NATIONALS TO ENGAGE IN FISHING ON THE HIGH SEAS [...]

³ UNCLOS, ARTICLE 77 (2) STATES THAT THE RIGHTS REFERRED TO IN PARAGRAPH 1 ARE EXCLUSIVE IN THE SENSE THAT IF THE COASTAL STATE DOES NOT EXPLORE THE CONTINENTAL SHELF OR EXPLOIT ITS NATURAL RESOURCES, NO ONE MAY UNDERTAKE THESE ACTIVITIES WITHOUT THE EXPRESS CONSENT OF THE COASTAL STATE

the Geneva Convention on the continental shelf, and lobsters are not. The Northwest Atlantic Fishing Organization (NAFO) also recognizes the snow crab as a sedentary species (Government of Canada, 2016). However, as discussed by Hansen (2016), a definition (Dictionary.com, n.d.) would describe “sedentary” as a) not migratory, and b) permanently attached to something. The snow crab migrates throughout its life and is not attached to the sea bed. Following this definition, few biologists would classify the crab as sedentary species. On the other side, following an exact interpretation of the articulating of UNCLOS, the crab is, primarily, dependent of the sea bed to move. Hansen (2016) further notes that although there are disagreements on whether or not the crab is sedentary, no countries have so far directly questioned its sedentary status in the Barents.

According to the Norwegian Ministry of Foreign Affairs (2014) there is no dispute regarding the continuous continental shelf that extends north from mainland Norway and around and past Svalbard. The Ministry points out that all shelves which originates in Norwegian territory is Norwegian, and subject to Norwegian jurisdiction in accordance with the agreements made under the UNCLOS (United Nations, 2013). Shelf areas around Svalbard is therefore part of the Norwegian continental shelf, based on the sedentary status of the crab, this will in all probability be applicable for snow crab.

1.9.6 1st case: The Latvian vessel Juras Vilkas caught catching snow crab in the Loophole

On 18th of July, 2016, the Latvian vessel Juras Vilkas, and its captain, was issued a fine by the Commissioner of the Finnmark Police of respectively 2.500.000 NOK and 15.000 NOK for violating the Marine Resources Act section 61, cf. section 16, cf. Regulation on the Prohibition against Catching of Snow Crab, section 1. The Regulation prohibiting the catches of snow crab was commenced on the 1st of January 2015, and section 1 states the following: *Norwegian and foreign vessels are prohibited from catching snow crab in the Norwegian territorial sea and inland waters, and on the Norwegian continental shelf [...]* (Forskrift om forbud mot fangst av snøkrabbe, 2015). The vessel was caught with a catch valued to 2.530.710 NOK and was fishing on licenses provided by EU through the Latvian Ministry of Agriculture. The fines were not accepted, and the case was forwarded to Øst-Finnmark District Court.

Prosecutor argued that the captain should be sentenced to pay a fine of 18,000 NOK in addition to legal costs. Furthermore, the prosecutor argued that Arctic Fishing, the shipping agency of Juras Vilkas, should be convicted to pay 2,500,000 NOK in addition to legal costs. Both defendants called for acquittal and argued that it is the NEAFC Commission that exercises the administrative authority in the Loophole, cf. NEAFC Convention Art. 3 No. 2⁴ and NEAFC Scheme of Control and Enforcement Art. 1 (b)⁵.

The District Court agreed to the defendants' arguments that Norway has agreed to the NEAFC Scheme of Control and Enforcement and is thus obligated to respect the licenses and permits issued in accordance with NEAFC's administrative regime, also on the Norwegian continental shelf in the Loophole. The court did not find it doubtful that Juras Vilkas was fishing for snow crab in the Loophole under license issued in accordance with the guidelines provided by the NEAFC Convention and the NEAFC Scheme of Control and Enforcement. The court concluded that the national ban on the capture of snow crab on the Norwegian continental shelf did not apply in this case, as the ban is contrary to Norway's obligations under the NEAFC Convention and the NEAFC Scheme of Control and Enforcement, cf. the Norwegian Penal Code (2005) § 2⁶ (Øst-Finnmark Tingrett, 2017a). Both the captain and the shipping company was acquitted, however, the prosecution authority appealed on the grounds of misinterpretation of the law.

In June 2017, the Court of Appeal gave judgement that the Districts Court's judgement was set aside for both defendants, stating that the NEAFC Convention does not impose restrictions on the state's rights under UNCLOS, which means, Norway has an exclusive right to manage resources on the continental shelf. The captain and fishing company further appealed the

⁴ NEAFC CONVENTION ART. 3 No. 2: THE COMMISSION SHALL HAVE LEGAL PERSONALITY AND SHALL ENJOY IN ITS RELATIONS WITH OTHER INTERNATIONAL ORGANIZATIONS AND IN THE TERRITORIES OF THE CONTRACTING PARTIES SUCH LEGAL CAPACITY AS MAY BE NECESSARY TO PERFORM ITS FUNCTIONS AND ACHIEVE ITS ENDS

⁵ NEAFC SCHEME OF CONTROL AND ENFORCEMENT ART. 1 (B): "REGULATORY AREA" MEANS THE WATERS OF THE CONVENTION AREA, WHICH LIE BEYOND THE WATERS UNDER THE FISHERIES JURISDICTION OF CONTRACTING PARTIES

⁶ CRIMINAL CODE (STRAFFELOVEN) (2005) § 2: CRIMINAL LAW IS APPLIED WITH THE CONSTRAINTS IMPOSED BY AGREEMENTS WITH FOREIGN STATES OR BY INTERNATIONAL LAW

judgement to the Supreme Court, arguing that the judgement from the District Court must be upheld.

In the Supreme Court, the defendants upheld their argument that the NEAFC Convention comprises snow crab catching on the continental shelf outside the EEZ, and that Norway through its participation has given consent pursuant with UNCLOS Art. 77 (2) that [...] *if the coastal State does not explore the continental shelf or exploit its natural resources, no one may undertake these activities without the **express consent** of the coastal State.* In November 2017, the Supreme Court ruled that Norway is not obliged under international law to allow catching of snow crab on the Norwegian continental shelf, and that the state has not given any consent, and further dismissed the appeal (The Supreme Court of Norway, 2017).

The Norwegian Fisheries Minister later expressed that he was pleased with the Supreme Court's decision to give the state full right to enforce and regulate Norwegian law in the Loophole, and that the State will continue the practice with prosecuting those who do not comply (Lieungh, 2017).

1.9.7 2nd case: The Latvian vessel Senator caught catching snow crab in the Norwegian EEZ and SFPZ

On the 15th of January 2017, the Latvian fishing vessel Senator left Båtsfjord and headed towards the Central Bank in the Barents Sea, closely monitored by the Norwegian coast guard. The Central Bank is situated within the Norwegian SFPZ and EEZ, on the Norwegian continental shelf. The day after, the coast guard conducted a control on board Senator, discovering that a total of 2594 crab pots had been dispatched on the Central Bank. The captain was fishing on licenses provided by EU through Latvian authorities. The coast guard found that these licenses were not valid, cf. the Regulations on the ban on catches of snow crab. The vessel was instructed to cease fishing and retrieve the dispatched pots. According to documents from the district court, there was an argument between the coast guard and the Senator captain, resulting in the coast guard ordering the vessel to the port of Kirkenes, while abandoning the pots at sea (Øst-Finnmark Tingrett, 2017b). After the incident, the chief of police in Finnmark issued a fine to the shipping company, SIA North Star, and the captain on board. The fines were not accepted, and the case was forwarded to the District Court.

The prosecutions main argument was the sedentary status of the crab and management according to continental shelf rights. Further, that the continental shelf of Svalbard is a prolongation of the Norwegian mainland continental shelf, which gives Norway the full sovereignty to regulate catches of snow crab on the Norwegian continental shelf in compliance with UNCLOS Art. 77 (2). Finally, that the Svalbard Treaty is not applicable to the continental shelf, as it strictly mentions the *territorial waters of Svalbard*, which is 12 nautical miles from the baseline (The Svalbard Treaty, 1920, p. Art 2).

The defendants claimed acquitted on several grounds. Firstly, that it is not sufficiently proven that the crab is a sedentary species, and thus that it is not covered by UNCLOS part VI on continental shelf rights. One of the arguments against the sedentary status was that the crab is able to lie and move in layers on top of each other, thus able to move without being "*in constant physical contact with the seabed or the subsoil*". Another example was that a crab that has crawled upon a rock on the seabed can fall down, and at that time when it is falling will be moving without constant physical contact with the seabed. Furthermore, the defendants claimed that if the crab *is* to be considered a sedentary species and is to be managed according to continental shelf rights, Svalbard must be considered to have its own continental shelf. In that case, the Svalbard Treaty must apply to this shelf. As, in the defendant's perspective, the fishing was conducted on the Svalbard shelf, and the administration of the current regulations by Norwegian authorities, which only allow fishing licenses to Norwegian shipping companies, Norwegian authorities are breaching the rules on equality of the treaty partners. Further they argued that that there, in 1920, was no uniform interpretation of the legal nature of the territorial waters and that this weakens the intended meaning of the conceptual use. Finally, the defendant claimed acquittal based on the grounds of mistake of law, claiming that they believed the licenses issued by the Fisheries Division in the EU to the Latvian Fisheries Authorities were in order, and that they did not realize Norwegian law prohibited such catches.

The district court found it not doubtful that the crab is a species that is dependent on the seabed to move, and thus is sedentary in accordance with UNCLOS, part VI, art. 77, and further concludes that the Norwegian State has the right to manage the snow crab on the Norwegian continental shelf. Further, that the Svalbard Treaty could not be interpreted in an extended meaning to apply beyond the territorial waters and in the SFPZ, as the wording in

the treaty clearly states that the scope of the provision at sea is geographically restricted to areas within the territorial waters. The court established that there, in 1920, was a fairly uniform view of the territorial waters' character when the treaty was ratified, referring to several sources of law⁷. The court recognizes that there are different views on whether the treaty may or must be interpreted extensively to apply to the fishing zone or any economic zone that may be created. There is no evidence that suggests that the provisions of the Treaty regarding the rights of other nationals, including Article 2, had a different purpose than to guarantee *existing rights* as formulated by Churchill and Ulfstein (2010, p. 572):

«[...] the object and purpose of the Treaty relating to the rights of parties other than Norway, it was suggested, concerns the preservation of preexisting rights. Fishing and mining beyond the territorial sea were not preexisting rights under Svalbard's terra nullius regime»

Based on the court's conclusion regarding the scope of the treaty into the sea beyond the territorial limit of 12 nautical miles, it does not consider it necessary to conclude on whether or not Svalbard has its own continental shelf and in the case of where the border between Svalbard's continental shelf and the continental shelf of the continent would in this case be and then again which shelf the pots were actually put on. The court also found it beyond any reasonable doubt that both the captain and shipping company intentionally violated the current regulations (Øst-Finnmark Tingrett, 2017b).

Both the captain and SIA North Star were convicted of violation of the Marine Resource Act, § 61, cf. § 16 on the Regulations on the ban on catches of snow crab, to a penalty of NOK 40,000 and 150,000, respectively. In addition, the shipping company was sentenced to withstand an indemnification to the Norwegian state of NOK 1,000,000, an estimated value of the crabs captured in the pots.

⁷ THE COURT REFERRED TO THE WHITEMAN "TERRITORIAL SEA AND CONTIGUOUS ZONES" (DIGEST OF INTERNATIONAL LAW VOLUME 4), PAGES 2-4, INCLUDING THE MENTION OF THE HAGUE CODIFICATION CONFERENCE IN 1930, AIR NAVIGATION CONVENTION 1919, THE INTERNATIONAL CIVIL AVIATION CONVENTION 1944, THE SUPREME COURT OF CUNARD V. MELLON 1923 AND STATEMENT OF LORD CURZON TO THE HOUSE OF LORDS CONCERNING THE SUPREME COURT'S JUDGEMENT. FURTHER REFERENCE IS MADE TO THE COMMENTS "TO THE ARTICLES CONCERNING THE LAW OF THE SEA", YEARBOOK OF THE INTERNATIONAL LAW COMMISSION 1956 VOLUME II REPORT TO THE GENERAL ASSEMBLY, IN PARTICULAR THE COMMENT TO ARTICLE 1. LASTLY, IT IS REFERRED TO THE ENGLISH "TERRITORIAL WATERS JURISDICTION ACT" 1878, ARTICLE 7, AND CANCELLI-PROMEMORIA OF FEBRUARY 25TH 1812, ARTICLE 1.

Following the judgement from the district court, the captain and the shipping company appealed against the assessment of evidence and the application of law on the question of guilt to Hålogaland Court of Appeal. Appeal negotiations was held in Tromsø in mid-January, 2018. One of those who explained in court was Senior Researcher Jan H. Sundet from the IMR. Based on his explanation, the court of appeal finds that the snow crab does not possess physical or anatomical properties that allows it to lift itself up from the sea floor to swim. Thus, it was the court's decision that the crab can be identified as a sedentary species and concludes that no one can catch a snow crab on the Norwegian continental shelf without the express consent of the Norwegian authorities. The Court of Appeal upheld the verdict from the district court (Hålogaland lagmannsrett, 2018). The case is appealed to the Supreme Court, however, it is to this date not known whether or not the appeal is accepted (Schmidt, 2018).

In April 2018, the Latvian Prime Minister stated that “Riga will appeal to the European Court of Justice with a lawsuit against the European Commission regarding the Latvian Senator fishing vessel arrested in Norway”, as the government believes the Commission has not protected the interests of the member state in resolving the case (EurAsia Daily, 2018)

Discussion

The aim of this thesis has been to explore the governability of the snow crab in the Barents Sea. I aimed to identify the wicked problems connected to its governability, and to study what challenges occurs when a new resource is to be made manageable, in accordance with the Norwegian principles of fisheries management and international obligations and agreements. To gather all information on the subject, a governability assessment matrix was prepared in advance. In this chapter the findings will be discussed.

The assessment of the social SG showed that the diversity and the number of actors involved are limited, compared to other fisheries. The main actors are the commercially interests involved in the fishing activity for snow crab, and to some extent those involved in other fisheries such as e.g. the shrimp fishery. The interactions between governing authorities, scientists and fishermen has made the Norwegian fisheries management regime a well-functioning cooperation, with a successful coexistence and dialog providing a widely accepted management regime and advisory system. Current conflicts related to complexity in the SG are mainly linked to the use of areas and conflicting gear, where e.g. the pots from the crab fishery results in damages on shrimp trawls, and on the other side, trawls cause injuries on the crab. It is assumable that Norwegian fisheries authorities will introduce measures to reduce these conflicts, e.g. trough allocation or rotation of the areas between fishing vessels using different gear, as proposed by Gjosteland (2017). In the natural SG diet studies shows no major ecosystem impact inflicted by the crab, and studies indicate that it might even have a positive impact by serving as food for other species and strengthening the benthic coupling in the Barents. It is assumable, however, that impacts on ecosystem dynamics will become clearer in the future as the crab stock establishes fully in the Barents. The current management plan on snow crab establishes that the primary goal is sustainable harvest based on long-term maximization of yield and to minimize risk of undesirable ecosystem effects.

The GS within Norwegian boundaries is fairly diverse and extensive, meaning that the capacities to govern the SG are more than sufficient. The GS includes representation from all relevant stakeholder groups in the SG, both when it comes to scientifically advices, fishermen organizations and NGOs. This type of interaction contributes to a higher degree of governability, where all interests are as well taken care of as possible and helps ensure both sustainable utilization of resources and profitability in a socio-economical perspective. The

joint management of shared stocks between Norway and Russia also seems to work well, both when it comes to agreements on utilization and exchange of knowledge. In relation to dynamics, the main change within the GI was the decision to close the fishery, which is disputed by some scientists. The question is if the Norwegian authorities are in fact applying the precautionary approach when introducing TAC and restricting entrance to the fishery. These measures are considered necessary when stocks are in need of rebuilding, to reduce effort and increase profitability. The snow crab stock, however, is rapidly increasing and spreading across the Barents Sea continental shelf, and the closing could contribute to speeding up the spread even more without certain knowledge about the consequences. It can be argued that precaution, in this matter, would be to limit the pace of the spread to closely monitor changes in the ecosystem. Further, there are severe challenges on a higher scale, connected to the cooperation with the EU and its member states, more specifically, related to the interpretation of the Svalbard Treaty and whether or not the snow crab can be defined as a sedentary species.

Regarding the status of the crab, there seems to be a consensus that it is sedentary. However, as long as a thorough legal assessment has not been conducted, this consensus does not have much validity. The problem keeps reappearing. The definition “*organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil*” is so vague that it allows for different interpretations as long as a concrete classification is missing. It is noteworthy that the EU, although previously recognizing the sedentary status of the crab, continues to authorize licenses. This can only be understood as the EU being prepared to fight for the interests of its Member States, as they see an opportunity to challenge the existing regime in the Barents. The case of Juras Vilkas is primarily about whether the status of the snow crab as a sedentary species gives Norway the right to exclude other countries from fishing in the Loophole, ascertained through UNCLOS, or if the NEAFC Convention outplays this exclusive right. The case of Senator adds to the polarization within the GS by challenging the current interpretation of the Svalbard Treaty provision on equal treatment.

As the Svalbard Treaty approaches its 100th anniversary, conflicts have arisen on the subject of its range. Many of the signatories argue that as international law of the sea has evolved, so should the treaty. In the 100 years that has passed, new regulations have been established

through international conventions, providing the coastal states extended rights. These include the right to establish a 200-mile EEZ and the sovereign right to utilize resources on the respective continental shelf. In 1920, the only regulation on coastal states rights to the marine space was the territorial waters, which is included in the treaty. The question is: what was the initial intention? Some argue that if today's regulations on shelf rights and EEZs existed then, it would have been included, and thus the treaty may or must be interpreted extensively to apply to the SFPZ or any economic zone that may be created. Others argue that the intention of the treaty was simply to secure the preexisting rights under the terra nullius regime. There seem to be a paradox in the Svalbard Treaty, where Norway is given the "full and absolute sovereignty" over Svalbard, while it at the same time promises "equal enjoyment and access" to the signatories. The case of the vessel *Senator* might be the first case where the supreme court once and for all have to address and establish the treaty's application. It is clear that the ongoing trials is a way of challenging the existing regime in the SFPZ and continental shelf of Svalbard. In addition to concerning the valuable snow crab, the conflict further involves the fight for even more valuable resources: oil, gas and other minerals. It is further expected that climate change will lead to changes in the Arctic and reveal new resources. The snow crab conflict can be seen as an experiment which will set the standard for what will happen further. Perhaps is it not governability that is low, but the willingness to be governed.

We are inevitable moving towards some kind of management regime for the snow crab in the Barents, however, the wickedness within this issue proposes outcomes that can not please all stakeholders. Norway could continue its one-sided track, declaring exclusive rights over the continental shelf stretching past Svalbard. This will result in, as it has already, objections from other states that do not agree with Norway and may end with major consequences for Norway's diplomatic relationships. It is, however, not likely that Norway will choose to accept an extended application of the Svalbard Treaty, which includes rights to the continental shelf and its resources. One possible outcome is that Norway and the EU try to solve the problem with a temporary solution, as with the lobster-case between France and Brazil in 1963. In that case, it will in all probability be subject to the provisional resolution that this does not provide any guidance on future outcomes.

1.10 Summary and concluding thoughts

There are uncertainties connected to the SG, as both the natural and the social parts of the SG are under development. The current conflicts related the social SG seems resolvable and are not considered wicked. Further, the knowledge on the snow crabs impact on the natural SG is limited and makes governance outcomes uncertain, however, they seem to be considered subordinate with regards to the current and more pressing conflicts within the GS. Before a complete management regime can be implemented, the challenges related to the institutional framework of the GS must be clarified. The Norwegian judicial system has concluded that the crab is sedentary, and it appears that there is a consensus on this, both among scientists and politicians. It is likely that the case of the Latvian vessel Senator will be tried before the Supreme Court. In that case, the Supreme Court may, for the first time, have to decide on the application of the Svalbard Treaty. The conflict related to the interpretation of the Svalbard Treaty constitutes a problem that is highly wicked. Its intended meaning is perceived in different ways by the different stakeholders, and there seem to be no right or wrong solution to the problem that could fulfill all stakeholder needs and wishes. Technically everything is in place, but there are disagreements related to the regime itself. All though the Norwegian authorities have a clear perception of the state's rights, the disagreements add limitations on maneuverability. A rapid progress will in all probability be perceived as provocative. The challenges related to scale should, according to the theory of interactive governance, be met with caution. It is clear that governability at this point is somewhat limited by political interactions – or simply, the will to be governed is limited.

References

- Anisimov, O. A., Vaughan, D. G., Callaghan, T. V., Furgal, C., Marchant, H., Prowse, T. D., . . . Walsh, J. E. (2007). Polar regions (arctic and antarctic). *Climate change*, 15, 653-685.
- Armstrong, C. W., Eide, A., Flaaten, O., Heen, K., & Kaspersen, I. W. (2014). Rebuilding the Northeast Arctic Cod Fisheries—Economic and Social Issues. *Arctic Review*, 5(1).
- Benjaminsen, C. (2015). Snøkrabbe kan bli en stor eksportvare for Norge. Retrieved from <http://forskning.no/2015/04/snokrabbe-kan-bli-en-eksport-vinner> Accessed 29.11. 2016
- Blanchard, J. L. (2015). Climate change: A rewired food web. *Nature*, 527, 173-174.
doi:doi:10.1038/nature16311
- Bologaro, K. (2017). Oil lurks beneath EU-Norway snow crab clash. Retrieved from <https://www.politico.eu/article/of-crustaceans-and-oil-the-case-of-the-snow-crab-on-svalbard/> Accessed May 12th 2018
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*, 9(2), 27-40.
- Chabot, D., Sainte-Marie, B., Briand, K., & Hanson, J. M. (2008). Atlantic cod and snow crab predator–prey size relationship in the Gulf of St. Lawrence, Canada. *Marine Ecology Progress Series*, 363, 227-240.
- Chuenpagdee, R., & Jentoft, S. (2009). Governability assessment for fisheries and coastal systems: A reality check. *Human Ecology*, 37(1), 109-120.
- Chuenpagdee, R., & Jentoft, S. (2013). Assessing Governability – What’s Next. *Governability of Fisheries and Aquaculture: Theory and Applications*, 335-349. doi:10.1007/978-94-007-6107-0_18
- Chuenpagdee, R., Kooiman, J., & Pullin, R. (2008). Assessing governability in capture fisheries, aquaculture and coastal zones. *The Journal of Transdisciplinary Environmental Studies*, 7(1), 1-20.
- Churchill, R., & Ulfstein, G. (2010). The disputed maritime zones around Svalbard *Changes in the Arctic Environment and the Law of the Sea* (pp. 551-594): Brill.
- Dictionary.com. (n.d.). Sedentary. Retrieved from <http://www.dictionary.com/browse/sedentary> Accessed 22. April 2018
- Dvoretzky, A. G., & Dvoretzky, V. G. (2015). Commercial fish and shellfish in the Barents Sea: Have introduced crab species affected the population trajectories of commercial fish? *Reviews in Fish Biology and Fisheries*, 25(2), 297-322.
- EurAsia Daily. (2018). Latvia to sue Norway on arrested fishing vessel. *EurAsia Daily*,. Retrieved from <https://eadaily.com/en/news/2018/04/26/latvia-to-sue-norway-on-arrested-fishing-vessel> Accessed April 28th, 2018 Access 2018
- Evans, L. (2015). *Snow Crab Fisheries in the NEAFC Regulatory Area*. Brussels: Politico Retrieved from <https://www.politico.eu/wp-content/uploads/2017/06/SPOLITICO-17061514340.pdf>.
- Fenstad, A. (2016, 21.09.2016). EU med krav om snøkrabbe i Svalbardsonen. *Fiskeribladet Fiskaren*,, p. 6. 2016
- Fife, R. E. (2007). *Folkerettslige spørsmål i tilknytning til Svalbard*. Oslo: Utenriksdepartementet.

- Fiskeri- og kystdepartementet. (2011). Norsk fiskeriforvaltning.
- Food and Agriculture Organization of the United Nations. (2016). *The state of world fisheries and aquaculture*. Rome: Food and Agriculture Organization of the United Nations.
- Forskrift om fiskevernsoner ved Svalbard, (1977).
- Forskrift om forbud mot fangst av snøkrabbe,, (2015).
- Franceschetti, D. R. (2017). *Principles of Scientific Research*. Ipswich, Massachusetts: Salem Press.
- Gjesteland, H. M. (2017). *Beskrivelse av skadeomfanget på snøkrabbe (Chionoecetes opilio) ved interaksjon med bunntål i Barentshavet*. UiT The Arctic University of Norway.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York, USA: Aldine de Gruyter.
- Government of Canada. (2016). Northwest Atlantic Fisheries Organization. Retrieved from http://www.dfo-mpo.gc.ca/international/media/bk_nafo-opano-eng.htm Accessed 21. April 2018
- Groenning, R. (2017). The Norwegian Svalbard Policy – Respected or Contested? Retrieved from <https://www.thearcticinstitute.org/norwegian-svalbard-policy-respected-contested/> Accessed 1. April 2018
- Gullestad, P., Aglen, A., Bjordal, Å., Blom, G., Johansen, S., Krog, J., . . . Røttingen, I. (2014). Changing attitudes 1970–2012: evolution of the Norwegian management framework to prevent overfishing and to secure long-term sustainability. *ICES Journal of Marine Science*, 71(2), 173-182. doi:10.1093/icesjms/fst094
- Hålogaland lagmannsrett. (2018). LH-2017-144441. Retrieved from <https://lovdata.no/dokument/LHSTR/avgjorelse/lh-2017-144441>.
- Hansen, H. S. B. (2015). *Snow crab (Chionoecetes opilio) in the Barents Sea. Diet, biology and management*.
- Hansen, H. S. B. (2016). Three major challenges in managing non-native sedentary Barents Sea snow crab (*Chionoecetes opilio*). *Marine Policy*, 71, 38-43.
- Hvingel, C., Hansen, C., & Holte, B. (2015). Snøkrabben spiser den maten fisken ikke finner. Retrieved from <https://forskning.no/meninger/kronikk/2015/05/snokrabben-skurk-eller-nyttig-mellommann> Accessed March 13th 2018
- Hvingel, C., Sundet, J. H., & Hjelset, A. M. (2017). *Snøkrabbe i norsk forvaltningszone - Biologisk rådgivning 2017*. Retrieved from www.imr.no: https://www.imr.no/nyhetsarkiv/2017/april/har_gjeve_det_forste_snokrabberadet/les_heile_radet/radgivning_snokrabbe_2017_final.pdf/nb-no
- ICES. (2016). *Final Report of the Working Group on the Integrated Assessments of the Barents Sea (WGIBAR)* Retrieved from Murmansk: <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEA/2016/WGIBAR/WGIBAR%20FINAL.pdf>
- Jentoft, S. (2007). Limits of governability: Institutional implications for fisheries and coastal governance. *Marine Policy*, 31(4), 360-370. doi:10.1016/j.marpol.2006.11.003
- Jentoft, S., & Chuenpagdee, R. (2009). Fisheries and coastal governance as a wicked problem. *Marine Policy*, 33(4), 553-560.

- Johnsen, J. P. (2014). Is fisheries governance possible? *Fish and Fisheries*, 15(3), 428-444.
- Joint Norwegian-Russian Fisheries Commission. (2015). *Protocol for the the 45th session of the joint Norwegian-Russian Fisheries Commission (Protokoll for den 45. sesjon i den blandete norsk-russiske fiskerikommisjon)*. Retrieved from <https://www.regjeringen.no/contentassets/29188fd766734f7984c5220e8c2b2973/protokoll-45--sesjon.pdf>.
- Joint Norwegian-Russian Fisheries Commission. (n.d.). Regulations. Retrieved from <http://www.jointfish.com/eng/REGULATIONS> Accessed 21.09. 2017
- Jørgensen, L. L., & Spiridonov, V. (2013). Effect from the king-and snow crab on Barents Sea benthos. Results and conclusions from the Norwegian-Russian Workshop in Tromsø 2010.
- Kaiser, B., Kourantidou, M., & Fernandez, L. (2017). *A Case for the Commons: The Snow Crab in the Barents*. Paper presented at the XXIII Conference of the European Association of Fisheries Economists (EAFE).
- Kooiman, J., & Bavinck, M. (2013). Theorizing governability–The interactive governance perspective *Governability of fisheries and aquaculture* (pp. 9-30): Springer.
- Kooiman, J., Bavinck, M., Chuenpagdee, R., Mahon, R., & Pullin, R. (2008). Interactive Governance and Governability: An Introduction *The Journal of Transdisciplinary Environmental Studies*, vol. 7(1).
- Kooiman, J., Bavinck, M., Jentoft, S., & Pullin, R. (2005). *Fish for life: interactive governance for fisheries*: Amsterdam university press.
- Lieungh, E. (2017). Advarer EU mot å gi tillatelser til utenlandske krabbefiskere,. *NRK*. Retrieved from <https://www.nrk.no/finnmark/advarer-eu-mot-a-gi-tillatelser-til-utenlandske-krabbefiskere-1.13811270> 2017
- Ikirodah, B. B. O. (2005). The Legal Regime of the Continental Shelf, its Economic Importance and the Vast Natural Resources of a Coastal State. *Journal of Energy & Natural Resources Law*, 23(1), 15-35.
- Lorentzen, G., Voldnes, G., Whitaker, R. D., Kvalvik, I., Vang, B., Gjerp Solstad, R., . . . Siikavuopio, S. I. (2018). Current Status of the Red King Crab (*Paralithodes camtchaticus*) and Snow Crab (*Chionoecetes opilio*) Industries in Norway. *Reviews in Fisheries Science & Aquaculture*, 26(1), 42-54.
- McBride, M. M., Hansen, J. R., Korneev, O., & Titov, O. (2013). *Joint Norwegian-Russian environmental status 2013. Report on the Barents Sea Ecosystem. Short version*. Retrieved from <https://brage.bibsys.no/xmlui/bitstream/handle/11250/2373684/1/Kortrapport34.pdf>
- Ministry of Foreign Affairs. (2014, 2007-02-06). Kontinentalsokkelen: Spørsmål og svar. Retrieved from <https://www.regjeringen.no/no/tema/utenrikssaker/folkerett/kontinentalsokkelen-sporsmal-og-svar/id448309/> Accessed 29.11. 2016
- Ministry of Justice and Public Security. (2015-2016). *Svalbard* (Meld. St. 32 (2015–2016)). Retrieved from Oslo:
- Mossop, J. (2007). Protecting Marine Biodiversity on the Continental Shelf beyond 200 nautical miles. *Ocean Development & International Law*, 38(3), 283-304.
- Nærings- og fiskeridepartementet. (2014a). Fiskerisamarbeidet med EU. Retrieved from <https://www.regjeringen.no/no/tema/mat-fiske-og-landbruk/fiskeri-og-havbruk/ny->

- [sidestruktur/fiskeri-og-havbruk-ny/forste-kolonne/fiskeri-ny/rydde-internasjonalt/fiskerisamarbeidet-med-eu/id437333/](https://www.regjeringen.no/no/dokumenter/Horing-forvaltning-av-snokrabbe/id2009299/) Accessed May 10th, 2018
- Nærings- og fiskeridepartementet. (2014b). Høring - forvaltning av snøkrabbe [Press release]. Retrieved from <https://www.regjeringen.no/no/dokumenter/Horing-forvaltning-av-snokrabbe/id2009299/>
- Nærings- og fiskeridepartementet. (2017a). Endrer regulering av snøkrabbefangst - Plan for forvaltning av snøkrabbe på norsk kontinentalsokkel [Press release]. Retrieved from <https://www.regjeringen.no/no/aktuelt/ender-regulering-av-snokrabbe/id2564252/>
- Nærings- og fiskeridepartementet. (2017b). Har fastsatt snøkrabbekvote [Press release]. Retrieved from <https://www.regjeringen.no/no/aktuelt/har-fastsatt-snokrabbe/id2557952/>
- Nærings- og fiskeridepartementet. (2017c). Snøkrabbe-kvote i 2018 [Press release]. Retrieved from <https://www.regjeringen.no/no/aktuelt/snokrabbe-kvote-i-2018/id2582483/>
- Nærings- og fiskeridepartementet. (2017). *Noregs fiskeriavtaler for 2017 og fisket etter avtalene i 2015 og 2016* (Meld. St. 28, 2016-2017). Retrieved from Oslo:
- Norges Råfisklag. (2017). Statistikkbank. Retrieved from <http://www.rafisklaget.no/portal/page/portal/NR/PrisogStatistikk/Statistikkbank>
- Norskpetroleum.no. (2018). Activity per sea area. Retrieved from <https://www.norskpetroleum.no/en/developments-and-operations/activity-per-sea-area/#barents-sea> Accessed April 22nd 2018
- Øst-Finnmark Tingrett. (2017a). *16-127201MED-OSFI*. Retrieved from https://www.stortinget.no/globalassets/pdf/eu_open/Snokrabbe_16_127201MED_OSFI_ulovlig_fiske.pdf.
- Øst-Finnmark Tingrett. (2017b). *TOSFI-2017-57396*. Lovdata Retrieved from <https://lovdata.no/dokument/TRSTR/avgjorelse/tosfi-2017-57396?q=snow%20crab>.
- Pinfold, G. (2006). *Overview of the Atlantic Snow Crab industry*. Retrieved from http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/reports-rapports/sc-cn_e.pdf
- Rhodes, R. A. W. (1996). The New Governance: Governing without Government. *Political Studies*, 44(4), 652-667. doi:10.1111/j.1467-9248.1996.tb01747.x
- Samuelsen, G., & Lieungh, E. (2017, April 3rd). Frykter halvering av fangst av snøkrabbe i Barentshavet. *NRK.no*. Retrieved from <https://www.nrk.no/finnmark/frykter-halvering-av-fangst-av-snokrabbe-i-barentshavet-1.13459153> 2017
- Sandberg, P., & Søreide, I. E. (2018). Snøkrabbe og tjuvfiske på norsk sokkel. Retrieved April 24st, 2018, from Nordlys.no <http://nordnorskdebatt.no/article/snokrabbe-tjuvfiske-pa-norsk>
- Schmidt, N. (2018). Saken om snøkrabbene: «Kanskje den viktigste konstitusjonelle saken i vår rettshistorie». *Advokatbladet.no*. Accessed May 9th, 2018
- Song, A. M., Johnsen, J. P., & Morrison, T. H. (2017). Reconstructing governability: How fisheries are made governable. *Fish and Fisheries*, 19(2), 377-389.
- Store Norske Leksikon. (2014). Barentshavet. Retrieved from <https://snl.no/Barentshavet> Accessed Sept 19th 2017

- Sundet, J. H. (2015). The snow crab – a new and important player in the Barents Sea ecosystem. *Fram Forum*, 2015.
- Svalbard Museum. (n.d.). The Svalbard Treaty. Retrieved from <http://svalbardmuseum.no/en/kultur-og-historie/svalbardtraktaten/> Accessed 5. April 2018
- The Barents Euro-Arctic Council. (n.d.). Climate change and the Barents region. Retrieved from <http://www.beac.st/en/About/Barents-region/Climate-Change> Accessed 29.11. 2016
- The European Union. (2018). *2018 EU total allowable catches in the Atlantic and North Sea*. Brussel: The European Union, Retrieved from <http://www.consilium.europa.eu/media/32288/final-table-rev.pdf>.
- The Supreme Court of Norway. (2017). *HR-2017-2257-A*. Retrieved from <https://www.domstol.no/globalassets/upload/hret/decisions-in-english-translation/hr-2017-2257-a-snow-crab.pdf>.
- The Svalbard Treaty. (1920). Traktat mellem Norge, Amerikas Forente Stater, Danmark, Frankrike, Italia, Japan, Nederlandene, Storbritannia og Irland og de britiske oversjøiske besiddelser og Sverige angående Spitsbergen [Svalbardtraktaten]. Retrieved from <https://lovdata.no/dokument/NL/lov/1920-02-09> Accessed 5. April 2018
- United Nations. (2013). United Nations Convention on the Law of the Sea of 10 December 1982. Retrieved from http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm Accessed 26.09. 2017
- Winger, P. D., Legge, G., Batten, C., & Bishop, G. (2015). Evaluating potential biodegradable twines for use in the snow crab fishery off Newfoundland and Labrador. *Fisheries research*, 161, 21-23.
- Young, R. (1961). Sedentary Fisheries and the Convention on the Continental Shelf. *American Journal of International Law*, 55(2), 359-373.