NORDIC FISHERIES IN TRANSITION

– future challenges to
management and
recruitment

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Jeppe Høst and Jens Christiansen

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Summary

In this publication we present two reports concerned with the transition of Nordic fisheries. The underlying research has been conducted in preparation for the conference on the coming challenges to Nordic fisheries organised by Nordic Marine Think Tank in 2018. The conference theme is particularly focused on understanding the use of market-based fisheries management systems, and to discuss the lessons learned from those Nordic countries that have an experience in their implementation and to better understand their effects on fishing communities, fishing fleets, revenues and the returns to society.

Nordic fisheries in Nordic societies

In the report “Nordic fisheries in Nordic societies” we explore the role of market-based fisheries management in the current transformation of Nordic fisheries and societies. With the recent inclusion of Finland, all Nordic countries have implemented variants of market-based fisheries management. In all countries these management systems are accompanied with lively debates that mirrors the social implications of individual and transferable quotas. Market-based fisheries management surely have its advocates and opponents and across the Nordic countries a range of topics are repeatedly discussed concerning small and large-scale fisheries, regional balances and the legitimacy of the concentration of quotas and wealth. The report addresses the questions of market segmentation, regional balances, concentration, resource rent taxation and governance through looking at the Nordic experiences with market-based fisheries management.

Coming from a historical situation dominated by owner-operated fishing units closely connected to their supporting communities, market-based fisheries management plays a role in promoting company-organised fishing units, non-fisher ownership and new social relations. Introducing market-mechanisms to distribute the limited marine resources is therefore not just a change in the technical regulation. It is an active engagement in social change and in that regard the report raises a series of questions for policy makers:

- What are the current and future role of “active owners”?
- Should future policies abandon the legislative protection of “active owners” and what will be the consequences of this for social legitimacy and working conditions?

- Should national protection of resource ownership be (further) deregulated if this can increase future competitiveness?
- What are the key elements to provide long term stability and avoid political turmoil as well as shifting policies in the future?

From school to skipper

The report “From School to Skipper” explores the relation between education, training and recruitment in the fisheries sectors in Norway, Denmark and Iceland. The work is based on studies in Norway, Denmark and Iceland but the findings are reviewed in a Nordic context. In particular, the study discusses the design and impact of different market-based fisheries management systems on the labour market and aims to outline more general trends in the industry that have implications for future recruitment. Under which conditions – and with which hopes and dreams – will young people be able to enter the fishing sectors in the coming years?

Education and training for the fishing fleet is increasingly formal and the trends are towards specialisation and advanced certification of the labour force. However, at the same time, deskilling can occur in certain positions and there is an increased competition for the “good jobs”. The report argues that while some life-modes are thriving under the new conditions (especially hired and highly skilled fishers) other ways of life as independent owners are faced with increasing barriers.

Part 1: Nordic fisheries in Nordic societies

1. Introduction

This report explores the role of market-based fisheries management in the current transformation of Nordic fisheries and societies. The main focus of this report is on the social dynamics and social aspects of fisheries management. Based on a review of the Nordic experiences with quota markets and quota transferability, the report examines and discusses some of the changing relations between fishers, management, fishing sector and society. Throughout its history, Nordic fisheries have been dynamic and developed through the use of changing technologies and through internal competition and cooperation. Similarly, the fishing sector's relation to state and society has been changing – shifting in the recent century from a state focus on economic expansion over a focus on scientific resource conservation to the current focus on economic performance.

Market-based fisheries management?

In this report we use the term *market-based fisheries management* to explore the effects of market mechanisms in the allocation and distribution of fishing rights. Market-based fisheries management as a term therefore covers a wide range of instruments that all have introduced some kind of transferability in order for market mechanisms to facilitate the distribution of quota and fishing rights. In one end there are systems with a high degree of transferability, where quota and vessel can be traded individually and where quota shares can be split in quantity and species. In the other end we have systems where vessel and quota are linked together, and where the fishing right is an indivisible bundle of quotas for different species. In between we can observe multiple combinations that are designed with specific national objectives in mind.

The questions raised here is, in a social perspective, which influence the introduction of market-based fisheries management have had in shaping Nordic fisheries? Why have individual and transferable quotas been so disputed and how do they change the internal dynamics of the sector?

Understanding this will inform debates and conversations on the use of market mechanisms in the distribution of fishing rights. Civil servants, producer and fishermen's organisations, politicians, fishers and the public all have an interest in a stable and adaptive fisheries management – and in a sound debate on the pros and cons of market-based fisheries management. The findings in this report are illuminating regarding the different ways to balance policy objectives in each Nordic country. The main points in the report are:

- All Nordic countries with market-based fisheries management have lively discussions on the legitimacy and distribution of fishing rights;
- We observe an increase in the application of market-based quota instruments, but also a tendency to reopen policies and “soften” the reach and impacts of market mechanisms. We propose to see the latter as part of a general scepticism of centralised economic planning and that striking the right balance is crucial to the stability of the property rights and related investments;
- In order to sustain coastal and small-scale fisheries, a pronounced objective in most countries, strong market segmentation (i.e. dividing the market for fishing rights according to vessel sizes) and supplementing instruments (i.e. open groups) are the most effective instruments;
- In most countries debates are concerned with the regional impacts and two economic logics seem to collide, resulting in a recurrent tension between company profitability in the primary sector and a wider regional distribution of the fisheries related value chains (catching and processing). This tension can, in many cases, be traced into the ministerial departments and their differing objectives;
- The social patterns around Nordic fisheries are changing due to the combination of decline in employment, increase in scale, concentration of rights and introduction of advanced technologies. Nordic fisheries have become less “local” and less embedded in coastal communities as a central contributor and recruiter. In relation to this social change we see two policy tendencies. One is the application of resource rent taxation. The other is the implementation of safeguards and supplementing instruments in order to actively support regional economies or small-scale fisheries.

In the report we explore how market-based quota allocation systems contribute to a change in the basic social organisation of most Nordic fisheries and introduce new property relations. In this context, company and investor ownership and hired fishers constitute the thriving social organisation at the expense of independent owner-operated fishing units. This change and the resistance it produces, we claim, is central to understanding the current transformation and conflicts in Nordic fisheries.

Chapter 2 discusses the above points from a sociological perspective and explores the fisheries’ relations to society and coastal communities and vice versa. In Chapter 3, we explore the more technical and managerial aspects, focusing on Nordic experiences with safeguards and policy design. Across the Nordic countries we look at the relation between small and large-scale fisheries, regional safeguards, concentration limits and resource rent taxation. In Chapter 4, the introduction and use of market-based instruments in each Nordic country is described country by country, including short introductions to the national debates and controversies.

1.1 Methodology

This report supplements and draws on earlier work made through Nordic cooperation, most notably the reports on coastal fisheries in the North Atlantic (2015) and the review of Nordic experiences of fisheries management from 2009 (Mandag Morgen, 1998; Nordisk Ministerråd, 1993, 2009; Viðarsson *et al.*, 2015). However, in this report the starting point is in the social aspects of market-based fisheries management and the report offers social anthropological perspectives on the controversies, debates and social tensions in Nordic fisheries – specifically concerning market-based fisheries management. Our analytical starting point is in the policies and instruments, but we include the social relations of quota owners, self-employed fishers, hired fishers, communities and the public in our perspective. In doing so, we implicitly take for granted that the use of market mechanisms in quota allocation processes have proved their worth as a powerful policy instrument for restructuring and realigning otherwise malfunctioning fishing sectors. Similarly, we assume that the Nordic countries have sound and properly working biological advice and management. Rather, our interest is to ask what kind of social development is instituted and what kind of resource use is promoted by the introduction of market-based fisheries management.

As mentioned, this report discusses the societal aspects of market-based fisheries management and is based on a policy analysis supplemented by interviews with key stakeholders, research literature, supplementing policy papers as well as media documents. While focusing on market-based fisheries management, the report will review a range of the current controversies and debates to establish a general understanding of the conflicting interests and diverging lines in Nordic fisheries and how these relate to the technical management.

To facilitate this examination, we have applied both a historical perspective as well as an understanding of society as heterogenous and consisting of different social groups. This means, first of all, that former legislation, institutions and values in the fishing sector are rooted in historical compromises between different wills as well as in the joint interests between a wide group of stakeholders. Market-based fisheries management is therefore imposed in a social field marked by already existing relations between crew, boat owners, communities, fish buyers, investors and the state, among others.

Secondly, our approach implies that the fishing sector is not understood as consisting of “fishers”, but of different groups of fishers, each group with their distinct way of life, each having their distinct conditions and demands. While these groups can have common traits and aspirations in some areas, the introduction of a new policy will most often affect these groups differently. As a consequence, we cannot impose one specific logic on all the agents in the fishing sector, nor can we give easy directions or a quick fix to solve the existing conflicts. We can, however, point at some underlying tensions, principles and practices that can guide the future policy process

2. Conflicts and controversies in Nordic fisheries

The introduction of market mechanisms to tackle the allocation of limited fishing rights can be seen as a global trend. In this chapter we review some of the Nordic experiences of market-based fisheries management seen from a *social perspective*. Fisheries management is related to the biological and economic management of fisheries, but also have various implications for different social groups, social relations and for individual career patterns. In particular, market-based fisheries management has been implemented in many ways and with very different objectives in the Nordic countries. In this chapter we look at themes across the Nordic countries, while the following chapters will provide insights into the more technical aspects of market-based fisheries policies. The main quest is to reach an overall understanding of the current reforms and transformations of the Nordic fisheries and the opposition that can be empirically witnessed. In some way or another, these debates, controversies and conflicts relate to the question of the legitimacy of market-based instruments.

2.1 Main findings

A look at the Nordic experiences reveal that market-based instruments in fisheries management are disputed and the principal legitimacy is often debated. At the same time, there can be widespread industry support and overall, market-based management methods have improved the overall economic performance in the fisheries. Still, in the public, in communities, in parliaments as well as in academia, opinions on quota trade are often very divided (see for example Holm, Raakjær, Jacobsen, & Henriksen, 2015).

The main points in this chapter are:

- *Legitimacy*: All Nordic countries with market-based fisheries management also have intense debates and controversies on the distribution of rights and concentration of ownership. Even though the support for quota markets and individual quota rights in general is increasing in the sector, there is nothing to suggest this tension will disappear. On the contrary, recent political developments give rise to renewed debates regarding the purpose of fisheries management. In several countries, changes have been recently made to “soften” the effects of market mechanisms;
- *Balanced alternatives*: The introduction and mainstreaming of market instruments in Nordic fisheries should be understood in relation to the state demands for

increased profitability and international competitiveness. However, as in other sectors, there is increasing popular opposition to this model of economic development and balanced alternatives should be better explored. One of the main tensions in Nordic fisheries – especially in fisheries dependent countries – is between (export oriented) profitability and more regionally diverse economic strategies. Seen from the individual and/or community perspective, national economic gains do not compensate for the local loss of opportunities (even though it might do so in an abstract sense through for example taxes);

- *Social change*: In general Nordic fisheries have grown out of a fishing tradition with owner-operated units based on a common access to the resource. The political and social characteristics of the fishing sector have been shaped in this context valuing free and equal access to the resource, local cooperation on land and competition on the sea. In many instances legal structures and tax subsidies were put in place to protect and promote this owner-operated and share-based form of life. The introduction of market based economic instruments therefore represents a paradigmatic change of the social and productive base. As a consequence, the introduction of market-based fisheries induces social change promoting new individual logics and social relations;
- *Social diversity*: In many instances the public and political support for locally based small-scale fisheries is not converted into policy action. In practice, the intention to include social sustainability in policy reforms is often sacrificed on the expense of economic and ecological objectives. This might partly be caused by a limited understanding of the social complexity in the Nordic fisheries sectors, or because the fundamental relation between the social organisation and the property system have been disregarded in the policy reforms, subjected to the overarching economic imperative that has aggregate growth and efficiency as its aim. We find that alternatives to large-scale fisheries are still attractive to youngsters if the right policy design allow for the different business models to co-exists. Further, the large-scale fisheries that are promoted by deregulated quota markets risk promoting a form of wage-work that are only temporary attractive (for youngsters or migrant laborers).

2.2 Market-based fisheries management in the Nordic countries

With the recent inclusion of Finland, market-based fisheries management methods have been introduced in all of the Nordic countries. In the first phase, exemplified by the Icelandic herring fisheries in the 1970s and reaching into the early 1990s, the allocation of individual and later transferable fishing rights to the vessels was based on a combination of environmental concern and economic considerations. It was the combination of a resource crisis, poor economic performance and the subsequent distribution problems that gave room for market mechanisms in quota allocations. In this first phase, operators were sceptical and divided on the issue and the introduction of individual quota and transferability was often seen as a temporary

solution. This is the case for the first Icelandic systems (for herring in 1979) as for the first Norwegian trials (1990). These were all motivated by a combination of severe resource decline, some sort of licensing (and closure for new entrants) and the subsequent distribution issues.

In a market-based system the operators can increase their share by purchasing quota shares from other operators. In theory, the catching capacity is therefore (without state intervention) better matched with the available resource. As a result, the constant lobbyist pressure from the sector for higher fish quotas, state intervention and subsidies are somewhat reduced. Market-based fisheries management have been introduced in most Nordic countries, step by step, and are now a common aspect of Nordic fisheries management.

In a second phase, from the early 1990s and until recently, economic motivations alone were the main driver for market-based fisheries management. This is the case with the Greenlandic shrimp ITQs in 1990, the Faroese ITQ system from 1994 (which were quickly replaced with *days at sea system* in 1996), the Danish trials with pelagic and demersal ITQs from 2003 and 2007 as well as the Swedish ITQ system in the pelagic fisheries from 2009. The mainstreaming and expansion of the Icelandic ITQ system in 1990 was also strongly based on economic motives. The shift between the two phases should probably be understood as part of a general change in the state administrations focus on economic performance, as well as on the background that the resource situation was coming under better control and the main issue arising was the individual economic performance.

However, there are also exceptions to the reforms in this period. Despite vast changes, the Norwegian Structural Quota System kept a strong focus on regional distribution and this was also partly the ambitions with the Swedish introduction of market mechanisms in 2009 and 2017. The latter example, including Finland in 2017, can, perhaps, be seen as part of an emerging third phase where different objectives are increasingly balanced through regulated quota markets and the complimenting management instruments. Recent changes to the Danish, Icelandic, Faroese and perhaps soon also the Greenlandic systems also point in this direction – a “softening” of market mechanisms.

In all of the Nordic cases reviewed for this report, the transferable quota has been allocated to the vessel for free and most often based on historical catches or activity. This makes sense since most of the introductions of transferable quotas have been concerned with improving the economic situation in the sector. Auctioning rights to existing operators or new ones have therefore made little sense at the time. The reference to recent historical activity in the allocation process ensures that the quotas are assigned to the active vessels. However, the original “gifting” is an often-debated point and is often mitigated by setting a time duration on the allocation. What will happen at the end of the set time period is often left open, and in most cases the existing allocations have simply been renewed. Similarly, the legal status of allocated quotas is subject to debate and questions are raised whether the quota right can be regarded as private property or ultimately as state property. The challenge is to find a

balance between long-term stability for the quota holder and the ability for the state to change or revoke quota rights.

Market-based fisheries management is increasingly being applied and mainstreamed in the Nordic countries. Still, most of the Nordic countries are experiencing debates and controversies concerning the fish resources and distribution systems (see box). In some Nordic countries fisheries issues are crucial in elections and to the political parties, while in other Nordic countries it can be a minor political theme. However, the recent debates in Sweden and Denmark indicate that the principal questions are still important to the public and can cause political turmoil, even in countries where fisheries are of minor importance.

Debate and controversies in Nordic fisheries

Most Nordic countries have discussions on the consequences of market-based quota systems and are currently in the process of redesigning fisheries policies:

- Greenland are currently negotiating a new fisheries act which could include a partial redistribution of quota rights;
- In Iceland the newly formed government announced to look at resource rent taxation and increase the support for coastal fisheries;
- The Faroese government are currently introducing fundamental changes to the distribution of quotas including auctioning and a “development quota”;
- The Norwegian coastal quotas which run to 2027 are currently being evaluated and potential redesigns will be discussed by the Norwegian Parliament;
- Denmark is limiting quota concentration and improving conditions in the coastal fisheries;
- In Sweden the regional effects of pelagic ITQs and individual demersal quotas with annual leasing are currently being discussed.

See further each country description in Chapter 4.

Even though individual and transferable quota have proven to be a powerful tool to solve the complex distribution issues, they are clearly not a quick fix to all fisheries related problems. The Nordic debates revolve around central themes such as the principles of resource ownership, the balance between small and large-scale fisheries, regional distribution, concentration of wealth and quotas as well as the taxation of the benefits derived from privatisation. In the sections below, we will examine the background for some of these controversies and dividing lines in Nordic fisheries.

2.3 Historical traits and social change

The first point to be examined here, is how market-based allocation systems induce and relate to social change. A part of this is a new overall relation between the state and the fishing sector. Historically, reforms and state induced changes have been crucial in shaping and modernising Nordic fisheries. Throughout the 20th century,

government support, subsidies and tax exemptions have been given to help the fishing sectors transform and adapt to modern fish gear such as nylon, hydraulics and new fish finding techniques. In some places, the development of modern fisheries has been entrenched in independence and nation building efforts (most notably in Greenland, Iceland and the Faroe Islands). In other countries, as for instance Norway and Denmark, fishing has been important to secure an even and stable regional and rural development. In most cases, state regulation of access, subsidies and tax discounts have contributed to the growth and development of the catching capacity and the related processing industries.

Retrospectively, it is easy to see the problematic combination of technological development, public subsidies and the open-access character of the Nordic fisheries and connect this to the subsequent crisis. But at the time, there was only a slowly growing awareness of the coming resource scarcity. Instead, in many places, the free and equal access to the resource was the foundation of a profession of fishers seeing themselves as free, entrepreneurial and independent and who were actively supported by the state and protected by a legal framework that guarded their collective and individual way of living. Formed over time by the conditions of the ocean, fishing technology and the social organisation, Nordic fisheries have developed through specific traits and virtues.

2.3.1 *Uniting against passive ownership*

With some exceptions, the share-based organisation has been central to Nordic fisheries. Through share organisation fishers owned parts in vessels and gear and distributed the resulting income (or loss) equally between the people on board. Independent and share organised units proved viable, innovative and competitive throughout most of the 20th century (see for example Høst, 2015b; Löfgren, 1977). In contrast to for example British fisheries, Nordic fishers managed to compete with and politically limit the development of capitalist organised fisheries. In other words, owners were active in fishing activities and outside ownership were to a large degree limited. Ownership of vessels and recruitment of crew were kept local and, often, on a family or community basis. Because of their economic importance in nation building or as a motor in regional development, the dominance of self-organised and independent fishing operations shaped the legal apparatus and definition of a fisher, as for example in the Greenlandic “rubber boot” clause or the Norwegian Participation Act, which protected the active fishers and fishing communities from passive ownership (of vessels and resource). The point is that in many Nordic countries, share-organised fishers have succeeded in competing with large-scale and investor-based fisheries, even though this model was dominant in neighbouring countries. They did so partly with the support of the state through legislation which restricted ownership to the means of production (vessel and gear) to *active* fishers.

The introduction of individual quotas and later quota markets should be understood on this historical background. From guarding the resources *from* ownership, the state becomes involved in distributing ownership. Market-based fisheries management

therefore profoundly alters the social foundation of the locally based and share organised Nordic fisheries. It does so, in a way that is more than just the general technological and economic development – as it changes the root of the social organisation, the free and equal access to the resource. To understand this shift, a few key principles in the historical organisation of Nordic fisheries should be highlighted as they form the background for the social change that have been induced with individual and transferable quotas (and therefore also the resistance to it).

Equal and free access

Equal and free access meant that the same rules and technical regulations were applied to all fishers and that operators did not have to pay an external landlord for accessing the fisheries. The equal and free access meant that the fisheries was a “common” for the coastal population, and as such, it was an economic field also open to newcomers. Operators and communities competed on sea and through innovation, teamwork and knowledge of the fishing grounds. Coastal areas in Finland and part of Sweden are notable exceptions to the free and equal access.

Share organisation

Historically, share organisation meant that each fisher received a share of the income (or loss), while the boat and gear also received a share to cover costs related to their reproduction. In this way they have viewed themselves as independent and self-employed. In earlier times, fishers could meet in the morning with a set of nets or baited hooks, prepared in the household and later also be responsible for processing or selling a share of the catch. Today the share structure is mainly used as a pay structure, and shares can differ according to rank. There is, however, in principle no profit accumulated to an outside company owner. The share organisation has influenced the labour market in several ways. Primarily, it was a flexible and resilient way to organise production, with all members on board sharing both the ups and downs of fishing activities. In open fisheries, crew members could establish their own operation or switch to another one with better conditions if desired. Further, the share organisation often created closely-knit and industrious crews that, as mentioned, often was the most competitive units despite their smaller sizes. Only where specific conditions (distance, gear investments, etc.) favoured large-scale fisheries with “passive” owners or investors, was this the dominant way of organisation, as in some pelagic trawl fisheries for example. In general, Nordic fishers have valued working for themselves or for closely related peers.

Resilience and flexibility

The equal and free access was also crucial in the resilience of share-organised fisheries as it allowed flexibility to switch between species and catch areas when favourable conditions for some reason shifted between the different fisheries. This flexibility and the ability to increase the workload has been a cornerstone in the resilience of Nordic fisheries. Flexibility also included the option to move to other fishing grounds for a limited amount of time.

In many ways the free and equal access was the base for both the share organisation and the resilience in Nordic fishing communities. Based on the three dimensions above a wide variety of fishing operations – ranging from small and locally based to larger and more mobile vessels – could coexist, sometimes collaborating and sometimes competing. Only when the combined fishing capacity and efficiency reached an unsustainable level from the 1960s and onwards was this social structure fundamentally challenged.

In many Nordic countries the first quota instruments mirrored the social system of the share organised fishers. The rations systems for example, where quota rations are allocated to the vessels on a biweekly or monthly basis, were ways to carry on and imitate the social and economic traits from the share-based fishery in a new management regime. However, the ration systems and similar new instruments meant that the former freedom and flexibility of the fishers was now packed in an administrative system and subject to the “distant” scientific advice on fish stocks. As the resource declined, the administrative control increased, and so did the economic difficulties. The constant cry for higher quotas and/or subsidies is in this perspective a natural result of the systemic design in ration and common pool systems.

2.3.2 *The social implications of market-based fisheries management*

Licensing and ration systems induced closures and administrative limits on the freedom and flexibility so central to the independent fishers. Seen in retrospect, these management instruments did not solve the main issues but created instead an unsustainable development path. While operators were kept equal, the basic flexibility and dynamism were disrupted. With ITQs and other market-based management instruments a solution to this problem was found – but also a paradigmatic change in the social base of share organised fisheries. With individual and transferable quotas all the three dimensions elaborated above are fundamentally changed.

First, the introduction of licenses and the closing of the open access have ended the common nature of the fish resource – which was duly one critical aspect of the overfishing problem. Principal closure to newcomers have therefore also been the case with other management regimes (as rations). However, with individual and transferable quotas *the equal and free access is replaced with a closed and privileged access*, functioning as a form of private property allocated to the vessel owners. The introduction of property rights freezes social relations that have otherwise been dynamic over time. In consequence, crew members (and future crew) are left in a fundamental different position without the same principal access and choice as before. Access is neither free nor equal anymore and this is often the cornerstone in debates, and a point raised by youngsters with ambitions of becoming self-employed skippers. The policy response to this is to set aside a portion of the overall quota in open groups or other instruments to facilitate new entrants (for example temporary quotas on loan).

The *share-based organisation* has often been continued as a pay pattern but under the surface the relation has become increasingly asymmetrical: The interview material reveal that crew shares can be lowered and that new (leasing) expenses for quotas are

put on the crew's shoulders. We have also found examples of fixed monthly wages – in particular in relation to foreign workforce, but also considered for general use. Another finding, which of course should be mentioned, is fewer but better paid jobs (especially in pelagic fisheries).

Thirdly, the flexibility that was so crucial for the *resilience* in the previous common access regime is replaced by an increase in costs. With the fixed and individual allocations, the only way to switch to another fishery would be through acquiring quotas or through leasing. Acquiring new quotas can be undesirable, especially if it is for a fishery that is only considered as a temporary solution. The new regime promotes specialisation over flexibility and specialisation demands size and mobility.

Another consequence is that financial capabilities are decisive in the competition for quota. This is not always equal to rewarding the most efficient fisher. With the quota investments representing an increasing part of the necessary investments in a fishing operation the ability, desire and conditions for loans become more and more crucial. Across the Nordic countries experience show that company structured fishing operations in general have better financial conditions, and that small-scale and coastal fishers often are reluctant to invest, valuing financial independence higher than quota acquisitions. Inviting investors on board is contradictory to the ambitions of being independent. The effect of this can be a social structure where some companies invest and lease to others, giving rise to the figurative language of *quota barons and sea lords*. On the other side, individual quotas give quota holders a new stability through the certainty that a fixed share of the quota will be available for them – also later that year.

Is all this good or bad? It is, we will argue, at least a fundamental change. Mainstreaming market-based fisheries is therefore also altering the social base of the Nordic fisheries, not just a change in management models. Property relations are linked to the social and cultural organisation of Nordic fisheries.

2.4 Social diversity

Market-based instruments in fisheries management bring fundamental changes to the social relations and ownership conditions in the fishing sector. What the actual implications are from these systemic changes depend on the policy design and development over time. However, acknowledging that central cultural and social aspects were entrenched in the former fisheries management, it is easier to understand the general scepticism that the "ITQ" systems have had to overcome in the fishing sector and the critique that can still be made from crew and young vessel owners – as well as from the wider public sphere. It is a challenge to the equal opportunity, the flexibility and to the social dynamics of the previous system and values. Instead, quota markets and quota trade promote the logics of investors and company organised fisheries: quota can be accumulated (most often within certain limits), fishing activities can (and due to the significant investments must) be commercially planned to obtain full-scale profitable production. With full-scale production all year round the owner can no longer be continuously on board and suddenly the semantic meaning of being a

fisher and vessel owner is in transition. In the longer run quota investments can secure a rational base for the production and future growth. Thus, it also means an increased pressure on the regulations restricting ownership to active fishers, a pressure on wages and new relations between people as employer and employee. Behind the back, it also means a transformation of the fishers themselves.

Again, we cannot say whether this development is good or bad, but point to the changes that are inevitably brought in with the mainstreaming of individual and transferable quotas. With the current development, we can foresee a future situation, where the marine resources are owned by passive owners and harvested with the help of hired fishers.

If another social situation is desired, economic advisors must also engage in understanding the different benefits and the diversity of Nordic fisheries. We stress this point because the introduction of individual and transferable quotas makes it possible to imagine and simulate a situation where 100% of the quota for a number of species is allocated to a few companies. But this would be a situation unlike other sectors – even those with similar historical traits. For example, in many countries land ownership has been and is still subject to a number of conditions regarding maximum ownership, public access and the use of it. Agriculture is heavily governed. Nor can for example large international companies or supermarket stores typically obtain monopoly on the total output of their produce. There is no total supermarket quota or way to hinder a new supermarket or kiosk to open in a town. Nordic experiences indicate that the social diversity in the fisheries is dependent on the policy design and on the combination of policy instruments. The following chapter will elaborate further on the technical aspects of these instruments.

2.4.1 *Small and large-scale fisheries*

Looking at the Nordic fisheries sectors one of the most prevailing tensions is between large-scale and small-scale or coastal fisheries. This tension is present in all Nordic countries in different empirical variants. It is a debate concerned with more than the question of size, but also with the societal purpose and benefits of the fishing resource. It is also important to understand the differences in the types of operation and their different qualities for the people involved. Across the Nordic countries coastal fisheries are actively supported and protected, but also challenged by the effects of quota markets and the general economic development.

Definitions of small and large-scale fisheries vary strongly between the Nordic countries, but in all countries the dualism is present as a governance challenge. In one end there is fishing as part of a mixed household strategy. Here, fishing is often only seasonal and combined with other economic activities to form a whole. The fish can be further processed in the household, as with herring in Finland, or perhaps the fisher is involved in the subsequent marketing and sale. In Greenland fishing activities often form a whole with other activities like hunting.

Figure 1: Examples of differences between small and large-scale fisheries

Note: The difference is more than a question of size, but also relates to the social organisation and the role of the production in regional economies.

Then there is the long range of owner-operated units ranging from the one-man operation to semi-large vessels often operated by people from the same community or related by family. These units were traditionally based on the share system and some have obtained joint loans to increase their annual allocations or rely on the leasing market. In the other end of the scale, there is the medium and large-scale fisheries where there has been a full transition to a company structure, sometimes with outside investors and with professional onshore management, even though sometimes these units still are family owned. In the latter cases, there are more “typical” work relations between owners on one side and workers on the other, often mediated by the professional skipper or manager, who is overseeing the daily operation but who is not involved in the ownership of the vessel or quota. Offshore Greenlandic shrimp fisheries and many Icelandic companies are examples of this type of operations. Deck hands, managers and owners have different interests in the production, but still need each other to obtain their wage or profit.

Across the Nordic countries definitions and understandings of small-scale and coastal fisheries differs. However, central in the debates on small and large-scale fisheries, is the different types of organisations and their specific demands and qualities.

It would also be wrong to view small-scale fisheries as outdated and unattractive. Our research as well as the focus studies in Iceland, Norway and Denmark (see further the sub-report "From school to skipper") reveal that some youngsters still desire the qualities of a small unit (the independence, the local connections and the interaction with nature), but the right conditions must be in place for this to work out. In general, market-based fisheries management increases the barriers to self-employment but promotes a fishing sector which creates job that are attractive for other groups. Here youngsters value the hard work, the pay and the long and intense work followed by just as lengthy periods of holiday. Based on the Nordic experiences with market-based fisheries management we can observe the following dynamics:

- Unregulated individual and transferable quotas promote company structured and specialised large-scale fisheries on the expense of small-scale fisheries and share organised fisheries. It is therefore not viable in the long-term to have small and large-scale fisheries organised in the same quota market if a sustainable coastal or small-scale fleet is desired;
- There is a growing gap between the two fleet segments (especially in the Faroe Islands, Iceland, Denmark and Sweden). In other words, the fishing fleets are less uniform in size distribution today than before. Large-scale fisheries are investing to gain further large-scale advantages, while small-scale fishers are downsizing and changing strategies to improve resilience;
- Young fishers still seek self-employment in the fisheries sector if the policy design allow for a reasonable entrance point (as the open groups in Norway).

Small-scale fisheries often receive support in political statements, but until recently the major policy changes seem to have favoured large-scale fisheries. This is, arguably, a result of the changing relation between state and fisheries and should be understood as part of the more general reforms of the Nordic welfare states (P. Holm *et al.*, 2015). Accordingly, there is an institutional push for improving the economic situation in the sector and to withdraw public subsidies. Large-scale fisheries are promoted in this context to improve the efficiency. Yet, as mentioned, there is also a political and popular desire for coastal and small-scale fisheries, which are seen as important for economic activities along the coast as well as bringing positive social and cultural values to the local communities.

2.4.2 *Regional tensions and economic strategies*

A common theme that also are recurrently discussed in most Nordic countries is the regional distribution of fishing activities. It is related to the above discussion of small and large-scale fisheries, but also touch upon some other issues of market-based fisheries management. With the introduction of quotas allocated to the individual vessel owners and the formation of a quota market, access to the fish resource (the quota share) can be sold by operators in one place to operators in other places. These

transfers can, like other market transactions, occur “overnight” or without the prior knowledge of the remaining community. Thereby earlier common access to the fish resources have been replaced by a regime, where market conditions and financial capabilities determine the geographical distribution of access to the fisheries. Criticism and resistance against market-based fisheries instruments should also be understood on this background, as they introduce new logics into an existing social structure.

With market-based fisheries, individualized rights and choices clash with community aspirations and feelings. In the light of the lack of other opportunities in some regions, this loss of opportunity is experienced as a negative aspect of transferable quotas. Therefore, a fair regional distribution is often voiced in the public and political debates, but, is harder to implement in practice. The Nordic experiences range from quotas locked to specific counties (Norway), premiums for local landings (Sweden), geographic landing obligations (Norway). In other countries the regional distribution is captured through the other features of the management system, such as the general segmentation of quota groups. Before we look closer into the debate, it is important to note that in the economic theory, regional limitations on market transactions are generally seen as compromising the optimal economic efficiency (Ragnar Arnason, 2012; Kroetz & Sanchirico, 2010).

Individual quotas allow for an exclusive use of the resource and provides equity for further investments. Quotas therefore can be accumulated on fewer but more mobile vessels, articulated as a concentration on the most efficient vessels. The only limits for this process is in principle the natural limits to large-scale advantages and the technical regulations set by the authorities (on maximum ownership). Economic theory sees consolidation as the most efficient and optimal use of the resource, which allows for a potential resource rent to be extracted to the sector or to society. Opposing this argument, we can observe local dwellers, community organizations, some producer organisations and municipalities bemoan the loss of opportunities and the economic contributions from fishing activities. Other scholars point at the different use values and economic contributions of fisheries in regional economics.

2.4.3 Exports or settlements

One of the countries where the conflict between economic concentration and regional diversion is most pronounced is Greenland. Here, fisheries make up almost 90% of the export value and is of national importance as a source of taxation (see further chapter 4). In 2009, a commission suggested to lift the geographical bonds on landings and to abandon the distinction between inshore and offshore shrimp fisheries (Fiskerikommissionen, 2009). In this way the profitability would be improved with the objective of reducing public subsidies and to obtain a better societal return. The commission also suggested a wider use of market-based instruments and based on this the Greenlandic government introduced an ITQ scheme for the Greenlandic halibut fisheries in 2012. However, the fish resource is also an important regional input and contributes to a diverse range of fishing activities in towns and settlements all over the coast (Delaney, Jacobsen, & Hendriksen, 2012). Some scholars have questioned the

economic arguments and pointed out that estimating the costs and benefits of different types of fisheries is not such a simple task. The conclusion depends very much on the range of factors that is assessed (Hendriksen, 2013; Jacobsen & Delaney, 2014; Rasmussen, 2003; Søbye, 2018). Even though coastal fisheries are less profitable and taxable than large-scale fishing companies, it might still constitute an important economic factor and a reasonable way of supporting regionally dispersed economies, they argue. In Greenland, as well as in other places, small-scale fisheries might be the basic economic activity that makes coastal livelihoods possible. With the introduction of ITQs in the halibut fisheries, the Greenlandic government aimed at economically reforming the fisheries to make the sector more profitable. However, in Greenland, the distribution of fishing rights and its regional aspects have recently been brought up on the political agenda again, and changes in the distribution might be introduced from the political side.

2.4.4 *Balanced alternatives*

Greenland is perhaps the most pronounced case, and the case with the greatest implication of the policy decisions. However, the tension between regional concentration and diversion is present in most of the Nordic countries. In Sweden 17 coastal municipalities recently criticized the government for neglecting the local significance of fisheries in policy development (Simrishamn kommun, 2017). The Icelandic and Danish management systems, which both have strong economic objectives in their design, have also been criticized for leading to geographic concentration and the deterioration of small-scale fisheries. In the Icelandic case, an open-access coastal scheme was introduced in 2009, partly to accommodate this challenge. Even though it might not be significant in its economic contribution, it is a principal entrance point for new entrants and a supplementary fishery for other coastal fishers. In Denmark, a strengthened coastal scheme will now be implemented to support regional objectives and small-scale fisheries. In Norway an “open” quota group give principal access for new entrants and “part-timers” and a similar coastal quota is in place in Sweden as a supplementary management instrument.

Across the Nordic countries the following experiences can be highlighted:

- Reforming fisheries policies through market mechanisms to facilitate a consolidation of activities is conflicting with other strategies of regional economic development;
- The Nordic experiences indicate that a stable way forward is a combination of instruments that both allow for concentration and competitive export-oriented companies on one side, but which also give space for regional economic development and small-scale fisheries on the other.

The starting point for fisheries management is a sustainable use of the resource. In addition to this, the main driver for market-based fisheries has until recently been national economic objectives. However, as the political power and agendas shifts so do

also the prioritisation of objectives. The last years have seen an increased focus on “fairer” access and the regional balance as political priorities, partly (we suggest) to mitigate the implications of economic globalisation. Shifting and conflicting economic objectives in the management of fisheries can have negative effects, as investments made in one logic can be made useless by the developments in the other. It seems in the interest of both the sector, communities and Nordic societies to find a balance that has long-term durability.

2.5 Legitimacy in Nordic fisheries

Above we have argued that the introduction of market-based fisheries management inevitably has led to changes in the social relations of production. We further noted that quota allocation based solely on market mechanisms have resulted in less uniform fleets. While large-scale fisheries have invested to increase advantages of scale and efficiency, small-scale fisheries have hesitated or downsized to increase resilience. We argued that this was rooted in the different socio-cultural characteristics, one downsizing to remain independent and the other expanding to improve efficiency. We also explored how conflicting notions of economic development have influenced the fisheries sector and coastal communities, with market-based instruments favouring a company profitability over other regional economic contributions. In the following section we will discuss the question of legitimacy, which relates to many of the issues raised above.

Legitimacy refers to the relation between the governed and the governing body. There is both a narrow understanding of this, as a relation between the state administration and the fishing sector, as well as a broader understanding, where coastal communities and the wider society and stakeholders are included in some way. Legitimacy is a central question in relation to the introduction and mainstreaming of market-based fisheries management. This is due to the part it plays in a profound transformation of the sector as explained above.

Policy changes can often be slow and ineffective when translated into practice. However, ITQs and similar market-based management instruments have shown to be effective and to create rapid and irreversible change in a very short time. For economists and policy makers, the agility and effectiveness of the market-based quota systems means that they are powerful tools for reshaping the fisheries. It is possible to imagine and argue for a situation, where 100% of the national quotas are distributed through market mechanisms. The question that emerges is to what extent such a development is legitimate in the sector, the coastal areas and in the wider society?

With the recent inclusion of Finland, variants of market-based fisheries management are implemented in all Nordic countries. More than just a management tool market-based reforms of fisheries management play an important part in the modernization of the Nordic fisheries to fit the future welfare states. Today, Nordic citizens must be productive and generate tax incomes to finance welfare institutions. Openness to innovations, global trade and change is seen as central for

competitiveness, while labour and capital must be mobile and allocated to the most productive sectors. This is also true for the Nordic fisheries (P. Holm *et al.*, 2015). Through the expansion of Economic Exclusive Zones and the introduction of Total Allowable Catches, Nordic fisheries have become “normalised” as a sector and as an object for reform according to the above principles (P. Holm *et al.*, 2015). Nordic fisheries are therefore being scrutinized for their use of public resources and contribution to national wealth. In this perspective there is an increasing demand for efficiency and for a withdrawal of subsidies and price-controls as well as for a complete termination of publicly financed scrapping schemes. The main economic focus is on growth, competitiveness and the aggregate contributions to national wealth. As mentioned, individual and transferable quotas provide a good instrument for many of these objectives. At the same time, some operators have seized the new opportunities and used the quota markets to expand and institute new relations in the sector.

While the Nordic states and their fishing sectors are being transformed to meet these conditions and demands, there is at the same time, also a wide-spread sectoral and societal scepticism concerning the privatization of fish resources. Maybe this scepticism should be understood in a broader context. Even if the current modernization of Nordic welfare institutions partly is “necessary”, there is at the same time a growing and real opposition in the public calling for a slowdown of the economic globalization, its effects and the related institutional reforms. These movements are increasingly decisive in the political landscape and in the balance between different development logics. The current drive and Nordic mainstreaming of market-based fisheries management should therefore also be assessed in relation to the social costs, opposition and insecurities, that reforms and market induced changes will bring.

As it has been argued above, a full and unregulated application of market mechanisms might not result in a socially legitimate and stable fisheries management. As this development becomes evident we can therefore observe the following reactions in the Nordic countries:

- As the fisheries sectors develop in scale and become less embedded in coastal communities there is a corresponding interest in and application of resource rent taxation, as a way to secure a return to the society (currently implemented in Greenland, Faroe Islands and Iceland);
- The actual designs of market-based fisheries management often come with so-called safeguards (i.e. Norway, Sweden, Greenland) and/or have been subject to later alterations (i.e. Iceland, Denmark, Faroe Islands). Having safeguards for different social objectives are becoming the norm.

In the following chapter we will investigate the Nordic experiences with both resource rent taxation and social safeguards in more detail.

3. Safeguards and policy design in Nordic fisheries

The chapter reviews the technical and regulative aspects of market-based fisheries management in Nordic countries by addressing the questions of market segmentation, regional balances, concentration, resource rent taxation and governance. The main focus is on the social aspects and less on economic and environmental policy objectives. The main point is that the politically and publicly desired diversity will have to be introduced through the design of market-based fisheries management – including subsequent modifications of already existing regulation.

3.1 Small-scale and coastal fisheries

In this chapter we present the main policy ideas and social dynamics of Nordic fisheries management. The purpose is to provide an overview and a basis for further discussion. Therefore, there are technical details and regulative aspects we do not touch upon. Other things are simplified and in general we depend heavily on the concordance between policy descriptions and the actual practice in each country.

One of the central challenges in using quota markets as a management instrument, is the internal dynamics between small and large-scale fisheries. To understand this challenge, one has to understand the different social characteristics, and why they struggle to co-exist in the same quota market. For large-scale fishing companies, individual quota shares are used as a way to expand and obtain a full-scale annual production. For this purpose, individual and transferable quotas have many beneficial qualities. The individual quotas allow for better planning and specialisation both in relation to fishing seasons and for the annual price fluctuations. Quota shares can be accumulated to obtain full production and a return to the investors. Further, when a certain profitability is reached, additional quota shares can be purchased, the vessel can be extended or a new and more modern can be acquired to further increase the production and return on investments. The expansion in the large-scale sector therefore is a continuous process and not a one-off event. On the other side, we can observe coastal or small-scale fishers who are much more reluctant to use the quota markets to increase their quota share. Their organisational model values economic independence, and together with the inferior financial conditions (i.e. poorer interest rates, lack of investor capital and formal business skills, etc.) it means that the tendency to invest among coastal fishers are lower than among large-scale companies. Instead, small-scale fishers turn to leasing or specialise in fisheries, where large-scale advantages cannot be obtained in the same manner. Market-based

fisheries management thus leads to a greater division of the fleet in independent “smallholders” and companies operating with hired fishers and investor capital. There are exceptions of course, but the general trend is that large-scale fisheries increase and that small-scale decline. In most Nordic countries, small-scale and coastal fisheries are regarded by the public to have many positive attributes ranging from environmental, cultural, social and to regional. Therefore, most Nordic countries have specific design features or safeguards in place to secure the continuation of small-scale fisheries.

3.1.1 *Nordic experiences*

In this section we will look at the Nordic ways to approach the dualism between small and large-scale fisheries. In general, there seems to be three principally different ways to handle this challenge in market-based fisheries management:

- Maximum limits to ownership;
- Market segmentation;
- Supplementing instruments (open groups).

In the systems, where economic objectives have been the strongest (Iceland, Denmark and partially also Greenland), there is little or no regulation of the quota trade, besides from maximum limits to ownership. A stronger approach is market segmentation, whereby the quota market is divided and limits trade to inside certain size groups. In the Faroe Islands and Norway, such advanced market segmentation is used to influence the internal distribution. In these instances, ownership can still be concentrated to some degree internally in each group but the structural balance between group segments can be controlled. Finally, there are countries where a common or “open group” is applied to promote new entrants and small-scale fisheries. This is the case in Sweden and Norway, but also in limited ways in Iceland and Denmark (through summer fisheries and part-time licenses). These three approaches can be combined as they are in many instances and all have their pros and cons.

The open groups allow for new entrants and support the nature of small-scale fisheries, but bear with them many of the negative effects of “Olympic fisheries”: seasonal closures, potential overcapacity, price deflation, etc. Limits on maximum ownership is a weak instrument as a stand-alone and rely on transparent ownership relations but can work in combination with other instruments. Market segmentation is a more rigid approach, which can be hard to reform, but which give managers a better control over the development. Even though definitions of small-scale and coastal fisheries differ quite a lot between the Nordic countries, each country have debates regarding this dualism. Below we present national summaries over how the relationship between small and large-scale fisheries is managed in the Nordic countries with market-based fisheries management:

- *Sweden*: In Sweden, market mechanisms were introduced in the management of pelagic fisheries in 2009 as a proper "ITQ" system, and in the demersal fisheries in 2017 through individual quotas with transferability however restricted to annual leasing. In the pelagic fisheries, small-scale fisheries are currently protected through combining the ITQ market with open common access quotas, limited to small-scale fishers (passive gear and trawlers below 12 meters). In the demersal fisheries, there is a similar open group for small-scale vessels, while the transferability of quota shares is limited to annual leasing;
- *Iceland*: Iceland has one the most liberal ITQ-systems in the Nordic context and there are only little restrictions on quota trade. The exceptions being the jig and line system, which is a designated ITQ-system in itself. The jig and line system allow for vessels with a maximum of 15 meters in length or 30 gross tonnage in size. In addition, there is the common access strandveiðar quota, which was introduced in 2009 in response to long-lasting debates on the principles of access and the loss of local opportunities. Even though it is only a summer fishery it is a new entrance point to the fisheries and allows operators a range of daily catches in the summer months;
- *The Faroe Islands*: The Faroese parliament has recently reached an agreement leading to substantial changes in the Faroese fisheries management, introducing partial auctioning of quotas and new concentration (or antitrust) limits. For now, the *days at sea* system introduced in 1996 will be prolonged for a year. The system applies a thorough segmentation of the fleet in six groups, with restrictions on trade between the groups. In addition, the Faroese management is based on geographic gear restrictions, either seasonal or permanent. In this way the medium-scale and coastal fisheries are protected, even though coastal fisheries are still reported to be in decline. With the new agreement, 8.5% of total quotas are reserved for "development" purposes;
- *Denmark*: In Denmark, individual and transferable quotas were introduced first in the pelagic fisheries (from 2003) and later in the composite demersal fisheries (in 2007). The pelagic is regulated by maximum ownership shares, while the demersal market was introduced with a coastal fishery scheme. Operators with vessels below 17 meters and engaged in shorter fishing trips could sign up for a three-year period and receive extra allocations. In this way coastal fisheries would be supported. During the three year-period the vessel and quota cannot be acquired and transferred to none-coastal vessels. However, the coastal scheme proved not to be strong enough to hinder a decline in the coastal fisheries, partly because it was only a temporary market restriction and partly because extra allocations were not any significant help. Therefore, a new scheme rewarding operators with substantial extra quotas have recently been introduced for coastal fishers on the condition that the vessel owners voluntarily ties his share *permanently* to the scheme. Through this scheme Danish authorities are trying to introduce a more rigid market segmentation. As a supplementing instrument, part timers were originally secluded into a special scheme with transferable licenses. These cannot

be bought by the demersal fleet and functions occasionally as an entrance point for younger fishers;

- *Greenland*: In Greenland the fisheries are divided into offshore and coastal fisheries. The two are defined by size and geography, giving privilege to coastal fisheries in the area from the shore and until three nautical miles from the baseline. Coastal vessels can be a maximum of 120 gross tonnage in size (32 GT for Greenlandic halibut). ITQs were introduced in the offshore shrimp fisheries in 1990 and in the coastal shrimp fishery in 1997. The offshore have concentration limits on 33.33% on ownership while the limits in the coastal fishery are 15%. In 2012, ITQs were introduced in the coastal Greenlandic halibut fisheries, however, vessels below 6 meters were excluded from the system. Instead, this socio-economically diverse group is managed through common district quotas;
- *Norway*: In Norway, the demersal resources are distributed as “quota factors” in seven groups according to vessel size and with geographical limitations put on trade. This system is designed to keep the structural balance but still allowing for some economic concentration (restructuring). Quota factors mean that quota shares are indivisible and not tradable individually (per species) but only as bundles of quota. For each group there is a maximum number of factors that can be combined on one vessel.

3.2 Regional balances

Another theme that is frequently debated in Nordic countries is the regional distribution of quotas and fishing rights. The new quota markets are a fundamental break with the former common access and have contributed to changes in the sector and employment system. Market-based quota allocation can lead to regional concentration, but also to more local loss of opportunities. While the relative distribution between regions might be fairly stable, individual towns can still experience loss of fishing activities. Often technological and economic development play a role as well, as the entire production system is changing towards globalised large-scale companies. Fisheries are often seen as an important way to secure economic activities along the coast, and therefore regional objectives can be included in the quota market regulation.

3.2.1 Nordic experiences

The instruments described above designed to protect or promote small-scale and coastal fisheries, most often also serve regional distributive objectives, as they in general decreases the barriers to entry. These can be supplemented with specific instruments aimed at governing the regional distribution. Only Norway, Iceland and Sweden have instruments clearly based on regional development objectives. In short, these instruments can be characterised as:

- Landing obligations and premiums;
- Geographical bonds on quota trade.

In a regional economic perspective, the three types of instruments have different logics. Landing obligations ensure an economic flow through the coastal communities, while the geographic bonds on trade is related to the distribution of ownership. Below Nordic policy experiences with regional quota distribution are presented:

- *Norway*: In general, the Norwegian structural quota system has strong regional objectives. The advanced segmentation provides a starting point and is supplemented with geographical restrictions on trade. Until 2016, quota factors could only be traded inside the same county, unless it was bought by an operator in one of the three most Northern counties. From 2016, the geographical restrictions on quota trade have been loosened and is now restricted to occur inside either a southern or northern region. In Norway landing obligations have mainly been applied to the offshore trawlers, in order to secure that landings benefitted the coastal population. As such they were also part of a political struggle that led to legislation favouring the owner-operated coastal fleets and communities against the large-scale trawler companies;
- *Greenland*: In Greenland, landing obligations are used to ensure that the benefits of fish resources are channelled through the coastal communities. Landing obligations are generally applied to coastal fisheries (with exceptions), while in the offshore shrimp fisheries it is limited to 25%. The landing obligation means that catches must be landed and processed in Greenland. Due to the vessel sizes and large distances, this practically ensures landings closer to the fishing grounds. The landing obligations are disputed because the lower the profitability for some companies. The ITQ system for halibut launched 2012 is complimented with district quotas for the vessels below 6 meters formally excluded from the quota market;
- *Sweden*: Regional distribution is also a main concern in Swedish fisheries management, and the market-based quota systems has been designed in order to hinder a too strong concentration in the Western parts of the country. For the Baltic Sea therefore, pelagic quota is reserved and distributed to operators *fishing from and landing in* the Baltic Sea area. The extra premium quotas are not allocated as permanent shares, but are distributed annually by the administration, and distribution principles can be adapted accordingly to maximise impact. In the Gulf of Bothnia, the underutilised herring and sprat resource have been opened up to vessels without pelagic licenses, in order to strengthen operators in these coastal regions and increase the stock utilisation;
- *Iceland*: The already mentioned coastal fishery instrument introduced in 2009 was a response to the debates on regional distribution and access. Coastal communities also engage in the jig and line system as well as in other fisheries as the lumpfish fishery.

3.3 Quota concentration

The application of maximum limits to ownership serves two purposes. First maximum limits can be applied as an antitrust measure, primarily implemented to avoid dominant actors on the quota market. This is to avoid that some large quota holders obtain a position, where they can control quota prices and influence decisions of other actors as processors, banks and investors. Secondly, maximum limits can be applied to secure a legitimate distribution of wealth. In other words, a lower maximum limit will secure a higher number of operators. Concentration limits is a cardinal issue in relation to the image of quota holders in the remaining society.

3.3.1 Nordic experiences

It is difficult to compare the maximum limits across the Nordic countries since group segmented quota systems already put a limit on the ownership, or since the way ownership is measured differs. However, below are some examples:

- In the *Greenlandic* shrimp fisheries for example, around 40% of the TAC was allocated to the coastal fisheries in 2014. Each entity was allowed to hold a maximum of 15% of the coastal quota, equalling 6.5% of the overall TAC (Berthelsen, 2013). Offshore companies are allowed to hold 33% of the offshore quota, equalling around 19% of the overall TAC;
- In *Iceland* the maximum limits range from 12% for cod, 20% for herring, haddock, saithe and deep-water shrimp to 35% for redfish. In the jig and line quota system ownership is limited to around 4% to 5%;
- In *Denmark*, ownership limits to pelagic quotas range from 10% to 15%, while demersal limits range between 5% and 10% per species. A limit on the share of the total value of catches are currently being considered;
- In the *Faroese Islands* ownership limits range between 20% to 30% (of licenses or "days at sea");
- In *Norway* the overall quotas of cod, haddock and saithe is distributed in seven quota groups according to vessels size, and quotas are further allocated in so-called quota factors. Each quota factor translates into allocations in a number of species and can only be sold as one bundle together with the vessel. The concentration is thus governed through the quota factors which can be changed dynamically. Offshore vessels can potentially acquire four further quota factors, while coastal vessels over 15 meters can hold eight quota factors, while vessels above 11 meters and less than 15 meters can hold four factors in total. Vessels less than 11 meters cannot acquire any extra quotas;
- In *Sweden*, pelagic ownership for one individual agent is limited to 10% of the total pelagic resources.

From the examples above, it is evident that concentration rules in Nordic fisheries are mainly applied as antitrust measures, in order to guard the quota market from negative effects of large and influential quota holders and to secure some minimum number of participants. The maximum limits do also secure a minimum distribution of the wealth, even though this does not seem to be the primary use of concentration limits. 5% limits, for example, are equal to only 20 operators. The numbers and limits should, however, be reviewed in relation to the specific fishery.

3.4 Resource rent taxation

Resource rent taxation is about taxing the super profits that can be made from extracting natural resources as is the case in fisheries. Resource rent taxation is relevant as a governance theme as a way to secure a return to society from the invested (private and public) capital including the natural resource. In open access or common access fisheries the resource rent has typically been dissipated on the multiple users (and communities) or negative due to overcapacity.

The use of market-based fisheries management has played a significant role in creating more profitable fishing sectors and has contributed to a wider transformation of Nordic fisheries. Today fishing activities are less embedded in coastal communities and more corporate in its nature than before. With less operators and fewer people engaged, and with fewer direct social benefits to coastal communities, resource rent taxation has become an increasingly reoccurring topic. A taxation of resource rent is under these conditions an instrument to reassure a return to society. In the Nordic countries only Greenland, Iceland and the Faroe Islands have currently implemented such resource rent taxations. The taxations are complex and tailored to the individual contexts but in general based on taxing the super profits made in the sector. For the Greenlandic shrimp for example, resource rent taxation begins at a certain kilo price and increases gradually until it reaches a certain limit.

3.4.1 *Good governance and legitimacy*

Good governance refers to a legitimate and transparent governance system protecting individual rights and enforcing political and democratic decisions. All the safeguards and regulations described above rely on transparency, compliancy and strict monitoring of the fishing sectors. This is perhaps obvious, but nonetheless difficult to maintain. Most Nordic countries with market-based fisheries management have their stories of dubious company structures and creative interpretations of ownership, often unpredictable at the offset. Legislation often tend to be one step behind the quota accumulation process. The rules therefore have to be clear and quota concentration monitored, but also the definition of goals need to be thought through. For example:

- What is concentration and when will market mechanisms be exposed to monopoly power?

- Do rules apply to ownership or catch, and what about leasing?
- Are rules concerned with the individual, the vessel or the company?
- And, do national policies form a coherent whole, so the loss of opportunities from fishing is balanced by other instruments?

Without these precautions, compliance might be low in the sector as pressure is on gaining further large-scale advantages through quota accumulation. In general, the individual systems must balance market freedom and flexibility for operators with sectoral compliance and social legitimacy. In this regard, lack of good governance can in itself lead to a loss of legitimacy as media and public will not hesitate to insinuate problematic relations between industry giants and administrators. However, the experiences presented above also show that the Nordic countries are actively engaged in designing their market-based quota markets, subject, as always, to the fluctuating political agendas and popular desires.

3.4.2 *Conclusion and recommendations*

The application of market-based fisheries management introduces a range of new governance questions and challenges. Above we have presented the main safeguards and policy instruments that have been implemented in Nordic fisheries management in order to promote economic, social and regional objectives. The actual designs of market-based fisheries management are a result of stakeholder consultations and subsequent compromises between different objectives in the national and regional contexts. By introducing market-based mechanisms to facilitate the difficult and complex quota distribution, the Nordic states have engaged in an economic restructuring and a new relationship between state, sector and resource. The different instruments and safeguards discussed in this chapter are all meant to influence or compliment market forces in order to obtain a range of social objectives relating to the diversity and legitimacy of Nordic fisheries. In other words, the sole use of individual and transferable quotas entails a transformation of the sector that is only partially desired in Nordic societies – as witnessed by the existing opposition and criticism. Where the balance is or should be struck between the different objectives will change over time and between regional contexts.

Across the Nordic countries we can highlight the following points on the design and implementation of safeguards and social objectives:

- Strong market segmentation is a key to preserving small-scale and coastal fleets;
- Regional distribution can be governed through safeguards and instruments that support local initiatives. However, a tension between regional and sectorial development persists and should be addressed;
- Policies should have clear definitions of targets (i.e. balances between regions and between small and large-scale fisheries). These balances should be continuously

monitored and evaluated – as changes in the fleet composition might call for further adjustments;

- The use of supplementing instruments (i.e. open groups) can further support the nature of small-scale fisheries and facilitate the entrance of new independent operators;
- Flanking measures can be considered to facilitate career changes for laid off fishers or induce new development logics for existing operators.

The above points are perhaps most clearly articulated in the Norwegian Structural Quota System. The seven size groups each have their defined portion of the TAC and inside each group quota is transferred through so-called quota factors, which are bundles of quota for different species. To control consolidation there is a maximum limit for the number of quota factors that can be assembled on one boat. The Norwegian discussions on resource rent have been concluded by acknowledging the regional and local importance of the fisheries and in the decision to allow the resource rent to stay in the local communities. Iceland have chosen a more liberal approach with a wide ranging and integrated quota market that aims at the profitability and competitiveness of the Icelandic fishing sector and related industries. But even Iceland have excluded the jig and line quotas from the “greater ITQ-system” and have introduced a new coastal fishery to mitigate discussions on access and fairness.

In this way the Nordic implementations of market-based fisheries management all have different designs tailored to national needs and balancing different objectives. The actual designs are compromises and the loss on one account should be understood as a gain on another, not just as a cost. The Nordic experiences show that market-based fisheries management can have great and rapid impact on the structure of the fishing sectors, and the above review points at market segmentation as the most basic instrument to handle the effects of quota markets. In addition, to reach a stable fisheries management, the review indicates that the diversity of the fishing sector and the opinions of the wider society should be acknowledged: Either safeguards were built into the system at the beginning or they have been implemented afterwards.

4. Market-based fisheries management in Nordic fisheries

The chapter presents summaries of the Nordic experiences with market-based fisheries management country by country. In each country we examine the historical development of the fisheries sector, with a focus on the formation of market-based instruments, before turning to the current regulation and ongoing debates. In general market mechanisms have been superimposed as a distributional instrument over the technical and biological management of marine resources. Quota markets and the like are instruments mainly related to the governance of the economic behaviour in the fishing sectors, but they have wider implications. The country reports are sorted according to the chronology by which the countries have introduced variants of market-based instruments in their fisheries management.

4.1 Iceland

Iceland was one of the global pioneers to introduce individual transferable quotas. Beginning with the herring fisheries in 1979 the Icelandic ITQ-system has since then been mainstreamed to include most species and Icelandic fisheries. The Icelandic system is characterized by a liberal approach, which has stimulated growth in the sector, but also led to national disputes on the distribution of wealth and access to the fisheries.

4.1.1 *Introduction of market-based instruments*

After the independence from Denmark in 1944, the promotion of an export-oriented fishing sector became a key national concern. In the following decades the large-scale fleet grew and capital investments in the fishing sector increased more than output. Coupled with a rising resource concern it was economic considerations that led to the early Icelandic adoption of market-based fisheries management instruments in the 1970s and 1980s. As in other countries, the individual quotas were made possible by the Icelandic expansion of its Exclusive Economic Zones (EEZs) in 1975 from 50 to 200 nautical miles. By expanding its zone of sovereignty, a more advanced management and national distribution of resources was made possible.

The first step towards ITQs, was the introduction of Individual Quotas in the herring fisheries in 1975. When these individual quotas later were made transferable in 1979, Iceland became the first country in the Nordic countries (and perhaps globally) to

introduce a modern science-based regime of property rights in its fisheries management.¹

The individual quotas came after a decade of intensified management. Due to a decline in the herring fisheries in the late 1960s, an overall quota was introduced in 1969. However, this did not end the decay, and in 1972 the herring fisheries was suspended. The individual quotas were then introduced when herring fishing resumed in 1975. Due to the limited size of the individual herring quotas the operators proposed to introduce transferability, which were approved by the Icelandic authorities in 1979. Through the individual and transferable quota system, the Icelandic authorities had found a convincing instrument to solve the distribution problems related to a limited resource and large fishing capacity.

Individual transferable vessel quotas were then introduced in the demersal fisheries in 1984 – also as a response to declining fish stocks. The system covered cod and five other species, but also included an option for operators to choose an effort-based management option (days at sea). Initially, vessels under 10 GT were not included in the system. In the first period of the demersal ITQ-system from 1984 to 1990 the quotas were not officially made permanent and the different quota allocations were linked to the vessel and could therefore only be sold as one big allotment together with the vessel (Helgason & Pálsson, 2000). In other words, the different quota shares could not be split up and sold individually, but only all together in one bundle including the vessel.

4.1.2 Reform and expansion of ITQs

In the 1980s the individual quotas and transferability had, as mentioned, been introduced as a form of crisis mitigation and with quite some scepticism from the operator side. This changed with the reform made through the *Fisheries Management Act* in 1990. With the substantial changes the main management focus shifted from ecological protection to the economic performance. In that way, the *Fisheries Management Act* of 1990 introduced several new features. The alternative effort-based option was terminated and the new ITQ-system also included vessels from 6–10 tons, which had hitherto been excluded. There was a reason for this. From 1984 to 1990 the number of vessels under 10 GT had doubled, increasing its share of the total catches (R. Arnason, 1993). For the other operators this meant that their relative share of the TAC decreased. With the new act this loophole was closed. In addition, new species were added to the system.

The new emphasis on economic performance were also apparent in the deregulation of the former restrictions on transferability. With the 1990 act, quotas were detached from the vessel and became independent commodities and fully

¹ Historically property rights have been used in several Nordic countries in relation to the marine environment. Examples are Eastern Sweden and Finland, where fishing privileges have been controlled by local landlords or delegated by the King to certain cities. In Denmark the eel yard right gave farmers with property adjacent to the coast the exclusive right to set fish traps as far as a pole could reach the bottom – a right that could be leased on to others. However, in general, in the 20th century, access to the marine resources in Nordic countries has been based on principles of equal and free access for all coastal dwellers.

divisible. In addition, and also based on an economic motivation, the time limit on quota shares were lifted to increase the stability and base for investment. The inclusion of vessels under 10 GT meant that more than a further 700 vessels now entered the ITQ system, which was now mainstreamed across species and sub-sectors. Whereas the first years of regulated ITQs had reduced the number of operators, the shift to an economic emphasis and deregulation resulted in a subsequent concentration process where ITQs were concentrated on the largest vessels. This concentration has further increased since then.

From 2001 to 2014 the 25 largest firms increased their quota share from 34% to 75% (Agnarsson, Matthiasson & Giry, 2016). This has been accompanied by a qualitative shift, where large and vertically-integrated companies have gained ground on the expense of smaller and medium sized operators and local processing facilities. Differences in loan conditions and readiness to invest has been one of the main drivers of this transformation (Helgason & Pálsson, 2000). Over the years, the concentration of quotas and its geographical as well as social implications have been widely debated and disputed both in the sector, in the public as well as in academia (R. Arnason, 2005; Eythórsson, 2000).

4.1.3 *Debates and controversies*

Since fishing is such an important sector in Iceland, any changes in the management of fishing activities and in the distribution of fishing rights constitute major political issues and have wide impact for many Icelandic communities. It is therefore not surprising that ITQs have from time to time become a central topic in Icelandic public debates. The debates have centred around the geographic concentration of quotas, changes in production and the legitimacy of the ITQ system in relation to newcomers as well as the introduction of a resource fee.

“Sea-lords and quota tenants”

While the economic performance of the fishing sector has improved, the emergence of large vertically integrated companies with investors and shareholders have also transformed the organisation of Icelandic fisheries and created new relations of production. One of the aspects of this new situation is leasing. By *leasing*, parts of the *annual quota allocation* are transferred to other operators. Leasing allows for flexibility in order to lease in extra quota at the end of the year, but can also be used in itself as a distinct business strategy. Through the leasing relation the payment to the actual fishers are driven downwards, giving rise to criticism and feudal metaphors such as sea-lords, quota kings and quota tenants. Though not illegal in any way, these arrangements have contributed to a negative image of the ITQ system in the public.

Regional concentration

It is difficult to delineate the implications of the ITQ system from the wider demographic shifts and changes in the Icelandic economy. The Icelandic experience cover a period where urbanisation has increased and where a larger proportion of the population are settled in cities and particularly in Reykjavik. Thus, concentration is linked to other economic processes, but are nonetheless identified with trade of quota and the ITQ system. While there is evidence of some regional concentration, concentration is mostly felt on a local level (Chambers & Kokorsch, 2017; Runólfsson, 2016). Activities have been concentrated in fewer harbours and in larger units, and some towns and coastal settlements have lost their connection to the fishing sector.

As mentioned, the concentration of quotas has been accompanied by a shift in the organisational structure of companies towards larger and vertically integrated units often registered as joint-stock company. The ways of doing business have arguably changed and decisions are taken in different ways and on different values than in earlier times. More than nostalgia however, the public voices and concerns should be understood as a mirror of two different social organisations and their different qualities. The former fishing operations based on common access to the resource had its own values and distinct ways of collaboration and competition.

Quota shares and the Human Rights case

One of the principal discussions raised in the Icelandic debates have been the legitimacy in the initial allocations of quota shares (the vessel's permanent percentage of the TAC). In Iceland the allocation of quota shares was based on a three year catch history. This right was then allocated to the vessel, i.e. the vessel owner. As ITQs initially were introduced on the background of an ecological and economic crisis the original implementation had been matter of closing access and distributing the limited rights in a sound and accepted system. However, these initial beneficiaries have since then been able to enjoy a steady stream of wealth, to lease out parts of or to once and for all sell their quota share. This becomes even clearer once the resource has recovered and the same quota share (in percentages) result in much larger actual allocations (in kilos). The issue of the initial allocations has been brought to the Icelandic courts twice and resulted in the somewhat ambiguous rulings. The court criticised the system for restricting access to fisheries to certain operators who had access at a specific time, but at the same time asserted, that the Icelandic government was entitled to distribute ITQs to a restricted group of people. Two fishers brought the issue to the UN Human Rights Committee, which ruled in 2007 that the initial allotments were a violation of the equality principle embedded in the International Covenant on Civil and Political Rights (Directorate General for Internal Policies, 2012). The Human Rights committee further ruled that the Fisheries Management Act should be brought into line with the equality principle.

Responsive changes to the ITQ system

The Icelandic debates over the initial distribution and the subsequent geographic concentration and social implications have led to a range of amendments to the Fisheries Management Act. A community quota clause has been established giving the municipality the right to buy vessels that are otherwise being sold to firms outside the community. Accordingly, this community right has seldom been used, because it does not include the vessels' quota. Another response has been the introduction of the strandveiðar (coastal) fishery in 2009, an open access and common pool system which is operational in the summer months from May to August (see box). The system allows a diverse group of fishers to gain access to the otherwise expensive fish resource, but is not without challenges (Chambers *et al.*, 2017).

Resource rent

Another way that the Icelandic government has responded to the critique has been through the introduction of resource fees in the fisheries. From 1994–2003 a user fee was applied based on gross tonnage and on the size of the quota share. The purpose was to cover costs of management and modernisation of the fleet through funding scrapping of old vessels. However, from 2004, a proper resource rent taxation was applied with the additional purpose of securing the broader society larger portion of the wealth created. The exact way to determine the resource rent taxation has been changed and finetuned several times over the years. The taxation is currently based on 33% of the earnings before tax and then distributed on the different species with considerations for operational costs and value created on land.

Iceland has been a global front runner in implementing market-based fisheries management and has later mainstreamed and shaped the system based on economic objectives. Hence, Iceland has also experienced the negative and positive effects of quota markets and the related public debates and controversies. Despite recent changes to the ITQ system through the introduction of the open-access coastal fishery scheme and the increased resource rent taxation, the Icelandic development also prove the long-term stability of market-based instruments and property rights in fisheries management. However, as indicated by the recently elected government, which has declared that it will increase the support for coastal fisheries and reassess the resource rent system, discussions are not over.

Strandveiðar

As a response to criticism of the Icelandic government introduced a commercial coastal summer fishery in 2009 as a complementing instrument to the individual transferable quota systems, which had created significant entry costs for new entrants. The Strandveiðar is an open-access system running from May to August. The system is effort and output regulated and allows operators to catch 650 kg demersal fish pr. day. When the monthly catch limit is reached in one of the four areas the fishery will close down until next month. The participating fishers are either without ITQ or must have finished their ITQ allocations before entering the Strandveiðar.

4.2 Greenland

Fishing is of great importance for the Greenlandic economy – both on a national economic scope as well as in the dispersed regional economies. Therefore, support and reform of the Greenlandic fishing sector has also come to play a significant role through the 20th century in the strive for national independence. This was the case with the great modernization plans in the 1950s and 1960s and again in the more recent efforts to engage independently in the globalized economy. However, both former and current plans have been subject to resistance and dispute. As a result, multiple industry and state objectives struggle to co-exist with local ambitions in one uniform management regime. On one side, ITQs and similar market-based instruments are perceived to be central in increasing and securing the national income from fisheries. On the other side, ongoing debates indicates that this is not a simple case. Fisheries are instrumental as a source for national income, and a further drive for efficiency and increased export incomes can only be realised on expense of the regional, social and economic benefits of local fisheries.

4.2.1 Background

Understanding the recent historical development of the Greenlandic fisheries is helpful when comprehending the current conflicts and controversies. Until the end of World War II, Greenland was administered as a Danish colony, but after the war, Greenland moved towards a more open economic model and towards a more equal relationship with Denmark. In 1950, a wide-ranging modernization plan for Greenland was introduced with the aim of modernizing and industrializing the Greenlandic economy as well as society. At this point fishing was predominantly carried out as a part of a wider hunting and gathering practice in the dispersed settlements. Efforts had been made earlier in the 20th century to develop a salt fish industry, but the new plan radically proposed to develop fishing in to a proper modern industry and suggested it to be the future source of stable employment in Greenland. Instead of the salt fish products, the new industry was to be based on frozen fish products. For this reform to happen, investments in processing facilities and people had to be concentrated in the south-western areas which had good access to the sea all year round. This would, the plan suggested, also improve the basis for provision of other public services. However, the centralisation plans were met with popular reluctance and it proved hard to develop a self-sustaining private sector. Therefore, after Greenland obtained home-rule in 1979, a more regionally diverse strategy for investments was applied, partly as an opposition to the previous concentration politics. This meant substantive public investments in land-based processing facilities and even in publicly owned fishing vessels. In addition, favourable loans and subsidies were given – all with the objective of developing competitive codfish, halibut and shrimp industries. As a result, the capacity doubled, but at the same time cod resources began to decrease and global shrimp prices declined. The resulting economic crisis for both operators and the state was the actual background for the introduction of ITQs in the offshore shrimp fisheries in 1991. However, it also left the home-rule with a geographically dispersed infrastructure.

4.2.2 *Market-based fisheries management in Greenlandic fisheries*

Departing in the cod and shrimp crisis market-based instruments were introduced in the Greenlandic fisheries. The section below account for shrimp and Greenland halibut currently managed through market-based systems. Other important species for coastal fishers (such as cod and snowcrab) are managed in “Olympic” systems under a shared quota. In Greenland, all the main fisheries, including the MSC-certified inshore lumpfish fishery, are managed by the use of Total Allowable Catches (TACs) and by splitting the TAC in offshore and coastal fisheries. The coastal fisheries are materially and socio-economically diverse but can in principle operate within 3 nautical miles from the baseline, thus covering all the fjords and archipelagos.

Shrimp

By introducing an ITQ system in 1991 for the shrimp fisheries, Greenland was one of Nordic pioneers in applying market-based management instruments in quota allocation. The ITQ model was later expanded to the coastal shrimp fishery in 1997. The ITQ system has facilitated a concentration of the shrimp fisheries on fewer operators and improved the profitability in accordance with the political objectives. The maximum ownership limit on shrimp in offshore fisheries is 33.33% and two companies are close to the limit, while in coastal shrimp fisheries the limit is 15%. There is also a “flex quota” system, allowing operators to transfer partial quota shares in-between two years. Shrimp is the primary Greenlandic export commodity, and as such, important for the national trade balance, but also as a source of local employment on land. Therefore, the offshore shrimp fisheries have a landing obligation for 25% of the catches, while in the coastal fisheries there is a general landing obligation (with some exceptions). The landing obligation means that catches must be processed in land. The catches that are not landed locally on Greenland are, most often, the most profitable seen from a company perspective. The ITQ system which has created significant wealth and concentration of ownership has also been met with some public critique and has been subject to a resource rent taxation since its introduction. Currently the resource rent tax is applied on the vessels with on-board processing, and is based on a method where the prices (on company level) for the last four quarters are used as a reference. A resource rent of 0.01% is introduced when prices reach DKK 9.60 per kilo and the rent rise until prices reach DKK 24.60 wherefrom it is locked on 15%.

Greenland halibut

The Greenland halibut fishery is the second most important both in quantity and in value. For the offshore fisheries, there is a license system, where each license holds a maximum catch, but where the license is not transferable. In the coastal Greenland halibut fishery an ITQ system was introduced in 2012 for vessels over 6 meters. The system was primarily introduced to improve economic performance. At the same time, the open access for vessels under 6 meters was carried on but closed for new entries so the total number of active operators would decrease over time. The under 6 meters were not included in the scheme, partly because of the management difficulties it would create and partly because of the diverse socio-economic use of the resource in

this group (Jacobsen & Delaney, 2014). The category of under 6-meter vessels also covers ice-fishing from dog sledges and snowmobiles.

Until 2012, as the shrimp was concentrated on a handful of export-oriented companies mainly operating from the southern region, the Greenland halibut increased its importance as a source of livelihoods in other regions. The implementation of ITQs and the closure of access for newcomers therefore also touch upon some central issues in the Greenlandic economy, which will be discussed further below.

4.2.3 Debates and social tensions

As the most important sector in the Greenlandic economy, fisheries are constantly subject to public debate and political reform. The most crucial debates are between optimising economic benefits of exports on one side and regional distribution of activities on the other side. Behind this debate is a social tension between the company structure favoured by market-based systems and the variants of independent vessel owners as well as the many livelihoods, where fishing is combined with other economic activities. This tension is, in many ways, a mirror of the different visions for how Greenland should develop. In addition to the differing social ambitions, matters are complicated by the surge for national independence and the position of Greenland in the global economic geography (Rasmussen, 2003).

Profitability on the agenda

In 2007 it was decided to establish a commission to create the basis for a reform of the fisheries policies. It was a central point in the commission's mandate to suggest ways to improve the profitability of the sector by an increased use of market mechanism (Fiskerikommissionen, 2009). The resulting commission report had a wide range of proposals for reform of the sector. First of all, the report recommended a general use of ITQs in the Greenlandic fisheries with as few market regulations as possible (Fiskerikommissionen, 2009). In addition, the commission suggested an abolition of the distinction between offshore and near-shore fisheries, as well as changes to the so-called rubber boot paragraph and an elimination of the landing obligations. The purpose of the rubber boot paragraph has been to secure that the ownership of the means of production was on the hands of active fishers. The suggested measures were all based on the objective of developing a sector with as little subsidies as possible and as large profits as possible.

The recommendations form a coherent argument for a radical market-driven transformation of the Greenlandic fisheries (Søbye, 2018). The introduction of quota markets should lead to concentration that would require investor capital, outside ownership and new competences. This explains the break with the rubber boot principle and landing obligations. To maximize economic profitability the new companies would be export oriented and both the landing obligations and the division of offshore and near-shore fisheries would be a regulative hindrance for the operators. However, the commission also presupposes that other job opportunities will be readily available for the vessel owners and crew that will be leaving the fisheries as a result of

the market-driven concentration. The commission report from 2009 points at mining and the oil industry as a future source of employment and concludes with a parallel to the 20th century reforms by suggesting that the “transition to other professions will necessitate that housing is increased in locations, where the future job opportunities will arise” (Fiskerikommissionen, 2009). It was on this basis that ITOs in 2012 were introduced in the near-shore Greenland halibut fisheries, while other recommendations from the report have not been introduced yet or have been somewhat altered on their way through the political system.

Local contributions of fisheries

Other scholars have disputed the inferior performance of the near-shore fisheries and instead pointed at its regional economic contributions and complex social services for a diverse range of operators (Delaney *et al.*, 2012; Hendriksen, 2013; Jacobsen & Delaney, 2014; Rasmussen, 2003). Viewed in a regional perspective the economics of export-oriented large-scale fisheries is less favourable for many communities, where fishing and fish landings are still a valuable source of employment. The promotion of market-based fisheries management to further species in Greenland will most probably create a large-scale sector integrated in the global markets, while at the same time decrease the regional benefits of the resource. This is not an easy dilemma, and it is hard to once and for all untangle the logics of public subsidies and private sector economies (Hendriksen, 2013; Jacobsen *et al.*, 2011; Rasmussen, 2003). Towns and settlements are relying on different sources of public support and have different roles in the value chain.

In addition, it is hard to economically account for the contributions of coastal fisheries to the pluri-activity of hunters or the informal significance of local fish landings. The intense discussion in Greenland also point at some socio-cultural paradoxes, namely that while the town-based fishing companies and processing factories in general are in need of labour, there is an increase in the search for fishing licenses allowing people to become self-employed fishers. It seems that while dwellers in the settlements are reluctant to move for the potential wage earner jobs in the cities, they remain in the settlements in proximity to family and community – willing to work harder for less based on coastal fishing and other activities (Søbye, 2018). The overall long-term challenge for the fisheries policy in Greenland is to balance these differing social logics in a stable way, as to avoid the disturbance of shifting policies coming with shifting governments.

4.3 Faroe Islands

The fishing sector plays a prominent role in the national economy and history of the Faroe Islands as the modernisation of the fishing fleet was an important aspect in the aspirations for Faroese independence in the 20th century. Through motorization and through the application of deck boats the Faroese agricultural economy was supplemented with an export-oriented fishing sector. In 1950, one third of the working

population was employed in fishing and in the fish processing sectors. In the same period, the Faroese large-scale fleet was modernised, and catches doubled from 1960 to 1970, while the number of fishers began to decline. A characteristic of the new Faroese large-scale fleet was that it was greatly engaged in distant fisheries, mainly along the coasts of Iceland and Greenland, Newfoundland, Barents Sea and Svalbard while the coastal fleet was occupied with the domestic near-shore fisheries. The distant fleet formed the basis for investments in processing facilities which were established all around the islands to gain locally from the incoming catches from the large-scale fleet.

4.3.1 *Distant fleet and Exclusive Economic Zones*

With a high dependency on distant catches the expansion of EEZs in the late 1970s meant radical changes for the Faroese fishing fleet. As a consequence, a great share of the distant fleet returned to the home waters and national catches subsequently increased in the first part of the 1980s. In contrast to many other countries who implemented *output quotas* in this period, the Faroe Islands continued with a management based on a series of technical regulations and temporary closures of areas, supplemented in 1987 with a license system to curb the catching capacity (Hegland & Hopkins, 2014). However, a combination of high fishing pressure and low bio-recruitment in the late 1980s led to a crisis in the fishing sector and thus ultimately also to a national economic crisis in 1992 (ICES, 2004).

As part of the economic restructuring, an ITQ system was introduced in 1994 for the main demersal species (cod, saithe and haddock). However, the Faroese ITQ system was abandoned already after two years due to the increasing difficulties for the administration in estimating the stock sizes (including concerns for discarding and misreporting of catches) and due to wide-spread opposition in the sector (Hegland & Hopkins, 2014). Accordingly, the sectoral opposition to the ITQ system was also fuelled by a sentiment that it was imposed on the Faroese sector from the Danish authorities. Thus, in 1996 a new system was introduced by the Faroese government based on days at sea management and primarily aimed at avoiding discard problems as well as misreporting of landings. Each fishing day would give operators access to fish on all three species, and the ecological wellbeing of fish stocks was subsequently to be managed mainly by limiting fishing days and by closures of fishing areas. From the beginning the days at sea system featured both transferability and an elaborated segmentation based on vessels size and gear types.

4.3.2 *Segmentation in the days at sea system*

Until the very recent changes, the Faroe Islands stood out with their mixed whitefish fisheries as one of the few effort-regulated fisheries in the North European and Nordic context. The difference between an output quota system and effort regulation is that the fisheries are not regulated through the allocation of outtake quotas (TACs) but through restricting and allocating fishing days, the so-called *days at sea*. In other words, it is the input of effort that is regulated, not the output of catch. The central point then is to foresee the

dynamic development in catching effort and to adapt this to the fluctuations in the available resource. The “days at sea” was from the beginning allocated in an elaborated and segmented framework with several groups and the system introduced limited transferability between the different vessel groups. This means that days at sea can be sold and leased between operators, but only inside each group. Licenses for vessels measuring 15 GT or less cannot be transferred to vessels over 15 GT, and licenses from vessels measuring 110 GT or less cannot be transferred to vessels over 110 GT.

The elaborated segmentation serves two purposes. First, the fishing effort released through one day at sea, and therefore the anticipated fish mortality of one fishing day, obviously will differ between small and large vessels and between gear types. With unlimited transferability, a day at sea will result in very different impact. Therefore, the system had to segment gear and vessel sizes. Secondly, the segmentation fulfils a political objective, by keeping the social and regional balance in the sector relatively intact. This is done by keeping the relative share of the annual fish mortality between the vessel groups stable, and by limiting transferability to trade inside each segment (see table).

Due to the historical development of the Faroese fisheries described above the different fleet segments were still rather well defined when the management and resource crisis occurred. This segmentation formed the background for the different groups and their management. Thus, coastal vessels gained a privileged access to the near-shore areas. In the understanding the Faroese fisheries management one must therefore also include the regulation of access to the fishing areas. Most of the year the fishing grounds on the Faroese plateau, covering areas with depths around 150–200 meters, are reserved for hook and line fisheries, while the area within 6 nautical miles is reserved for coastal vessels under 110 GT. These and other closures are an important part of the Faroese fisheries management and supplements the days at sea system.

4.3.3 *Key challenges and social tensions*

Initially, the Faroese systems was appraised for its design, allowing a great deal of operator flexibility in the multi-species fisheries. By the use of “days at sea” the Faroe system was not based Total Allowable Catches and therefore contrasted the mainstream advisory in for example ICES. There was no weekly licenses or annual quotas to be observed. On the other side, the days at sea system has recently been criticized for its high fishing pressure and for the “marginalisation” of scientific advice (Hegland & Hopkins, 2014; ICES, 2004). Today especially the cod stocks are under pressure, which has a further negative impact on the coastal fisheries that depend on the cod resource. The current reforms of the Faroese fishing policies are aimed at this issue among other issues.

Table 1: The Faroese segmentation of vessel categories allow for limited transferability of rights and days at sea

Group	Type	Gear	Regulation system	Concentration limit
1	Trawlers >400 HP (merged with group 2 in 2011)	Trawl	By-catch quotas	30% of catch licenses
2	Pair trawlers > 400 HP	Trawl	Individual days at sea	20% of fishing days
3	Long-line vessels > 110 GT	Line	Individual days at sea	20% of fishing days
4A*	Coastal 15–40 GT	Trawl/Line	Individual days at sea	20% of fishing days
4B*	Coastal > 40 GT	Trawl/Line	Individual days at sea	30% of fishing days
5A**	Coastal < 15 GT	Line	Individual days at sea	
5B**	Part-time	Line	General days at sea	

Note: * No transfer of licenses from group 4 to 1–3.

** No transfer of licenses or fishing days from group 5AB to groups 1–4.

The Faroese Islands was also involved in the so-called Mackerel war, where Iceland and the Faroe Islands unilaterally increased their mackerel quotas and catches. This increase was based on a claim that mackerel stocks had gravitated north in the recent years (due to climate change) and were now more abundant in their economic zones. In 2013 the conflict escalated and led to a blockade of Faroese vessels in EU harbours as well as trade sanctions. However, in 2014, the Mackerel Wars ended by an agreement reached between the EU and Norway and the Faroe Islands. As a part of the agreement the Faroese shares of the mackerel fisheries were increased on expense of the EU member states and Norway. The process and final resolution mirrors the complex situation when a range of countries share fish stocks. In the Faroe Islands, it was the subsequent national allocation of the quotas between its operators that caused domestic debate. The debate was caused by the fact that the new mackerel rights were distributed first freely to the existing operators, resulting in a dramatic creation of wealth for this group of operators (which was subject to resource fee from 2011). This allocation is an important background for understanding the current reform of the Faroese fishing legislation. At the same time, the Faroe fisheries have changed socio-economically over the last decades. Employment is steadily decreasing, and the (commercial) coastal fishery is at a very low level. As in other Nordic countries the remaining operators have increased their company size, investments and technological complexity.

4.3.4 *Current reforms*

After failed reform processes in both 2008 and 2013, a substantial reform of the Faroese fisheries management system was put on the political agenda with the change of government in 2015. As the fishing rights had already been formally denounced ten years earlier a new policy was technically needed for the beginning of 2018. Based on the drastic development in the fishing sector in the recent years the new government wanted to introduce substantial changes. A commission was therefore established in 2016 with the purpose of looking at possible changes.

The mandate for the commission was to formulate policy initiatives that adhered to scientific counselling, and which moved away from “gifting” rights and private trade. In other words, the reform should introduce a move towards state auctioning of fishing rights. In addition, the new policies were supposed to underline the national ownership of the resource by limiting foreign ownership and by requiring catches to be landed on the Faroe Islands.

National turmoil and difficult decisions

In the spring of 2017, the Faroese parliament was supposed to vote on a new fisheries bill including changes on the above-mentioned points. The bill that was put forward, was far from as radical as the commission mandate indicated and was instead aimed at a pragmatic process through parliament. For example, only 25% of the fishing rights were to be redistributed through auctions. In addition, fishing rights were no longer to be transferred between operators but would return to the state when a company could not use them anymore. However, the bill was not passed in parliament in the first try. Regional interests and local as well as international pressure from businesses kept a number of parliamentarians from supporting the law, which was subsequently postponed over the summer. The Faroese debates are thus centred around the legitimacy of the ownership structures and the concentration of wealth, coupled with questions of the distribution of individual, societal and national benefits of the resource. At the time of writing the new fisheries act has just been passed and will introduce a shift to a TAC system, partial auctioning (15% of the TAC of major fish stocks) as well as a new development quota (8.5% of the TAC). Foreign ownership is to be phased out in 6 years and anti-trust measures have been introduced. Another new demand, is that collective agreements from the Faroese labour market must be applied on the licensed vessels. The Faroese government is thus taking steps to increase the societal legitimacy of the fisheries management and introducing new instruments to increase the public benefits.

4.4 Norway

The Norwegian quota management regime has been under development since before WWII, starting with the offshore fleet (cod trawlers and purse seiners). The collapse of the Norwegian spring spawning herring stock in the late 1960s and not least the profound crisis in the cod fisheries during the late 1980s have had a strong influence on the management system. Both were wake up calls for the management calling for the long-term ecological planning. First with limited outtake for larger offshore vessels and then with the cod crisis in the 1980s, also an inclusion of coastal vessels in the management system. Through the 1980s the cod resource was gradually depleted while the management responses were not effective enough to turn the situation around. An important reason for this was that the coastal fleet was allowed to continue fishing after the quotas were taken, and it became obvious that this could not continue. This led to a radical and complete

closure of the cod fisheries in April 1989. Closing the cod fisheries for the coastal fleet included this fleet segment in the new management regime, in which first environmental and then economic sustainability took a more central position. The management systems have been further refined during the years and are currently under review to increase flexibility and to decrease administrative burdens.

As an important source of employment along the Norwegian coasts, the closure was critical for the coastal communities and their fisheries dependent economies. As a response to the challenges coastal societies and fishery dependent regions were facing, regional and social objectives were integrated into Norwegian fisheries management and used as arguments and criteria for quota distribution. The main social service of the marine ecosystem had previously been the equal and inexpensive access to the fish resources for coastal dwellers. After 1989, these regional and social objectives were put into the management system through its advanced allocation system (Johnsen & Jentoft, 2018) applied to the fisheries North of 62°N (elaborated below).

Important for the understanding of Norwegian fisheries is the division between offshore and coastal fisheries. The offshore demersal trawler fleet had been licensed early in order to guard the coastal fleet and its interests from the negative impacts of active fishing gears and their voluminous landings. For the offshore trawler fleet, a system of Unit Quotas was introduced from 1990, which allocated quota units to the vessels. The system allowed some transferability inside each vessel group and limited concentration to a maximum of two quota units on each vessel. Also, it was decided that the acquired quota could only be kept for 18 years. These were the first formal experience with market-based management instruments. For the longliners and the coastal fleet, the Norwegian authorities originally had proposed an ITQ-based system to deal with the overcapacity, but this was met with widespread resistance in the sector (Johnsen & Jentoft, 2018). Instead a system of Individual Vessel Quotas was formed. In addition to these individual quotas, a portion of the national quotas were put into an open group for the less active vessels and for possible newcomers – thus keeping a minor portion (6–7%) of the resource under a common access regime.

While the system for the offshore fleet had introduced a limited transferability, the individual quotas for the longliners and coastal vessels were in principle not transferable. However, in practice a market for coastal quotas emerged by trade with vessels and the subsequent administrative transfer of licenses, much in a way that resembled the offshore system. For both the offshore and the coastal fisheries, therefore, market mechanisms entered the Norwegian fisheries management in the 1990s – however in limited and in discrete ways (Hersoug, 2006; Johnsen & Jentoft, 2018). The individual quotas were initially conceived as a response to the cod crisis but were renewed in a revision in 2003 – this time with the support of the main fishermen's organisation.

4.4.1 Current regulation

The reform in 2003 (further adjusted in 2006) resulted in the Structural Quota System, which built on the previous systems but formalised the transferability aspect. The Norwegian structural quota system differs in nature from an ITQ system by operating with quota factors each releasing annual quotas for a set of species – in other words a quota package containing amounts for several species. A quota factor is a share of that vessel group's share of the total catch.

Figure 2: Example of the distribution of cod quota between different fleet segments north of 62°N

Note: At this TAC size, 29.6% is allocated to the offshore trawl fleet, while the remaining quota is distributed in five size categories and one open group.

Thus, it is not possible – as in a “pure” ITQ system – to split and sell the fishing rights (quota) on species and divide it in quantities. There is therefore – again in contrast to the “pure” ITQ model – only one transferable commodity for vessels and their quota factors together. In the case of a merger, one of the vessels will have to be decommissioned. In addition, trade is limited to occur inside distinct vessel groups (illustrated with an example in figure 2 – the annual percentages are dependent on the actual TAC) and divided in two geographical markets.

Offshore

The market for offshore trawl licenses is not divided in vessel sizes, but according to geography. Thus, quota factors from a trawler in the most Northern counties cannot be transferred to one of the Southern counties. Geographic restrictions also apply to the offshore purse seine fisheries, illustrating that regional and social objectives still are active even in the Norwegian large-scale fisheries management. Another point is the restrictions on the concentration of quota factors. For the offshore fleet, this was originally set at four further quota factors, which could be transferred to a vessel already holding one (4+1).

Near-shore

For longliners and coastal vessels trade can only occur inside each vessel group, thus keeping a relative diversity in the fleet. In total, the Norwegian distribution system consists of seven groups, whose primary objective is to balance regional and social objectives with economic flexibility for the operators. The vessels groups, which also define the markets for quota factors, are illustrated in figure 2. The maximum limit is dynamic and can be adjusted over time to align with the need for increase in scale and productivity. For the coastal vessels, the original restrictions allowed vessels over 15 meters to potentially acquire two further quota factors (1+2), while vessels between 11 and 15 meters could only obtain one extra (1+1). After a recent update the restrictions allow vessels over 15 meters a total of eight quota factors, and vessels between 11 and 15 meters a maximum of six quota factors.

Geography and time limitations

Upper limits on quota blocks are not the only restriction on concentration and ownership. The acquired quota factors can only be kept for 20 to 25 years. For the offshore fleet quota factors will “go back” to the whole group and the amounts are subsequently redistributed to the remaining operators. For the coastal fleets, only 80% of the quota factor is transferred to the buyer while 20% return to the group. For the coastal fisheries, it is currently undecided what will happen to the quota after the 20-year period expire, but the Norwegian parliament supposed to discuss the matter soon. In addition, a coastal vessel with quota factors could until recently only be sold to another operator in the same county, unless it is acquired by an operator in one of the three most Northern counties. From 2016 sales can take place within northern and southern Norway respectively.

4.4.2 Key challenges and debates

The Norwegian Structural Quota System (SQS) and its predecessor based on individual vessel quotas is within the Nordic countries probably the clearest example of how fleet structure and social objectives can be mixed with market mechanisms in the distribution of fishing opportunities. The social objective, which is often articulated as keeping activities and employment along the coast, have been definitive in the design of vessel groups and in the regional bonds put on trade. At the same time, however, the SQS allows (in limited ways) for quota trade to improve the competitiveness and economic sustainability of the operators. In this way the Norwegian system balances social and economic objectives. Yet, it is still a balance that is debated. For example, the vessels less than 11 meters are currently not able to trade quota factors, but it would be a likely instrument to introduce in order to improve the economic performance in this group – and to improve the societal benefit of the resource (Noregs Offentlege Utgreiingar, 2016). In the debate there are voices promoting both the economic consolidation and voices fearing regional concentration. Thus, the Norwegian system also shows that it is difficult to arrive at new compromises, while the technological development and wage development in other sectors prompts for responses (Johnsen

& Jentoft, 2018; Standal & Aarset, 2008). While similar discussions occur in the other Nordic countries, Norway has the most advanced, but perhaps also most rigid, system for controlling regional distribution and social diversity in the fishing sector. The administrative burdens and inflexibility of the system is the background for a current reform process (see below).

The controversies between economic profitability, fleet structure and regional distribution of the fishing opportunities are not the only debate in the Norwegian society on the use of their wild capture fish resources. Since the arrival of large offshore demersal trawlers in the mid-20th century, these trawlers have been disputed and contested by coastal fishers for destroying the coastal livelihoods. As a compromise the trawl concessions have been linked to geographic landing obligations, so that certain amounts of the landings must go through processing companies in the dispersed coastal communities. In this case there is also a regional objective and a limitation put on the market mechanisms. The receiving companies are obliged to uphold activities and to process the fish locally. The system of landing obligations is accused of being diluted by exemptions and raise new governance issues.

The arrangement described above with several restrictions is of course not very much aligned with the current liberal understanding of competitiveness in an export-oriented sector. The same can be said on the so-called raw fish act from 1938, which still gives fisher-controlled organisations control over first hand sales of fish landings. Both are market regulations that are disputed from time to time, but which also safeguards certain ways of life and community aspects.

Historically, the landing obligation and the raw fish act, as well as the participation act from 1972, were in fact conceived as measures to guard the Norwegian fishing communities and fishers from companies and “passive” owners. The landing obligation secured that fish processing companies cannot develop their own value chain outside the communities, while the raw fish act guarded the individual fishers from powerful fish buyers and middlemen. The participation act defines the owner of a vessel as an active fisher, historically guarding the sector from external investments and ownership. These legal statutes are partly still in place though with some modifications, and as time goes by and the situation in the fishing sector changes, these regulations might lose their practical validity for some groups, while they might also be conceived as desirable as a way of safeguarding a certain way of life or company form by others (Petter Holm & Henriksen, 2016).

Coming changes to the Norwegian fisheries policies

Due to the changes in the sector over time and the complexity of the Norwegian fisheries management, the Norwegian fisheries policies are currently being reviewed. In late 2016, a commission report on the future of the Norwegian quota systems were published debating fundamental changes in the quota system (Noregs Offentlege Utgreiingar, 2016). The key objectives of the proposed changes are to decrease administrative burdens and to increase the operator flexibility in order to specialise or diversify in ways that are hindered by the current quota system. The key to understanding the proposed changes is the bundled quota factors, which means several

species are allocated in one “quota” and the uniform sizes of these “quota factors”. Each vessel in the same size category receive an equal portion of the overall quotas for that vessel group, which in addition are bundled together with other species. This give rise to several challenges.

First, in order to secure that the available quota is actually caught the sum of the individual allocated quotas exceeds the sum of the available resource. This is referred to in Norway as “over regulation” and means that all operators cannot be guaranteed their indicated “maximum” quota. It also means that catches have to be constantly monitored, computed and at a certain point the individual quotas have to be revised. All though this mechanism has proved to be functional, it is administrative burdensome and have some problematic incentives built into to it. The uncertainty results in a push for an increase in fishing capacity, and for a fishery focused on certain species first, instead of inciting steady landings over the year. Secondly, the bundling of several species together in one quota factor hinders specialisation as well as diversification in other ways than the bundled quota rights.

The proposed solution to the above challenges is to introduce a simpler management system including partial leasing of annual quota allocations. Thus, the task of securing that the national quotas actually will be landed is proposed to be handled through a leasing system driven by the operators. Operators will be allowed to lease out a share of their quota holding. In addition, the “unbundling” of the species will allow specialisation and new ways of diversification. At the same time, the report suggests moving from quota factors to actual quota shares expressing a fixed share of the overall national quota. All in all, these changes will ensure a greater flexibility to future challenges. If these proposals are introduced Norway will reform their Structural Quota System in a way so it increasingly resembles a standard ITQ system. However, there is still a strong focus on keeping a diversified fleet and in having active fishers as quota holders.

4.5 Denmark

The introduction of market-based fisheries management in Denmark is an evidence of the rapid effects that quota markets can bring, but also of the difficulties of safeguarding coastal fisheries (Høst, 2015a). The main objective was to make room for a restructuring and investments and in this regard the Danish market-based models have been rather successful (Andersen, 2012). However, despite the initial intentions to preserve a viable coastal fishing fleet, it has been necessary to readjust the coastal fishery scheme to better secure a long-term survival of the coastal fisheries. In this way Denmark is an example of rather comprehensive and liberal design that have recently been adjusted to better fit social objectives.

4.5.1 Background

The success of Danish fisheries in the 20th century can be traced back to the flexible and industrious self-organised and independent fishers populating the Danish coastal communities. Based on relatively small vessels often operated in local partnerships catches grew through the century employing a stable 13,000 to 15,000 people until the end of the 1970s (Høst, 2015b). Based on the free and equal access, community and family ties, these operators were able to deliver a high-quality catch in great volumes, while operating over large parts of the North and Baltic Sea. In addition, only a small number of vessels were involved in distant deep-sea fishing, most often around the fishing grounds of Iceland. From the 1960s to 1970s pelagic fisheries grew in national waters from a mere by-catch to a specialized fishery triggering a rapid growth. However, it was only by the late 1970s that a few Danish fishers invested in large-scale vessels comparable to the North Atlantic fleets – inspired in fact by foreign fishers (Faroese and Norwegian purse seiners). Therefore, when output quotas and subsequently the multilateral expansion of the EEZs were introduced in the North Sea, the Danish fleet was, despite some variations in size and activity, relatively homogenous.

Through the 1970s concern was raised over the well-being of fish stocks, particularly in the North Sea. This led to a stop for herring fisheries early in the 1970s and to the introduction of national quotas for the important cod fishery in 1974. The cod quotas were managed as a common quota for all operators, quickly leading to the negative effects known from Olympic fisheries (Høst, 2015b). Increased catches lowered prices and the common quota was fished up well before the end of the year, leaving fishers without income or driving them into to other areas causing a chain reaction of quota introductions in other Danish fisheries.

Ration system

From the 1980s licenses was introduced and a ration system was developed, which imitated the social structure of the independent share-organised fishers. The ration system, allowed the ministry to divide the national quota into time periods and catch areas and to allocate these on the basis of vessel size and activity. Through the system fishers maintained a degree of flexibility and equality in relation to accessing the resource, however the freedom and independence was compromised. In addition, through the 1990s, the ration system became increasingly complex and rigid in its management, without satisfying the sector nor the management. The system led to issues of overfishing and misreporting of catches, which challenged the management and legitimacy of the system. As a result, the economic performance and competitiveness in the fishing decreased and the fluctuating TACs induced crisis after crisis.

4.5.2 *Market-based fisheries management in Danish fisheries*

It was on this background that the Danish parliament took a decision in 2001 to introduce "ITQs" in the herring fishery as a five-year trial starting from 2003. After request from the sector other pelagic species followed in 2004 as Individual Quotas, which could only be sold with the vessel. The trial fuelled an already existing interest in introducing market-mechanisms in the demersal fisheries management, a decision which finally passed through the parliament in 2005. Even though support was growing, the sector was still very divided on the issue. Therefore, in the shape of *Vessel Quota Shares* (Fartøjskvoteandele) market mechanisms entered the complex and multi-faceted demersal fisheries management in 2007. At the same time the existing pelagic models were revised and made semi-permanent as proper ITQ systems. With the current regulation the quota markets and property rights can principally be denounced on an 8-year notice, but this has to pass through parliament.

Pelagic fisheries

Besides the technical regulation, the pelagic quota system is mainly governed through maximum limits for ownership and through a policy objective to keep pelagic fishers, capacity and companies apart from demersal fisheries. The individual quota rights and transferability was introduced to obtain an economic restructuring and renewal of the fleet. For the first trial with herring quotas it was an additional motive to increase the share of total catches landed for consumption. Seen from these three perspectives the reform was a success and sparked a prompt and extensive restructuring of the fleet. Today the pelagic fisheries are highly concentrated and modernised, but also widely transformed bringing the value for some of the companies over EUR 100 million. The social setting is therefore also radically changed compared to the earlier times and the pelagic fisheries will be most likely be transferred in the future through the mediating help of investors or through stepwise investments by youngsters in the joint-stock companies who owns vessels and fishing rights.

Demersal fisheries

The so-called Vessel Quota Share system became effective in January 2007 in the demersal fisheries covering a range of species and all five Danish catch areas. In a Nordic comparison the system is therefore rather complex and comprehensive in regards to the many types of fishers, species and catch areas regulated under one market with only limited market controls. There were as such no regional controls nor any consideration of gear or vessel size in the initial design. The main market regulations were the voluntary coastal fishery scheme which put a voluntary three-year bond on transfers (no transfers to vessels outside the scheme) and the overall maximum ownership limit defined initially as the maximum "acquisition and transfer" of four vessels.

The vessel quota shares were allocated to the vessels based on a three-year reference period. For the first years the transferability was linked to the vessel, meaning that operators would have to acquire the vessels to acquire the quota, before it could be transferred to the main vessel. There were exceptions to this rule allowing operators to

transfer 25% of a quota without the vessel. The 25% exception was meant to allow vessel owners flexibility and to specialize the operation in fewer species and catch areas. The same was the motive for the formation of quota pools, producer driven organisations, where quota could be leased forth and back. However, these exceptions also meant that there were ways to work around the linkage of vessel and quota – for example by selling forth and back using the 25% rule several times or by leasing deals between vessels in the same company. Because of this the linkage between vessel and quota was later abandoned.

The Vessel Quota Share system quickly proved capable of delivering a great restructuring of the demersal fleet. It allowed for expansion for some and for smooth retirement for others, and quota trade quickly took off. Because of the restructuring, the composition of the demersal fleet has become more uneven, with a large-scale fishery that have expanded, and a coastal fishery that has decreased. This development has also been the main concern in the public debates as it links to both regional development and environmental issues.

Changes to the concentration rule

In 2012, the previous regulation for maximum ownership, which was set as a maximum of four vessel that could be “acquired and transferred” to one vessel was replaced with maximum percentages (see table 2). The four-vessel rule had proven to be ineffective in the actual management and had given way to creative solutions involving acquiring and leasing from oneself (hence not “acquiring and transferring”). Given that the vessel quota shares were initially distributed to more than approximately 1,000 vessels, the maximum percentages now between 5 and 10% can be considered as a relatively high concentration. Despite the new attention given to the concentration issue, the new rules only applied to the registered quota amount on the vessel, not the actual catch, and therefore different leasing models could be used to further increase the catches beyond the concentration limits.

Table 2: New quota concentration rules were introduced in 2012, setting a maximum ownership of quota by percentage per person and vessel

Quota	Maximum limit
Cod in the North Sea	5%
Cod in Skagerrak	5%
Cod in Kattegat	5%
Cod in the Eastern Baltic	10%
Cod in the Western Baltic	5%
Plaice in the North Sea	6%
Plaice in Skagerrak	7.5%
Plaice in Kattegat	7.5%
Plaice in the Baltic Sea	5%
Haddock in the North Sea	10%
Haddock in Skagerrak and Kattegat	10%
Norwegian lobster in Skagerrak, Kattegat and the Baltic Sea	10%
Norwegian lobster in the North Sea (EU zone)	10%
Norwegian lobster in the North Sea (Norwegian zone)	10%
Monkfish in the North Sea (Norwegian zone)	10%
Sole in the North Sea	10%
Sole in Skagerrak, Kattegat and the Baltic Sea	5%
Pollack/coalfish all catch areas	10%

Source: Fiskeristyrelsen.

4.5.3 Key challenges and social tensions

As mentioned above the Vessel Quota Share system included a specific scheme to promote coastal fisheries. The coastal fishery scheme was designed as a voluntary scheme that awarded vessel owners with extra allocations proportionally to their existing quota holdings. Despite having more than 300 participants in the first three-year period, the downward trend for the coastal fisheries have been one of the recurring points in the debates. One issue has been the decline in Danish seine and gillnets and the corresponding increase in trawl fisheries (Høst, 2015b), raising an environmentally based concern as well. The regional balance has also been raised as a concern in public debates, linking to cultural and social loss. In both the Danish market-based management systems, there is no instrument as such to facilitate the regional distribution of quota holdings. The quota is divided in catch areas, but one vessel can in principle hold maximum shares in all areas and for all species. The main instruments directed at this is therefore the coastal fishery scheme for the demersal fisheries. It should be mentioned here, that vessels with a low activity level (below EUR 30,000) in the reference period (2003–2005) have been given transferable licenses that give the right to annual rations. These licenses are sometimes used as entrance points by youngsters. However, the main instrument for regional and social objectives in the Vessel Quota Share system was the coastal scheme.

Changes to the coastal fisheries scheme

As the central instrument for regional and environmental objectives the coastal fishery scheme has therefore been the political focal point and consequently revised several times. First, in 2014 by introducing a premium allocation for passive and semi-passive gear (an extra 50%) and by increasing the overall size of the coastal quota. The period also saw the formation of a new producer organisation initiative representing so-called low impact fishers.

So far, the coastal fishery scheme was still based on three-year voluntary enrolments. In practice, therefore, the coastal scheme was only a limitation on trade from coastal to large-scale fisheries for a limited amount of time. Coastal fishers were therefore compelled to reconsider their market value and exit strategy every three years. Over the years, this mechanism (and the internal trade) led to a decrease of coastal vessels. Therefore, and due to political pressure, the coastal fishery scheme was revised again in 2017 introducing a more principal change, namely a permanently “closed” segment, where, if coastal fishers enrolled, they would not be able to sell to vessels outside the segment anymore. In this way, the Danish authorities are trying to introduce market segmentation.

Public debates

In the wider society, the overall transformation, where large-scale fisheries have gained ground on the expense of the independent coastal fishers have attracted attention. In the pelagic fisheries, ownership is highly concentrated with 16 companies owning two thirds of the quotas (Rigsrevisionen, 2017). In the demersal fisheries the ten biggest quota holders hold 21% of the national quota. For both the responsible ministry and

researchers it has been difficult to monitor the development. The design of the system and safeguards had led to a widespread use of leasing and of so-called quota-vessels, small boats holding quota for the purpose of leasing. Thus, there was a growing discrepancy between the registered holdings and the actual catch, which has distorted most evaluations of the system from 2007 and onwards. What was experienced as a competition for quota among vessel owners, did not alarm the responsible administration. In the public media, however, the rapid concentration and the use of creative leasing arrangements to circumvent concentration rules gave rise the popular notion of “quota kings”.

In 2017, a report from the Danish national audit criticised the lack of consistent methods to govern, monitor and control the concentration process (Rigsrevisionen, 2017). The report also determined that the ministry had failed to implement the initial political intentions, which were clear on avoiding a vast concentration in the sector. In a technical point of view, the authorities only had a vague image of the desired concentration/spread. By applying a mix of individual quotas linked to vessels (in the four-vessel rule) and the flexibility of divisible “ITQs” (through leasing and the exemptions to the former rules) the Danish authorities had created a self-contradictory system. Until recently, the main motive, which was an economic restructuring of the sector, were decisive in the development and interpretation of the rules and have favoured large-scale fisheries and the related quota accumulation process. However, with the recent introduction of a closed coastal fishery segment, the Danish authorities are seeking to reintroduce a more rigid management, in order to firmly protect and promote the remaining coastal fisheries.

4.6 Sweden

The Swedish experiences with market-based fisheries management is restricted to its pelagic fisheries, where an ITQ inspired system was introduced in 2009, and recently in the demersal fisheries where individual quotas (but only allowing leasing) were introduced in 2017. Prior to this, the Swedish fisheries had mainly been managed through a (TAC based) ration system, where vessels were assigned a maximum catch for a fixed period, and where the ration size could be based on the vessel’s size, activity, gear or number of crew. Over time, this system resulted in a poor economic performance due to technological investments and because the system hindered rational planning over the year (Nielsen *et al.*, 2007; Waldo & Paulrud, 2013). In addition, the ration based system was disposed to overfishing and misreporting. However, the main concern for the pelagic ITQ system was not the well-being of the fish stocks, but the economic performance of the individual operators. The mission was to improve the profitability not only in the fleet but also in the rest of the value chain and to enhance the international competitiveness of the Swedish fisheries. However, while the lead motive for the Swedish authorities has been to improve the economic performance, a balanced regional distribution and the conservation of small-scale fisheries have served as important policy concern as well.

4.6.1 *Introduction of market-based fisheries management*

On the background of limited marine resources and the poor economic performance, the Swedish board for fisheries suggested in 2005 that pelagic fisheries (mackerel, herring, sprat, blue whiting and sand eel) should be managed through individual and transferable vessel quotas. As a first step, annual individual pelagic quotas were introduced in 2007. The individual vessel quotas were based on historical catches in a reference period from 2001 to 2004. In late 2009 it was decided to allow transferability of these quotas. At the time the pelagic fleet consisted of 81 vessels.

The introduction of transferability came with a range of policy designs to safeguard small-scale fisheries and to ensure a continued regional balance in the distribution. The political fear was that the Swedish fisheries would be further concentrated in the West coast region. Therefore, specific regional instruments were introduced in the Eastern Baltic and Gulf of Bothnia, while a common-access coastal quota system was continued for vessels with passive gear and trawlers under 12 meters. The individual quotas were allocated as a share of the total quota for the pelagic segment and limited to ten years in duration. In addition, a maximum limit for ownership was set at maximum 10%. An evaluation in 2014 concluded that the profitability had improved. In 2009, 81 vessels had been allocated individual quotas, while in 2014 there was 37 vessels holding pelagic permits, but distributed regionally more or less in the same manner as in 2009 (Havs- och vattenmyndigheten, 2014). Part of the reduction in vessels can be explained by license holders having two vessel permits prior to 2009 and then combining these two into one vessel. While two license holders have sold their pelagic rights and entered other fisheries, 24 of the vessel license holders that have sold are no longer active fishing. At a first glance the regional objective seems to have been obtained. However, another evaluation in 2017 revealed a heavy concentration on the Western coast. According to the “follow up” the ten largest companies all come from Gothenburg and hold 85% of the fishing rights (Sveriges Riksdag, 2017b, 2017a). Further, 95% of pelagic quotas are held by vessels on the West coast, 4% on the South coast and only 1% on the East coast. All though the Swedish system can be criticized for not fully adhering to the economic principles of market-based fisheries management, as for example through the regional bonds and the limited holding period of ten year, the system has nevertheless allowed a significant improvement of the economic performance in the sector (Stage, Christiernsson, & Söderholm, 2016).

4.6.2 *Regional safeguards and small-scale fisheries*

The introduction of ITQs in the Swedish pelagic fisheries was supplemented by a coastal quota system and so-called regional allocations. The regional allocations were installed to counter the anticipated geographic concentration and reserved to vessels *fishing and landing* in the Baltic Sea area. The regional allocations are not as such based on fixed vessel shares but can be used more flexible to target specific objectives. Out of the 81 vessels originally enrolled in the pelagic ITQ-system, 16

vessels received regional allocations designated for vessels both fishing and landing in the Baltic Sea. Today 12 vessels receive the extra allocations, whereof 5 are above 24 meters. Another regional instrument was for the Gulf of Bothnia, where it was decided to open up the underutilized herring and sprat stocks for vessels without pelagic permits.

Small-scale fisheries

The so-called coastal quota (*kustkvot*) was designed to guarantee the continuation of the Swedish small-scale fisheries and to ensure an entrance point for newcomers into the pelagic fisheries. With a few exceptions, the coastal quota is reserved for vessels with passive gear (gillnets), small seines and trawlers less than 12 meters long. In principle, the coastal quota is a common-pool system and as mentioned open for new entrants. Since the introduction, the number of vessels participating has been fairly constant around 300 vessels. In the first period, the coastal share of the total pelagic landings increased. This was partly the intention of the coastal quota as it was designed to strengthen and renew the coastal fishery.

Table 3: The coastal share of pelagic landings was fixed in 2010 and varies substantially between species

Fishery	Coastal share
Herring (Skagerrak/Kattegat)	1.5%
Sprat (Skagerrak/Kattegat)	4%
Mackerel	5.5%
Herring (Western Baltic)	20%
Herring (Eastern Baltic)	2.5%
Herring (remaining areas)	20%
Sprat (remaining areas)	0.5%

However, an expanding coastal share of the pelagic fisheries potentially challenged the value and stability of the pelagic ITQ system. For example, the coastal herring fisheries in the Western Baltic Sea increased from 5% in 2008 to around 20% in 2010. While this is by far the most substantial increase, a potentially expanding coastal fishery challenge the stability of the property rights in the pelagic ITQ system. In 2010, this problematic interaction between the two pelagic quota systems led the Swedish authorities to fix the coastal shares (see table), a decision which have increased the trust in the pelagic ITQ system. On the other side, a new problem has emerged in relation to the distribution of the coastal quota between different types of operators, regions and gear types. So far, this puzzle has been solved by introducing temporary closures, by differentiating on gear and by introducing vessel rations or dividing the coastal quota over the year. However, many of these instruments resemble those in use before 2004 and which led to the weakened economic performance in the sector. So even though the coastal quota share is fixed, the long-term solution might not have been found yet.

Demersal fisheries

In January 2017 a new system of individual fishing opportunities was introduced in the Swedish demersal fisheries (for different whitefish, shrimp and Norwegian lobster). The system is officially motivated by the new landing obligation and allows for temporary annual transactions of quota between the operators (leasing), but not permanent transfers of shares. Through individual quotas the authorities hope to avoid collective fishing stops and “micromanagement” of gear types. With individual quotas the operators can better plan and lease from each other to “cover” unwanted bycatch at the end of the year. Baltic Sea vessels fishing for cod with passive gear are not included in the system and will be managed through a demersal coastal quota. The system has been introduced with a range of limitations on the in-year transferability. Quota that requires specific permits (like shrimp) cannot be transferred to vessels without these permits. Nor are pelagic vessels allowed to begin a proper demersal fishery based on quota leasing – only bycatch can be covered in this way. In addition, to avoid concentration of fishing activities the system will be implemented with upper limits for how much a commercial fisher can obtain annually of the national quotas for the different species (limits ranging from 4–13%). The system was implemented for approximately 250 demersal vessels.

4.6.3 *Debates and social tensions*

In addition to the diverging interests of small and large-scale fishers, the main tension in Sweden is the regional tension between the West coast operators and the Baltic Sea areas. The two areas have different fishing traditions, where the large-scale West coast fleet traditionally was based on a higher mobility between fishing areas. With the prospect of market-based instruments being introduced in Swedish fisheries, operators and communities have feared that a concentration process would take away the activities from the Eastern shoreline in favour of the west coast communities. The fear has been that landings in the area would fall below a level, where proper service facilities can be upheld. They have therefore called for special safeguards to be put in place. This concern has also been voiced in relation to the recent changes in the demersal fisheries. The situation should be seen in relation to the current situation of low prices for Baltic Sea cod and the increased “competition” that passive gear fishers face from an increased seal population. Because of the grey seal, most fishers from the Eastern Baltic have been forced to move their activities to the Western Baltic in consequence increasing the fishing pressure on that quota. The introduction of a market-based quota system in a time, where fishers are struggling hard to make ends meet, might yield an undesired geographic concentration, not promoting the most valuable use of the resource.

In 2017, 17 coastal municipalities from all over Sweden reacted to the downward trend of small-scale and locally based fisheries in Sweden (Simrishamn kommun, 2017). The 17 municipalities noted that despite political intentions and decisions to support local small-scale fisheries the actual development is negative. They further pointed at the consequences this has for local businesses, communities and the environment – as

well as for local identity and cultural heritage. In response the group called for a fisheries management, where the social dimension and potential socio-economic value is central to the distribution of fishing opportunities, and where all three dimensions of sustainability is assessed systematically and equally when fishing policies are reformed.

As the above sections reveal, the Swedish fisheries is currently undergoing wide-ranging reforms. While economic objectives and regional considerations are being addressed by a mix of ITQs and a common-access coastal quota, the debates around the demersal fisheries reveal that this tension is not at all solved permanently. The conflicting policy objectives draw lines to the political task division and policy hierarchies, and while political statements support small-scale fisheries the actual policy design is less clear-cut (Arias-Schreiber, Säwe, Hultman, & Linke, 2017).

4.7 Finland

Finland has only very recently applied market-based quota allocation, when individual and transferable quotas were introduced in the herring, sprat and salmon fisheries in 2017. These new instruments will be briefly described below. In addition to this, Finland has a long tradition of private rights to coastal areas and lakes.

According to FAO the Finnish fisheries sector contributes to 0.1% to the gross domestic product, while the most important fishery is the Baltic Sea herring, but also sprat, cod and salmon as well several coastal species contribute to the landings. In addition, Finland has a relatively large inland fishery with an employment of 400 people (with 70% being full time). In the commercial sea fisheries another 2000 people are employed whereof 78% are engaged on a part time basis. For a great part of coastal fishers, fishing is operated on a family basis with pluri-active households sometimes involved in the processing of the catch (P. Salmi, 2005; Pekka Salmi, 2012). Small and large-scale fisheries are mainly divided through the different gear applied, i.e. the open sea trawling or the trap net fisheries. Despite the decline in the number of fishers, fishing is still an important regional activity generating livelihoods and cultural value along the coast.

4.7.1 Market-based fisheries in Finland

In 2017, individual and transferable quotas were introduced in the herring, sprat and salmon fisheries. The law clearly stipulates that the resource still is owned by the Finnish state and are distributed to operators on a ten year basis (Finnish Government, 2017). However, the right can later be prolonged for a period of five years at a time so that the right always has at least a five-year duration. The state can in other words decide to abolish the system with a five-year notice.

The quota shares were allocated based on the principle of catch history, however, with a share of the overall quota (4%) reserved for newcomers. The shares allocated to new entrants are not transferable and they have a duration of only five years. The objective is to allow for young fishermen to enter the industry based on non-transferable

rights. During this time they may also acquire transferable rights from the market. In this way Finland has found a novel way to balance the closure and exclusiveness of the allocated fishing rights with a principal entrance point for newcomers.

As the quota shares are allocated according to gear there is an implicit distinction between small and large-scale fisheries. The quotas for open sea herring and sprat fisheries are large-scale while the trap-net and salmon fisheries quotas are considered small-scale. It is not possible to transfer a share for the coastal trap-net fisheries to a company for trawl fisheries. The coastal fisherman can however transfer its annual quota to be fished by a trawl company. Thereby coastal fishermen can sell unused quotas to trawlers e.g. after the summer season for trap-net fishing has ended. The main objective of the reform is optimising operational planning and commercial conditions. As in other countries market-based instruments are imposed on top of existing technical regulation.

4.7.2 *Other property rights and coastal areas*

Historically, Finland has a long history of property rights in relation to fishing rights. The former strength of farmers meant that the ownership of coastal land often also included a right for the adjacent marine waters to a certain extent. Today, the above-mentioned water parcels which were associated to the private land ownership are either managed individually or jointly by real estate owners. In the largest lakes and outside the private boundaries, water and marine resources are owned by the state.

The main issues in the Finnish debates concerning fishing are the public access to the coast and coastal resources. There are limits on the exclusive rights of the private land owners and common rights for fishing has been introduced, granting the public the right to some forms of recreational fishing. However, there are a range of disputed “grey areas”, for instance around guided fishing trips and nature-based tourism.

Part 2: From School to Skipper

5. Introduction

This report explores the relation between education, training and recruitment in the fisheries sectors in Norway, Denmark and Iceland.² The research has been conducted in preparation for conference on the future challenges to Nordic fisheries organised by Nordic Marine Think Tank in 2018. The conference theme is particularly focused on understanding the use of market-based fisheries management systems, discuss the lessons learned from those Nordic countries that have an experience in their implementation and to better understand their effects, and acceptability, on fishing communities, fishing fleets, revenues and the returns to society.

The work is based on studies in Norway, Denmark and Iceland but the findings are reviewed in a Nordic context. In particular, the study discusses the design and impact of different market-based fisheries management systems on the labour market and aims to outline more general trends in the industry. The main objective is to identify major trends and challenges in Nordic fisheries and examine how these trends affect young and aspiring fishers. Under which conditions – and with which hopes and dreams – will young people be able to enter the fishing sectors in the coming years? As a question related to this, we explore the central role of market-based fisheries management in the transformation of Nordic fishery-related labour markets and educations.

5.1 Nordic fisheries in transition

Nordic fisheries are in the middle of a profound transition influenced by various factors, such as economic globalization, technological development and changing governance instruments. Although the different Nordic fisheries vary from each other, they are all influenced by these trends in some way or the other and need to adapt to the changing conditions. Through the last decades there has been an increase in the scale of vessels as well as in the knowledge and technology applied in the fishing activities. Larger commercially structured operations have gained ground, partly by using transferable quota systems to grow and expand. Nordic fisheries are in general oriented towards export markets and even the remaining small-scale fisheries are often well-integrated into the competitive global fish markets. Changes like these have had, and will continuously have, a great influence on the fishing practice, career choices and the everyday life of fishers on board the vessels. Therefore, these changes will also have an impact on the skills needed in the sector.

² The research in the three focus countries have been conducted by Gunnar Már Gunnarsson (University of Akureyri) Signe Sønvisen (SINTEF Ocean) as well Jeppe Høst and Jens Christiansen (Oxford Research Denmark).

However, it is not a uniform development. Technology can both require more advanced knowledge and training from the fishers onboard, but also lead to deskilling of certain positions. Sometimes technology replaces manual labour, and sometimes it increases the divide between those in control of computers and machinery and those working on deck. Often new technology demands even greater investments to pay off, but in some instances, new technologies emerge that promotes small and flexible units, and sometimes new value chains are created through for instance social media. Some fisheries segments have abundant and competitive labour forces while others are in labour shortage.

While technological development, company structures and increasing scale are characteristic of Nordic fisheries in these years, we can still easily find youngsters who search for self-employment and who hope to become skippers on their own boats. In these cases, new business skills and an understanding of the quota systems are required. In general, new skills and certifications are required to make business plans or to enter a competitive labour market, which very likely will only decrease in terms of nominal employment.

In this report we explore how aspiring and young fishers perceive their education and their future labour market, as well as how they can enter the fishing sector in the future. The fishing educations are in general dynamic and reflect the national fishing sectors and their development. Formal education for the fishing sector is a relatively new thing. Very few of the older skippers we have interviewed for this report went to a fisher school of the sort that is common today. They have a navigation certificate, but the craft itself they learned by spending afternoons at the harbour as youngsters and later by joining fishing trips with family members or other boats in their community. Learning the craft was a form of primary socialization, where the knowledge and competences were acquired by being in and around the fishing community.

After quitting school and further learning from their mentors, these youngsters could often invest in a vessel or, at least, a vessel share. Others were happy to remain as crew members and receive a share of the outcome. In the past, fishing communities supported their fleets with a flexible and dedicated labour force, while the fleet secured an economic flow in the community. Today, the transfer of knowledge and competences has increasingly moved from primary socialisation through family and community to the formal school systems. However, as we will show, fisheries remain a craft and practical experience are highly valued, while formal education does enable labour market mobility. In the following we will present the main points in the report.

5.2 Main findings

5.2.1 *Interplay of education, quota markets and capital-intensive fisheries*

The technological developments, the pursue of economies-of-scale and the introduction of market-based fisheries has promoted a large-scale and capital-intensive fleet, which demands a higher degree of labour specialisation. This is a demand that fishing schools must observe and increasingly comply with. At the same time deskilling occurs and fishing schools must also cater for a work force that only need the basic certifications and who might increasingly be exposed to wage pressure. If the above trends continue, we assess that fishing schools will have to serve three different groups that can have potentially contradictory demands:

- Firstly, there will be need for a group of highly skilled fishers who can manage and control the operations. Besides being specialists and fully certified in navigation or engineering, they must master quality control and possess the leadership skills to head the daily operations on board;
- Secondly, hired fishers will require the basic certifications that enable labour market mobility to work as deck hands, but who, seen from their perspective, must make sure that they cannot be replaced by cheaper labour without vocational training;
- Thirdly, there are still young fishers aiming at becoming independent fishers. This group needs to master all the skills in their productions and must increasingly obtain knowledge on business planning and financial matters. To increase the value of small quota holdings, this group might be increasingly involved in marketing, processing and selling their catches – introducing even further skill demands from the educational system.

Today, the fishing schools to some extent still mirrors the former dynamics in the coastal employment system, where young fishers were able to buy a vessel and begin fishing straight from school. Especially in Denmark and Norway, the fishing schools aim at educating maritime generalists that can handle gear, machines, radio equipment while also mastering some degree of navigation. If the development continues with increased specialisation, not all pupils will need to be trained as generalists.

The current development points at more specialised positions, mainly in navigation and engineering, requiring full certification as skipper or chief engineer. Norwegian and Icelandic educations allow students to continue into academic levels. At the same time, we can still observe an interest in becoming independent and self-employed fishers if the conditions allow for it. Besides generalist competences, independent fishermen will need business skills that are central, but currently lacking. Striking the balance between various competence demands from fishermen with different aspiration will be a central challenge for fishing schools in the future, and relations to other levels and areas of education should be strengthened, in order to serve as a possible entry point for further specialisation.

5.2.2 Horizontal and vertical mobility

There is a wide diversity in the ways that fishers can use their educations. Common to the three focus countries is that the young and aspiring fishers see their future labour markets not just as the fishing industry, but as a broader range of fields related to maritime activities and working on board a boat. Thus, the students aim at the fishing industry as their first priority, but also see offshore, sea transportation, cruisers and so on as their possible labour market. Certifications (safety, radio, engineering) enables mobility between these sectors and subsectors. In Iceland, youngsters certified in engineering even see land-based jobs as part of their labour market. In general, the horizontal mobility between types of fisheries and between sectors is considered important by the young and aspiring fishers – it is a form of safety net for them. Talented fishers can obtain further certification and gain vertical mobility to acquire “better” positions in the fleet, though formal training does not substitute for practical experience.

Figure 3: Fishers emphasize the mobility as important for their situation in the labour market

Note: Young fishers see the formal training as an access to different sectors including off-shore and land-based occupations. This horizontal mobility is typically obtained by certifications, networks or through documented experience. Others value the vertical mobility through acquiring new skills and higher positions.

5.2.3 Competition on the labour market

Fishers are sensing a future ahead of them where the rates of employment in the fishing industry will decrease, thereby creating increased competition between hired fishermen. Confronted with a labour market with increased competition, fishermen might use their level of certification as a competitive advantage when seeking employment. This development can already be seen in Iceland where well-certified fishermen are willing to take a lower level position if it is on what they consider to be a “good boat”. It is possible that we will see this tendency unfold further in the future. Although certifications might initially have been used to comply with maritime regulations, they can also be a way for a fisher to compete on the labour market by being able to officially document his skills.

5.2.4 *The good life of fishing*

In general, there is a positive interest in the fisheries sector. Students and young fishers are attracted to the alternating rhythms of the fishing occupation giving them intense periods of work followed by lengthy periods of holiday. They stress the hard work and the good pay. Being in nature and the fluctuating nature of fisheries are also mentioned as bringing a joy to the work-life. Some find joy in mastering the skills while others see the formal certificates as a basic qualification in the increased labour competition.

However, we have also found young and aspiring fishers who already have decided that they will leave the fisheries sector early. They point at the physical tear and the demanding work-life. The long periods away can also be a hindrance for realizing modern expectations of family life. While there is a general interest and desire for the jobs in the fishing industry, there seems to be some areas where a combination of hard manual work, physical tear and lower incomes reduces the attractiveness. These operations can experience recruitment problems, and instead, positions are taken only temporary or by migrant labour. Internal differences in the fleet can therefore lead to a shortage in one segment while others can have an excess of labour at the same time.

5.2.5 *Experience and "finished" fishers*

When we have interviewed stakeholders, students, fishers and skippers, there has been a persistent preoccupation with the leap from training to experience, from theory to practice. As a vocational training fishing schools only prepare students for the job, they do not produce "finished fishers", schools argue. Still, the labour market is competitive and employers require both skilled *and* experienced fishers. Gaining experience is therefore consistently on the minds of young pupils. In this regard, the three countries mix schooling and practice in very different ways.

In Norway and Denmark apprenticeships are formally organised in cooperation with the sector, while in Iceland students are supposed to seek experience on their own hand. This stems from a former practice where students *already had* experience before entering the school to become certified. However, this is changing now and Iceland might have to look at other countries to find the right model for including practice in the formal education. In Denmark students board vessels for apprenticeships early on, while in Norway apprenticeships appear in the third year of a student's studies. There are different ways to mix school and practical training, but experience is considered important in all cases, and apprenticeships are necessary as a bridge between school and practice.

Experience from earlier positions or though apprenticeships have several positive attributes. According to our interviews, experience boost the utility of courses (although some become obsolete). Apprenticeships provide the students with their first knowledge of and network in their future labour market, links that are becoming more important with the changing employment system. The main purpose of the apprenticeship is of course to connect formal training with the actual practices onboard a fishing vessel. This is highly valued by the students and we have

found several examples of older fishers who play a role as teachers or mentors for the aspiring fishers. Peer to peer learning is therefore not replaced by formal education, but rather supplementing it. The learning processes that take place on board the vessels should not be overlooked, although they cannot really be formalised.

5.2.6 *Future life-modes in Nordic fisheries*

To further understand the social diversity in Nordic fisheries and to explore the implications of fisheries policies, we propose to break the category of fishers into four distinct life-modes. These four ways of life illuminate the different relations and meanings that young and aspiring fishers put into their work and career development. Each life-mode are dependent on different conditions, and introducing new policies will likely have a different impact on each of them. For some, a life-mode is just a temporary situation on the way to another, while for others it is the main occupational choice. The four life-modes proposed here as an analytical tool are the hired fisher, the highly skilled fisher, the quota holding fisher and the self-employed fisher. Seen from the young and aspiring fishers' perspective these four ways of life have different ambitions and intentions in their career. They also have different opinions on quota trade and ownership:

- *The hired fisher* values the intensity of work and the lengthy time off from work as well as the lucrative pay. They see no value in being involved in quota ownership that will demand a lot of them in return of very little extra here and now;
- *Highly skilled fishers* enjoy the work and the development in their career and aim for full certification that will enable them the greatest job mobility. They play an important role in the operation either as skippers or as chief engineers – also lifting the managing responsibility;
- *Quota holding fishers* are determined that they can build up a company and put a pride in providing crew – as well as their crew's families – with an economic base. They see quota ownership as a long-term investment and also engage actively in the financial aspects;
- *Self-employed fishers* seek to build an independent operation either alone or with partners. They enjoy the freedom of being one's own boss, even though that entails a lot of obligations. Unlike the quota holding fishers, they have little interest in investing and expanding their respective companies, if the requirement is loss of independence.

Figure 4: The four life-modes can be used to explore the current situation and to evaluate pros and cons of potential changes in the fisheries sectors

5.2.7 *Generational transition*

One important aspect is the generational transition of quota rights, which often is pointed out as a critical aspect of market-based fisheries management. The four life-modes mentioned above can be used to explore this question. For the hired and the highly skilled fisher there is a very limited interest in the ownership of the resource. They thrive in the new conditions all though they must compete for the best portions. Generational transition is therefore mainly relevant as a challenge in relation to the quota holding and the self-employed fishers.

Students and young fishers alike express that the barriers to entry to the quota markets are high. In Denmark and Iceland youngsters are in general very pessimistic about self-employment and quota acquisition, while in Norway there is a much more optimism. The general assessment in Norway is that if you work hard, "you can do it". Many factors influence this and the different quota systems is one of them. Those that defy the barriers to entry often use alternative quota instruments (open groups or part time licenses) and rely on community support and/or a seller who are willing to engage in a planned transition step by step.

5.2.8 *Future perspectives*

With regards to the open market competition for quotas, and particular in relation to the medium to large-scale companies, our material suggests that ownership of these are outside the reach of the younger generation. Instead, these are bought by existing companies or by investors. It remains as an unsolved question how these companies will change hand in the future, and if fishers will be involved in the ownership in any way. For the hired fishers and the highly skilled this will mean little. Highly skilled fishers will take over the managing role previously taken by the owning skipper, while the hired fishers will still be needed to do the labour-intensive parts. Only in fisheries protected from market mechanisms by so-called safeguards or through voluntary withdrawal of quotas from open markets can entrepreneurial young fishers gain access to the resource as owners.

6. The background

The chapter introduces the analytical and contextual background for the study. The chapter reviews the main characteristics of the Nordic fisheries as a labour market and outline the basis for understanding current changes. As an overall framework the report explores the changes to recruitment, education and training as part of a change from a “coastal employment system” to a “fisheries employment system”.

6.1 Changing labour markets

The fishing sector can be viewed as an unusual labour market. Not only is the work on board still shaped by the rough and strenuous conditions on sea, it is also shaped by the limited ocean resources and corresponding regulation. The productive limits of the maritime environment have in many instances been reached. In other words, there is little likelihood of a future increase in the employment rates. At the same time the necessary investments to run a modern production of sufficient scale are increasing. In many Nordic countries the most central fish quotas have been allocated as transferable rights. Still, numerous businesses are run by families or as small-scale business alone by independent operators, but purely company-structured operations are gaining ground. In many ways, the Nordic fishing sectors are currently in the middle of a transition expressing the characteristics of both an old and a new situation. This transitional character informs the analytical base for this report.

Across the Nordic countries the number of fishers is decreasing, and the average age is generally rising. This is partly a result of the closing of access to fishing grounds from the 1980s and onwards – but is also a sign of the general appeal of the sector to the youth. At the same time some young people still do search for opportunities in the fishing sector either as deck hands, engineers, skippers or as a way to live a self-employed life close to nature. It is difficult estimate the exact full-time employment in Nordic fisheries since fishing is still an important part time occupation in many places. However, in many countries current employment in the fisheries sector is already down to 10% and 20% of its maximum in the 20th century. For example, in Norway, employment peaked in the 1960s at around 60,000 fishers and is currently down to 12,000 (whereof 9,000 have fisheries as the main source of income). It is estimated that 5,000 of these are coastal fishers. In Iceland 4,000 is employed in the catching sector, and Greenland has about 3,500 full time fishermen whereof 2,000 is in the coastal sector. The Faroe Islands have 1,500 full time fishers, and very few coastal fishers (below 60). Despite the downward employment trends in Greenland, Iceland and the Faroe Islands fisheries remain an important contributor to the national economies and

regionally as a source of employment. But its decisive impact on coastal communities is in decline.

In Denmark, employment peaked in the 1970s at around 18,000 fishers. Today, Denmark has about 1,200–1,300 full time fishers. In Denmark, 500–600 of these are employed on vessels below 18 meters, while only 220 of these are registered in the proper coastal fisheries scheme. In Sweden, the number is about the same around 1,200–1,200 fishers. In Finland, fisheries are characterised by part-time occupation. Approximately 560 are working full time, while another 1,800 are employed part-time.

Depending on how you add the numbers, the Nordic countries have between 21,000 and 26,000 fishers with a significant number of part-time fishers as well. There are a very few subsectors and areas that have minor increases in employment, but the overall trend is a continuous decline in employment in the last decades. At the same time, the overall catch is rather stable meaning that Nordic fisheries are driven by rise in productivity and increases in scale. New technologies are introduced which promotes efficiency and which continuously secure higher product standards as well as the full utilisation of the catch and its by-products. Technology replace labour but also changes the work on board. As a work place, modern fishing vessels are continuously marked by advanced technology and machinery in combination with a careful preparation, monitoring and registration of the products for the purchasers and consumer markets.

With a limited resource available and a steady rise in productivity the existing trends suggests that employment will continue to decrease. There is, however, still a need to recruit new fishers to replace older ones and to secure that the management and ownership of the companies are passed on. The combination of a relatively closed and decreasing labour market and a structural need to recruit new fishers is a peculiar characteristic of the sector. Coming generations of young fishers will have to be equipped with the proper skills to accompany the rise in productivity and the cautious operation of the vessels.

6.2 The employment systems

Nordic fisheries are as mentioned in the middle of a qualitative transition. As an overall framework this report explores the above changes to recruitment, education and training as part of a change from a “coastal employment system” to a “fisheries employment system” (Sønvisen, Johnsen, & Vik, 2011). The introduction of formal fishing educations in the Nordic countries is a recent phenomenon and constitutes a change in the way that fishermen acquire their professional competences. Prior to the introduction of formal educations, new fishermen were typically trained and recruited in the coastal community that they had grown up in. Appropriation of the required skills were done through primary socialisation – by family members or community members – and therefore often confined to the coastal areas themselves. This previous recruitment practice can be referred to as a “coastal employment system”. There are of course exceptions to this situation, but as a general rule, elements of this system characterised the situation in large parts of the Nordic countries up until the 1980s.

Figure 5: The main characteristics of the former “coastal employment system” and the emerging “fisheries employment system”

For the community the fishing activities would serve as a central component in the local economy and youngsters would be introduced to professional fishing practices as they grew up. Learning the profession was thus part of informal everyday life and competences were redistributed dynamically. The informal training and recruitment of fishermen often meant that many fishermen worked from the same community as where they grew up. This furthermore entailed a mutual dependency between different sectors of the local community's economy. The fleet would be a central source of income for the community while the community would support and provide the flexibility that was necessary. In short, the “coastal employment system” signifies a situation with:

- Deep integration and mutual dependency between fishing activities and the coastal community;
- Primary socialisation as the main educational source and recruitment through family, kin and community relations;
- High resilience and flexibility as a key to accommodate ecological and market changes.

We can add to the above points, that the “coastal employment system” was based on the open and free access to the resource. In other words, a community specialised in certain types of fisheries competing to some extent against other communities, a process which created and enforced the community ties. The free and equal access allowed for the flexibility to switch between species and catch areas which underpinned the individual flexibility to choose between fisheries and in organising the fisheries and crew sizes.

As the next parts of this chapter will explore further, the introduction of formal education, the technological development and regulative changes have (among other factors) created a new situation in the way that fishermen are trained and recruited for the fishing fleet. We refer to this as a “fisheries employment system”. The new situation is characterised by a higher specialisation in the fishing fleet, involving larger vessels, more advanced technologies (and training) and an increase in investments. Education

and training is to a larger degree obtained through the formal education system although practical experience is still important. The formal education provides the basis for horizontal and vertical mobility more than the community ties did in earlier times. The recruitment patterns are increasingly characterised by individual networks and labour often specialises in one of the subsectors (i.e. pelagic, trawl, gillnets, etc.). Where the former “coastal employment system” was based on the open and free access the emerging system is organised around market-based quota management and – in general – company structured operations are replacing family and community-based share-organisations. In short, the emerging “fisheries employment system” is characterised by:

- Formal education and certifications;
- Individual network-based recruitment;
- Highly specialised and company-based production units.

The two “systems” should be seen as archetypes representing two ends of a development. As the following chapters will reveal, in many aspects Nordics fisheries are currently in an “in between” phase, where characteristics from both systems shapes the situation. One example are the large companies still run by family organisation or youngsters recruited locally to engage in a generational transition of quota ownership. Regulation in many ways still protect the active fisher as an *owner* of vessel and quotas but technological development and market-based reforms introduce new demands to policy makers. The future will tell how stable these “hybrids” are or if they are only steps in a transition. There is, however, also evidence that in certain conditions, the traits of the “coastal employment system” can be carried on in modern ways promoting communities through community quota companies, certifications or through social media and new sales channels.

6.3 Methodology

The main methodological approach in this report has been qualitative interviews with stakeholders in the fishing industries of the three focus countries as well as a review of literature presented in the report “Nordic societies”. The largest share of interviewees has been with fishing students and young fishermen that have recently graduated from a Nordic fishing school. The interviews have been semi-structured allowing us to focus each interview on the most interesting points and aspects. In total we have conducted interviews with more than 40 stakeholders mainly in Norway, Denmark and Iceland, but also a handful in other Nordic countries.

While most interviews have been conducted individually, a few interviews have been conducted as group interviews. This kind of qualitative research have allowed us a valuable look into how young and aspiring fishermen perceive their training, labour market and the industry they are becoming part of. Thus, in contrast to quantitative

studies that can shed light on overall trends, qualitative research can shed light on fishermen's own concern and how they assess their own situations.

Initially we had expected a greater variance between students and younger fishers, but the view in these two groups have been a long the same lines and divides. In this report they are therefore often referred to as one group. To supplement and qualify the views of young and aspiring fishermen, we have also conducted interviews with school officials, skippers, vessel owners and producer organisations. These have been valuable to shed further light on and to qualify the statements that the students and young fishermen presented.

A final point, in this report we perceive the fishing sector as composite social system, and we use the qualitative material to explore different viewpoints and the mutual relations between different types of fishers. There is as such no single "truth" we can dig into, instead we present the most important perspectives from the relevant stakeholders and try to explore their structural background.

In the following chapter 7 we present the main characteristics of the fishing school and formal education systems in the three countries. Chapter 8 presents students and younger fishers' views on educations and preparations for their work-life, while Chapter 9 portrays their view on the industry and labour market. Both chapters use other stakeholder opinions to qualify and nuance the understanding. Based on the young and aspiring fishers' perspectives, Chapter 10 suggests four life-modes as a way to understand current and future Nordic fisheries. Through these life-modes we explore the mutual interdependencies and the barriers to entry. In the final chapter, "Nordic fisheries towards 2028" we examine the major trends and developments that this report has identified and discuss the potential future development and its implications for social diversity and relations.

7. The schools

“Young fishermen do not grow up in fishing today. They lived in it before. They knew what it was about and they did it out of pride because they wanted to show their mothers and fathers that they were good at it – not because they could make money on it.”

(Danish Skipper)

“Today you have these young men growing up that don’t have any know-how (verkþekking) (...) Young people start working late and are hardly introduced to the crafts (iðngrein), or not at all.”

(Icelandic Skipper)

The chapter describes and compares vocational fishing educations in Norway, Denmark and Iceland. Besides many similarities, educational systems and content varies between the countries as they reflect the different fishing industries and sectors in the three countries. In Denmark, Norway and Iceland fisher educations are all organised as vocational studies, where students learn practical skills that allow them to embark in a well-defined profession afterwards.

7.1 Main findings

Fishing as a craft is learned today by attending schools and formalised training. Historically, this is quite a novel situation and actors in the fishing industry are, as the quotes above indicate, quite aware of this novelty. Even though all the schools are organised as vocational training, there are still differences in terms of course content.

The main points in this chapter are:

- *Fishing educations across the Nordic countries have a strong focus on certifications.* School periods are typically made up of shorter courses that certifies the students in accordance with either international standards or national regulation;
- *The degree of specialisation across the countries vary.* The Icelandic education system produces specialised fishermen that are prepared for a hierarchical labour market, while the Danish and Norwegian systems train fishermen more as generalists. Furthermore, the Icelandic and Norwegian system allows students to continue in a more academic pathway, while this is not possible for Danish students;
- *The use of apprenticeship varies across countries.* In Denmark and Norway, students engage in apprenticeships as part of their educations. However, this is not the case with the School of Navigation and Marine Engineering on Iceland. This difference corresponds with a difference in student populations. The School of Navigation and Marine Engineering rarely admits students without

experience and the Danish school in Thyborøn rarely admits students with experience. However, the situation is changing in Iceland and the lack of practical experience is a concern for the students in regard to their sub-sequent situation in the labour competition.

As mentioned, formal education in the fishing sector is a rather new phenomenon. Until recently fishermen used to be trained and recruited in their local community and on board the vessels. The following sections will review the fishing educations in the three countries.

7.2 The Danish fishing education in Thyborøn

Today, there is only one fishing school left in Denmark, which is situated in the town of Thyborøn on the West Coast of Jutland, Denmark. The school dates back from 1992 and has been the only fishing school for approximately ten years. Thus, in the Danish fishing sector formal education besides navigation is relatively new but also rather limited in choice. The decision to place a branch in Thyborøn was made because there was, back then, already a boarding school for 10th graders. The boarding school had as a speciality fishing courses integrated into its courses. However, the 10th grade part of the school in Thyborøn is now closed.

Today, the fishery school in Thyborøn is therefore the main educational entrance into the profession. The school is part of the technical school EUC Nordvest, which offers a wide range of vocational training on secondary level. As a part of this, the fishery school offers four different two-year programmes, which all relate to fishing and aquaculture. Besides offering training and certification for commercial fisheries, students can graduate in aquaculture and as fish mongers. A fourth programme was launched recently and focuses on product quality and production processes and allows students to graduate as fishery technologists.

The education for commercial fishing takes two years and the aim is that the students learn *to navigate and operate a medium-sized fishing vessel*. The fishing programme begins with a three-week introductory course – which was introduced in 2014 to decrease the drop-out rate – where the students board a fishing boat for the first time during their education. The introductory course is thus used as a screening process, where the student is given a crash course in fishing techniques and a chance to experience the activities at sea. If the student decides to continue his education after the introductory course, he enters a programme that has two schooling periods of 11 weeks and three apprenticeships of approximately half a year each. When students graduate, they are certified to control a vessel up to 15 meters and be the first officer on a 24 meters vessel. To support the students' training, the school has a 24 meter long vessel, M/S Athene, which is not only used for fishing, but also for giving students practical training with safety procedures and engineering.

The apprenticeships that students participate in are guaranteed when the students join the school and are arranged in coordination with the producer organisation Danish Fisherman Association. During their apprenticeships, the students are basically hired as junior employees and are paid a fixed salary for their work. Often, they get a share of the income from catches as well. In this way, the Danish Fishermen Association is playing an active role in the content and organisation of the fishery programme and they see it as a way to secure the future workforce for Danish fisheries. In practice, consultants from the school is organizing the apprenticeships in coordination with vessel owners, but these tasks are paid by the producer organisation.

The courses during the fishery education are largely built around various certifications that are required by the Danish Marine Authority (Søfartsstyrelsen). If courses change at the school, it is primarily due to changes in these national regulations. The courses that students are taught include safety, first aid, navigation, radio, fishing techniques and more. One recent change to the fishing programme is that a STCW safety certificate has been introduced, which makes it easier to shift to jobs in the offshore industry or the transport sector.

A challenge is that few students graduate from the school – primarily due to high dropout rates; around 60% of the pupils that enter the school leaves without graduating, which means that only around 25 students graduate from the school every year. There are various reasons for why, so few students graduate from the school in Thyborøn. According to the school headmaster, one significant reason is that students suffer from seasickness and simply drop out. Other reasons are that students realise that they are unable to spend so many hours away from home, that they do not like the tone on fishing boats or that they realise that professional fishing was never the right occupation for them in other ways. To lower the dropout rate they have, as mentioned, recently introduced an introduction course. The challenges with students that drop out is also a sign of the new employment system, where students enter school without close experience of fishing activities.

Finally, the fishing school in Thyborøn is also attended by a fair share of youngsters with either social problems or pupils that have been unable to find other suitable educational options – and therefore have been suggested fishing because of its practical and conceived simplicity. A school official estimates that it is about a third of the school's students that are "rootless" and that a rather small fraction of these students ends up graduating. This is part of the explanation of the school's high dropout rates.

If the students aim to become skippers they will have to study further, typically at the skipper school in Skagen further North in Jutland, Denmark. Having completed studies and certification at the skipper school, the student will be allowed to navigate a ship weighting up to 500 tons. Before attending this school, the student will need to have 36 months of relevant work, and most students from the fishing school in Thyborøn will thus have to work in the industry before they can become certified as skippers.

7.3 Icelandic fishing educations

On Iceland, the Technical College (*Tækniskólinn*) in Reykjavík is the main institution for fishing education, and you can thus find students from all over the country at the school. Because the Technical College is the only institution that offers certification for engineering and navigation on all levels, the school is a central institution when it comes to educating new Icelandic fishermen. It is however, not the only one. The programmes at the school are divided into five different levels that each provide some formal certification for working in the fishing industry, and which complies with formal international standards. Thus, students come to the Technical College from all over Iceland to become fully certified, which also allows graduates to jump several salary grades when they enter or re-enter their profession. Recently, the school has launched a distant-learning programme. Out of the school's 150 students, it is approximately 100 students that are enrolled in the school's distant-learning programme.

Because the Technical College only used to admit fishermen that had already been working at sea, the school does not have a tradition of organising apprenticeship. However, the prerequisites for entering the school has recently been changed, which means that inexperienced fishermen can also be admitted to the school. Yet, in order to graduate with full certification, the graduate needs to have had a certain number of hours at sea. Since the school does not organise apprenticeships for the students, there is a minority of inexperienced students that entered without prior experience and who are thus unable to graduate with full certification. Meanwhile, the school does not have a vessel that the students – with or without experience – can practice on. The school currently has a simulator that students can practice on, but students do not formally accumulate hours at sea by practising on the simulator. However, those that do finish the safety course, school courses and service hours receive an international certificate.

The students at the Icelandic Technical College specialises to a large extent during their studies. As previously mentioned, there are five levels of certification that the student can go through. Furthermore, the students at the Icelandic Technical College that seek to go into fishing need to choose between two programmes. They can either study navigation or engineering. Thus, the students are differentiated not only in terms of their respective level of certification, but they also specialise in accordance with the positions on the Icelandic vessels (see box).

Traditionally, the school has always had a focus on practical training for fishermen. Although training fishermen is the central objective for the school, training can be used for a plurality of other professions and even qualify students for further academic studies. The majority of students still become helmsmen or engineers when they graduate, but fishing educations at Technical College are increasingly preparing students for university degrees. Some students, although a minority, even enter the Technical College with the goal to specialise on an academic level.

Division of labour on an Icelandic vessel

On an Icelandic large-scale vessel, there is a relatively high degree of specialisation as there are several clearly specified positions on the boat. These positions are described in each employee's individual contract, and many positions on the vessel require some degree of formal certification.

One example could be a freezer trawler of 60 meters with 27 crew members. The crew on such a trawler would typically work in shifts of six hours each. On each shift there would be a captain and a first helmsman working in the bridge, who are both fully certified; three certified marine engineers; one certified cook and one kitchen assistant; one fully certified 2nd helmsman; one "netman" (*netamaður/netagerðarmaður*) who is experienced and might have some degree of certification; one "inspection man" (*matsmaður*) who is experienced and might have some degree of certification; and finally, one "bader-man" (*badermaður*) who is experienced and might have some degree of certification. Thus, there can be up to ten members of the crew during each shift that can have some kind of certification. The rest of the crew does not necessarily have any formal certifications.

Besides the Technical College, there is a range of smaller fishing educations across Iceland, which offers courses that are not as comprehensive as the full certification that is offered at the Technical College. One of these schools is the Icelandic College of Fisheries (FTI), which dates back from 2007 when the head master of Sudurnes Comprehensive School proposed to cooperate with local fisheries to create a fishing education on secondary school level. The aim was to combine theoretical specialist-training with vocational training in a workplace, which would give students the competences to work in various parts of the fishing industry. After a committee was set up, which comprised representatives from the fisheries, processing plants, unions, the municipality of Sudurnes and educational institutions, the fishing school was finally set up in 2009. However, it was only in 2012 that it became formally recognised as a secondary education.

Besides the basic fishing courses, FTI also offers three specialisation courses – one on quality management in processing, one for "MAREL" processing technicians and one on aquaculture. Each year of study is generally organised as one term of formal school studies and one term of practical training as part of an apprenticeship. During their formal training, students are introduced to a range of subjects that are relevant for the contemporary fishing industry and the work places that are linked to the contemporary fishing industry. The courses thus cover processing, knowledge of fishing and aquaculture; the structure of the sector and economic issues related to the industry; as well as safety, rights and obligations in the industry.

Whereas the first year of studies introduces many aspects of the fishing industry, the second year leads to further specialisation. During the second year, the student can choose to study English for professional purposes, management of smaller companies, marketing and development, fish processing and quality control systems. Following their specialisation, the students finish their education with a company that matches their respective specialisation.

Although some students are young and inexperienced when they enter the school, most of them already have experience from the fishing industry when they enter the school. The many students that enters the school with experience are usually entering

the school as part of a professional development scheme that they have organised with their respective employers. These students do not only re-enter the industry with further responsibility, but they also jump several salary grades, which is explicitly specified in the contracts.

7.4 Norwegian fishing educations

Although there are today 13 different high schools that train fishermen in Norway, they are generally organised in accordance with the overall guidelines defined by the Norwegian Directorate for Education and Training. The training is vocational training (*yrkesfag*) and is organised as secondary school. Such vocational training in Norway is divided into three parts: Vg1, Vg2 and Vg3. Whereas the one-year course Vg1 gives the student more general knowledge, it is possible to specialise towards a specific profession during Vg2. Thus, a student that strives to become a fisherman will generally first complete the Vg1 course called “naturbruk”, which literally means “use of nature”, and will then complete the Vg2 course on fishing, *Fiske og Fangst* (fishing and hunting) afterwards.

The Vg2 course on fishing gives the student a broad training in the practical sides of the fishing profession as well as an introduction to fisheries management. Thus, during their two main courses on vessel operation and fishing and fishing equipment, students potentially learn to operate vessels weighing up to 500 tons and fish in accordance with existing national and international regulations. This means that students are introduced to navigation, loading and unloading in an environmentally friendly manner, planning trips, and much more, but they also have a range of courses that are common for all students, such as physical education and sports, Norwegian, and English.

During the last part of the vocational fishing programme, Vg3, the students typically spend time on a professional fishing vessel where they join the crew. This part of the students’ training takes two years. At Gravdal Videregående, these apprenticeships are organised by the Norwegian producer organisation OK Fisk and are guaranteed for the student when he or she enters the programme. Alternatively, students can choose to take a more theoretical path during Vg3, which builds on their skills from the first two years and allows them to subsequently get admitted into a university programme.

Like their counterparts in Denmark and Iceland, it has become important for Norwegian students to acquire certificates. During Vg2, students have the option of acquiring the D5 certificate skipper certificate (*dekksoffiser*), which is the certificate that officially allows students to operate a 500 tons vessel. There are several other certificates that are also becoming important for the ambitious student. For example, it is also important for the students that they receive a certificate documenting their apprenticeship. The certificate makes it possible for students to document their experience to employers and the apprenticeship certificate is perceived to be a “safety net” by many. Besides these certificates, they also receive a radio certificate and an international safety course. The safety course furthermore enables students to work outside the fishing industry since it is a wide-spread demand for employers in the maritime sector.

7.5 Comparison: Iceland, Denmark and Norway

Above we have described the fishing educations in the three focus countries. In the following we will compare the three and discuss the differences between them. Despite many commonalities, there is also a range of significant differences.

7.5.1 *Course content*

When we compare how fishing educations have been organised in Norway, Denmark and Iceland we quickly see that the fishing educations in the three countries are centred on certifying the student in accordance with existing regulations. These certifications are linked to national as well as international standards. On the national level, schools naturally must make sure that their students comply with the demands in the industry. Meanwhile, the schools are also orienting themselves towards the international standards set by the International Maritime Organisation, which implies that students are also being trained for a global labour market. Overall, the result is that the schools are an important mean for young fishermen to become certified for a broad maritime labour market, not only fisheries.

7.5.2 *Apprenticeships*

In terms of the content of the various fishing educations in Denmark, Norway and Iceland, different traditions mean that only some of the schools have arranged apprenticeships for their students. In Denmark there is, as we have seen, a practice of recruiting pupils directly from primary school. Consequently, Danish fishing students rarely have any prior experience, and it is therefore essential that Danish students get experience during formally organised apprenticeships. These are arranged and financed by the producer organisation. The Norwegian schools that we have described both have formal apprenticeships as part of their fishing educations – just like the Danish fishing education in Thyborøn – but unlike the Danish fishing educations, the Norwegian educations tend to attract students with more experience within the industry. In this way, the Norwegian recruitment pattern still have traits from the “coastal employment system”, however, with formal education now playing a leading role. Whereas the Danish students’ apprenticeships are spread out during their entire education, Norwegian fishing students tend to get their experience during the last two years of their training. On Iceland, on the other hand, the fishing schools have had a tradition of admitting experienced fishermen, and it is only recently that inexperienced pupils could be admitted. This means that the Icelandic fishing schools have not had a tradition of formally arranging apprenticeships for their students.

7.5.3 *Specialisation and academia*

The different labour markets also tend to be reflected in the course content of the different Nordic fishing educations. Not only is there a difference in terms of whether and how apprenticeships are included in fishing educations, as described above, but there are also differences in terms of how much the students specialise during their courses. Whereas students on Iceland can get specialised training that allows them to take on specific tasks on a large-scale vessel, Danish and Norwegian fishing educations seem to offer students more generic training. These differences can be explained by the different fleet compositions, with Iceland having a relatively dominant large-scale fleet, and Denmark and Norway having a larger medium sized segment. However, the current trends might be a challenge to the generalist approach, as fewer and fewer will be involved in handling the coastal vessels. As the solitary fishing school in Denmark, the school in Thyborøn is concerned with giving students generalist training that enables them take different position on various kinds of vessels.

In contrast to the Danish fishing education, the Icelandic and the Norwegian fishing educations enable students to pursue a more academic path as preparation for university degrees. At the Danish fishing school in Thyborøn, it is not considered that students should move onto an academic degree. However, the new fisheries technologist programme might point in another direction.

7.6 **Conclusions**

As this chapter has shown, fishing schools have introduced a new way to organise training of fishermen in the Nordic countries. Whereas training was previously in the local community, formal educations have become the new main gateway to the fishing sector. What characterise the schools in the three countries is their mutual focus on certifying the future workforce. Certifications are built around the core tasks and practical functions on board the fishing vessels. The education programmes differ first of all in terms of apprenticeship since there are no apprenticeships at the Technical College in Iceland. Furthermore, the Danish school in Thyborøn is the only one that does not allow students to take their education in an academic direction. Another point of difference is the amount of specialisation. The Icelandic Technical College delivers more specialised educations, which should be seen in relation to the specialised labour market the school serves in Iceland. In these ways, the different schools are shaped by the national contexts, while each country also face specific challenges in the larger transformation of the fleets and recruitment systems. In the next chapter we will describe in further detail how the students themselves perceive their educations.

8. The students

The chapter assesses how pupils and young fishers view their education and explore why they decided to enter the fishing school. The insights from students and young fishers have been further qualified by interviews with skippers as well as with a number of producer organisations. There is a significant difference in the perceptions of the fishing educations. Whereas young fishermen and students tend to expect a lot of practical training in fishing educations, school officials expect that aspiring fishermen will learn the practical sides of the craft outside of their school training. There are thus clearly differing opinions in terms of what a good fishing education *should be* as well as what one can expect from a well-trained fishing graduate.

8.1 Main findings

Based on interviews in the three focus countries our main findings are:

- *Student attitudes towards their studies differ widely across and inside countries.* The fishing students we talked to in the three countries gave different reasons for entering a fishing education. The Danish students tended to value the high salary and long periods of vacations that they would get after graduating; Icelandic students typically used the education as a stepping stone in their careers as highly skilled fishermen; and the Norwegian students expressed that they wanted to work in nature – and some of them even had plans to become self-employed, in contrast to most Danish and Icelandic students. However, inside each country there was a range of different reasons as well;
- *Peer to peer learning is still important.* Students and young fishermen often argue that they only really acquired certain skills when they were taught by their peers or colleagues on board and during fishing activities. The informal training that characterised the recruitment system prior to the introduction of formal schooling should therefore not be overlooked. Rather, the two should be seen as a productive collaboration. Students with fishing experience often gain more from courses, all though some courses are considered irrelevant for students with experience;
- *The students fear that they do not acquire the practical skills they need during their studies.* Students are aware that practical experience is demanded by the industry and they fear that what they perceive as a lack of practical training during school will leave them disadvantaged on the labour market.

In the following we will elaborate on these findings, before turning to the viewpoints of school officials at the end of the chapter. According to school officials all practical skills cannot be learned during a formal education. Students will have to learn many basic skills either during apprenticeships or when they enter the labour market.

8.2 Students and young fishermen's view on education

This section will describe how fishing students view their educations and the skills they acquire during their training as well as why they chose to study fishing. One of the themes that consistently crops up in the conversations with students is the relation between theory and practice, between school learning and the actual work on board a vessel. There is a general sense that you can only learn what it means to be a professional fisherman through practice and that the training they receive during their educations is too theoretical. For some of these practically oriented students, there is a concern that they do not learn the competences that they actually need. However, there is also an appreciation among students of courses related to engineering, navigation and a general appreciation of the formal certification they receive. Students tend to see the certification they receive as a "safety net", as the next chapter on labour markets will elaborate further on.

8.2.1 Career considerations

When asked about why they decided to study fishing, Danish, Norwegian and Icelandic students give diverging explanations. The Danish students often put emphasis on the salary they receive and their long periods in land, but they will rarely put much emphasis on the everyday tasks of being a fisherman. They look at the sector as consisting of different types of fisheries, each having their personal preferences. Although the salary and holiday periods are clear benefits that come with the job as hired fishermen, there are also downsides that keep the students from wanting to be professional fishermen their entire professional lives. Being a physically demanding profession, some Danish students argue that the job will tear you down over time, and it is not good to stay in the profession your entire professional life.

By contrast, Norwegian and Icelandic students tend to have a clearer image of where exactly their educations will take them and what it is they find attractive about being a fisherman. Both Norwegian and Icelandic students are very explicit about the excitement that comes with working in nature and the unpredictability that it entails, Danish students are less vocal about the attraction that comes from working at sea. This might be a result of many Icelandic and Norwegian having already worked with fishing or their closer community ties and knowledge about the job. Because more Icelandic and Norwegian students have previously worked with fishing professionally, they know what parts of the job they enjoy.

In contrast to the Danish students' emphasis on the salary and the vacation, the Norwegian and Icelandic students are more professionally determined when they

explain their reasons for studying fishing. Many Icelandic students had entered a fishing school as part of a career plan. They had already worked on a vessel for some time and they entered school to acquire (further) certification that could allow them to advance in their career paths. They imagine re-entering the fleet as highly skilled fishermen, and they often had specific positions in mind, such as becoming a well-paid chief engineer. By contrast, some Norwegian students imagine becoming self-employed after graduation, which is rather exceptional in comparison to the Danish and Icelandic students we interviewed. Having already acquired their own boats, some Norwegian students we talked to had already made some concrete preparations.

Thus, Danish, Icelandic and Norwegian students clearly differ in their determination and motivation. However, once they have entered a fishing education, they will all tend to emphasise that their studies are not as practical as they wanted. This point will be elaborated in the following section.

8.2.2 *Schooling and practical experience*

Students in all of the three focus countries expressed a concern that they did not receive enough practical training. On Iceland, this concern is made most explicit as students do not have apprenticeships and they do not have a vessel to practice on. For the students, there is an expectation that school periods will give them a clear understanding of what practical work as a fisherman is about. Practical experience helps them learn theoretical coursework and students sense that they need experience in order to meet the demands on a labour market that is becoming more competitive.

The Danish students we interviewed explained that although there are good elements in their courses, they still feel they need to be better prepared for their first trip. It is the real work of handling, gutting, cleaning and unloading fish that is felt as the biggest challenge when they enter a boat for their first trips. Likewise, during interviews, some Norwegian students similarly argue that there should be more training at the docks where they practice with the fishing gear. The call for more practical training is understandable, but as we will see below, the school leaders see the school as mainly preparing them for *learning* the craft. Still, students call for more practical experience in all three countries. In Norway, if the Norwegian students do not aim to get D5 skipper certification, which involves more theory, they should be able to spend more time at the docks with the practical gear, they argue. As a Norwegian student says:

“We haven’t been nearly enough at sea with the school vessel. Too much focus on theory, but [we] should have had even more practice.”
(Norwegian student)

This theme is also appearing in Iceland. As an Icelandic student expresses, not only is there little practical training, but even the experience he has from when he worked as a helmsman is not being appreciated by the school:

"It's maybe not nice of me to say so, but I feel as if I haven't learned a damn thing. I'm right where I started. I was already a helmsman, having finished the year in school and with my experience. There were perhaps three courses where I learned something. Everything else was either common sense or nonsense. (...) When I enrolled I was offered an assessment interview (raunfærnimat). My experience, however, wasn't really valued as such."

(Icelandic student)

The young fishermen that have recently graduated from a fishing school similarly argue that it was difficult to get the practical skills when they were attending a fishing school. Fishermen in the profession are also emphasising that being able to acquire experience is essential for young fishermen.

Out of Iceland, Denmark and Norway, Iceland might be the country where the students voice the most significant concern about their studies not being practical enough. Students consciously compare their training with that of Norwegian and Danish fishing educations. Students at the School of Navigation and Marine Engineering are generally worried because their school does not have a vessel at all. As a student explains:

"In Norway the schools have their own boats. It's a completely different experience, obviously. When you're at sea you can feel how everything responds to your command (...) But things are hopefully changing, though. The school is getting a new simulator this summer. A Norwegian group visited us as well. In their opinion, things were out-dated here. But with the new simulator we're on the right track."

(Icelandic student)

As it is articulated in the quote, students are worried that their theoretical courses are not readily translatable into practice. Good teaching and simulators might bring the students some of the way, but actual training on board a vessel is seen as the proper way to acquire the necessary skills. Another student also complains about the lack of practical training. Since the school has started to admit students without prior experience, practical training is, according to this student, more needed than ever. To make matters worse, this student also sees a labour market that is changing. There are going to be fewer positions for fishermen, and without experience, it is going to be difficult for students to find employment:

"Why doesn't the school own at least one ship? Then you could put together a crew and train those kids – not just read from books. They come out of this school absolutely wet behind their ears, because reality doesn't match with what they read in the books."

(Icelandic student)

Statements by other Icelandic students also lend support to the view that the labour market is increasingly competitive and that both experience and training is important entry requirements. Because of the competition they sense on the labour market, students expect to receive certifications and experience during their school time. One student states that companies "are not really thinking about training and sharpening up the younger generations – it's very rash. They don't take the time to instruct the recruits.". Another student, who already have experience from working at sea, is certain

that his experience will at least be able to give him a job on a cargo ship. However, he is less confident that some of his fellow-students will find work as easily. As he says, "I'm not too sure about the boys that are starting now and have never worked at sea. I'm not sure they have much qualification." According to this viewpoint, there is still a large supply of fishermen with practical experience in the industry. In the next chapter we will describe the students' view on their labour market more in depth and how they also see their labour market as becoming more competitive because of the demand for certificates. However, for now it is important to note that students are concerned that they will not receive sufficient practical training to satisfy the industry's demands.

Since apprenticeships are not part of these Icelandic students' education, there is little to compensate for the fact that they do not get to practice on a fishing vessel during their education. Potentially, formally organised apprenticeships would make it possible for students to try out their newly acquired knowledge in practice. This is also one of solutions the Icelandic students point at. Having experience is not only about establishing contacts and getting a sense of the practical work – it is also an asset to already have experience when you enter a fishing education. Experienced students tend to find it easier to make sense of what they are taught in school. As a student explains:

"A lot of people may enrol here but if you don't have any experience, most likely you'll drop out quickly. It's difficult for those students to grasp everything and soon enough they realize they don't have the apprehension they need."

(Icelandic student)

Having experience is therefore not only a matter of being prepared for professional life after graduation. Prior experience is also what renders formal education meaningful for the individual student by putting their coursework into perspective. An experienced student is thus more likely to appreciate his or her learning and contextualise coursework. This observation is confirmed by a Norwegian vessel owner who argues that "these boys from our community are special" because they enter school with fishing experience that allow them to have a critical engagement with their studies.

Across the three countries students were concerned that they did not get enough practical experience during their studies. As our interviews showed, students demand more practical work during their studies as they sense that it is valued on the labour market. Practical experience is furthermore a good precondition for learning. In addition, experienced fishers often play a key role in connecting school training and fishing practices.

8.2.3 *Peer to peer learning*

The school courses should not be seen as standing alone in the learning process. It is through the actual work that the skills are picked up. In this process mentors and peers still play a significant role, which means that it can be quite difficult to learn fishing only through a formal education. Some of the professional fishermen that took a formal education recall how they only learned fishing when they started practising as

fishermen. A young Danish fisherman, for example, tells the story of how he learned to mend nets. In school, he did not have a talent for it to say the least. He finished his course with the lowest grade a student can receive without failing. When he started his first apprenticeship, he received an interest in fields that had not interested him before, such as mending nets. It was another fisherman that took the time to show him how it was done. Today, even though he almost failed the course in school, he is the expert on mending nets on the boat where he is currently working. Likewise, two fishermen in Norway, who both attended the fishery programme at Gravdal Videregående, explain that it was other students in the programme, not their course teachers, that taught them how to repair nets. Thus, some fishermen only become good at their craft through practice and cooperation with peers and colleagues.

Like the practising fishermen, students highlight that they have to acquire practical experience outside of their studies and that is what allow them to learn the craft. This is characteristic of both Iceland, Denmark and Norway. However, since apprenticeships are not formally organised as part of the education in Iceland, Icelandic students' need for practical experience outside their studies will be especially important if they enter school without prior experience. One Icelandic student appreciates the tacit knowledge that he was acquired by simply helping other fishermen:

"In many ways the school doesn't prepare you for the job. (...) I'm lucky. The guys working the bridge on my ship often let me take their place when they take a break, so I know what it feels like."

It is not lessons that he could have learned through a book; it is a certain *feeling* of the job and about establishing networks with other fishermen who are able to show what fishing is like. Learning from peers and colleagues is thus a way of learning that is important across the three focus countries. This tells us that the informal training that students receive is still important, despite the increasing formalisation of fishing educations.

The next section describes the view of some school officials at Nordic fishing schools. As the following section will show, although fishing schools have become increasingly academic, school officials believe that fishing should be learned through practice – but they insist that learning through practice needs to be done outside the school.

8.3 The schools' view on education

School officials at Nordic fishing schools have a clear objective to train practical fishermen. However, partly due to the way fishing educations are organised and partly due to some educations becoming increasingly academic, fishing educations do have several theoretical components. Furthermore, with educations being structured around certificates, theoretical training becomes indispensable as part of the certification process. Yet, school officials will argue that there are only a certain number of things that students can learn during a school period. The schools will prepare students for learning the craft *after graduating* the school officials argue.

8.3.1 *Becoming a craftsman*

Like the students and the practising fishermen, school teachers and school leaders also believe that one can only learn how to fish through practice, through proper fishing. Although the schools do have discussions about how to strike the balance between theory and practice in the course material, they rarely have an intention of producing fully-fledged fishermen that knows all practical aspects of the profession. Thus, there is a certain limit to the practical training that an aspiring fisher can get while attending school. The school leader at the Danish Skipper School explains this concisely:

“The thing that no one can teach them is to fish! We teach them to sail safely and navigate, load the ship and other basic things. But we can’t teach them how to fish. They get a “driving license” to the ship in accordance with legal requirements. There is no doubt that they graduate as navigators or fishermen, but it is after graduation that they need to learn their craft.”
(School leader, Denmark)

Similarly, a representative from the fishery school in Vest-Lofoten, Norway, argues that students are not “finished fishers” when they leave the school. A teacher at Gravdal Videregående, Norway, argues that it is a misunderstanding that the education is the sole responsibility of the schools. He argues that the education of students is also based on their apprenticeships with established fishing companies. Thus, while students argue that they do not learn the practice in school, school representatives generally agree with this, but argue that the schools can only teach students the basics – the rest would have to be acquired outside schools. School officials therefore argue that it would be a mistake to believe that students graduate as fully-fledged fishermen. Instead, schools can certify students, prepare them for their future work and give students knowledge that they would not necessarily learn on a fishing boat. Health, safety, biology and hygiene are some of the topics that the school can teach students during their school time, which can rarely be learned only by fishing.

Therefore, the discrepancy between theory and practice in Nordic fishing educations does not seem to be in terms of what schools, fishermen and students think makes a proper fisherman since the schools also acknowledges that their courses are in themselves insufficient. Rather, the discrepancy is between what students expect to learn during their time at a fishing school, on the one hand, and the course content, on the other hand. Still, the students themselves hope to leave school as “finished fishermen”, not just youngsters prepared to learn the craft.

8.4 Conclusions: Theory and practice in contemporary Nordic fishing educations

As this chapter has shown, there is an almost unanimous support for the viewpoint that fishing is a practical craft, which requires hands-on experience. Nonetheless, there are diverging expectations in terms of what students and school officials believe the role of fishing educations is. Fishing students tend to be quite concerned about whether they receive enough practical training. The Icelandic students that we interviewed are especially concerned about this, given that the Technical College does not formally organise apprenticeships and does not have a vessel for students to practice on. However, students in Denmark and Norway also tend to argue that their studies are too theoretical. Students see a labour market that expects “finished fishermen” to graduate from the schools, not just people with a fishing education. Students are therefore concerned whether they can live up to these demands. This is one of the keys to understanding why students are so concerned about whether they receive sufficient practical training during their educations. We will look further into this in the next chapter.

Taken together, the students and fishermen’s perspectives show us that learning *in situ* is still essential for becoming a well-trained fisherman. The fishing schools have thus not replaced the training that comes from learning from your peers. Instead, peer-to-peer learning is still important as a supplement to the fishing schools. In these ways, the informal ways of learning that have earlier characterised training in the fishing industry are still active, despite the increased formalisation of education and training.

Finally, there is a discrepancy between what students expect from their training and what they are taught. This is not because there is a fundamental difference in terms of what students and school officials believe makes a good fisherman. Instead, they all believe that students can only learn about fishing at sea. But whereas the students hope to learn the practical side of fishing during their studies, the schools tend to emphasise that it is mainly the formal requirements and the certifications that they can teach – learning the craft can only take place through practice.

The following chapter will explore how the students assess their future labour market and elaborate on the role of training and certification.

9. The labour market

The chapter focuses on the young and aspiring fishers' perception of the labour market that they are about to enter. Overall, our research shows that the recruitment of new fishermen into the industry has, as expected, become more formalised as the larger vessels and fishing companies demand certified standards in terms of the fishermen they hire. The increasing dominance of large-scale fishing vessels, partly fuelled by the introduction of market-based fisheries management in the Nordic countries, have created an increased demand for specialised and certified fishers. This lends a central role to educations that offer formalised training and certification of fishers. Certification on the other hand can enable fishers with both horizontal mobility between sectors and different fisheries as well vertical career mobility.

9.1 Main findings

The unprecedented importance of certifications offers new possibilities and risks for young fishermen: On the one hand, certifications enables mobility on the labour market, on the other hand, there is a sense that the labour market is becoming more competitive and those without certificates will be left behind. There are expectations that further certifications soon will be mandatory in the sector. The main findings can be highlighted in the following points:

- *Certifications enables labour market mobility.* The increased use of certifications enables fishers to switch between vessels, different fisheries and to other industries – giving them *horizontal mobility*. Fishers that seeks to become promoted to captain or chief engineer need to have increased formal education, which enables *vertical mobility*;
- *Certifications as a necessary condition for the entering the fleet.* While certificates increase mobility for those that have them, those that are not certified, or have a lower level of certification, risk being excluded from a labour market that is becoming more competitive. In this competitive labour market, certificates become an asset and fishermen know the value of having their “papers in order”.

This chapter is divided into two parts. The first part of this chapter will show how fishers see certifications as a way to increase their mobility on the labour market. The mobility is both in terms of the individual fisherman's ability to advance within the fishing industry as well as his ability to move into other, related sectors. It thereafter shows that certifications not only create opportunities for the individual

fisherman but are also becoming increasingly necessary for contemporary fishermen in a labour market that stakeholders sense is becoming more competitive. Because more fishermen are getting certificates, those that don't are facing more competition.

9.2 Certifications and labour market mobility

In the following we will explore the aspiring and young fishers' view on the labour markets. Again, we are dealing with a stakeholder perspective, and where relevant, we qualify this with insights from other stakeholders.

Among young, Icelandic fishermen, there is an acknowledgement that certification is important for their future labour market. Students in general highlight that they chose to go to the School of Navigation and Marine Engineering because the school offers full certification. The School of Navigation and Marine Engineering allow students to become fully certified and thus increase their labour market mobility. This can be illustrated by the following quote where the student puts emphasis on the excitement about the future opportunities that comes with receiving full certification:

"It was the diversity that fascinated me. When you have your certificates, you can take on all sorts of side work; for the power plants, anything that has to do with industrial refrigeration systems, and things like that. You become a very versatile handyman (allt málígt mann). Hopefully. That's the plan at least."
(Icelandic student)

The range of possibilities that he sees ahead of him can be part of his future career plans. Whereas some educated fishermen show little, if any, interest in other sectors, some student sees onshore work as one relevant possibility amongst many. Also, the student might try to use his competences to get promoted to chief engineer in the long run:

"If I get a job at sea, I would like to become a chief engineer. My goal was always to get unlimited licence. But if I end up working in land I would settle with being a common machinist – start there. Then perhaps I would advance to become a superior [in the workshop or the factory]. If I could get a good pay in land I might prefer that. But working at sea can be ok though, if you work alternately for a month, and then get a month off. If that's the case, you get good vacation to spend with your family."

The passage above shows that the student not only acknowledges the horizontal mobility on the labour market that his certificates give him, but he also has ambitions that his certifications will enable him to be promoted – that is vertical mobility. While looking for the fishing sector, he evaluates the pros and cons of different positions, including land-based occupations. Thus, the student sees his education leading to both vertical and horizontal mobility. This is also confirmed by skippers on Iceland who are also aware that full certification – and especially engineering certification – opens many possibilities in fishing industry as well as in other industries. In general, stakeholders see

the fishing education as opening up for opportunities in a broad field of maritime occupations and even in comparable positions on land – not just work on fishing vessels.

Norwegian students at Gravdal Videregående emphasise that the certificates, especially the D5 skipper certificate, is one of the central reasons why they decided to go to the fishing school there. They emphasise the importance of the skipper certificate – although the certification course can be hard for students to get through. Students emphasise that certificates are a “safety net” since they allow students to more easily apply for jobs in other fisheries. Rather than necessarily being hired through personal networks, their certificates make it possible for them to document that they are suitable for the job by having the formal qualifications. Thus, insofar as the skipper certificate can allow them to be promoted, it offers the possibility of vertical mobility. Also, as certificates can allow you to move from one job to the next, they can give you horizontal mobility – and a safety net if fishing becomes less lucrative. However, certificates are not only giving young fishermen possibilities. As the next section will show, students see a future ahead of them where certificates are becoming necessary because of the increased vessel sizes as well as increased competition from other certified fishermen in the fleet.

9.3 Labour market competition

Whereas certifications enable horizontal and vertical mobility, students also see that the labour market will become more competitive, especially in fisheries. Students explain that these certifications are becoming next to mandatory for ambitious fishermen that wants to advance his career and receive a better salary. Those without certification tend to be left behind:

“Most of the students are completing full certification. The most basic licence will not get you very far, there aren’t many boats of that size today; the engines have become bigger. Your options multiply, as you get further with your studies. And you can also finish journeyman’s examination (sveinspróf) in mechanics [this includes both practical training in a workshop, and regular courses]. Most students do that, and get a higher salary. If you have ‘The Mechanic’ as well, you have a certain stamp. You should be more qualified for certain tasks and jobs.”
(Icelandic student)

The student cited above highlights that the increased vessel-size has created an increased demand for certified fishermen, and the labour market for uncertified fishermen has become increasingly narrowed down. Certifications are thereby not just for the ambitious few or those that want to change their career paths; certifications are becoming the norm in a fleet that is characterised by fewer and fewer positions on larger and larger vessels. This is confirmed by a teacher at Gravdal Videregående, who is also rather explicit about students’ need to be certified:

“The relevance of the education is important. Size of vessels are increasing. The capital is increasing and on fewer hands. This leads to increased risk, but also increase in demand for formal education (certificates)”
(School teacher, Norway)

It is becoming close to mandatory in practice to have the standard range of certifications. However, the increased skill level in the fishing sector also creates another form of competition on the labour market. On Iceland, it is becoming increasingly acceptable for fishermen with formal education to take on work as deck hands if it is on “a good boat” (*í góðu plássí*). This is because many more fishermen are getting better educations and a higher level of certification. The labour market for fishermen is, according to a student, becoming much more competitive. As he explains, “Ships are getting fewer in number and the crews are getting smaller as well, and the old skunks cling to the jobs.” Icelandic vessel owners also confirm the notion that the labour market is becoming increasingly competitive, arguing that those who graduate with full certification – especially engineering certification – have much better opportunities than the rest of the students.

Like their Icelandic counterparts, students that we interviewed in Denmark and Norway acknowledge that they are facing a labour market where there is an increased demand for certifications. Therefore, among students, there is a broad appreciation of the certifications that they receive during their educations. While there are some of the certificates that Danish students acquire that are mandatory if they want to enter the fishing profession, Danish students believe that many of the additional certificates that they acquire will be mandatory in the future – either *de facto* through competition or because of new regulations.

9.4 Conclusions

As this chapter has shown, the new capital-intensive and specialised fishing fleet has created a demand for young fishermen to be certified – or in other words, an increasingly specialised labour force. This has led to a situation where fishing schools are crucial for the individual fisherman and for the industry as such because fishing schools offer the certifications that have become integral to fishermen’s labour markets. This is a function of the new employment system, where labour mobility is decoupled from close community relations. This chapter has shown the duality that this development poses for fishermen. For young and aspiring fishermen, certifications can both be a way to secure labour market mobility, but it can also be an increasing demand. On the one side, certificates allow the fisherman to become promoted or seek jobs in other fisheries. On the other side, more and more certificates will be necessary for the individual fisherman since larger vessels and companies have created a demand for advanced labour force. The overall skill level among fishermen tends to be increasing, which leads to worsened opportunities for those without certification.

10. The work-life

The chapter focuses on young fishers and explore four different ways of life that illustrate the social diversity of current Nordic fisheries. We refer to these four types as *life-modes*, since more than just different career choices, each of them involves a series of coherent factors ranging from quota regulation, vessel and gear to the values put in notions such as colleagues, work and holiday. In this way the four life-modes form a whole, each with different preconditions in and contributions to the surrounding society. The report argues that while some life-modes are thriving under the new conditions (especially hired and highly skilled fishers) other ways of life as independent owners are faced with increasing barriers.

10.1 Life-modes in Nordic fisheries

The four life-modes illuminates the most central elements that young and aspiring fishers face today and should therefore be understood as ways to emphasize the principal differences between them and not all Nordic fishers will empirically fit easily into one of the typologies. However, constructing life-modes is a method to explore the main characteristics and preconditions for each life-mode and to understand their place in a larger totality.

The four life-modes explored in this chapter are:

- The hired fisher;
- The highly-skilled fisher;
- The quota holding fisher;
- The self-employed.

The four life-modes fall in two principal categories: whereas the first two are employed by others the two latter are defined by a certain ownership of vessel or quota rights. In the following sections we will introduce and discuss the four life-modes in Nordic fisheries. By breaking the fishing sector into these four life-modes, we wish to illustrate the different ways of life and their interrelations. The point is that the same policy instrument and resource can be used differently by each life-mode, and that policy changes will affect these four life-modes differently. In the latter part of the chapter we discuss the closer relations between fisheries management and the four life-modes, in particular the question of “barriers to entry”.

Figure 6: The four life-modes can be used to explore the current situation and to evaluate pros and cons of potential changes in the fisheries sectors

10.2 Hired fishers

The main characteristics of the hired fisher is that he or she is not involved in the ownership or management of the operation. Instead, the hired fisher is a necessary labour input in the fishing activities as deckhand or in other positions. In our material we have found that hired fishers enjoy the intensity of the work followed by the lengthy holiday periods as well as the pay. The opportunity to engage in profitable and hard (manual) work and to be in the affinity of nature are also mentioned by hired fishers. They might also have personal preferences among the different types of fisheries and functions on board. Based on skills, network and experience they can move around from vessel to vessel until they find a “good place” with good conditions. As we have inquired in the Danish material some hired fishers might plan to leave the fishing sector rather early due to the physical tear. We have also interviewed hired fishers who valued the share-based pay structure, as it gave a variation and excitement in the work-life. However, we have also registered fixed salaries implemented or being considered by skippers for their crew. In addition, hired fishers sees migrant labour as a potential and growing threat.

One specific finding relating to the education is the functioning of certifications in the labour market. Among young Icelandic fishermen, for example, there is an acknowledgement that certification is important. Many students highlight that they chose to go to the Technical College (Tækniskólinn) because the school offers *full certification*. From the perspective of hired fishers, certifications allow horizontal mobility – to move between fisheries. The ability to switch between vessels and sectors is part of their flexibility to find suitable jobs for shifting life conditions.

Hired fishers understand their labour market as more or less everything that has to do with coastal sea transportation and with work carried out on board ships. Not only certifications but also the formal skills from the school is necessary for the horizontal

mobility between different vessels and fisheries as well as between sectors. The STCW safety certificate, for example, enable students to make an “easier to shift for jobs in the offshore industry and in the sea transport sector”, as the school leader at the Danish school explained. The students consider their schooling as a way to acquire these certificates for free. Their expectation is that the certifications they acquire through the school will be mandatory in a few years anyway, either formally or in practice.

In short, the hired fishers value the hard work and the lengthy time off, while they also appreciate being in nature and taking part in the fluctuating nature of fisheries. They see a labour market consisting not only of the fisheries sector but also offshore and coastal sea transportation. Their formal education and certificates enables them to move between employers and sectors.

10.3 The highly skilled fisher

For some the position as a hired fisher on deck is only a temporary starting point and they look for advancing to (in their view) “better” positions involving further skills and with increased responsibility. For this type of fishers, vertical mobility is the central notion. The highly skilled fisher plays a central role in the daily management of the operation, for example, as chief engineer or as hired skipper. Education and certifications are key to this kind of vertical mobility. With full certifications in navigation or engineering the career-oriented highly skilled fishers can advance to higher positions in the hierarchy, eventually becoming chief engineer or 1st helmsman. They are, however, not interested in the obligations coming from proper ownership and the related financial burdens. Instead, what is valued is the work itself involving for instance leadership, machines or navigation. By not being involved in the ownership, they remain mobile both vertically and horizontally between sectors.

“My father was a fisherman, so I have a role model there. And I’ve always been interested in machines. I think the future prospects are good; if you want to work, you can always find a job – and the salary is good, most often. My ultimate goal is to get the hours and qualify as a marine engineer. But when I get some experience I think I will try to get a job at the power plants and get old there.”

(Icelandic student)

The highly skilled fishers set career goals and take responsibility for finding the right positions. As mentioned, the highly skilled fisher also plays an important role in managing the on-board activities or in navigating the vessel to optimize the fishing efforts. In medium sized operations this might be demanded only as a support and stand-in for the owner (on trips he is not on board), while in larger operations the organisational structure can include several highly skilled fishers with no owners involved in the on-board operation. The large-scale vessels in the Icelandic fisheries are examples of this with well-established job hierarchies and salaries.

As a young Danish skipper sees it, there will be a demand for certified skippers in the future. The skipper asserts that by getting a skipper certificate, young fishermen have improved job security:

“You need to get a truck certificate – and then you need to get your skipper certificate as fast as possible after you graduate from the fishing school. It will become important in the future. The ships are getting bigger and bigger, and all ships longer than 24 meters need to have at least two people with skipper certificates. In the future, there will be work for those that have their papers.”

In short, the highly skilled fishers are motivated by the work and the advancements they can make. They enjoy mastering the necessary skills to advance and to be responsible for the operation but see no reason to make the kind of investments that owners have made. They either see investments as involving too many risks, hindering their mobility, being too costly or involving too much managerial work that takes time away from the work they enjoy. In addition to the vertical mobility, they too have a horizontal mobility which includes other sectors and even land-based operations.

10.4 The quota holding fisher

The quota holding fisher is characterised by being involved in the ownership of the operation. As we will illustrate below, ownership can be limited to a certain share, with plans to gradually take over the remaining parts. Besides the ownership, they take part as active skippers and in the management of the operation like the highly skilled fishers. The main difference is in their relation to ownership. We find that the quota holding fishers see a promising future in the fisheries and that they see the investments in quota as a form of savings. They value being able to continue the operation and to provide jobs and support for the crew.

In market-based fisheries management, it is increasingly difficult for young fishers to become involved as quota holders since the investments needed are very large. In open competition with large quota holding companies they will therefore most often loose out when quota shares come for sale. Quota holding fishers are therefore often involved in some kind of planned generational hand-over in cooperation with the initial owner – or involved through family bonds.

In Denmark, we have met two young fishermen that have managed to become quota holding skippers. Both were able to buy shares in the companies where they worked as their respective skippers realised that they had talent and interest. Even though talent was an essential part of their success stories, they also had to rely on their bosses and the bosses' plans for their respective companies. As one of them expressed with the current management system:

“It becomes more difficult to buy your own boat. I would not have been able to have my own boat if I had not been offered to join the company. It is difficult if you want to start on your own as a new fisherman (...) Those that are back have paid for their boats long ago and received quotas when they were handed out.”

What these two quota holding skippers have in common is that they have both entered companies where the vessel owners seem to have a relatively strong "sense of community" and do not want the fishing industry to leave their town. Therefore, these vessel owners have sympathy towards young and promising fishermen. The previous owners in these two cases have thus had other motives than pure profit-seeking.

In addition to this, the young fishers realize that the old fishermen need to find an exit strategy for their companies and that there are basically two options. They can either sell all their assets to a so-called "quota king" (kvotekonge) or you can make a gradual transition where the old owner sells the company step-by-step to a young fisherman. The owners of the companies that the two Danish skippers are now part of chose the latter option to keep activities in their community. It should be noted that in their account, the third option, where vessel and quota is put on sale in one piece and acquired by a younger fisher is not even considered realistic.

The two quota holding skippers had to think about financial matters when they became co-owners in their respective companies. In one case, the former owner bought another ship for the young skipper and rented quotas that made them able to continuously make a profit, so they could buy up quotas and expand the company. The extra ship also made it possible to make use of the state granted quota loans for newly established fishers – a specific scheme in the Danish system to promote the generational transition.

Making business plans and negotiating investments with the bank have become an integral part of their work. When asked about the advantages of being self-employed, one of them answers that there are of course the economic benefits, but he does not think he earns more than most other fishermen. He takes pride in creating jobs for the crew and thus supporting their families. However, one financial aspect that does come to his mind is the equity he is building since his boat and his quotas in the company are a form of savings. Because the transferable quotas are now a rather substantial part of the capital in contemporary fishing companies, quota holding fishers need to consider carefully the future of the operation. To some degree, they need to think about their activities as an abstract, economic investment. Quota holding skippers and highly skilled fishers have many common features. Even though they rely on each other for their future economic activities, they are nevertheless in different ends of the property relation. This puts the quota holding fishers in a principal different situation than the hired and highly skilled fishers.

10.5 Self-employed fishers

Despite the increasing scale of Nordic fisheries, there are still numerous vessels operated by one fisher alone or by a small group of fishers considering themselves to be self-employed and independent. The self-employed fisher need to master all the skills needed in the operation ranging from quota regulations, navigation, fish gutting, gear mending to business planning and so on. Mastering these different skills is in itself valued by the self-employed – as are the independence and freedom of being one's own boss. There is a strong link between the daily input and the resulting output. In the actual fishing activities self-

employed are often characterised by a closer attachment to a single harbour and community but can in principle move between different fishing grounds.

As is evident from public media, academia and confirmed by our material as well, the conditions for self-employed or owner-operated fishers are very different to those decades ago. In the interviews conditions today are constantly compared to those decades ago. The share-organised independent fishers had their heydays in the times of equal and free access. The introduction of first output quotas and later market-based fisheries management is often mentioned as a cause of decline for the self-employed fishers. The increasing costs of entry combined with the value put by these fishers on financial independence have made it difficult for self-employed to engage in the quota trade and as we have observed alternative entry points are applied as strategies. Since the specific conditions vary substantially across the focus countries, the below sections will therefore present the findings for each focus country one by one.

10.5.1 *Iceland*

The Icelandic students are sceptical about ever becoming self-employed. They argue that after working more than the other fishermen and also doing management related tasks, you still risk getting a mediocre wage. Thus, although Icelandic students may seem optimistic about the possibilities they have on the labour market as hired and highly skilled fishers (as explained above), they are much less optimistic about the future of being self-employed fishermen. There is a consensus among the students that it is very difficult, if not impossible, to become self-employed:

“Well, you can just forget about it. If you want to buy a small boat, like men did 40 or 50 years ago? As the situation is right now, you can forget about it. Earlier you could start with a small boat and buy a bigger one if things went well, but that’s rarely the case today. Some of my buddies have tried this – former classmates and also friends of mine that never went to the school – but it hasn’t worked out so far”

Another student, who himself hoped to become self-employed, is also rather pessimistic about the prospects of it:

“You cannot make a living with a small boat (trilla) today; the quota is too expensive and the prices for the fish too low. I was going to start a business and go into inshore fishing (strandveiðar). I was going to do it with a friend of mine, but we made the calculation and it just didn’t add up. Newcomers don’t have the knowledge or the connections or the equipment to be competitive.”

Others see the significant barriers that self-employed are facing but do consider self-employment a realistic opportunity. However, it does involve a lot of hard work:

“If I could get a loan, it could be realistic. Sure, if you want to start with small vessels. But you wouldn’t be able to buy a trawler. You would need to rent quotas to begin with, and gradually buy as much as you can. But it’s difficult to rent quotas from today’s market. And if you want your company to pay off you cannot really take any days off. This is not something I’ve really considered.”

Getting settled as a self-employed fisherman in Iceland is thus not only risky and costly, but it also means that one must devote much more time to one's work than a hired fisherman would do. It is also dependent on the banks' good-will – or at least their assessments of the young fishermen's ability to make profits. In addition, despite working hard, it might not be possible to earn enough to move from leasing to proper quota holding. The Icelandic student above furthermore highlights that:

“Not everyone is suited for running a company. You need to be a natural-born businessman.”

In the student's perspective, self-employed fishers need to be willing to take risks and able to plan business if they want to become self-employed. All these factors taken together means that there are both objective economic conditions that create barriers to entry and subjective. In other words, one needs to be willing to take risks and spend all available time on the operation.

10.5.2 *Denmark*

Similar to Iceland, there is not much optimism in Denmark in terms of becoming self-employed: it is costly, it tears you down in the long-run and students see little reason to leave the position as wage earning hired fishers to take up the risks as self-employed. The introduction of transferable quotas has created a situation, where quotas have been highly concentrated, and few stakeholders see that this trend is stagnating, much less reversing. This also means that young fishermen and students in Denmark tend to see a future ahead of them as hired fishers or as hired skippers. The school leader at the Danish fishing school sees a clear schism in the way that the young fishermen see the labour market they are part of:

“The young fishermen know the profession is changing. It is more difficult for the old of us to accept it than it is for the young. It is natural to be a wage-earner. I hope that many are still dreaming of being self-employed, but the job as a fisherman has very much become accepted. There are also many for whom it is okay not to have to go out and invest.”

This is confirmed by Danish students we interviewed, who do not see the point in becoming self-employed. Why, they ask, would you quit your job as a hired fisherman where you earn really well, just to pursue the risky job of becoming self-employed? Furthermore, they say, being a fisherman is hard work; it tears you down. Therefore, few of them plan to stay in the profession their entire lives – which accordingly lessens the incentive for the young to build up companies and quota ownership.

For this report we also met with a newly established and self-employed fisher. It turned out that he had used the license system for “less active vessels” to establish his own operation. The licenses for “less active vessels” were introduced parallel to the proper quota markets in the demersal fisheries management in 2007. When the quota market was introduced, operators with an annual income from fishing below EUR 30,000, were given licenses instead of quota shares. The licences allow holders fixed annual rations according to the specific catch area they are registered in and also give

access to some open fisheries. Our interviewee was happy about having an entrance point to the fisheries but did not seem optimistic about the size of the quota rations in the long run. In other words, he would need some way to access further quota shares to reach a sustainable economic turnover.

10.5.3 Norway

Norwegian students, on the other hand, are much more optimistic than the Icelandic and Danish students. There is a sense among the Norwegians that a young fisherman can acquire quotas. Among Norwegian students we have interviewed, we did find some that show a clear determination to become self-employed and have already elaborately planned how they are going to get there.

One student is very positive in terms of their possibilities: The banks are willing to lend out money to buy vessels and quotas. Innovation Norway, which is a Norwegian organisation that seeks to promote national development, is also a source of funding for the young fishermen, he says. As another student argues, although large vessels with quotas are expensive, it is possible to slowly built up a company if “you start with a smaller vessel and smaller quota”. Other students have teamed up and speak confidently about their long-term goals as self-employed fishermen:

“The ultimate goal is to have our own fishing vessel. We are planning to buy one together. We want a 15-meter coastal vessel. First, it will be only the two of us, but eventually we will be able to advance and then have a crew.”

When asked about the future of fisheries in Norway, the two entrepreneurs and a fellow-student agree that although the future is uncertain because of the many changes that are currently happening in the fisheries, they are facing a bright future. Another student repeats the dictum that seem to characterise the Norwegian students’ experience: “Those who really want in, are able to do so.”

These testimonies are also backed-up by Norwegian school administrators and teachers that tell stories about young students that already have vessels during their school periods. An example of this, according to a school administrator, is a student who had been fishing with his father and already acquired a boat when he was 17. He then used the boat to fish in the open group in the periods he did not have to attend school.

The Norwegian students thus seem to have a basic understanding of the system that they are placed in, and they raise critical questions about the concentration of quotas and how this affects their local community. Rather than being naïvely optimistic, the students seem to have some fundamental understanding of how to operate in the system. Comparatively, there is thus a relatively large group of aspiring fishermen in Norway that both understand the system and have a wish of becoming self-employed.

10.6 Discussion

Across the three countries in focus, conditions vary, but there are ways to enter. However, except for Norway, the economic sustainability is questioned. Despite the recent increases in scale and technological developments we can easily find young fishers who considers self-employment or are trying it out. More than nostalgia and reluctance to modernisation, youngsters seek the independence and qualities of the self-employed fisheries. In this pursuit they still see the fishing sector as a potential arena, however, they are acknowledging that is increasingly different. In the following section we will discuss the relation between the policy design and the barriers to entry for young fishers.

The transition of ownership of the fishing quotas is an issue that is often pointed out as problematic given that a first generation of vessel owners initially were gifted with the quotas for free, whereas the next generation will have to buy the very same quota to get involved as quota owners on the same level.

As we argued above, the hired fisher and the highly skilled fishers both were life-modes that had no interest in getting involved in quota ownership. People in these positions were happy with the job mobility and the qualities of their positions. They saw no benefits in the extra risk or in the bookkeeping that would come with the quota ownership. Barriers to entry into the labour market for fishermen for these two life-modes are, as we have outlined above and in previous chapters, a matter of certifications, job mobility and labour competition. Below, we will therefore focus the discussion on self-employed and on quota holding fishers. It is in relation to these ways of being a fisher that transition of ownership is crucial.

10.6.1 *Self-employment and market-based quota systems*

As we have seen in this chapter, the Norwegian case is clearly different from the Icelandic and the Danish. In Norway, there is a significant share of students that believe it is possible to build up a company by fishing in the “open group” and then continue into the closed quota system, where they eventually will have to buy quotas. There are still barriers to entry, but this does not stop students from planning for a self-employed future in partnership with fellow fishers.

By contrast, according to the Danish and Icelandic students, they face so substantial financial barriers to entry that they in general consider a future as self-employed unrealistic. Despite exceptions, this was the general statements from the different stakeholders. Those who ventured into self-employed projects anyway, often used alternative entry points, and were met with substantial challenges to obtain a sustainable level of operation.

There is a range of factors causing this difference between the countries, ranging from the characteristics of the landscape and resource base to the current currency developments in Iceland. However, it is also apparent from our research that the design of the quota system has an instrumental part in explaining these differences. In the following section we will compare the three systems to understand how they support the ambitions of young fishers aiming at a livelihood as self-employed and independent.

10.6.2 *Design and segmentation*

The Danish and Icelandic management systems are both designed with strong economic objectives in mind and with little segmentation of the fleet into distinct markets. Quota from small vessels can be purchased by large vessels and vice versa. Only the jig and line quotas are excluded from the mainstreamed Icelandic ITQ-system. As we saw, Icelandic and Danish youngsters were pessimistic about the chances of becoming self-employed. The entry points in their view were only the marginal alternatives through the coastal summer fishery (*strandveiðar*) in Iceland and the licence system for “less active vessels” (MAF) in Denmark. Both these instruments are supplementary to the main market-based instruments and with different characteristics. The *strandveiðar* was introduced in 2009 and is in essence a common-access and effort regulated fishery, while the MAF licenses are small bundles of regional quota portions. The MAF licenses can be sold but cannot be put on a vessel holding demersal quotas or already holding a MAF license.

In Norway we can also observe that a supplementary instrument is considered useful by the youth, namely the open group. However, they also see it as realistic to purchase proper quota shares. This is probably due to the strong Norwegian segmentation, where the quota is divided in seven groups. Trade can only occur inside each group. Together with relatively low maximum limits on transfers and geographical restrictions the segmentation still ensures a stable number of operators and realistic quota prices. Thus, it is a combination of an open group and a segmented quota system that underpins the Norwegian fishers’ optimism.

10.6.3 *The quota ladder*

Seen from the perspective of young and aspiring fishers hoping to become self-employed, the national quota systems can be understood as a ladder. If the distance from one step to the next is too large, it will be difficult to fulfil the ambitions and reach a sustainable level as self-employed. In Iceland, the new *strandveiðar* is considered as a realistic entry point. However, according to the Icelandic fishers, it is a beginning but not enough in itself and the distance to the next step is too large. However, the coastal fishery makes it possible to buy a vessel and get the first experiences in organising it and running the operation.

In Denmark, we found that young fishers buy licenses that were originally intended for part-time fishing. This also allows them to gain practical experience, but similar to Iceland the next step is too big. The new closed coastal group introduced in 2017 might provide a new step in the quota ladder, but it is too early to conclude. State granted quota loans or funding can help aspiring fishers reach the next level, as can community initiatives that facilitate the financial aspects of quota transactions.

The Norwegian quota system is in comparison the smoothest quota ladder, with the open group as an entry point and the different quota segments as realistic next steps for hard working fishers.

In Denmark, the Thorupstrand coastal guild is an example of a community organisation that facilitates the entry of independent fishers. Through a membership in the guild, young fishers (even those without a vessel) will be allocated an equal quota share as the other members. In turn, they can only fish with certain gear types and must land their catches in the local community.

In short, we can observe that a realistic quota ladder and supportive state and community instruments are key to the survival of self-employed and share-organised fishers. Even though the Norwegian quota system allow for a new generation of self-employed fishers to enter the sector, the “quota ladder” is not a realistic perspective in many cases. It is an entry point in the low end for those who seek independence, but not for those who wish to be engaged in large and medium-sized operations.

10.6.4 *Planned transition*

For the large and medium-sized operations quota holdings can be so substantial that is unrealistic for young fishers to buy these in open competition with larger companies. Instead, a gradual transition can be planned, allowing the aspiring quota holder to buy the vessel and quota step by step. In most cases, a planned transition is based on an existing family or work relation.

Planned transitions can also be helped along by community initiatives and by state granted quota loans. In Denmark, the Fiskernes Fremtid (Fishers’ Future) initiative in Hvide Sande facilitates the quota handover between older and younger skippers. When an older and a younger skipper are interested in planning a transition, the organisation helps establishing a sound business plan and facilitates meetings with the banks. Also in this case, there is a strong tie to the community, as the organisation is established with the purpose of keeping fishing activities in the town of Hvide Sande.

Through this kind of planned transitions, quota transfers are facilitated outside the open market, with a clear motive of keeping the activities in the community. There is a general feeling among stakeholders that it is hard for young people to compete with established companies in open market processes. While planned transitions can work in medium sized operations, all three countries have quota holding companies that are now so large that not even planned transitions over long time seems realistic as a way to facilitate a transition from one active fisher to another. In that case, other companies, and in the longer run, ownership by outside investors, will be the most likely development.

10.6.5 *Resource ownership*

Through the wide application of market-based instruments and the general increase in scale, Nordic fisheries are therefore moving in direction where capital-intensive companies and the accompanying resource rights increasingly will be owned by investors and corporate entities, as opposed to the active owners of the past. If we recall the four life-modes from above, then the hired fisher and the highly skilled fisher will co-exist unproblematically with this development. There might be new challenges arising like increased wage pressure, as investors will seek to increase the profit they can withdraw from their investments, but in principle, the two life-modes will be able to obtain the desired qualities in their work-life. This will not be the case for youngsters who seek self-employment or a career as quota holding fishers. These life-modes can only be upheld through a determined policy design that deflect market mechanisms or through individual choices to withdraw quota shares from the profits of open market competition.

11. Nordic fisheries towards 2025 – and beyond

The chapter examines the trends identified in relation to the future development of the fishing industry and policies. We discuss how these trends affect the industry in the future and how they will affect the hired, the skilled and the self-employed fisherman as well as the quota-holding fisherman in the longer run. For hired and highly skilled fishers, this will mean only little change. For those who desire to invest in quotas, it will be hard to compete in open competition with the large companies. To alter this development, the desired social diversity has to be even further rooted in the fisheries policy design. This makes the public debate and policy process even more important.

11.1 Education, training and recruitment

The aim of this report has been to explore the relation between education, training and recruitment in the fisheries sectors in Norway, Denmark and Iceland. The previous chapters have provided insights on the development of fishing schools and labour markets as well as how students and young fishermen judge their roles and opportunities within the two.

In terms of education and training, we have seen that schools have come to play a central role in the formal certification of the future work force. This certification can be linked to an increased specialisation as well as the increasing dominance of large-scale vessels. While acknowledging the importance of certifications, students are worried that they do not receive the practical skills they need after leaving school. Because of this, students appreciate apprenticeships, practising on vessels and learning informally through peers and colleagues.

In terms of their labour markets, students and young fishermen see certificates as becoming more important. This does not render experience obsolete and therefore fishermen face higher overall demands for skills. This means that it is increasingly necessary for fishermen to acquire certificates – not just if they seek to be promoted or move to other companies, but to remain competitive in the labour market. In the preceding chapter we explored different life-modes in the Nordic fisheries comparing their demands, relations and values. While hired and highly skilled fishers use the formal education system to enter the fishing sector, where they find good conditions for their desired work-life, it is increasingly difficult for fishers to obtain an ownership of the quotas.

11.2 Skilling and deskilling the future labour force

Throughout the previous chapters of this report, we have seen that the fishing industry is increasingly hiring fishermen that have completed some sort of formal education. In the case of Iceland, we saw that the specialised positions on some of the larger vessels were reflected in the educational system. There were different levels of certifications which matched with position on board the vessels.

Furthermore, advancing academically has become an option in Norway and Iceland. However, nowhere has the increased formalisation of fishing educations in Nordic countries been more evident than in the omnipresence of certifications in the fleet. Certificates have allowed fishermen to document their skills and live up to the demands of the industry. This is a sign of the new employment system being organised as a sector more than on a community basis. Especially the increased scale of vessels and operations have created a demand for a labour force with advanced and certified skills. If the certification and formalisation of skills continue, how will hired fishermen and highly skilled fishermen be affected?

We suggest two possibilities: either the labour market will become further characterised by increased skill levels and competition, which would unsurprisingly favour the highly skilled fishermen. Or, alternatively, the labour market might split between a segment that can compete on skills and a segment that can compete on lower wages. The actual development will probably vary between the different types of fisheries, and between countries.

There is already now a tendency that young fishermen are facing a labour market with a relatively high level of skills, which creates competition on the labour market. This was most evident on Iceland where highly skilled fishermen were willing to take jobs as deckhands as long as it was on what they termed “a good boat”. In face of such labour market competition, it is likely that the hired fisherman that is not highly skilled will struggle. They must become certified to secure his position on the labour market. Systemically then, there will be an overqualified work force in the sector and an on-going labour competition.

However, a second possibility is that the labour market becomes polarised: Whereas one group of fishermen will have skills and human capital as their competitive advantage and input to the operation, another group of positions will be deskilled and fishers in these positions will have lower salaries as their competitive advantage. We can imagine different future developments that could lead to such a polarisation of the labour market: an automation of the tasks on board could lead to a situation where there is a lower skill requirement for deckhands. Another opportunity is that the industry at some point find that there is only a limited number of positions on each boat that require highly skilled fishermen and the industry’s skill demands have been met. Under such circumstances, instead of hiring overqualified fishermen, the industry might try to find fishermen that at least live up to the minimum competence criteria and will do the job for a lower wage.

In a situation where fishermen’s labour market become polarised into skilled and deskilled segments, one could imagine that migrant labour can come to play a more

significant role as long as it can compete on wages. We have already seen that migrant labour is playing a role in fisheries today, and in some types of fisheries, it can potentially come to play an even larger role in the future. The question is if fisheries should be treated differently in this respect than other economic sectors?

Given that all Nordic countries have strong debates on the social benefits and purposes of privatized marine resources, policy makers should at least consider and observe this development. As a former common-access resource, the public might further contest the legitimacy of market-based fisheries management if the employment that the system creates is mainly for foreign labour.

11.3 Future generations and quota ownership

In the debates on market-based fisheries management a recurring critique is the gifting of quotas for free to one generation of vessel owners, while the following generations will have to buy their way into the fisheries. When we have spoken to young and aspiring fishers, this aspect seems to be very much accepted as a basic condition in the sector. But there is also a general agreement that the coming generations of fishers will be in a principally different position than the previous one, and that barriers to entry are increasing. It is common to all the Nordic countries that quota ownership was given for free, which is explained by the fact that the initial policy intervention was motivated by economic objectives; namely to restructure and rationalize a suffering fleet. The gifting of quotas as well as the potential equity was necessary to spark the economic restructuring and investments (see further in the report “Nordic fisheries in Nordic societies”). In the three countries, Norway is the only country that has formalised procedures for a partial return of the quota ownership. But even in Norway, the tendency is towards concentration and a reduction in the number of operators. We can ask then, how will this development shape the fisheries sectors in the coming years?

Across the Nordic countries stakeholders generally express that barriers to entry are increasing and young fishers are sceptical about endeavouring into self-employment. Compared to the Danish and Icelandic quota systems, the Norwegian quota system is more supportive of youngsters who seek to establish their own independent unit. This is due to the quota system that creates not only an entry point (in the open group) but also a “quota-ladder” that hard-working youngsters can climb to reach a sustainable level of independence. However, in all countries the value of many companies with large quota holdings exceeds the financial capabilities of most individuals. Instead, if for sale, these companies will most probably be sold to other large fishing companies or sold gradually as shares to other investors. For hired and highly skilled fishers, this will mean only little change. For those who desire to invest in quotas, it will be hard to compete in open competition with the large companies.

We can therefore imagine a future where ownership of the resource is in the hand of companies and investors with a limited involvement of active fishers in the ownership – unless the regulations define the rules otherwise. We can also imagine that pressure for deregulation of ownership rules will increase, challenging the different Nordic

“rubber boot” clauses and participation acts. Step by step quotas will be accumulated in company structured capital-intensive fishing operations. If this is the case, Nordic fisheries will have undergone a tremendous transformation of the social structure. In just a few decades the equal and common access which supported highly independent fishing communities and owner-operated units in a competitive hunt for fish have been replaced by external ownership and hired fishers to harvest the quota. It will be the greatest loss for those youngsters who aspire becoming self-employed or quota holding fishers.

“Traditionalists” will argue that the risky and rough nature of the job demand a (quota holding) owner on board to make sure that vessel, gear, catch and crew is treated gently and safely. In contrast, “modernists” will argue that the fishing sector finally resembles other industries in a dynamic and efficient structure securing profits with minimum public subsidies.

There is probably some truth to both positions. The most productive way to approach this dilemma is probably by emphasizing that these social forms, so far, have been able to co-exist. What is new in the current development is that the co-existence has to be even further rooted in the fisheries policy design. This makes the public debate and policy process even more important.

The development should therefore also be assessed in a long term strategic view. The central question in that regard is what kind of market situation will be deciding in 2025 and beyond for Nordic fisheries? There might be several answers to this depending on the different fisheries and the different national contexts. However, the future policies should enable Nordic fisheries to be both robust and responsive to the coming changes and shifting market conditions, whether export-oriented or aiming for local value creation.

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Sammendrag

I denne udgivelse præsenterer vi to forskningsprojekter, der begge undersøger forandringer i de nordiske fiskerierhverv. Projekterne er blevet til som en forberedelse til Nordic Marine Think Tank's konference om fremtidens udfordringer for de nordiske landes fiskerierhverv. Konferencen finder sted i Stockholm 2018 og vil se nærmere på brugen af markedsbaserede forvaltningssystemer herunder omsættelige fiskekvoter. Målet med konferencen er at diskutere de hidtidige erfaringer i de nordiske lande og bidrage til at fremme forståelsen af systemernes påvirkning af kystsamfund, fiskeflåder, økonomi og samfund.

Samfund og forvaltning

I den første delrapport "Nordic fisheries in Nordic societies" ser vi nærmere på forholdet mellem fiskeriforvaltning og samfundsmæssige forandringer. Samtlige nordiske lande anvender i varierende grad markedsbaserede systemer i deres fiskeriforvaltninger. I alle lande er systemerne genstand for debat og for en livlig kritik, som afspejler de underliggende samfundsmæssige konsekvenser systemerne medfører. Kvotehandel og markedsbaserede systemer har naturligvis både tilhængere og kritikere, og på tværs af de nordiske lande diskuteres en række fælles emner herunder forholdene for kystfiskeri, regionale hensyn samt selve legitimiteten af den koncentration systemerne skaber. Rapporten ser nærmere på de forskellige nordiske landes erfaringer med at designe kvotemarkeder, regionale hensyn, koncentrationsregler, ressourcebeskatning og med den overordnede strategiske forvaltning af erhvervet.

Indførelsen af markedsbaseret fiskeriforvaltning skal ses i forhold til det historiske udgangspunkt, hvor det nordiske fiskeri i høj grad har været præget af ejer-drevne enheder med stærk tilknytning til lokale kystsamfund. Markedsbaserede systemer bidrager til at fremme større og specialiserede selskabsformer med en højere grad af "passivt" ejerskab og med et mindre lokalt tilhørsforhold. Det er blandt andet disse nye sociale relationer som afspejles i de nordiske landes diskussioner af kvotemarkedernes effekter. For fiskeriforvaltningen betyder dette, at nye bekendtgørelser ikke blot er tekniske ændringer, men en aktiv og uundgåelig indblanding i social forandring og rapporten peger på en række opmærksomhedspunkter:

- Hvad er den nuværende og fremtidige kobling mellem ejerskab og aktivt fiskeri?
- Skal fremtidige bekendtgørelser ophæve den særlige beskyttelse af den "aktive fisker" og hvad vil dette betyde for fiskeriforvaltningens legitimitet?

- Bør den nationale beskyttelse af ejerskab ophæves, hvis dette kan bidrage yderligere til konkurrenceevnen?
- Hvordan sikres en langsigtet og stabil fiskeriforvaltning uden politisk uro og skiftende politiske prioriteringer?

Rekruttering

Rapporten "From School to Skipper" undersøger forholdet mellem markedsbaseret fiskeriforvaltning og unge fiskeres muligheder på deres kommende arbejdsmarked. Undersøgelsen er baseret på studier i Island, Norge og Danmark, tre lande der på flere måder afspejler de forskellige varianter af markedsbaserede fiskeriforvaltningssystemer i Norden. I rapporten ser vi nærmere på uddannelse, oplæring og karrieremuligheder og identificerer en række fælles nordiske tendenser omkring rekruttering og generationsskifte. En række livsformer i fiskeriet trives mens andre får ændret deres grundlæggende vilkår i de nye systemer. Mens at selverhvervende fiskere og iværksættere kæmper hårdt ser det anderledes ud for den hyrede og den højt uddannede fisker.

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Nordic fisheries in transition

In the last decades Nordic countries have been implementing quota markets and similar instruments to manage mainly the economic performance of their fisheries. Coming from a historical situation dominated by owner-operated fishing units closely connected to their supporting communities, market-based fisheries management plays a role in promoting company-organised fishing units, non-fisher ownership and new social relations. Introducing market-mechanisms to distribute the limited marine resources is therefore not just a change in the technical regulation. It is an active engagement in social change. The publication reviews the Nordic experiences with market-based fisheries management and discusses the implications for managers and future recruitment.

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