Detailed study of social robustness in four cases

Baltic Sea, North Sea, Western Shelf, and the Faroe Islands

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Baltic Sea, North Sea, Western Shelf, and the Faroe Islands

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Foreword

The aim of Comparative Evaluations of Innovative Solutions in European Fisheries Management (CEVIS) is to evaluate fisheries management innovations from four different perspectives: biological robustness, cost efficiency of management, economic robustness and social robustness. This report presents the analytical framework for studying social robustness and the empirical testing of this framework in four case studies: Baltic Sea, Faroe Islands, North Sea, and Western Shelf.

This report is based on the work of Work Package 6 (WP6). The aim of WP6 is to evaluate the social robustness of innovative approaches for European fisheries management, such as: participatory governance, rights-based management (RBM), and effort-based management in the four case study areas.

We understand social robustness to be a combination of three factors that allow a management regime to adapt to a broad range of potential ecological, economic and political situations. These three factors are: 1) the acceptance of the regime by stakeholders; 2) the capacity for institutional learning in the regime and 3) the innovations' legal conformity to the existing legal context. Stakeholder acceptance depends on how stakeholders perceive and respond to management. Institutional learning is the process in which institutions change in reaction to internal pressures (e.g. of those holding and managing fishing rights) or external changes in ecosystem and socio-economic contexts (e.g. pressures by non-rights holding stakeholder or administrators). Understanding legal conformity requires us to analyze how well management innovations reflect and implement relevant EU and international law with respect to fisheries, the environment, trade, competition and state-aid. This report only focuses on the first two aspects of social robustness: stakeholders acceptance and institutional leaning[1].

The case studies were carried out using two different sources of information: literature review (scientific as well as grey literature), and field research and interviews. The first source involved reviewing existing literature on the management innovations focusing on our four case study areas. The second, and most important, source of information was from interviews of stakeholders as diverse as fishermen, conservationists, scientists and managers. The people interviewed expressed their views from a variety of academic and professional perspectives. Through their narratives, they identified which decisions and circumstances they found to be beneficial, and which detrimental to their fisheries systems.

[1] The aspects of legal conformity are presented in Deliverable 15 of CEVIS: A Legal Policy Brief for Fisheries Management.

The partners in the WP6 are grateful to the European Commission and to all institutions and individuals in the Baltic Sea, the North Sea, the Western Shelf, and the Faroe Islands who have devoted their time and expertise to help us with our endeavours.

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Contents

1.0. Introduction

What is successful fisheries management and what is not? This question relates to the purpose of fisheries management. Is it to ensure stock abundance; or rather to make certain that fisheries produce the maximum economic yield for the lowest management costs? Or is the purpose to advance systems that are seen as fair, and which provide stability in the local areas dependent on fisheries?

In CEVIS, we have evaluated fisheries management regimes and innovations both within Europe and abroad with regard to four management objectives: biological robustness, economic efficiency, cost effectiveness of management, and social robustness. These studies have shown that trade-offs often occur between management objectives—a management regime/innovation can be successful in some respects while ignoring others. Yet in order for a regime to be sustainable over time, the regime probably needs to address and be considered robust in all four management objectives at some level.

In this report, we focus on the social robustness of four case studies. Before presenting these, a conceptual framework is needed: What does it mean that a management innovation/regime is

socially robust? How can you say whether a management system is socially robust or not? How can you measure social robustness? First of all; we understand social robustness to be a combination of three factors that allow a management regime to adapt to a broad range of potential ecological, economic and political situations. These three factors are: 1) the acceptance of the regime by stakeholders; 2) the institutional learning of the regime; and 3) the innovations' legal conformity to the existing legal context. Stakeholders' acceptance involves how stakeholders perceive and respond to management. Institutional learning is the process in which institutions change in reaction to internal pressures or external changes in the ecosystem or socio-economic contexts. These three factors were chosen based on the earlier work of CEVIS (Aranda, 2007) in USA (Alaska), Canada, Iceland, and New Zealand.

1) Stakeholder acceptance is important as fisheries management does not always work according to the intentions of policy and decision-makers. When managers implement fisheries regulations, fishermen may change behavior and adapt to the new conditions. This can lead to a discrepancy between policy goals and resulting practice. Regarding both democratic legitimacy and efficacy/performance, the success of a fisheries management regime depends, to some extent, on how it is perceived by stakeholders. Stakeholders do not only provide legitimacy, knowledge and implementation capacities, but they can also obstruct new innovations that they do not support.

2) Institutional learning. The success of management innovations also depend on the institutional learning that takes place in the system. Institutional learning is the process in which institutions change in reaction to internal pressures (e.g. of those holding and managing fishing rights) or external changes in ecosystems and socio-economic context (e.g. pressures by non-rights holding stakeholders or administrators).

3) Innovations in fisheries management also need to conform to relevant international and EU law; otherwise they are susceptible to legal challenges and are unlikely to persist. Especially under EU law, a broad range of legal questions surround fisheries management, relating to the free movement of goods, persons and capital, competition and state aid rules, and the Common Fisheries Policy CFP itself. Such legal questions include aspects of fisheries law, environmental, trade, subsidies and competition regulation, as well as community policies, such as non-discrimination laws. Understanding legal conformity requires us to analyze how well the management innovations reflect and implement relevant EU and international law with respect to fisheries, the environment, trade, competition and state-aid.

This report presents four case studies, which have evaluated the social robustness of fisheries management innovations. The four case studies are: 1) the closed areas and division of cod stock in the Baltic Sea; 2) the fishing-days system on the Faroe Islands; 3) the Dutch co-management system of Biesheuvel and the UK Producer Organisations (POs); both operating in the North Sea; and 4) the fishing rights of the Basque industrial fleet in the North East Atlantic Fisheries Convention (NEAFC) grounds, and the territorial rights of the Basque Cofradias in the Western Shelf. These innovations present different, and, most often, multiple and varied aspects of RBM, effort-based management, and participatory governance.

Based on the work of earlier CEVIS studies, (Aranda, 2007) in USA (Alaska), Canada, Iceland, and New Zealand, five hypotheses on the relationship between management innovation/regime and social robustness were developed.

1.1. Contents of the report

Chapter 2 presents the methodological and conceptual framework of the four case studies including working definitions of social robustness, stakeholder acceptance, and institutional learning.

Chapter 3 outlines the fisheries management innovations of each of the case studies.

Chapter 4 describes the three kinds of management regimes (RBM including effort-based management and participatory governance) with regard to the individual case study.

Chapter 5 presents the five hypotheses regarding social robustness and the empirical findings from testing each of the case studies. The conclusions are summed up in Chapter 6.

Appendix 1 contains the report from the Baltic Sea case study. This case study focused on two management innovations designed to cope with the severe stock depletion and high fishing pressure on Baltic cod: (1) closed areas and seasons for cod fisheries; and (2) new split management regimes based on division of cod resources among two areas – eastern and western cod stocks. Overall, stakeholders perceive the plan to be a complicated top-down-hierarchic system, which makes day-to-day fishing activities difficult. The innovations have reduced fishing opportunities and have had a negative impact upon legitimacy and stakeholder acceptance of regulations in the cod fishery.

Appendix 2 contains the report from the Faroe Islands case study. The case study focused on the 'fishing-days system' strategy, which was introduced in the mid 1990's. The system is an effort-based system, which has strong elements of participatory governance as the fishing industry plays a central role in the decision-making processes. The system can also be argued to be rights-based as the fishing-days system has many of the qualities as for instance a system for individual transferable quotas (ITQ) from an economic and legal perspective.

Appendix 3 contains the report from the North Sea case study. The report compares two systems of co-managed RBM: ITQs in the Netherlands (which were combined in the early 1990s with the Biesheuvel co-management system), and the UK's system of Fixed Quota Allocations (FQA), introduced in 1999, in which POs participate in quota management. These two European fisheries management regimes have been chosen not only because they combine RBM with co-management, but also because the systems seem to converge from different starting points. The Dutch system started as a pure ITQ regime, which over time, took on participatory features. The UK system began as a co-management system and is developing into a quasi-ITQ system. This contrast enables us to compare the two cases with regard to institutional learning capacity.

Appendix 4 contains the report from the Western Shelf case study. This case study focused on RBM and participation in the industrial Basque fishery and the Basque coastal fishery. The industrial fishery targets demersal species in the waters of the NEAFC and is managed through an ITQ system. The Basque coastal fishery in the Bay of Biscay employs territorial user rights. Cofradias, or fishermen's guilds, play a key role in the management process of coastal fisheries. In both Basque sectors, participation is strong and effective even though it is narrow because it only involves fishermen.

Appendix 5 contains the common guidelines made in plenary for the interviews during field research.

2.0 Methodological and conceptual framework

2.1. Methodology

These four case studies were carried out using a common methodological framework that was developed in plenary by the participants of the working group. The framework involved a literature review and field trips. Firstly, the working group reviewed existing literature including, scientific documents, grey literature and press reports relating to social robustness and fisheries management in case study areas. This allowed us to set innovations in the context of the overall fisheries system and identify key informants who led us to other relevant people and institutions.

The second, and most important, source of information came from field trips and interviews with stakeholders as diverse as fishermen, conservationists, scientists and managers. The aim of the interviews was to gather insights on the social robustness of the respective innovations. But in order to do so, it was necessary to develop a general understanding of how the system works and of any trade-offs in the system. Moreover, the interviews sought to identify day-to-day issues in fisheries management, as well as contingency measures undertaken to counteract threats to resource well being, such as non-compliant behaviour. The interviews covered two important categories: 1) the history and development of the innovations (institutional learning); and 2) the views and opinions of fishermen, the wider industry, managers, and civil society stakeholders on the management system and compliance with it (stakeholder acceptance). Approaching the issue of stakeholder acceptance, we also inquired into changes in costs and benefits for fisheries management operations associated with the innovation, what indicators they use to monitor and improve outcomes, what they see as the best practices in implementing, monitoring and enforcing the innovations, and resulting management measures.

The interviews were in-depth and open-ended allowing interviewees to express their views and relate the story from their variety of academic and professional perspectives. Participants were able to identify which decisions and circumstances were beneficial and which have been detrimental to their fisheries systems. Interviews generally lasted 1½-2 hours. The common interview guidelines can be found in Appendix 5, although these were adapted as appropriate in each case study.

The field trips took place between the summer of 2007 and early 2008. Prior arrangements were made to interview key persons in the field; but, in general, snowball sampling was used to select individuals to interview. The goal was to interview 15 key persons each field trip. . However, as Table 1 shows, each case study exceeded the goal.

Present job / Case study	Civil servants	Researcher	Green	Fishermen (or representatives)	Other industry or intermediate organisations[2]	Total
Baltic Sea	2	1	2	20		25
Faroe Islands	8	6		6	1	21
North Sea	10	0	2	19	6	37
Western Shelf		1	1	18		20
Total	20	8	5	63	7	103

[2] E.g. industry chambers, industry marketing organisations, fish auctions, quota traders/ vessel agents etc.

Table 1: Professional profile of the people interviewed

2.2. What is social robustness?

Here we elaborate on the concept of social robustness as outlined in the Introduction. For the purpose of this report, *social robustness* of a fisheries management regime is defined by two dimensions: acceptance of the regime by its stakeholders, and institutional learning within the regime.

More concretely, *stakeholder acceptance* of a management regime describes the position that fisheries stakeholders take (either in support or opposition) vis-à-vis that management regime. Fisheries stakeholders are groups and individuals that have an interest in the decision-making process and that are potentially affected by the decisions (Pomeroy and Riviera-Guieb, 2006). Most notably, these are: commercial fisheries interests (both primary and secondary interests); fisheries management actors, including scientists/advisors, government; and non-commercial interests, such as conservationists, recreational fishermen, and communities (Borrini-Feyerabend, 1996). Stakeholder acceptance may be assessed through analysis of several factors, including: compliance/noncompliance with the management regime; the views expressed by various stakeholders; stakeholder participation in management processes; and direct actions taken by the stakeholders in favour or against a management regime (e.g. protest, lawsuits). Thus, our approach to stakeholder acceptance assumes a link between compliance and acceptance (perceived legitimacy) for a management regime (Dietz *et al.*, 2003; Jentoft, 2000).

By *institutional learning* we mean the process in which institutions change in reaction to internal pressures (e.g. of rights holders or rights managers) or to external changes in the socio-economic context (e.g. pressures by non-rights holding stakeholders or administrators) or in the ecosystems themselves. A non-teleological process, Institutional learning differs from, but is built on, individual learning. It takes place when inferences from individual experiences are interpreted within networks and communities (Haas, 1992; Sabatier and Jenkins-Smith, 1993), and encoded into organisational routines (Levy, 1994). This type of learning involves the interaction of implicit (tacit) and explicit knowledge (Nonaka, 1994). When assessing institutional learning in the context of fisheries management regimes, we make two main distinctions. First, on the process level, we distinguish between simple learning ('adaptation') and complex learning (genuine 'learning') (Nye, 1987)[3]. Simple learning describes changes in means in order to more effectively achieve given goals, while complex learning describes changes in goals. Complex learning includes the more fundamental questioning and redefinition of underlying values and ends, the new specification of causal relationships, and may even encompass 'reflexive learning' as a revision of the very concept of problem solving (the ability to learn how to learn). Secondly, at the outcome-level, we differentiate between learning processes that address the problem at hand successfully (high problem-solving capacity) and learning processes that do not address the problem successfully (low problem-solving capacity).

The dimensions of stakeholder acceptance and institutional learning cover processes at the micro-level of individual actors (stakeholder acceptance) and at the meso-level of organizations and institutions (institutional learning). In the first case, the focus is on behaviour and attitudes (agency)

[3] Or 'double-loop' learning (Argyris and Schon, 1978), 'meta-level' learning (Hedberg, 1981), or simply 'learning' as opposed to 'adaptation' (Haas, 1990).

of actors, in the second case on the permeation of pre-existing structures with such agency, what Giddens referred to as structuration (Giddens, 1984).

Based on these definitions, a number of hypotheses on social robustness were formulated in the CEVIS project. The propositions link the dimensions of stakeholder acceptance and institutional learning in the context of RBM systems and forms of participatory governance (including co-management).

		Social robustness	
		Stakeholder acceptance	Institutional learning
Management regime /innovation	Rights-based management (incl. effort-based management)	1. RBM tend not to have broad stakeholder representation. 2. Commercial fisheries actors' acceptance of a RBM system will be a function of the extent to which: a) the management system is perceived by the fishermen to be practical [and necessary]; b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced; c) which new entrants are facilitated; d) which retirement options are provided for.	4. RBM systems restrict capacity for institutional learning.
	Participatory governance	3.The more diverse stakeholder involvement in the development and/ or operation of a management system, the lower the acceptance of the affected commercial fisheries actors.	5. The more diverse the stakeholders involved in the development and/ or operation of a management system, the more institutional learning takes place.

Table 2 shows the five hypotheses of social robustness

3.0. Fisheries management and their innovations

3.1. Introduction to the Baltic Sea case study

The Baltic Sea is the second largest body of semi-enclosed brackish water in the world. Baltic Sea fisheries are dominated by three species: cod, herring and sprat. Cod is the most commercially important species and there are two populations inhabiting the Baltic Sea, the *eastern* and *western* Baltic cod (Thulin and Andrushaitis, 2003).

The fisheries are managed under EU's Common Fisheries Policy (CFP) and enacted with scientific advice from ICES. The nine countries permitted to fish in the Baltic agree on the total allowable catch (TAC). Separate TACs for cod in the western and eastern Baltic cod were first tentatively proposed in 2004; however the new management regime came in place in 2005. The aim with this division was to improve management of Baltic cod through more appropriate measures that could be applied separately to each stock. A number of technical measures relating to the cod fisheries are also enforced in the Baltic Sea. These include minimum mesh size, minimum landing size, closed areas/seasons (aimed at limiting fishing effort as well as protecting juveniles), and gear specific measures to enhance selectivity in the fisheries. In order to enable undisturbed spawning, a regional closure of a main spawning area in the Bornholm Deep was implemented and enforced during the

main spawning seasons since the mid-1990s. Additionally, since 1995, there has been a seasonal closure for cod-directed fisheries in the entire Baltic. From 2005, this seasonal closure complemented a year-round area closure for all fisheries in specific areas of the Bornholm Deep, the Gotland Basin, and the Gdansk Deep (ICES Advice 2007, Book 8 and Council Regulation No 1098/2007). Thus, the two 'management innovations' under focus in this case are: 1) closed areas and seasons for cod fisheries; and 2) a new management regime based on the division of cod resources between the two areas. To analyze the stakeholder acceptance and institutional learning regarding these innovations, two fishing communities Nexø at the Danish Island Bornholm and Simrishamn in Sweden, were selected for this study. These communities are dependent on the cod fishery and there is – or at least used to be – a cultural preference for fishing there (Delaney, 2007).

In the Baltic case, although the stakeholders involved were not diverse, we found evidence of institutional learning (e.g. spawning areas, external factors affecting the cod resource, and genetic differences between the eastern and western stocks). A lot of learning seems to take place within ICES and other ecological research institutes working at the national level. These stakeholders have an advisory role and are not involved in decision-making. Institutional learning occurred mainly as a result of external changes and new knowledge about the Baltic Sea ecosystem. On the other hand, there is a low level of learning about generating trust between stakeholders and authorities, regime legitimacy, and regulatory compliance, as well as how to communicate the necessity of different management innovations on the local level.

The Baltic Sea case indicates that low legitimacy of management innovations affects support and compliance negatively. The division of the cod stock in particular has had negative impacts on legitimacy because of its practical implications for fishing. There are also indications that, even with a rule that is perceived as "necessary" among the stakeholders, acceptance and legitimacy may be low if the practical implications for day-to-day fishing activities are too severe. The importance of protecting spawning and juveniles is unanimously recognized and is highly accepted, but the complex management regime with many temporal closures also reduces the legitimacy of this innovation. The conclusion from the Baltic case is that even in the absence of diverse stakeholder involvement, there can be extensive frustration with complex management processes.

3.2. Introduction to the Faroe Islands case study

The Faroe Islands are a group of islands in the Northeast Atlantic with a population of some 47,000. The Faroe Islands have been a self-governed territory since 1948. They remain a part of Denmark, but not of the EU (Prime Minister's office, 2007). The Faroe Islands are tremendously economically dependent on the fishing and aquaculture industries compared to (almost) any other country in the world: 95 percent of Faeroese exports and almost 50 percent of the GDP stem from fisheries and fish farming (Gezelius, 2008). Faroese fisheries are mixed, targeting three main demersal species of fish: cod, haddock, and saithe.

On the Faroe Islands, they have an input-controlled system that focuses on the fishing effort (number of fishing days). The fishing-days system of the Faroe Islands shares many qualities of the ITQs. The fishing-days system is built on segmentation of the fleet into vessel groups (based on size of vessel and gear type). Each of these groups is annually allocated a number of fishing days per year and these days are allocated to the individual vessel. The fishing days are tradable within the group and, at the end of the year, also between the groups. The fishing-days system is supported by a number of technical measures for instance: minimum mesh sizes, gear restrictions, and fleet

capacity restrictions. Yet fleet capacity was frequently discussed in the interviews. Most informants agreed that capacity had increased and that the main flaw of the system was the lack of ability to measure and compare capacity over time (Jákupsstovu *et al.*, 2007, Løkkegaard *et al*., 2004).

Year	Management system	New situation	Institutional learning
Until 1994	Technical measures such as area closures and regulation of mesh sizes	Capacity was high, cod stock low. Overinvestment in the fleet lead to collapse of several banks.	Denmark interfered in Faroese fisheries policy, as DK demanded that the Faroe Islands set up a management system for their fisheries in return for loans. One can only guess what learning would have taken place if this had not taken place.
1994-1996	ITQ system	Political demand from Denmark in return for loans that the Faroe Islands should set up a management system. A Faroese group suggested an ITQ, which was adopted	Given the mixed fisheries on the Faroe Islands and the mis-match between the TACs and the actual catches, they abolished the quota system as it had no legitimacy with the fishermen.
1996-	Fishing-days system	Two very strong year classes of cod lead to high catch rates and too small quotas. Both fishermen and politicians worked to change the system. Today a high degree of acceptance among all interviewees.	Since the introduction of the fishing-days system, the system has not changed much. The lack of measurement of capacity is often mentioned as the key flaw of the system; but none of the interviewees saw themselves as being the one to open the debate.

Table 3 shows institutional learning on the Faroe Islands.

Given that Faroese exclusive economic zone (EEZ) is under Faroese jurisdiction, the minister and the parliament are powerful when setting the number of fishing days. But they do so in consultation with biologists and active fishermen. All people interviewed assessed that the industry had greater authority when setting the number of fishing days than the biologists. All participating stakeholders are commercial stakeholders. –The commercial fishing industry has particular influence in the decision-making processes.

3.3. Introduction to the North Sea case study

The North Sea case study looks into two management systems operating in the Netherlands and the UK that combine RBM and participatory governance to form what are, in effect, 'co-managed RBM systems.' We will focus on the implementation of these fisheries in the plaice and sole fisheries prosecuted by mainly Dutch beam trawlers in the southern North Sea and in the mixed demersal fisheries for roundfish (mainly cod, haddock and whiting) and roundfish/ Nephrops mixtures in the northern North Sea. In both countries, these fisheries are highly relevant in economic terms, involve significant segments of the national fleets and are dominated by smaller operators. They are managed under the CFP with TACs. These are complemented by technical and capacity control measures, including decommissioning programmes, and national enforcement regimes. In addition, multi-annual management plans are in place for sole and plaice and a cod recovery plan limits days at sea.

When it comes to managing the uptake of national quotas, both the Netherlands and the UK are operating what we will call, 'co-managed RBM systems.' In the Netherlands, a system of Individual Quotas (IQs), transferable only with vessels, was introduced in 1976 for plaice and sole. With full transferability of IQs allowed in 1985, an ITQ system was created. However, TAC reductions and national overcapacity (Davidse, 2001) fostered non-compliance, continuous overshooting of the Dutch quota and worsening state-industry relations in the 1980s (van Ginkel, 2005). In order to improve the situation, responsibility for quota management was devolved to industry groups in the late 1980s and, more systematically, in 1993 (Dubbink and van Vliet, 1997; Hoefnagel, 2005). The nine, so-called 'Biesheuvel groups,' ensure compliance with the group quota and manage quota transfers. Recently, their responsibilities widened somewhat. Acceptance of the system is high both among the Dutch fishing industry and governmental stakeholders. Interviewed members and managers of various Biesheuvel groups praise efficient quota uptake an end to the race for fish, stability of expectations, high levels of compliance, and better fish prices. They criticised practices to avoid the final sale of ITQs when fishermen stop fishing and the low level of new entrants to the sector. Membership within the Biesheuvel groups is ca. 97% of those eligible and is stable. Although individual incidents of non-compliance with quota rules have been reported over the years, the groups' self-policing is considered to function well. For fisheries managers, the system did not only improve state-industry relations, but reduced the costs of public enforcement. Conservation groups accept that the Biesheuvel system functions well with regard to quota management, if less so with regard to engine power limitation.

In the UK, industry self-governance of market supply and of withdrawal schemes within POs started in 1973 (Goodlad 1998, Phillipson 1999 and 2002). The PO structure was used as one pillar when a system of sectoral quota management was introduced in 1984. After that, allocations were initially based on vessels' most recent three years of catches, and as of 1999, on a fixed reference period, or'Fixed Quota Allocation' (FQA). The allocations are assigned to three groups: 'the sector,' (i.e. fishing vessels over 10m and belonging to Pos); the 'non-sector,' which includes over 10m vessels not in PO membership; and vessels under 10m. Co-management is limited to the 'sector,' i.e. to POs. These manage their members' cumulated allocations (Hatcher, 1997), which amount to 96 percent of the UK quota. Different systems of quota management have evolved within the POs, with ITQ-style systems slowly replacing the 'traditional' pooling of IQs (Nautilus Consultants, 2006). Among the interviewed members and managers of four POs, the co-managed RBM system is generally accepted, although less unanimously than in the Dutch case. While some interviewees appreciate the opportunity to fish against their own quota share and buy and lease quota, others see benefits in the pool system. As in the Dutch case, criticism relates to FQA-holders not actively involved in fishing and difficulties experienced by new entrants. In addition, there seems to be unease among some about the leasing and buying of quota (Hatcher et al., 2002:42-46; Anderson, 2006:5-7); concerns about insecure ownership status of FQAs; and quota being bought off by foreign flag vessels. PO membership is high, though less stable than in the Dutch groups. Self-policing and enforcement of PO quota management rules is said to have increased in recent years in relation to reduced TACs and the introduction in 2005 of fish buyers and sellers registration. Among the other industry groups, in particular, the less than 10m fleet, fears that members from POs and the non-sector fleet could fish against their allocation. Fisheries managers confirmed that the PO's role reduced some of the administration's burden; however, changes in quota management were regarded as necessary and policy-makers recommended the introduction of

fully-fledged ITQs (Cabinet Office 2004:105). At the time of our research, a consultation-based quota management change programme (UK Fisheries Departments, 2005) did have grounds to implement a halt due to the Scottish Government's opposition to ITQs. Environmental organisations did not appear to be interested in UK quota management. Some groups, however, have more general positions on RBM, with World Wildlife Foundation (WWF) (2007) stating a, 'healthy scepticism,' but not a general rejection of RBM.

3.4. Introduction to the Western Shelf case study

Fisheries are a traditional source of protein for the Basque communities (Arregi *et al.*, 2004). Indeed, Basque fisheries have a long history and have evolved to what is currently one of the most important fisheries of Spain. Basque fisheries are affected by management at three levels: a) the local management level where the Basque government receives advice from Cofradias and POs; b) the national management level in which the government of Spain rules the fisheries through the Ministry of Agriculture and Fisheries; and c) the community level of management which comprises the decisions made by the Commission and the Council of Ministries. Two Basque fisheries have been examined for the purpose of this study: the Basque industrial fisheries in the NEAFC (Gonzalez-Laxe, 2006) area and the coastal fisheries in the Bay of Biscay (Astorkiza *et al.*, 2000). The industrial fleet is managed through an ITQ system restricted to the census of vessels in the NEAFC area, and originally managed by effort quotas. Participation in this fishery is narrow and limited only to stakeholders—conservationists and others do not participate in the management. POs involved in this fishery are active in participation at the local, national and at Communitarian level through the RACs.

The Basque coastal fleet in the Bay of Biscay harvests anchovy and other pelagic species. The management of the fishery receives meaningful input from the Cofradias. This is especially notable when setting regulatory parameters, such as technical measures. This fishery is considered to have a territorial user rights (TURF) approach in the sense that no one without membership in a Cofradia is able to fish in a given fishing area (Astorkiza *et al.*, 2000). Cofradias and Associations of Cofradias are active in participation in local, national and EU level management through RACs. Conservationists or other groups do not have any role in the management of this fishery. Although management of the Basque fisheries studied is complex, Cofradias and POs have managed to adapt to EU requirements regarding participation in RACs and fleet reduction programmes. In the particular case of Cofradias, they exhibit a capacity to adapt to changes in the fisheries system and to react swiftly to challenges. This has been especially notable in the case of the anchovy fishery collapse, which has been closed since 2005.

In both the Basque and Bay of Biscay cases, stakeholder acceptance is high at the local level of management. Stakeholders are satisfied with the Basque government, which seems to be active in supporting the local fisheries and presenting their needs to the central government. However, management at the national level is barely accepted since stakeholders believe the Spanish government does not support the interests of Basque fleets. At the EU level, stakeholders accept management; and they consider recent innovations in participatory governance, such as RACs, improvements in European fisheries management. Regarding rights, the industrial fleet accepts the way rights have evolved; however, some of the stakeholders interviewed pointed out that factors external to the RBM have determined unequal competition with the Spanish fleets, such as the Asturias's. For example, Basque harbours and crews are far more expensive than Asturias's.

Regarding stakeholders' acceptance, on the one hand, they consider their rights to fish pelagic species in the Bay of Biscay has allowed them to have a say in the management of the fishery. On the other hand, they point out that their rights are not fully respected since the French fleet harvest the same anchovy stock using a technology banned in Spanish waters. In this regard, the Arcachon Agreement is widely criticized.

4.0. Management regimes in the case studies

4.1. Rights-based management (RBM) and effort-based management

RBM is being applied more and more widely in fisheries (Christy, 1996; Arnason, 2000); the most studied and referred example of RBM systems is that of Individual Transferable Quotas (ITQs) (Scott, 1988, Arnason, 2000). Rights are also applied, for example through territorial user rights (TURFs), to protect and keep community structures intact. (Christy, 1982). Often, the purpose of implementing RBM is to enhance a fishery's economic efficiency (Scott, 2000; Arnason, 2000). RBM (especially those strongly market based, such as ITQs) can negatively impact the social context of a fishery by drastically reducing the number of fishery participants, disrupting local fishing communities, or upsetting stakeholders that view the approach as a privatisation of the commons (Le Gallic, 2003). On a social meso-scale, RBM tends to lock in development of a management regime and immunize it against innovation. Three types of RBM systems have been empirically investigated: quota-based; territorial-based, and effort-based.

In the Basque fisheries studied, RBM is comprised of two approaches: ITQs for the industrial fleets and territorial user rights for the coastal fisheries. The ITQ system in the first case has evolved from an effort quota system. The base line came from the census performed in the early 1980s, which originated the '300 list.' This list consists of all the vessels with the right to fish in EU waters after the 1986 entry of Spain into the European Union. Since then, the RBM system has evolved, and the introduction of transferability in the effort quota system reshaped the fishing fleet. Currently, the transferable effort system has transformed into an ITQ system, which is still restricted to the original census. The other RBM system reviewed is the territorial user rights used by the Basque Cofradias in the Bay of Biscay. These are rights with an old history and they limit entry to the fisheries under the jurisdiction of Cofradias. To fish in a given area, a fisherman must be a member of the Cofradia concerned. Cofradias also have the right, recognised by law, of proposing technical measures to ensure sustainable exploitation of the resources. These measures are the base for most of the technical regulations for anchovy and other pelagic species. Rights of Basque Cofradias are widely recognised by the authorities and the civil society. These rights enable Cofradias to actively participate in the management of pelagic resources.

The RBM systems studied in the North Sea cases can be characterised according to the type of right, initial allocation, transferability, security and durability, and further features (Scott, 1996). In both cases, the rights are related to catch quota. The *initial allocation* of Dutch sole and plaice quota was 'grandfathered' on the basis of historical record, and one year later adjusted to include 50 percent engine power. The British FQAs were based on catch records over a fixed three year reference period. Regarding *transferability* of quota rights, trade and ownership of both the Dutch ITQs and UK FQAs are restricted through several regulations. Dutch ITQs can only be traded among owners of EU registered and licensed vessels; are subject to ministry approval; must be within limited periods during the year; are traded jointly for related species (i.e. ITQs for sole are

connected to ITQs for plaice); and formally traded only as whole units (non-divisibility). Selling part of a sole or plaice quota to vessels that do not have such ITQs is not allowed (Davidse, 2001). Fishermen exiting the fishery for good are obliged to sell their ITQ shares within three years, but this requirement can and often is circumvented. In the UK, for vessels over 10m, the FQA unit is attached to a license entitlement. Only since 2002, is it possible in certain circumstances, to transfer FQAs separately from licences (usually as part of a licensing transaction). FQA units may be transferred among others, to 'dummy licences' held by a PO. Quota rights are divisible and transfers need to be registered with the responsible Fisheries Department. In regard to the *security and durability* of the quota rights, the Dutch ITQs are based on a Ministry regulation and have duration of one year (renewable). Against the backdrop of the legal concept of 'legitimate expectations,' the entitlements are evaluated as being relatively secure (Arnarson, 2002:41). This is different in the UK, where the status of FQAs as property rights is weaker and the subject of an ongoing debate (Cabinet Office 2004). Formally, FQAs are governed by rules of the UK Fisheries administrations. A noteworthy additional characteristic of the Dutch system is a, 'national reserve' of ca. 5 percent of the national quota that is not turned into ITQs in order to compensate for possible overshoots.

Most fisheries management systems are focusing on the output of the fisheries – namely on the fish. Hence, the unit of management is usually quantities of fish. The fisheries rights that are distributed in quotas (shares of TACs) designate how many fish can be landed through the system. In effort-based fisheries management, the focus is different: Effort-based management is so-called input controlled systems that focus on the effort the fishermen apply to fisheries. The fishing right on the Faroe Islands is formulated in number of days the individual fishermen have the right to fish. Hence, the system is rights-based, and the fishing days are tradable within certain restrictions. The fishing-days system has many of the same qualities, for instance, a ITQ system approached from an economic and legal perspective. Both input and output based fisheries management systems are often supplemented with a number of technical measures on fishing gear and area restrictions.

4.2. Participatory governance

Participatory governance in fisheries management means an institutional context in which fishermen take part in the making of various fisheries management decisions (Gray 2005a; Kearney *et al*, 2007; Mikalsen and Jentoft, 2008; Ostrom, 1990; Symes, 2006; Wilson *et al.*, 2003). Participatory governance is held to internalise societal concerns and cope with uncertainty and change (Grote and Gbikpi, 2002; Heinelt *et al.*, 2002; Kooiman, 2002). Hence, it may foster innovation and institutional learning. Participatory governance can be institutionalised in a number of ways. Within the 'policy cycle' (May and Wildavsky, 1979, Sabatier, 2004), the scope of involvement may range from setting the agenda, to consultation and advice, decision-making, implementation and/or the evaluation of a management regime. According to the diversity of stakeholders involved, co-management (which involves the fishing sector and managers) or cooperative governance (which involves a more diverse range of stakeholders) may be appropriate (Gray, 2005b). There may be different levels of stakeholder involvement, including local, national, EU or international scales.

The two innovations analysed in the Baltic case have been implemented through a hierarchic top-down process with little involvement of stakeholders from the local levels. In Baltic fisheries, it is often high-level political negotiations that result in complex compromises. The trouble is that local

fishermen have little insight into the political negotiations that set the rules.

The fishing-days system on the Faroe Islands is mainly an effort-based system; but it has strong elements of participatory governance. Stakeholders are consulted about both complex and trivial matters - e.g. the development and the daily operation of the system.

In the North Sea case study, participatory governance was studied to the extent that it relates to quota management within the Dutch and UK RBM systems. In the Netherlands, co-management was introduced, above all, to increase legitimacy of and compliance with the RBM system and ultimately with the EU quota regulations (van Ginkel, 2005; Dubbink and van Vliet, 1997). In the UK, the participatory function of POs existed prior to RBM, but initially, related only to industry self-management of market supply and withdrawal schemes. The nine Dutch co-management groups are smaller and more homogenous in terms of regional basis, targeted species, and vessel and gear type than the 19 UK POs. Their prime functions are control and management of the groups' allocation of quota and, in the Netherlands, of days-at-sea. This includes facilitation and monitoring of quota transfers within and between groups, and annual submission to the administration of a joint fishing plan. Development of internal rules, including sanctions for when members overshoot their quota, was coordinated and is hence harmonised among the Dutch co-management groups. This is not the case in the UK POs, each of which set its own rules. The main difference between the Dutch groups and the UK POs is that the Dutch system of quota management is ITQ-based only, while the UK POs operate with ITQs, quota-pools and mixed systems for quota management. Beyond their functions in quota management, the Biesheuvel groups have recently acquired some capacity control and technical responsibilities, whereas (some of) the UK POs continue their traditional engagement in marketing, including the operation of processing facilities.

Participation is narrow in both Basque fisheries. It only involves fishermen. No conservationists have an official role in management of local fisheries. Industrial and coastal fishermen participate actively in management at the local level and through the Basque government in management at national level. Basque stakeholders are active in participation at the Communitarian level through RACs. Basque stakeholders state that RACs are a good platform for participation and a good mechanism to defend their interests. Indeed, Basque fishermen involved in industrial and coastal fisheries have made a good use of it as they hold leading roles in four RACs, and participate actively in the development of the management plans for anchovy and hake.

5.0. Synthesis of the case study reports on social robustness

5.1. Hypothesis 1: RBM and diversity of stakeholder involvement

The first hypothesis regarding social robustness is: *RBM systems tend not to have broad stakeholder representation*. This hypothesis was tested in the cases of the Faroe Islands, the North Sea and the Western Shelf.

The thinking behind this hypothesis is that RBM systems create a sense of ownership and rights on the part of a narrowly defined group (e.g. vessel owners) that discourages the involvement of other stakeholders. Hence, RBM systems are mainly concerned with the allocation and management of (individually) assigned fishing rights and are therefore are often perceived to be of little interest for wider stakeholders groups (e.g. conservationists, processors, local communities) to which rights are

not allocated. Hence, the perceived need for involvement of stakeholders with broader interests (such as fisheries management, marine conservation, securing the supply chain, and community development) during the development or implementation/operation phases is modest.

All four case studies confirm the hypothesis; yet the causality between the RBM and narrow stakeholder representation can be challenged as neither the Faroe Islands nor the Basque cases have strong traditions for a broad group of stakeholders participating in the decision-making processes. In the North Sea cases, stakeholder representation was only investigated in relation to systems of quota management.

The case study on the Faroe Islands partly confirmed the hypothesis as only a narrow group of commercial stakeholders are included in the decision-making processes. All stakeholders have commercial interests—each of them organised in their own association, (e.g. for captains, fishermen on deck, ship owners, engine workers, people who work on shore etc.). The breadth of stakeholder representation remains within these groups, and would, in an EU context, be considered narrow. So, on the one hand, the hypothesis is confirmed on the Faroe Islands; while on the other hand, stakeholder representation has historically always been narrow even before the introduction of the fishing-days system. It is difficult to assess whether it is the RBM system that created the narrow stakeholder representation or if it is due to other factors. These factors could have more to do with tradition, and reflect the tremendous importance of fisheries on the Faroe Islands and the economic crises that have occurred in the past whenever the fisheries were in a bad state.

The two quota management systems in the North Sea case also supported the hypothesis. In the Netherlands, only the fisheries administration and the concerned fleet segments were involved in the development and operation of the management system. A somewhat special role is that of the independent, non-industry chairman that Dutch co-management groups must have. Often, the chair is a local dignitary. He or she might be seen as a community representative, who mediates between community and fisher interests. However, the chair can also be seen as a disinterested part of the fishing industry. The latter view is supported by the fact that there exists no formal feedback mechanism to the local communities and that the chair really is mandated to act on behalf of the fishermen.

In the UK, stakeholder involvement extends to the fisheries managers and to the PO-organised segment of the fishing industry only. Non-PO members, both from the so-called ‘non-sector’ and from the ‘less than 10m fleet’ are not involved in the system’s operation. A certain role, however, is played by vessel agents, which act as non-fishing co-owners of vessels and of quota. They may exercise influence on quota management decisions through their business partners, who are PO members. Finally, environmental groups were not involved in the development or operation of the quota management systems. The cause for the narrow stakeholder representation can be seen in the narrow definition of responsibilities within the management system (management of predefined quota shares only), which results in a narrow definition of ‘stakeholder’.

In the Western Shelf case study, no representation by groups other than fishermen was found in the two cases studied: ITQs for hake and other demersal species, and TURFs for the Bay of Biscay anchovy. Again, it is hard to assess whether the RBM system has created the narrow stakeholder representation or if it is due to other factors. A lack of participation of conservationists could likely be the result of the negligible room for non-traditional stakeholders in the management process at national or Community level. Basque green NGOs have views on fishery issues and convey their

opinions to the civil society through the local media. However, they do not have any officially recognised consultative role in the management of Basque fisheries. Although stakeholder representation is narrow, RBM seems to have built strong and active participation on the part of industrial and coastal fishermen. They have an active consultancy role in fisheries management within the autonomous Basque jurisdiction. They are active in lobbying, and through their government channels, they express their needs to the central Spanish government and to Brussels. Furthermore, Basque fishermen are active in four RACs and have leading roles in some of them.

5.2. Hypothesis 2: Acceptance vs. characteristics of the RBM system

The second hypothesis regarding social robustness is: *Commercial fisheries actors' acceptance of a (RB) management system will be a function of the extent to which: a) the management system is perceived by the fishermen to be practical [and necessary]; b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced; c) which new entrants are facilitated; and d) which retirement options are provided for.*

The reasoning behind this hypothesis is that stakeholder acceptance is strongly related to a)–that fishermen perceive the management system to be practical and necessary. Acceptance is also strongly correlated with the perceived preservation of economic opportunities by existing users b) and d); and respectively by the maintenance of economic opportunities by potential future users c). The conclusions across case studies were that a) and b) are important determinants of commercial fisheries actors' acceptance of the management system, whereas c and d) are less important.

In the Baltic case, the overall impression from the stakeholders interviewed is that it is a complex, hierarchic system with many different temporary and area closures, which make the daily fishing activities difficult and complicated. According to the respondents, the management innovations implemented are not perceived to be practical (a). The area closure is seen as necessary, but the division of the cod stocks is neither necessary nor practical according to a majority of the stakeholders interviewed. These innovations have reduced fishing opportunities, made it more complicated, and have had a negative impact upon acceptance and legitimacy. Thus, these innovations have not reproduced the status quo of fishing opportunities when introduced (b). According to some of the respondents, it has also had an indirect impact on new entrants into cod fishing because the management system is more complicated than before – with unpredictability comes an unwillingness to invest. This is supported by the fact that the fisheries sector has had a very low recruitment in Nexø and Simrishamn during the last years (c). These two innovations have no impact on retirement options (d). Altogether this negatively affects the commercial fisheries actor's acceptance of the management system for Baltic cod, which is also verified in the interviews. The result from analyzing the Baltic case from this hypothesis strongly indicatesthat low legitimacy for innovations negatively affects support for and compliance with a management regime. The result also indicates that even when a rule is perceived as "necessary" among the stakeholders, acceptance and legitimacy can be low if the practical implications on the daily fishing activities is too severe.

On the Faroe Islands, there is an exceptionally high level of acceptance of the fishing-days system among the commercial actors. Acceptance took several forms: a) Fishermen found the system to be practical. Much of the information they needed appeared on the computer screen. Both fisheries inspectors and fishermen argued that it was not possible to cheat the system owing to the extensive satellite monitoring system. b) The system came in response to some difficult years for the fisheries

with low cod stock and bankruptcies among vessel-owners, followed by the ITQ system with too low TAC. Maybe this frustration created a willingness to engage in a new system as long as it would take the problems of the old system into account. The introduction of the fishing-days system left all fishermen in a much better economic situation. This could be one of the reasons why the allocation of fishing days between the fishermen did not cause conflicts as it did in other regions, for instance, in New Zealand. Further, nobody was forced to leave fisheries after the introduction; even the small non-commercial vessels were included and given a common pool of fishing days, which until now, has not been completely used. c) Facilitation of new entrants was not viewed as essential by the commercial actors. As in an ITQ system, new entrants have to buy/inherit fishing rights in order to enter the Faroese fisheries. d) None of the informants were concerned with retirement as an essential part of the system. However, people do have retirement options. If a vessel owner wished to retire, he can sell his fishing days and vessel. Pension schemes are provided for the employed fisherman.

In the Dutch case, we find a high, and in the UK case, moderately high level of acceptance among the fishing industry, which can be related to three of the above mentioned characteristics of the RBM system. In both countries, the systems are considered to be practical (a). The initial ITQ allocation (b) in the Netherlands reproduced the status quo of fishing opportunities, though only after some early adjustment of the allocation basis. Similarly, in the UK, both the rolling share system and the fixing of the quota allocation came close to reproducing the fishing opportunities status quo; although the time gap between the onset of FQAs and the qualifying period was substantial. Regarding retirement options (d), in both countries, pension schemes for fishermen exist independent of the 'windfall' incomes generated by selling or leasing out quota rights at the end of a fisherman's professional life. Actually, many active fishermen were quite negative about retired quota-holders and other non-fishing quota-holders. In the UK a group of quota holders exists that is not part of the fishing industry. The fact that people viewed selling quota shares after retirement as more legitimate than leasing them out points to a broader moral issue about holding and speculating quota. One condition of our hypothesis, facilitation of new entrants (c), was not met. Fishermen in both countries expressed concerns about difficulties and costs of entry, although possibly a bit more vehemently in the UK. These concerns did not, however, undermine the systems' general acceptance, perhaps because it relates to third parties rather than the fishermen themselves.

The RBM approach is partially accepted in the Basque cases. The system sets certain conditions to satisfy industrial fishermen: a) clear rules; b) initial allocation was based on historical criteria; c) facilitation of new entrants although they are required to buy licenses or rights from census's vessels; and d) The RBM system has facilitated retirement since fishers have been allowed to sell their rights and receive a scrapping bonus. Some stakeholders, however, do not feel satisfied with the RBM system. Unconformity is not a result of the RBM system, but of the unequal competition with other fleets. The evolution of the RBM has produced the reduction of the Basque fleet due to transferability (introduced in 1997), which has allowed the Galician fleet to grow in vessels and rights. Stakeholders see that factors such as running costs may have determined the predominance of the Galicians. In this case, acceptance of the RBM system rests on external factors. In the coastal fisheries, we found factors that may produce the acceptability of the RBM system: a) the system is practical since Cofradias partially manage the fishery; b) the rights allocation reproduced the status quo. Cofradias's historical rights to exploit and manage were respected; c) new entries are allowed

to join the Cofradia; and d) retirement options, from incentives to decommissioning, are available. Acceptability of the system, however, depends on external factors. A source of complaint is the Arcachon Agreement, which allows French pelagic trawlers (technology banned in Spain) to exploit anchovy. Stakeholders interviewed blame the national government for allowing "intruders" to exploit resources considered as to be Cofradias' historical rights.

5.3. Hypothesis 3: Acceptance of RBM and diversity of stakeholder involvement

The third hypothesis regarding social robustness is: *The more diverse stakeholder involvement in the development and/ or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors.*

The reasoning behind this hypothesis is that broad stakeholder representation may lead to a questioning of the legitimacy of other stakeholders as well as to frustration with the complex process. This hypothesis has been difficult to test directly through the case studies. On the one hand, none of the case studies have provided examples of diverse stakeholder involvement, on the other hand, high degrees of commercial stakeholders' acceptance have been found in (at least parts of) each case study. The hypothesis is not convincingly contradicted by the case studies.

The Baltic Sea case study did not confirm this hypothesis. The division of the cod stocks has been implemented without diverse stakeholder involvement and is operated by a centralised top-down management regime. Even so, there is a low acceptance among commercial fishermen for these innovations – particularly for the negative practical implications of the division of the cod stock. Closed areas and seasons for cod fisheries have quite a high acceptance, mainly when it comes to protect spawning and juveniles. There is some agreement among commercial fishermen on the importance of protecting spawning and juveniles, and acceptance is very high, but the complex management process—with many temporal closures and stops—reduces the legitimacy also for this innovation. The conclusion from the Baltic case is that even in the absence of diverse stakeholder involvement in the development and operation of the management system, the frustration over complex processes and practical implications can be extensive. With or without stakeholder involvement, management must make sense, or at least not contradict fishing practices that may be highly valued within fishing communities.

The fishing-days system on the Faroe Islands cannot test the hypothesis directly as there is no broad stakeholder representation in the system and the system enjoys a high degree of acceptance and support from both the users and the managers. The fishing industry is strong when making decisions regarding fisheries management. No greens or other non-commercial interest groups are represented in the decision-making processes. For example, the board that originally suggested the fishing-days system was composed by the administrative head of Fisheries Ministry, the chief biologist of the Faroese Fisheries Laboratory, and three fishermen representatives (one for the trawlers, one for the long liners, and one for the coastal fishermen). This board only functioned during the establishment phase of the system. Another example is the fishing-days board. This board is composed of a chairman and five active fishermen. The fisheries management on the Faroe Islands enjoyed general acceptance from the interviewed people. Yet many informants mentioned two flaws of the system: 1) that the biologists' advice was not taken into account properly when making decisions on the number of fishing days. And 2) that the system had failed to set up a system for monitoring the fishing effort. Even although both flaws are potentially strong enough to undermine the system, they were often considered of less importance in the overall picture. Whether

the decisions of these boards would have been less accepted if they had represented other non-commercial stakeholders is too speculative to assess; but the situation on the Faroe Islands does not contradict the hypothesis.

The situation in both the North Sea countries is quite similar to the situation on the Faroe Islands: apart from fisheries mangers, only specific industry segments have participated in the development and are involved in the operation of the co-managed RBM systems of the Netherlands and the UK. Stakeholder involvement is thus classified as 'non-diverse.' Acceptance of the concerned commercial fishermen was high among the members of the Dutch Biesheuvel groups and moderately high among those of the UK POs. The hypothesis could be rewritten as follows: the less diverse the stakeholder involvement, the higher the level of acceptance on the part of the concerned commercial fisheries actors. In this form, the proposition is confirmed. However, the causality is unclear. We cannot be sure whether the system's acceptance can be attributed to the non-involvement of wider stakeholders or whether it is actually due to other factors.

Involvement of stakeholders is narrow in the case of the fisheries on the Western Shelf: conservationists and other groups are not involved in the management process. The acceptance of stakeholders regarding the Basque government and its intervention in management is high. Low acceptance is found in relation to the national Spanish management for Basque fisheries. Basque stakeholders seem to have disconformed with central government management since they think it does not fully take into consideration the needs of the Basque fleet. Basque stakeholders argue that the central government has many fisheries to manage and cannot assure everybody's satisfaction. But the main complaint of the Basque fisheries is the low support from the central government, as when they allow the French fleet to fish anchovy through the widely criticised Arcachon Agreement. Moreover, Basque stakeholders see the complexity of managing Europe as a problem also faced by Basque fisheries. In this context, the interviewed stakeholders see RACs as a good platform to express their ideas, give their advice and defend their rights. Additionally, they view RACs as a point-of-encounter with counterparts of other nationalities in a sort of negotiation platform. To sum, in this case study, the hypothesis is confirmed at national and European level, but not confirmed at local level.

5.4. Hypothesis 4: RBM and capacity for institutional learning

The fourth hypothesis regarding social robustness is: *RBM systems restrict capacity for institutional learning.* The reasoning behind this hypothesis is that creation of property rights will create new expectations and demands for secure investments and hence, foster resistance to change and create dependency, which might affect the value of investment (e.g. through diluting or abolishing rights; creating a new pool of rights for other purposes; opening up the system to new entrants; or weakening the legal status of the rights). Such lock-in effects can be expected to be particularly strong when there are no sunset-provisions built into the allocation of rights. But even if sunset-provisions are given, rights holders' resistance may prevent changes to the management system.

The case studies show, however, that almost all the RBM systems studied have been able to institutionally learn after rights have been introduced. We can identify specific paths of institutional learning that indirectly confirms our assumption that RBM tends to narrow institutional development options. Learning was mostly geared towards making rights more easily transferable and/ or more secure and exclusive, thereby locking the systems increasingly into place. The trend towards greater transferability can be explained by the fact that, once differences emerge between

fishing capacity and available resources, pressures arise to trade rights, even when their trade was not originally intended. Rights become more secure and exclusive as rights-holders strive to hedge the investments they have made over time. In some cases, institutional learning also included making the RBM systems more participatory. In such cases, the effect somewhat differs from that of strengthening rights: the management systems in principle become more open and responsive to the involved stakeholders' demands, rather than more locked-in. The reasons for institutional learning and the responses of the systems are different in the various case studies.

Complex institutional learning has taken place in the fisheries management on the Faroe Islands during the last fifteen years. Prior to the national crisis on the Faroe Islands in the early 1990s, the fisheries were managed by capacity restriction measures and spatial closures. In 1994, the ITQ system was introduced after a Faroese committee had recommended ITQs from the early experiences on Iceland and New Zealand. The fishermen and many of the politicians were not happy with the system because the cod-TACs conflicted with the experiences the fishermen had at sea. The ITQ system was abolished in 1996, when the fishing-days system was introduced. Hence, the Faroe Islands had a RBM system, which did not restrict the capacity for institutional learning. This could be the only example of an ITQ system remaining in the world, as it has been abolished. To interpret this abolishment as a quality of the RBM system would be too hasty as a number of circumstances played an essential role in the abolishment: 1) The ITQ system was only in place for two years; and the fishing-days system was developed within this period of time. Hence, the fishermen did not adjust too much to the ITQ system. The lack of capacity adjustment also had to do with the general economic crisis on the Faroe Islands at the time. Nobody had made investments, which meant that nobody got caught too hard when switching systems. 2) The stock abundance of cod was tremendous at the time compared to how much cod the ITQ system allowed the fishermen to catch. Hence, everybody would gain fishing rights by changing to the new system. So, on the one hand, the Faroe Islands fisheries management has shown extraordninary capacity for insitutional learning. On the other hand, since the introduction of the fishing-days system, not much has been changed in the system. Although most informants agreed that the plan failed to set up a system for monitoring the effort and that an increased focus on the fishing capacity development was required, nobody wanted to take the first step. From this perspective, the fishing-days system has demonstrated a low capacity for institutional learning with regard to fishing efficiency.

In the North Sea cases, several steps of institutional learning can be identified to have occurred after establishment of the IQ system in the Netherlands (1976) and of the PO system in the UK (1973). The institutional learning that took place was mainly directed toward making the systems work more smoothly, through greater accountability and by making rights more easily transferable and secure. In the Netherlands, the first step of learning was the introduction of the transferability of quota in 1985. It was a reaction to the fact that fishermen had started to trade quota anyway although this had not been legally intended. The next step in initiating complex learning was the attempt to redesign the ITQs system into a participatory ITQ system by introducing quota management groups between 1988 and 1990. The idea was to counter both the issue of quota overshooting that the ITQ system had not been able to prevent, and the problem of crisis-ridden state-industry relations, which resulted from these. The attempt failed at first. It succeeded the second time round when, in 1993, an institutionally more sophisticated approach to quota management groups was developed and the Biesheuvel system emerged. Among others, the groups were obliged to publicly auction landed fish, which made for easier quota monitoring and

enforcement. As of the year 2000, building upon the systems' success, the system was further extended when the groups' responsibility was widened from quota management to the control of engine power and technical measures. In the UK, the major steps of institutional learning included linking the existing industry self-governance structure of POs with the RBM system, and the subsequent change from a sectoral quota management system (based on a rolling track record quota allocation introduced 1984) to a system based on fixed quota allocations in 1999. The political intention of this change, which was requested by at least parts of the industry, was to provide more stability. Emergence of quota trading and a quota market had not been intended by the fisheries administrations but intensified after successive rounds of decommissioning had 'freed' up quota (Hatcher and Read, 2001). These changes are unintended shifts in the system leading to new functions and practices rather than institutional *learning* as a conscious and intentional process. Interestingly, however, this unintended shift was geared, like in the Netherlands, towards making rights more transferable and secure, even though full-fledged ITQs are still resisted in the UK.

In the case of the Basque industrial fleet, it seems that the RBM system has not impeded the fishery to adapt to changes in the fishery system. Thus institutional learning has taken place regardless of the RBM mechanisms introduced. Rights have evolved naturally since decommissioning of vessels produced an excess of effort rights expressed in days at sea, which needed to be transferred to other vessels within the census. The shift to transferability of rights has allowed a more efficient distribution of rights. The recent introduction of a proper ITQ in the fishery has not been resisted, although it seems to be unpalatable for some of the stakeholders who have seen their effort rights absorbed by those more efficient (e.g. Galician fleet). Thus, it is likely that rights will continue to be gathered by the most efficient actors to the detriment of the less efficient. Another major welcomed change is the enhancement of participation in the management process at the EU level though RACs. This change was welcomed by fishermen because RACs are perceived as a platform to defend their interests and to deliver advice to managers. In the case of the Basque coastal fleet targeting anchovy in the Bay of Biscay, the management system has not required the fishery to adapt to the Brussels' standards regarding participation in RACs, renewal of the fishing fleet and incorporation of measures on security on board. It is worth pointing out that Cofradias react 'as a single man' in the face of challenges. They have an active voice when proposing the closure of the anchovy fishery because they see the recovery of this stock as fundamental to the sustainability of their fishing activity. In this context, they have questioned the opening of the fishery even for the experimental campaign carried out by commercial vessels in 2007. Institutional learning seems not to be restricted by the TURFs approach since the sense of resource ownership encourages stakeholders to participate actively in the RACs and to find alternative and innovative measures to manage the stock. For example, the coastal sector is now involved, together with scientists and managers, in the development of a management plan for recovering the anchovy stock.

5.5. Hypothesis 5: : Stakeholder diversity and institutional learning

The fifth hypothesis regarding social robustness is: *The more diverse the stakeholders involved in the development and/ or operation of a management system, the more institutional learning takes place.*

The reasoning behind this hypothesis is that the involvement of more diverse stakeholders widens the range of alternative views in deliberations and negotiations. Alternatively, one could expect that the involvement of highly diverse stakeholders could lead to conflicts that forestall any significant

change. There is a difference in whether the involvement pertains to advice or to decision-making. This hypothesis has been hard to test empirically as the all case studies involve narrowly defined groups of stakeholders.

As with Hypothesis 3, the present hypothesis cannot be tested directly through the case studies: On the one hand, none of the case studies have found examples of diverse stakeholder involvement; on the other hand, some degree of institutional learning has taken place in all the case studies.

In the Baltic case, stakeholders do not feel involved in the management process or feel that they have a say. Today, the main stakeholder group, the fishermen, is distant from the political process and decision-making that governs their fishing operations. This is also supported in the interviews from this case, *"We [fishermen] have no way of influencing decision-making in the cod fishery and there is a risk that no one bother about new rules due to the frustration over the lack of influence in the decision-making process" (trawl skipper, Simrishamn).* In the Baltic case, there is a significant instance of institutional learning – about spawning areas, external factors affecting the cod resource, genetic differences between the eastern and western stock, etc. – although the stakeholders involved were not particularly diverse. A lot of learning seems to be purely ecological and primarily performed within ICES and other ecological research institutes on national levels. These stakeholders have an advisory role and are not involved in decision-making. On the other hand, learning seems to be low in reagrd to creating trust between stakeholders and authorities, legitimacy and compliance for rules and regulations, as well as how to communicate the necessity of different management innovations down to the local level. The implementation of the BS RAC can be seen as a way of trying to deal with these issues. If the RAC gets more influence in the future, there is a chance that stakeholders can have a better say in the decision-making process and that more institutional learning can take place. So far, the RAC has made little impression at the local level.

On the Faroe Islands, stakeholder diversity is lacking; nevertheless, significant complex institutional learning has taken place as described under Hypothesis 4. The introduction of the fishing-days system was an example of complex institutional learning that was initiated in the absence of a diverse group of stakeholders to point out the weaknesses of the system. On the other hand, the lack of initiative to deal with flaws in the system (e.g. the black spot with regard to fishing capacity), suggests that the system is slower to progress with simple institutional learning. One can only guess whether the system would have been more open to change if broader groups of stakeholders were active on the Faroe Islands.

In the North Sea case study, this hypothesis is not confirmed by our analysis. In both the Dutch and UK cases, stakeholder involvement was relatively narrow, basically encompassing only the relevant industry segments and government. However, significant steps of institutional learning did take place. These include widening the Dutch RBM system to co-management and combining the pre-existing UK industry self-governance structure of POs with RBM. Apart from these two approaches to participatory RBM systems, we find institutional changes within the RBM system in both cases to be geared towards making rights more transferable and exclusive. Non-diverse stakeholder participation has favoured an even stronger movement toward market-based fisheries management.

Involvement is narrow in the case of the Basque fisheries. Conservationist groups, for example, do not participate. In addition to industrial and coastal fisheries, a third stakeholder, the Basque government could be thought to play a meaningful role for the sake of Basque fisheries, which are considered as strategic to the Basque region. Even though participation is narrow in the

management process of Basque fisheries, institutional learning has taken place in the last years in both fisheries. This fact does not confirm the hypothesis 5. Simple learning has taken place in both fisheries, for example, the swift adaptation to the new requirements of Brussels on modernisation and withdrawal of fishing capacity and involvement in RACs. In the particular case of the coastal fisheries, institutional learning at a complex level has taken place when shifting objectives from rent maximisation to resource protection. Coastal stakeholders were active in requesting the closure of the anchovy fishery and supportive to scientific advice even when it meant the indefinite closure of the fishery. Now they are actively involved in the development of the anchovy management plan. Moreover, the swift reaction and opposition to what they perceive as threats (e.g. experimental surveys in spring 2007) has proved their high problem-solving capacity.

6.0. Conclusions

This report has presented a framework for analysing the social robustness, – defined by the two dimensions stakeholder acceptance and capacity for institutional learning – of fisheries management regimes. The framework was then applied to four innovative management regimes in European fisheries which all combined some form of RBM with participatory governance. We discussed five hypotheses on the interrelations between these two management features and the two dimensions of social robustness.

We found that two of the management innovations – the North Sea and Faroe Islands cases – seem to be socially robust with relatively high degrees of stakeholder acceptance and the ability, in many situations, to institutionally learn. In the case of Basque fisheries, management seems to be socially robust with high institutional learning, but the stakeholders do not fully accept the system. The Baltic case seems to be less socially robust compared to the other cases: the innovations in the Baltic were implemented in a more traditional top-down fashion, and complex learning – that contains more fundamental questioning of redefining the underlying values and ends – has not taken place, affecting social robustness negatively. All the case studies only include narrow groups of stakeholders and it is easy to assume that a broader representation of stakeholders would have affected stakeholder acceptance and institutional learning and thus, social robustness.

Looking more closely at the factors influencing stakeholder acceptance, the North Sea, the Faroe Islands and the Western Shelf case enjoy a generalised acceptance among, at least, industry stakeholders. The systems are all perceived to be practical and necessary by the people who have to work them i.e. the commercial actors, and in some of the cases, the management. Conservation or green organisations do not play a central role in any of the cases studied although they are represented in some through the Commission's RACs. Yet, on the Faroe Islands, critical voices that say that the fishing industry is too strong and the biologists are ignored in decision-making processes can be found even though no green organisations are represented in fisheries management. Stakeholder acceptance of the management in the Baltic case is much lower than in the other case studies. The management system is not perceived to be practical and necessary, and as a consequence issues of stakeholders' acceptance and compliance have arisen. These same issues do not seem to be as large in all the other case studies.

Regarding institutional learning, the studied systems of the North Sea, the Faroe Islands and the Western Shelf have demonstrated capacities to institutionally learn and keep a fairly high

stakeholders' acceptance among the commercial actors. This happened in spite the involvement of narrow defined groups of stakeholders. The finding was not consistent with our initial hypotheses. However, we found that institutional learning within the RBM systems mostly took a very specific path: It was typically geared towards making rights more tradable and/ or secure or exclusive. This actually creates a paradoxical situation where options for future learning in the system may be reduced since rights-holders will want to maintain the value of their investment in the rights.

Let us briefly sum up the conclusions on the five hypotheses that were discussed:

Hypothesis 1 stated that RBM systems tend not to have broad stakeholder representation. This hypothesis was confirmed by the three case studies that had elements of RBM. Indeed, none of the RBM systems had broad stakeholder representation. Yet none of the case studies could establish a connection between RBM and narrow stakeholder representation as none of them had strong traditions for broad stakeholder representation before the introduction of the RBM system.

Hypothesis 2 regarded the commercial fisheries actors' acceptance of a management system considering it to be a function of the extent to which: a) the management system is perceived by the fishermen to be practical and necessary; b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced; c) new entrants are facilitated; and d) retirement options are provided for. The conclusions across case studies were that (a) and (b) are important for commercial fisheries actors' acceptance of system, whereas (c) and (d) are less crucial.

Hypothesis 3 asserting that more diverse stakeholder involvement lowers the acceptance of the concerned commercial fisheries actors was impossible to test as none of the case studies featured broad stakeholder representation. An alternative conclusion could be made, since the RBM systems with narrow stakeholder representation seemed to have high degree of acceptance among those stakeholders involved.

Hypothesis 4 proposed that RBM systems restrict capacity for institutional learning. This hypothesis was rejected as institutional learning could be identified in the development of each of the studied RBM systems.

Neither was Hypothesis 5 confirmed by our cases. It stated that the more diverse the stakeholders involved in a management system, the more institutional learning takes place. Stakeholder involvement was not diverse in any of the systems, yet all cases demonstrated capacity for institutional learning.

Finally, we find that in the various case studies, different factors have influenced the social robustness of fisheries management systems favourably, which cannot be assigned to the management systems and their characteristics themselves. On the Faroe Islands, cod have until recently[4] been exceptionally abundant since the introduction of the fishing-days system – this took the pressure off the fisheries management system. In the case of Basque fisheries, the emergence of RACs is seen as a positive development that allows the Basque fishing groups to defend their interests and to participate in giving advice– hence the RAC could take the pressure off the regional fisheries management. In the North Sea cases, social robustness of the co-managed RBM systems was fostered by the fact that inequitable quota concentrations have so far, been avoided. In addition, in both countries, capacity reduction, days-at-sea schemes and strengthening enforcement

[4] ICES recommended no fisheries for cod on the Faroe Bank in 2008 and 2009 (ICES, 2008).

frameworks supported the systems' working over the years, maintaining economically viable fishing opportunities for those still involved. Looking at co-management, social robustness was promoted in the Netherlands in particular by the Dutch neo-corporatist and consensus-oriented culture, which pervades many aspects of social life.

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Appendix 1: Report from Baltic Sea case study

Carl Rova

1. Introduction

> *Recent scientific advice from the International Council for the Exploration of the Sea (ICES) indicates that the cod stock in the ICES Subdivisions 25 to 32 of the Baltic Sea has declined to levels where it is suffering from reduced reproductive capacity and that the stock is being harvested unsustainably… the cod stock in ICES Subdivision 22, 23 and 24 of the Baltic Sea is over-exploited and has reached levels where it is at risk of reduced reproductive capacity (Council Regulation No 1098/2007).*

The ICES[5] has been calling for drastic quota reduction during several years due to the severe situation for the Baltic cod stocks. To prevent further overfishing, two "management innovations" have been introduced aimed at improving management of Baltic cod stocks: (1) closed areas and seasons for cod fisheries and (2) a new management regime based on division of cod resources among two areas – eastern and western cod stocks. The aim with closed areas and prolonged ban season is to ensure better protection of cod during spawning time while division of cod resources into two separate management units will improve management of Baltic cod through more appropriate measures that could be applied separable to one or another cod stock. These two issues affect a substantial part of Swedish and Danish fishermen, as well as fishermen from other Baltic countries who are operating on both stocks and will lead to serious economic and social implications (Delaney, 2007:9).

Fisheries management does not always work according to the intention of policy and decision-makers. The migratory nature of fish resources and the large area to monitor make regulations heavily dependent on voluntary contributions and cooperation of fishermen and other stakeholders. When the fisheries management implement regulations, such as the two described above, the fishermen change their behaviour and adapt to new conditions and a discrepancy between intention and result may arise – thus, the success of these management innovations depends on how it is perceived by stakeholders. Stakeholders not only provide legitimacy, knowledge and implementation capacities but can obstruct the implementation of the innovation when refusing support. The success of management innovations also depend on their ability to adapt to internal developments and to external changes, such as changes in their natural, social and economic environment (CEVIS).

[5] International Council for the Exploration of the Sea, ICES, is the organisation that coordinates and promotes marine research in the North Atlantic. This includes adjacent seas such as the Baltic Sea and North Sea (ICES).

The social robustness of a fisheries management regime[6] is (in WP6 of the CEVIS project) defined by two dimensions: acceptance of the regime by its stakeholders, and institutional learning within the regime. While stakeholder acceptance describes processes at the micro level of individual actors, institutional learning is about processes at the meso-level of organizations and institutions. Within WP6 of the CEVIS project, the following hypotheses are discussed in the Baltic Sea case:

1. *Commercial fisheries actors' acceptance of a management system will be a function of the extent to which:*

   a) the management system is perceived by the fishermen to be practical and necessary
   b) the management system reproduced the status quo of fishing opportunities when introduced
   c) which new entrants are facilitated
   d) which retirement options are provided for

2. *The more diverse stakeholder involvement[7] in the development and/or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors.*

3. *The more diverse the stakeholder involved in the development and/or or operation of a management system the more institutional learning takes place.*

Thus, the aim with this report is to analyse how different stakeholders perceive these "innovations" described above, do they accept and comply with them? Stakeholder acceptance of a management regime – in this case exemplified by these innovations - describes the position that fisheries stakeholders take vis-à-vis a management regime. In this report, stakeholder acceptance have been assessed through analysis of views expressed by various stakeholders (positive, neutral, negative) and through actions taken by the stakeholders as well as (non-) compliance with the management regime. Institutional learning is another key concept in this report. Institutional learning is the process in which institutions change in reaction to internal pressures (e.g. of right holders or right managers) or external changes in the ecosystems and socio-economic context (e.g. pressures by non rights holding stakeholder or administrators).

[6] In this report, management regime refer to the two management innovations in the Baltic Sea case, thus; (1) closed areas and seasons for cod fisheries and (2) a new management regime based on division of cod resources among two areas – eastern and western cod stocks.

[7] E.g. NGOs, processors, communities, etc.

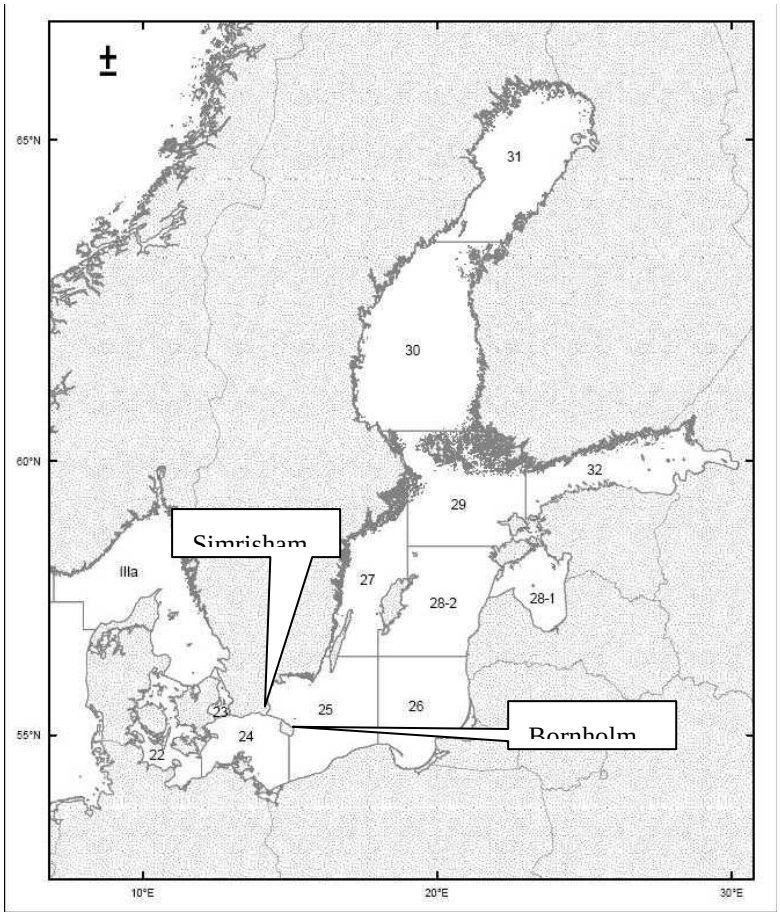

Figure 1. The Baltic Sea with ICES subdivisions and the two fishing communities under focus in this study (modified from Delaney, 2007:12).

To be able to analyse the stakeholder acceptance and the consequences of these two innovations, two "cod communities", Nexø at the Danish island Bornholm and Simrishamn in Sweden, has been selected for this study (see Figure 1). These two communities are highly dependent on the cod fishery and there is a strong cultural preference for fishing there. Downturns and forced closurers in cod fishing can therefore often result in negative impacts – thus, "the future of these communities are tied closely to the cod fishery" (Delaney, 2007:7).

Present job / Background	Civil servants and environmental NGOs	Researcher	Fishermen (and their representatives)	Total
Biologist/scientist	4	1	1	6
Social science			1	1
Fisherman			18	18
Total	4	1	20	25

Table 1. Profiles of interview persons.

This study is built on data collected from two main sources: (1) semi-structured in-depth interviews

with stakeholders (see Table 1); (2) written material, such as program documents, reports, official statistics and other documents concerning cod fisheries in the Baltic Sea. Semi structured interviews with local fishermen has been done in two communities; seven interviews in Simrishamn and eleven in Nexø. The main purpose with these interviews has been to receive information about how well these two management innovations have been accepted by local fishermen and how it affect their daily fishing activities. Additionally, interviews with the local chairman of the National Federation of Swedish Fishermen in Simrishamn, with the chairman of the Bornholms and Christiansøs Fishing Association in Bornholm and an interview with the chairman of The National Federation of Swedish Fishermen have been done. To be able to contrast between the responses from different stakeholder groups, interviews has also been done with representatives from two different environmental NGOs, the World Wide Fund for Nature (WWF) and the Swedish Society for Nature and Conservation (SNF) – these NGOs are also members of the BS RAC Executive Committee[8]. Additionally, interviews with a biologist from ICES and two representatives from the Swedish Board of Fisheries have been carried out. Thus, this study consist of 25 semi-structured interviews that each lasted between 45 minutes and 3.5 hours.

1.1 Simrishamn fishing community

Simrishamn is a small town with a population around 20.000 and is situated in the county of Skåne (Scania) on the southeast coastline of Sweden. It is a municipality with a high level of focus on marine issues. Simrishamn started out as a small fishing town in the 13th century with fishermen fishing for herring. During the 1880s fishermen caught cod, herring, salmon, flatfish and eel. Today, Simrishamn is the main port for the Swedish Baltic Sea fleet (Gustavsson, 2007).

The number of fishermen has fluctuated quite a lot over time – from approximately 250 in the late 1890s to around 320 in mid-1950s – until today with its all-time low of around 80 fishermen. The decrease in the number of vessels has continued during the last years in Simrishamn where the number of registered vessels is down to 62 in 2007, whereas in the year 2000 these were 77 (SBF database in Gustavsson, 2007:51). In the Simrishamn area nearly all fishermen are organised in the local branch of SFR and according to local fishermen in the area they seem to have no internal problems – this is also confirmed in interviews done by Gustavsson 2007.

Around 50 percent of Swedish cod catches in the Baltic area are taken by vessels from the Baltic coastline and Simrishamn stood for 24 percent of the total Swedish cod landings in 2006.[9] A majority of the cod vessels in the Simrishamn are rather small (15 m or less). In 2006 there were 40 vessels less than 15 m from Simrishamn that reported catches of cod and their landings amounted to 57.5 percent of the total cod landings by Simrishamn vessels. The location of Simrishamn – northwest of Bornholm – means that cod landing are dependent on both the eastern (ICES subdivision 25, see Figure 2) and western (ICES subdivision 24) cod stock (Interview 1, respondent

[8] The BS RAC is one of seven Regional Advisory Councils established by the European Council to increase stakeholder involvement in the development of a successful Common Fisheries Policy.

[9] Also vessels from the Swedish west coast fish in the Baltic Sea. The Baltic fleet almost exclusively fish in the Baltic whereas vessels from the west coast use all possibilities of fishing in Swedish waters – larger vest coast vessels from the vest coast land 50 percent of the the Balic cod TAC.

from the Swedish Board of Fisheries).

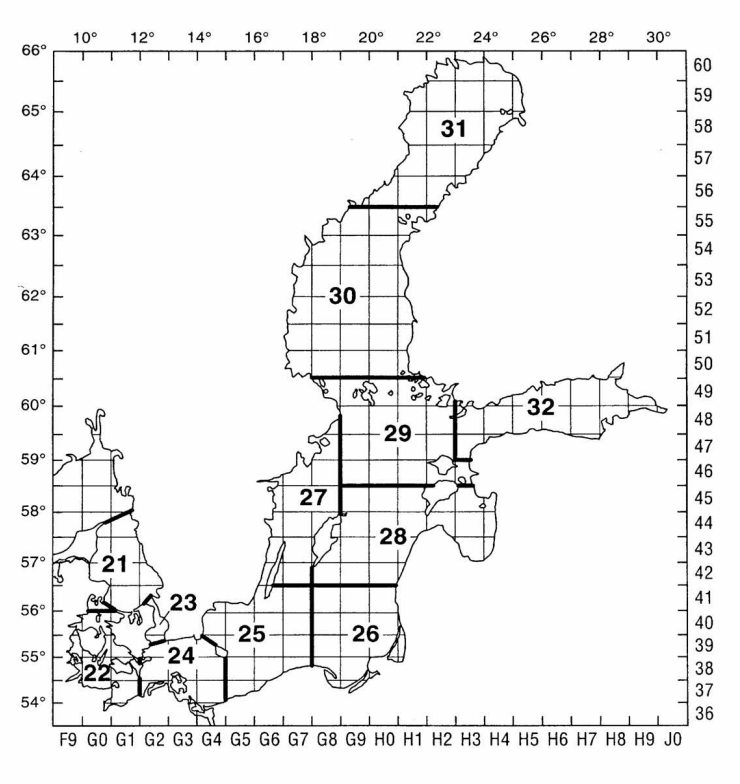

Figure 2. ICES Sub-divisions in the Baltic (ICES, 2004).

1.2 Nexø fishing community

Nexø is small town and located on the Danish island Bornholm which is situated in the Baltic Sea between Sweden and Poland. Nexø is the main cod fishing community at Bornholm and, in this study; interviews has accordingly mainly been done in Nexø. Due to the location, fishing has always been an important activity for the people of Bornholm. Fisheries in the water surrounding Bornholm have also attracted people from Denmark and other countries around the Baltic to land their catches there (Christensen and Hegland, 2007).

The fisheries sector is more important to Bornholm than Denmark in general. The fishery sector in Bornholm has traditionally been dependent on a relatively limited number of species, namely cod, herring, sprat and salmon. Cod is by far the most important of these and the development of the sector is therefore particularly sensitive to the development of the catch and landings of cod. Today, cod stand for approximately 90 percent of landed value on Bornholm (Interview 14, the chairman of the Bornholms and Christiansøs Fishing Association).

There were approximately 400 fishermen on Bornholm in 1996, as opposed to 1.000 in the mid-1980s and in 2003 only 251 persons were registered as full-time fishermen. After a peak in 1997, the tonnage on Bornholm has decreased with more than 15 percent. The introduction of the FKA

system in 2007 has changed the fleet of Bornholm dramatically (Christensen and Hegland, 2007).[10] The chair of the local fishermen's association, Birger Rasmussen, estimated in an interview that the fleet would consist of less than 100 vessels and approximately 230 commercial fishermen at the end of 2007. The fishermen's organization on Bornholm was a fierce opponent of the FKA system as they feared quota concentration. This is also the reason why fishermen on Bornholm is not organised in the national Danish Fishermen Association (advocate of FKA). It is primarily the smaller vessels that have been bought and emerged with other vessels. However, according to Rasmussen, a large part of the traded vessels have stayed on Bornholm (Interview 14). Not only the actual cod fishing by Bornholm vessels has decreased but also the bigger processing companies have moved the main part of their production to Poland.

2. The Baltic Sea

More than 200 rivers empty into the Baltic Sea, providing a catchment or drainage area of about 1.700.000 km2 – that is approximately four times larger than the sea itself. The Baltic Sea is a semi-enclosed brackish water area, the second largest in the world after the Black Sea. Saltier, heavier and oxygen-rich water from the North Sea enters the Baltic Sea through the shallow, narrow entrance and propagates along the deeper regions, while a counter of freshwater flows outwards at the surface. The Baltic Sea is characterised by a series of deep basins separated by shallow sills, and an inflow will usually fill up the first basin – the Bornholm Deep – only, with little or no transport in an eastern direction. The turnover time for full exchange of its water mass is estimated to 25-30 years (Thulin and Andrushaitis, 2003).

The Baltic Sea ecosystem is dominated by three species: cod, herring and sprat. Their overall abundance is greatly determined by the specific hydrographic conditions and the fishing pressure in the Baltic. There are two populations of cod (*Gadus morhua*) inhabiting the Baltic area: eastern Baltic cod (subspecies *Gadus morhua morhua*) and western Baltic cod (subspecies *Gadus morhua callaris*) with different morphometric characteristics and population genetics – one population east and the other one west of Bornholm. The eastern cod occurs in the central, eastern and northern part of the Baltic but not in significant amounts north of Aalands Islands. Areas west of Bornholm Island including the Danish Straits are inhabited by western cod population. This stock has historically been much smaller than the eastern stock but it appears to be a highly productive stock which has sustained a very high fishing mortality for many years. Recruitment is highly dependent upon strength of incoming year classes. The two stocks overlap in the area near Bornholm and there is some migration of fish between these areas. The eastern population is bigger and constitutes 90% of the total resource, but it may fluctuate due to differences and changes in exploitation level and recruitment.

[10] In 2007 (January 1st), the FKA (i.e. in English "vessel quotas system") was introduced in Denmark to replace the previous system. Each vessel was allocated a quota based on historical rights and the quotas follow the vessel when sold.

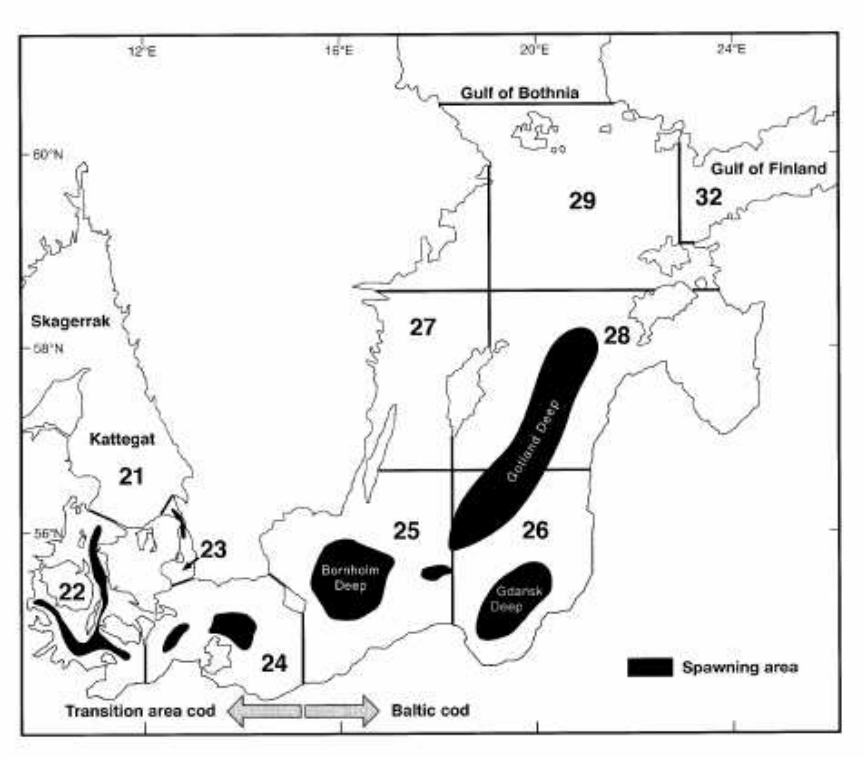

Figure 3. Historical spawning areas for cod in the Baltic Sea (ICES, 2004).

The spawning areas for eastern Baltic cod have in the past been the Bornholm, Gdansk, and Gotland Deeps (see Figure 3). The Bornholm Deep has been important in all time while Gdansk and Gotland Deeps have been important only in years when salinity and oxygen conditions have allowed successful spawning, egg fertilisation, egg development and when the spatial distribution of the cod stock has included these areas. This has especially been the case in years with a large cod stock (Thulin and Andrushaitis, 2003). In practice, this concatenation of circumstances has resulted in the existence of only one functioning spawning area for cod in the eastern Baltic Sea - the Bornholm Deep - with the Gdansk and Gotland Deeps being suitable only in those years in which there has been a strong influx of North Sea water. Thus, since the mid-1980s reproduction has only been successful in the Bornholm area. The spawning time for Eastern Baltic cod has varied over the last 100 years. In the first half of the 20th Century the peak spawning was in July-August. Then the peak spawning changed to May until the mid-1980s when it slowly moved backwards in time year by year to June and July by around 1995. Since then the main spawning time has been June-July-August (ICES, 2004).

Three major changes to the Baltic ecosystem occurred during the 20th century: intensification of fishing activity, eutrophication and eradication of nearly all marine mammals. Other changes have also occurred including species invasions and introductions, pollution by persistent contaminants (e. g., heavy metals, PCBs) and river runoff regulation due to hydroelectric power dams. It is not clear how these changes have affected the ecosystem and its animal populations, nor is it clear what impact a reversal of these changes might have (ICES, 2002). However, in the second half of the 1990s, the ecosystem of the Central Baltic Sea has changed from a state of high productivity for the cod stock – characterized by high salinity/oxygen conditions and low temperature - to a state of

high productivity for the sprat stock, characterized by low salinity/oxygen conditions and high temperatures (Delaney, 2007:10).

2.1 The history of Baltic cod fisheries

The fish community in the Baltic Sea has been exploited for centuries. The total annual catch of commercial dominant open sea fish stocks in the Baltic has increased tenfold in the past half century. Catches remained at about 120.000 tonnes until the 1930s, increased to about 500.000 tonnes by the late 1950s and almost reached a million tonnes by the end of the 1970s. During the past three decades overfishing and thus the failure to maintain sustainable fisheries has become increasingly pronounced. Baltic cod is the most important species in the area and this fishery targets mainly pre-spawning aggregations in late winter and spring. In the mid-1980s, the stock experienced a peak in abundance, but this has since dropped rapidly to about 20 percent of its former peak (Larsson, 2000). From a maximum annual catch of cod in the mid-1980s of nearly 450.000 tonnes, the catch declined by 1992 to about 50.000 tonnes and has been around 100.000 tonnes since then. The reason for the peak in cod fisheries (mainly the eastern stock) in the 1980s was unusual strong year classes in 1976, 1979 and 1980. These extremely good catches in the 1980s also resulted in an extensive expansion of the cod fleet in the Baltic Sea (Finfo, 2005:7).

The eastern Baltic cod is mainly fished by Denmark, Sweden and Poland. Between 150.000 and 250.000 tons of cod were caught per year in the Eastern Baltic (ICES areas 25-32) from 1970 to 1980. The maximum catch was reached in 1984 with 391.000 tons and the minimum so far in 1994 with 38.000 tons. Between 1995 and 2005 the size of the Danish and Swedish fleet (in kW) decreased by about 25%, while the Polish fleet did not begin to decrease until 2004 when the EU-withdrawal programme was launched. The western Baltic cod is primarily fished by Denmark and Germany. Comparing the size (in Kw) of the total Danish and German fleets with the fishing mortality of cod, illustrates that the fishing mortality has not declined significantly despite the fact that the main fleet (Danish) fishing for this stock was diminished by around 25% from 1995-2005 (WWF, 2006). The TACs for both stocks has been reduced quite significantly from 220.000 tonnes in 1989 to 40.000 tonnes in 1993 after which it went up to 180.000 tonnes in 1997. From 1997 and onwards the TAC has yet again declined to 61.600 tonnes in 2004.

Species (common name)	Species (Latin name)	ICES fishing zones	TAC 2007 in tonnes (except for salmon)	Commission proposal for 2008 TAC in tonnes (except for salmon)	TAC 2008 agreed by Council in tonnes (except for salmon)	Difference from 2007 TAC in tonnes (except for salmon)	% change from 2007 TAC
Cod	Gadus morhua	25-32 (EC waters)	40 805	31 561	38 765	-2040	-5
Cod	Gadus morhua	22-24 (EC waters)	26 696	17 930	19 221	-7475	-28

Table 2. TACs for Baltic cod in 2008 (Delaney, 2007:11).

For 2008 the Commission was proposing a reduction of 23 percent in the eastern stock, from 40 805 tonnes to 31 561 tonnes, and on 33 percent in the western stock, from 26 696 tonnes to 17 930 tonnes. However on the Council of Fisheries Ministers meeting in Luxembourg on fishing opportunities for 2008 in the Baltic ministers agreed that for the eastern stock, the TAC will be cut by 5 percent to 38 765 tonnes and for western stock the TAC will be reduced by 28 percent to 19 221 tonnes (Council Regulation No 1098/2007). The scientific advice of ICES was a zero catch for eastern Baltic cod stock and a significant reduction for the western stock (ICES Advice 2007, Book 8).

3. Current management strategy in Baltic cod fisheries

In the Baltic, vessels fishing for cod range from small boats of some few meters in length to large trawlers of up to 40 m. The most common gear types are gillnets and trawls. Today, cod fisheries in the Baltic Sea are mainly performed with vessels in the following segments; cod trawlers ≥24m, cod trawlers ≤24m, gill-netters ≥12m and gill netters ≤12m. Since the EU expansion, management of Baltic fish stocks, including cod as well as other fish species under TAC is almost entirely under competence of EU countries (Russia is the only country being outside of EU).[11] Thus, the Baltic Sea is managed under the EU's DG fish[12] with the Common Fisheries Policy (CFP) as the primary background policy. This means that the future of Baltic fisheries management will be based on bilateral cooperation between EU and Russia. The Baltic cod fishery is managed in the following way; first a total allowable catch (TAC) is agreed upon (as a result of political bargaining) by the nine countries permitted to fish in the Baltic. Each country is then allotted a predefined percentage of the TAC, which is ultimately used up by their professional or licensed fishermen. Within the framework laid out by the CFP, the national government may determine their own policy. The EU Baltic fisheries policy is developed with scientific advice from ICES, which is based on comparing the current status of the stocks to reference points for the biomass and the fishing mortality rates. If possible, this is done separately for both stocks. The TAC for cod was for the first time tentatively proposed separately for both the western and eastern stock in 2004; however the new management regime comes formally into force in 2005. The aim with this division of cod resources among two areas – eastern and western cod stocks, was to improve management of Baltic cod through more appropriate measures that could be applied separable to one or another cod stock. Originally, the idea with this division came from researchers at ICES (Interview 2, researcher from ICES).

A number of technical measures relating to the cod fisheries are also in force in the Baltic Sea. These measures include minimum mesh size, minimum landing size, closed areas/seasons (aimed at limiting fishing effort as well as protecting juveniles) and gear specific measures to enhance the selectivity in the fisheries. Especially the introduction of the Bacoma trawl in 2004 (diamond meshed trawl with a square meshed window in the cod end) has been considered as a main factor that reduced the catches of undersized cod. In 2005, two additional closed areas were established on Baltic Sea and the third was expanded - Gotland, Gdansk and Bornholm Deeps. There is currently a

[11] Earlier, the fisheries in the Baltic was managed by the International Baltic Sea Fishery Commission (IBSFC) which had six members; Russia, Estonia, Latvia, Lithuania, Poland and EU. The commission requested scientific advice from ICES. IBSFC was dissolved 1 January 2007.
[12] DG stands for Directorate General.

seasonal closure of the cod fisheries in the western Baltic area (area 22-24) between 1 to 30 April. The eastern Baltic cod (area 25-28) is subject to closures from 1 July to 31 August. In addition to the more general closures, there are specific closures of three areas from 1 May to 31 October – the Bornholm Deep, the Gotland Deep and the Gdansk Deep (Council Regulation No 1098/2007).

In order to enable undisturbed spawning a closure of a central part of the main spawning area in the Bornholm Deep has been implemented and enforced during the main spawning seasons since the mid-1990s for all fisheries. Additionally, since 1995 a seasonal closure was enforced for cod-directed fisheries in the entire Baltic (1 June – 31 August). This closure covered the main spawning season of the eastern Baltic cod stock. In 2005 the seasonal closure was enforced from 1 May to 5 September for all cod-directed fishery as well as year-round area closures for all fisheries in specific areas of the Bornholm Deep, the Gotland Basin, and the Gdansk Deep with the aim to reduce fishing mortality. In 2006, the area closures are enforced from 1 May to 31 October, while the closed period for cod-directed fisheries was scheduled from 15 June to 14 September, with 27 days extra closure to be distributed individually by the member states. In 2007, closures are enforced for Subdivisions 25-27 from 1-7 January, 5-10 April, 1 July - 31 August, and 31 December, with 67 days additional closure to be distributed individually by the member states (ICES Advice 2007, Book 8*).* In 2008, there is currently a seasonal closure of the cod fisheries in the western Baltic area (area 22-24) between 1 to 30 April. The eastern Baltic cod (area 25-28) is subject to closures from 1 July to 31 August. In addition to the more general closures, there are specific closures of three areas from 1 May to 31 October – the Bornholm Deep, the Gotland Deep and the Gdansk Deep (Council Regulation No 1098/2007).

Additional, by way of derogation from Article 1 of Council Regulation (EC) No 1627/94 of 27 June 1994, all Community fishing vessels of an overall length equal or greater than 8 m carrying on board or using any gear of a mesh size equal to or greater than 90 mm shall hold a special permit for fishing for cod in the Baltic Sea (Ibid).

In July 2006, the European Commission put forward a proposal for a Council Regulation (EU 2006a) for a multi-annual management plan for the cod stocks in the Baltic Sea aimed at rebuilding them. The plan defines a yearly reduction in fishing effort by 10 percent (counted as days-at-sea) until the defined target for fishing mortality is reached. Thus, a harvest control rule based on fishing days, so fishing effort are going to be reduced gradually by a fixed percentage every year until the recovery objectives and long-term targets have been reached. No timeline is given for the recovery of the stock or how it should be estimated. The proposal also lacks a strategy for how the fleet should adapt to proposed changes. In June 2007, the European Council agreed on a joint management plan for the two cod stocks in the Baltic. Under the new management regime, the Baltic cod fisheries are managed through a days-at-sea system from 1 January 2008. Vessels will be able to pick their fishing days under a total cap of 223 days in the western Baltic and 178 days in the eastern Baltic. If a vessel chose to fish in both areas, the maximum number of days is 223 per year with a maximum of 178 days in the eastern area (Ibid).

The Baltic Sea Regional Advisory Council (BS RAC) was established in March 2006 in order to

increase stakeholder involvement in managing the Baltic Sea. The BS RAC has an advisory role and their main purpose is to prepare and to provide advice to the European Commission and member states on matters relating to management of the fisheries in the Baltic Sea. It consists of representatives from the fishing sector and other interests groups (e.g. fisheries associations, POs, environmental NGOs, etc.) affected by the CFP. The BS RAC has three advisory working groups to help the Executive Committee to prepare advice: working groups on Demersal Fisheries (e.g. cod fisheries), Pelagic Fisheries and Fisheries for salmon and sea trout. According to the interviewed fishermen, the BS RAC has so far made little mark on the local fishermen.

3.1 Swedish commercial fishing

Sweden has a long coastline – almost 10 000 km and there are also many rivers. The west coast borders the Kattegat and the Skagerrak, and the south and east coast border the Baltic. The Baltic Sea with its brackish water has gradually become Sweden's most important fishing area. The fishing sector in Sweden is declining – landings (value as well as quantity), vessel numbers and numbers of fishermen are all decreasing. Swedish commercial fishing activities at sea are mainly carried out in the Baltic Sea and in the eastern parts of the Atlantic Ocean. The conditions for fishing differ between the Baltic Sea and the Atlantic Ocean. In the Baltic there are a few commercial species, the most important being cod, herring and sprat while in the eastern parts of the Atlantic Ocean there are several commercial species to fish. Other interesting commercial species in the Baltic Sea, which travel long distances during their lifetime, are salmon and eel.

The Swedish Board of Fisheries (SBF) was created in 1948 and is the governmental agency for fishery policy and implementation of the political decisions.[13] The SBF is governed by an Executive Board which is chaired by the director General and the members of the Board are nominated by the government. Within the Swedish system of government, ministers are rather small units focusing on policy making, whereas the SBF implement, survey, investigate and give advice on policy issues. SBF is also responsible for collecting and analysing data which are used for quota management and stock assessments. It has also a large research and development department which for instance produce the stock assessments and examines the selectivity of fishing gears. The National Federation of Swedish Fishermen (SFR) was created in 1949 and building upon the earlier regional fishermen's associations. SFR is responsible for fishermen's unemployment fund – through this fund fishermen can enjoy unemployment benefits during bad weather and also during times of fishing stops due to management decisions (Piriz, 2004:18ff). Today SFR is struggling with image problems as it claims that fishermen are often accused of illegal and unreported fishing by media and the Swedish Board of Fisheries. It is also a quite comprehensive debate going on in Sweden whether consumers should boycott Baltic cod or not.

Since 1995, as a member of the European Union and in line with the Common Fisheries Policy, Sweden transferred parts of its decision-making and management authority to the European institutional level. Thus, fisheries in Sweden are almost entirely regulated through TACs - about 95 percent of the landed value comes from species subject to TACs - and technical regulations and the

[13] The first name of the Board was the National Board of Fisheries.

governing organs of the EU (in particular the Commission and the Council of Ministers) are involved in decisions regarding resource conservation, setting targets for the size structure of national fleets and regulation of the market. The direction of Swedish work within the CFP can be summarised through the goals set by the government and Swedish parliament in their instructions to the Swedish Board of Fisheries and also in Sweden's environmental objectives (Finfo, 2005:7).

According to EU regulations the Swedish Board of Fisheries issue special permits for cod fishing in the Baltic Sea and these permits are primarily based upon previous catch records and not on geographical residence. The general Swedish trend in later years is a decrease in the number of vessels and in fishermen. The number of fishermen under the age of fifty has also steadily decreased particularly along the Baltic coast. On 14 December 2007, the Swedish Board of Fisheries decided on a national plan for Baltic cod. The plan is complementary to the EU plan and includes some additional rules for the Swedish fleet. The political priority in Sweden is the small-scale fishery with passive gears and a new component is the division of the Swedish cod quota between trawlers and other – generally smaller coastal – vessels (from 2008). For the western stock, 40 percent of the quota will be allocated to trawling vessels and 60 percent to other vessels. For the eastern stock the figure are opposite with 60 percent to trawlers and 40 percent to other vessels. The aim with this strategy is to strengthen the small-scale coastal fisheries in Sweden which has declined for several decades (the Swedish Board of Fisheries).

3.2 Danish commercial fishing

Denmark consists of 400 islands of various sizes and the coastline is approx 7 300 km. For a long period of time, Denmark has been a fishing nation and fisheries constitute a very important economic activity in specific regions of Western and Northern Jutland and the island of Bornholm in the Baltic Sea. The Danish fishing fleet is, in general, flexible. Vessels often take part in different fisheries throughout the year, and fishing patterns change from year to year (FAO, 2004). As in Sweden, Danish fisheries management works within the framework of CFP of the EU and the key instrument is the total allowable catch (TAC). The Ministry for Food, Agriculture and Fisheries (MFAF) has the right to define access to and exclusion from fisheries through the distribution of licences, to set up operational rules and management tasks, and finally the authority to decide on the regulation of the commercial exploitation of the Danish quotas (Christensen and Hegland, 2007). Once the TAC/quota agreement is adopted, the national management scheme is decided by Ministerial Order. The principles used in the management scheme are discussed with the Fishermen's organisation and the fishing industry before the conditions are finally assigned. The Danish Association of Fishermen represents the interests of most Danish fishermen and they are organized in 75 local branch associations around the country, however not the Bornholm fishermen (see page 5). From a peak in the late eighties, there has been a gradual decline in fleet size through scrapping, taking advantage of EUs decommissioning schemes, co-financed by national governments (FAO, 2004).

From mid-1990s up til 2007, the distribution of cod quotas in Baltic Sea has taken place through two parallel systems; one for smaller vessels and one for bigger vessels. The smaller vessels had the option of annual quotas while the bigger vessels were given a share to catch within a week, a

fortnight, or a month. However, it was also a few regulations connected to the system of annual quota; e.g. how much of the quota they should catch during different times of the year (Christensen and Hegland, 2007).

In 2007 (January 1st), the FKA (i.e. in English "vessel quotas system") was introduced in Denmark to replace the previous system. Each vessel was allocated a quota based on historical rights and the quotas follow the vessel when sold. The owner of the vessel can as well buy other and more tonnage (vessels) and quotas but authorities cannot influence who gets to own the quotas. "As the system has built in mechanisms for transferability and as the system has built in mechanism to join quotas through vessels but not to separate quotas out again, the system can be characterised as a system for centralisation of quota" (Christensen and Hegland, 2007:96). A common opinion in the interviews was that the introduction of vessel quota shares in 2007 has meant the consolidation of quota into larger boats with the small scale fleet being the losers (Interview 14, the chairman of the Bornholms and Christiansøs Fishing Association).

4. Stakeholder acceptance of the two management innovations in the Baltic Sea case?

4.1 Closed areas and seasons for cod fisheries

A quite general opinion among stakeholders interviewed is that the closure of the Bornholm, Gdansk and Gotland Deeps is *necessary* but not *practical* in its shaping.[14] 21 respondents are of the opinion that it is in some way necessary with these closures to protect spawning while only 4 respondents is entirely against a closure to protect spawning. The main argument among those against is that there are so few fishermen left that it is not necessary any more: "*the closure of the deeps are not necessary anymore because we are so few fishermen and vessels left and the pressure on the resource has been substantially reduced"* (Interview 25, trawl skipper from Nexø).

Stakeholder acceptance of closed areas and seasons for cod fisheries in the Baltic		
Positive: 17	Neutral: 3	Negative: 5

Table 3. Stakeholder acceptance of closed areas and seasons for cod fisheries in the Baltic

However among those that are positive to a closure to protect spawning there are a lot of opinions against how it has been done in practice – only 4 respondents answered that it was both necessary and practical in its shaping, thus that they are totally satisfied with this management innovation. One common argument is that: *"I am definitely positive for a closure during spawning in these areas but the closure in the Bornholm Deep is partly in wrong area – some parts are on just 50-55 meters depth and no cod spawn where it is so shallow"* (Interview 11, trawl skipper from Simrishamn). One common argument from the Swedish side is that the shape of the Bornholm closure is a result of political bargaining: *"The closure of the Bornholm Deep is OK but the real spawning area in the Bornholm Deep is more to the southwest than the closure today – from*

[14] For further explanation see page 1-2.

beginning to the end it was a political and not an ecological question, Denmark wanted to protect their own fishing opportunities" (Interview 6, the chairman of The National Federation of Swedish Fishermen, SFR). *"Bornholm is a well functioning spawning area but the closure is partly in the wrong area, it should be more southwest but Denmark oppose this because it would have restricted Danish fisheries to much"* (Interview 5, respondent from the Swedish Board of Fisheries). The argument that it is a lot of political reasons behind the closures was also an opinion expressed by one of the representatives from an environmental NGO: *"The closure of the Gotland and Gdansk Deeps is a political question because these areas are useless from a reproduction perspective"* (Interview 2007-11-14, respondent 5 from an environmental NGO).

A common argument is also that even though spawning is not so successful in Gdansk and definitely not in Gotland deeps there is a reason to keep these areas closed to protect and lower the pressure on "larger cods" and to be "ready" when the prerequisites are right for spawning in these areas. *"Spawning success has diminished in the Gotland Deep and it is uncertainty about the success in Gdansk, but the closure in these areas can have a function to lower the fishing pressure on large cods"* (Interview 2, respondent from ICES). However, also many Danish stakeholders are discussing the actually shape of these closures *"The closure of the Bornholm Deep was in principal right – where it is spawning it should be closed and I think that all of our fishermen accept that, but both the area and time has been expanded too much. This affect legitimacy negatively since it is right in principle but wrong in practice* (Interview 14, the chairman of the Bornholm and Christiansøs Fishing Association). Also many fishermen in Nexø are of the opinion that the actual closure is too large and too much on shallow Swedish waters: *"…the closure is too large, on the Swedish side, it is large parts on pure shallow waters where the cod never could reproduce"* (Interview 16, trawl skipper from Nexø).

A quite common opinion in the interviews was that an overwhelming majority of the respondents are in favour of closed seasons that reflect spawning periods, however, many of them do not think that the actual closures reflect spawning periods and would like to discuss changing them. But opinions differ and range from those who think it is enough with just one months closure to those who think that it would be closed during the whole year: *"In principle, spawning areas should be closed during the whole year because this will favour the fishing industry in the long-run…*(Interview 4, respondent from an environmental NGO). However, even if many of the respondents are discussing practical issues in the shaping of this management regime it seems like a majority of the respondents understand and accept this management innovation as legitimate and necessary.

4.1.1 Division of cod resources among two areas

The figures for stakeholder acceptance of the division of cod resources into an eastern and western stock is almost the opposite too closed areas and seasons. 17 respondents are negative while 7 are positive and 1 is neutral. This regulation has upset fishermen in both Simrishamn and Nexø and also other stakeholders have problem to see how it can work in practice. As much as 20 (80 percent) respondents consider this regulation as *not practical* and 16 consider it as *not necessary*. Accordingly, 9 respondents believe that it is a *necessary* rule and 5 apprehend it as *practical*.

Stakeholder acceptance of a new management regime based on division of cod resources among two areas – eastern and western cod stocks.		
Positive: 7	Neutral: 1	Negative: 17

Table 4. Stakeholder acceptance on the division of cod resources among two areas.

One of the most common arguments against the division is that it has complicated the daily fishing activities a lot: *"the division has made it much more complicated to be a fisherman and it will probably not affect the stock situation"* (Interview 24, trawl skipper from Nexø). There are many reasons why fishermen think that it has been much more complicated and difficult to be a fisherman after the division of the cod stock. They argue that the natural fishing pattern has been destroyed due to the fact that they cannot travel between the western and eastern area as they use to do. A Danish fisherman needs to land and report his catch before he enter into a new area while a Swedish fisherman cannot change to the western area for a calendar week if he has started to fish in the eastern area (this was implemented in 2008). According to many fishermen, it is not as flexible as it uses to be and the fishing pressure is much more concentrated in certain areas than it was before. *"In the beginning of this autumn [2007] it was too high pressure on the western stock when it was closed in the eastern area"* (Interview 9, skipper on a gill-netter from Simrishamn). Thus, the division has put a much harder pressure on the western stock because when it is closed in the eastern area almost every trawler and gill-netter is fishing on the western stock. Another common argument is that they cannot se the biological reasons for this division or as one Swedish skipper expressed it *"now we just have to learn the cod to swim either west or east of Bornholm"* (Interview 12, trawl skipper from Simrishamn). Another argument is that when fishermen cannot se the usefulness or the reason behind rules and regulations it affects legitimacy negatively: *"The division of the eastern and western stock is totally insane; we can follow the fish when it travels between these areas. The only result with this regulation is that it has been so much harder to behave legal… the legitimacy for rules and regulations decreases when we as fishermen cannot se the usefulness with this legislation"* (Interview 16, trawl skipper Nexø).

Also the incentives to cheat increases according to some of the fishermen: *"It increases the incitement to misreport catches, you report catches from the wrong area which make catch statistics incorrect"* (Interview 11, trawl skipper Simrishamn). The division is biological justifiable but not practically feasible according to the chairman of the Swedish Fisherman Association. He believes that in the long-run it will be a common management of the stocks again. As it is now it increases the incitement for fish poaching and illegal behaviour according to him – *"this approach provides opportunity for misreporting area of capture"* (Interview 6).

There are other stakeholders besides the fishermen and their representatives that also have doubts against the practical implications of the division of the cod stock. *"The practical problems with the division of the stock has resulted in a lower legitimacy for rules and regulations among fishermen… this management has created a lot of cheating"* (Interview 1, respondent from the Swedish Board of Fisheries). *"The division has resulted in problems with monitoring and surveillance – it is hard*

to monitor which affect legitimacy negatively, the overall problem in the Baltic Sea is the non-compliance behaviour and the lack of resources for surveillance and monitoring" (Interview 5, respondent from an environmental NGO). However, according to another Environmental NGO they are entirely positive to the division because it is built on a proposal from ICES (Interview 4). The respondents among the fishermen that are in some way positive to the division is equally distributed between Simrishamn and Nexø and they all have either small gill-netters or trawlers under 15 meters. The main reason why they are positive is that it does not affect their daily fishing so much. Together with the days-at-sea system that have been implemented in 2008 (see page 10) they look quite positive on the future. A huge majority of the respondents are very positive of the days-at-sea system instead of the previous system with a lot of temporal closures – they express the opinion that they can plan their fishing activities much better now and that their flexibility regarding management and daily fishing has increased.

To sum up, the two innovations are only partly seen to be practical and necessary in an overarching sense. The closure yes but the division of the cod stocks no. These innovations have reduced fishing opportunities make it more complicated and this impact negatively on acceptance. According to some of the respondents it has also had an indirect impact on new entrants into cod fishing because the management system appears to be more complicated than before. These two innovations have no impact on retirement options.

4.1.2 Do fishermen comply with the management system?

The fear about reduced legitimacy and non-compliance for rules and regulations in Baltic cod fisheries seems to be a real threat and a severe problem. During 2005 and 2006, the EU Commissions fisheries inspectors conducted more than 200 inspections on the reliability of the system in place for the verification of declared catches of cod in: Germany, Denmark, Lithuania, Latvia, Poland, Sweden, Estonia and Finland. The inspectors carried out 22 inspection missions to the relevant states and analysed the catch records from 1040 fishing trips in respect of the vessels inspected.[15] They compared the catches during the inspection and the reports of four other landings of the same vessels. In all cases, the vessels have reported larger catches at the days of inspections. For Polish vessels, the difference is 48.7%, Swedish 21.4%, Lithuanian 15.6%, German 13.6%, Danish 12.7% and Latvian vessels 7.5%. The commissions evaluation report concludes: *"It was observed by Commission Inspectors that the serious level of unrecorded catches was inter alia as a result of the poor inspection and surveillance in particular, the poor quality and frequency of inspection in place to ensure the accuracy of the recorded data. These findings are in line with assessment of ICES for the region"* (European Commission Evaluation Report 2007:3). At the end of 2007 summer ban, the Swedish, Polish and German cod fisheries in the Baltic remain closed because estimates of illegal fishing indicated that they had already exhausted 2007 quotas. According to ICES, the level of illegal fishing on Baltic cod is at least 35 percent (The Fisheries Secretariat). These are catches that were not reported to the authorities and hence are missing from the official landings statistics. This makes it more difficult for fisheries scientists to produce reasonable stock estimates. This is also verified in the interviews where many fishermen give

[15] Finland and Estonia's catches of cod are nearly non existent and the inspectors focused their mission on visiting the centre for registration of the catches (European Commission Evaluation Report 2007).

expression for the opinion that the main problem is illegal and unreported catches in other parts of the Baltic Sea.

One of the main issues in the Baltic Sea according to the BS RAC is the sustainability of the cod stock and that non-compliance is a serious threat for a long-term sustainable fishery: *"The BS RAC recognises that non-compliance is one of the main barriers to maintaining a sustainable cod fishery in the Baltic Sea"* (BS RAC, 20071025). They also stated that they extended their support to the fishermen who perform their activities in accordance with the rules of CFP. The BS RAC urge all fishing organizations to build up a culture of compliance in the Baltic cod fishery and urge member states to establish appropriate sanctions (ibid). A majority of stakeholders in this report apprehend the division of cod resources among two areas as not practical and not necessary**.** A majority consider closed areas and seasons for cod fisheries are necessary but not practical in its shaping. This have certainly not beneficial effects on the compliance and support for the current management system of Baltic cod and can at worst further increase non-compliance behaviour.

4.2 Evolution of the management system and institutional learning

In the CEVIS project, institutional learning is defined as the process in which institutions change in reaction to internal pressures or external changes in ecosystems and socioeconomic context. When assessing institutional learning in the context of European fisheries management regimes we distinguish:

- At the process level: between simple learning (or 'adaptation') and complex learning (or genuine 'learning'). Simple learning describes changes in means in order to more effectively achieve given goals, while complex learning describes changes in goals. Complex learning includes the more fundamental questioning and redefinition of underlying values and ends, the new specification of causal relationships and may even encompass 'reflexive learning' as a revision of the very concepts of problem solving (the ability to learn how to learn).
- At the outcome-level: between learning process that address the problem at hand successfully (high problem-solving capacity) and learning processes that do not address problem successfully (low problem-solving capacity).

As been described earlier in this report, the principal policy instruments for managing the Baltic Sea fisheries are annual TACs supplemented by technical regulatory measures, such as minimum landing sizes, mesh size regulations (BACOMA trawl introduced 2004) and closed periods for fishing. Due to the severe situation, the international Baltic Sea Fisheries Commission (IBSFC) adopted a recovery plan for the Baltic cod stock in 2002. In addition to the catch quotas, a spawning closure of variable length has been established since 1995, prohibiting the fishery every year from late spring to summer and the IBSFC also implemented a seasonal area closure on all fishing in the Bornholm Deep. This closure was extended by several weeks in 2005, then lasting from 15 May to 31 August. Also in 2005, the IBSFC established additional spawning area closures in the Gdansk and Gotland Deep. In 2008, there is currently a seasonal closure of the cod fisheries in the western Baltic area (area 22-24) between 1 to 30 April. The eastern Baltic cod (area 25-28) is subject to closures from 1 July to 31 August. In addition to the more general closures, there are specific closures of three areas from 1 May to 31 October – the Bornholm Deep, the Gotland Deep and the

Gdansk Deep (Council Regulation No 1098/2007). There was not however, consensus on the duration of the spawning closures. The fishing industry argued that a shorter spawning closure i.e. one month in West and two in East, would enable the small-scale fishery to survive with a days-at-sea system regulating their effort to the remainder of the year, and that there was no unambiguous scientific documentation that spawning closures would enhance stocks. The green organisations argued for a spawning closure of two and three months respectively (BS RAC 2006).

Time	Management innovation	Type of institutional learning
1995	Seasonal closure in the Bornholm Deep	To protect spawning and after recommendations from ICES – complex learning to achieve a new goal. Adaptation to high fishing pressure combined with poor reproduction success. The good catches of the mid-1980s had declined dramatically – simple learning.
2005	Separate TACs for eastern and western cod stocks	Separated on biological grounds and after recommendations from ICES. Adaptation to ecological knowledge about differences in genetic characteristics between the two stocks and to the severe situation for the eastern stock - complex learning to achieve a new goal.
2005	Gotland and Gdansk Deeps were established as closed areas and the Bornholm Deep was expanded. Time and area closure (summer ban, spawning area closure)	The scientific basis was provided by ICES after a request from IBSFC on the 9th September 2003 (ICES 2004). Adaptation to high fishing mortality protects cod spawning without at the same time including a risk of redirecting fishing efforts towards juvenile cods - simple learning.

Table 5. Management innovation and type of institutional learning

The main reasons behind the implementation of the management innovations earlier described have been to cope with the severe situation and the high fishing pressure on Baltic cod. The adaptation and learning has been merely in accordance to scientific facts (ICES, 2004). They have been implemented through a hierarchic top-down implementation process with little involvement of stakeholders from the local levels. In Baltic fisheries, it is often high-level political negotiations that results in complex compromises (Delaney, 2007). However, as always in legislation on the European level and according to some of the respondents for this report it has been a quite intensive lobby campaign from both green NGOs and fisheries interests in legislation concerning fisheries in the Baltic. The trouble is that local fishermen have little insight into the political negotiations that set the rules (Gustavsson, 2007).

Many fishermen in the interviews describe management of Baltic cod like a *"never ending story with more and more regulations that are more and more complicated resulting in more and more frustrated fishermen"* (Interview 21, skipper on a gill-netter from Nexø). However not only the fishermen but also other stakeholders describe the management system as centralised and not well functioning: *"the management of Baltic fisheries has completely failed with ecosystem-based approach to management and BS RAC can be seen as a simple way for the Commission to get rid of*

the debate" (Interview 5, respondent from WWF). Even if individual fishermen are of the opinion that BS RAC has, so far, made little mark on the local level, the representatives for the fishermen organisations in the interviews consider that BS RAC work well and is a good initiative for the future, but as Rasmussen express it *"I would say that the RAC work well but I wonder why the Commission do not take into consideration the advice from the RAC"* (Interview 14). Maybe it is like one trawl skipper from Simrishamn expressed it *"fisheries managers need to learn how to better communicate with fishermen"* (Interview 11).

5. CEVIS hypothesis on social robustness

The CEVIS hypotheses under focus in the Baltic Sea case are:

1. *Commercial fisheries actors' acceptance of a management system will be a function of the extent to which:*

   a) the management system is perceived by the fishermen to be practical and necessary
   b) the management system reproduced the status quo of fishing opportunities when introduced
   c) which new entrants are facilitated
   d) which retirement options are provided for

2. *The more diverse stakeholder involvement in the development and/or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors.*

3. *The more diverse the stakeholder involved in the development and/or or operation of a management system the more institutional learning takes place.*

The first hypothesis about "commercial fisheries actors' acceptance of a management system will be a function of the extent to which ..." is clearly verified in this case. An overall opinion from the stakeholders in the interviews is that it is a very complicated hierarchic system with many different temporary and area closures which make the daily fishing activities difficult and complicated. This is particularly a problem for smaller vessels that are more dependent on weather conditions. Many of the fishermen also answer that it is very difficult to make business planning due to constantly changing time and area closures. The management system is not predictable. It is flexibility in rules and regulation but not in fishing operations – *"management and control seems to change continuously"* (Interview 15, trawl skipper from Nexø). Some of them can even accept stronger enforcement (particularly in other parts of the Baltic Sea, notably Poland) if the management system can provide clear and stable "rules of the game" in the fishery. Thus, the two innovations are only partly seen to be practical and necessary in an overarching sense. The closure yes (necessary) but the division of the cod stocks no (necessary and practical). These innovations have reduced fishing opportunities and made it more complicated and have had a negative impact upon acceptance and legitimacy. According to some of the respondents it has also an indirect impact on new entrants into cod fishing because the management system apprehends as more complicated than before – with unpredictability come an unwillingness to invest, this is supported by the fact that it has been a very low recruitment to the fisheries sector in Nexø and Simrishamn during the last years. These two innovations have no impact on retirement options. Altogether this affects the commercial fisheries actor's acceptance of the management system for Baltic cod negatively which is also verified in the interviews. The result from analysing the Baltic case from this hypothesis

strongly give indications that low legitimacy for management innovations affect support and compliance for a management regime negatively. In this case particularly the division of the cod stock has affected legitimacy for the management regime negatively due to the practical implications for fishing. The result also give indications that even with a rule that is apprehended as "necessary" among the stakeholders the acceptance and legitimacy can be low if the practical implications on the daily fishing activities is too severe.

The second hypothesis about "the more diverse stakeholder involvement in the development and/or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors" is not one-sided supported in this case. The division of the cod stocks has been implemented with no diverse stakeholder involvement but it is anyhow a low acceptance among commercial fishermen – not one-sided on the biological reasons for the division but with huge majority for the negative practical implications of the division. However, closed areas and seasons for cod fisheries have a quite high acceptance particularly when it comes to protect spawning and juveniles. The importance of protecting spawning and juveniles is almost a common opinion with very high acceptance but the complex management regime with many temporal closures and stops lower the legitimacy also for this innovation. The analysis behind this hypothesis is that diverse stakeholder representation may lead to a questioning of the legitimacy of other stakeholders as well as to frustration with complex process. The conclusion from the Baltic case is that even without diverse stakeholder involvement the frustration over complex processes can be extensive.

The third hypothesis about "the more diverse the stakeholder involved in the development and/or or operation of a management system the more institutional learning takes place". The analysis behind this hypothesis is that the involvement of more diverse stakeholders widens the range of alternative views in deliberations and negotiations. At the moment the impression is that stakeholders do not feel invested in the management process or feel that they have a say. It is the classical tendency of a purely centralised top-down management system (Rova, 2004). Today, the main stakeholder group – the fishermen – are far away from the political process and decisions that govern their fishing operations. On one hand, it is in the Baltic case a significant instance of ecological learning – spawning areas, external factors affecting the cod resource, about genetic differences between the eastern and western stock, etc – although the stakeholders involved were not particularly diverse. A lot of learning seems to be pure ecological and primarily performed within ICES and other ecological research institutes on national levels. These stakeholders have more of an advisory role and are not involved in decision-making. Institutional learning in this case has merely been done due to external changes and new knowledge on the ecosystem in the Baltic Sea. On the other hand, learning how to create trust between stakeholders and authorities, legitimacy and compliance for rules and regulations as well as how to communicate the necessity of different management innovations down to the local level seems to be very low. However, the implementation of the BS RAC can be seen as a way of trying to deal with these issues but so far it has made little impression on the local level.

6. Concluding remarks

The Baltic Sea case shows that the two management innovations have been implemented as a result of external changes and new ecological knowledge on the Baltic cod stocks. The institutional learning that has happened has merely been so called *simple learning* or adaptation to changes in the ecosystem with low *problem-solving capacity*. More *complex learning* that contains more fundamental questioning and redefinition of underlying vales and ends has not taken place. This, in turn, has affected social robustness and stakeholder acceptance for this management regime negatively. If the management system does not have the "ability to learn how to learn" the stakeholders involved understanding the aim with rules and regulations that have been implemented, the acceptance will most likely be low. With low stakeholder acceptance legitimacy and compliance for the management regime will also be low. Certainly, low legitimacy and non-compliance in management is still a serious threat for Baltic cod fisheries also after these innovations - thus, resulting in low problem-solving capacity. This is particularly important in a case like this, where local fishermen express the opinion that management and control changes continuously and that the management system becomes more and more complicated. In this case it is obvious that many stakeholders can see the *necessity* with for example closure during spawning but the management regime has failed to communicate how to design these closures so that they are *practical* for the local users. It highlights the importance of communication down to the local level to succeed with new innovations and regulations. Stakeholders need to feel part of the process and feel they have a say. With more diverse stakeholder involvement in the development and operation of the Baltic cod fishery the probability is high that more institutional learning had taken place. The BS RAC can be an initiative in that direction but is still to new and was not in force when the management innovations under focus in this report were implemented. This case also, to a certain extent, disconfirms the hypothesis that diverse stakeholder involvements in the operation of a management system lower the acceptance of the concerned commercial fisheries actors. Thus, even without a diverse stakeholder involvement the acceptance is quite low.

With reference to this case, the degree and consequences of any management innovation is a function of the extent it is perceived by the fishermen to be practical and necessary. If these innovations also affect fishing opportunities negatively when introduced this aggravate the situation. The innovations under focus in this report have not affected new entrants and retirement options to any major extent and it is therefore impossible to draw any conclusions from these two parts of the hypothesis. However, it is quite easy to speculate that if, for example, retirement options had improved; legitimacy for the management system had also improved. Dissatisfied fishermen could retire and the "classical mismatch" in many fisheries between the resource base and the harvesting capacity could be reduced. One innovation that is not under focus in this report but worth to mention is the newly introduced day-at-sea system that has affected many local fishermen positively. They are more positive about the future, times of bad weather can be compensated and they can more easily plan their operations, it allows for more flexibility and could ease for more weather dependent small-scale vessels. This is a step in the right direction, as it allows for more flexibility. With this innovation, local users can see the necessity and its practical use. Thus, it increases both stability and flexibility at the same time.

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Appendix 2: Report from the Faroe Islands case study

Anne-Sofie Christensen

1.0

This report is an evaluation of the social robustness of the Faroese fisheries management system, 'the fishing-days system'. The evaluation is conducted as part of work package 6 regarding social robustness of CEVIS (Comparative Evaluations of Innovative Solutions in European fisheries management). CEVIS is funded by the EU under the 6th Framework Programme under *Integrating and Strengthening the European Research Area - Policy-oriented Research*. CEVIS is focused on performance evaluation of fisheries management regimes with regard to economic efficiency, cost-effectiveness of management, and social and biological robustness. Other parallel studies have been conducted on the Faroe Islands as part of CEVIS with regard to biological robustness, cost efficiency of the management system, and economic robustness.

The report is based on two sources of information: 1) Desk studies including review of literature and web pages, and 2) field studies producing qualitative interviews with key persons. The desk studies were conducted both previous to the field study to get acquainted with the field and after returning from the field to check up on data etc.

The interviews took place during two weeks in October 2007 in Tórshavn (the Faroese capital) and Klaksvig (the biggest fishing port on the Faroe Islands). Kjellrun Hiis Hauge, who works as a fisheries biologist in Institute of Marine Research (IMR) Bergen, Norway, participated in the interviews of the first week. Prior arrangements had been made to interview key representatives from the Ministry of Fisheries, industry representatives and relevant people from academia. In total 21 people were interviewed; Table 4 provides an overview of the profiles of the persons interviewed.

Present job Background	Civil servants (People in Ministry or inspection)	Researcher	Fishermen (and their representatives)	Total
Biologist/scientist	2	2		4
Social science	3	4	1	8
Fisherman	2		6	8
Other	1			1
Total	8	6	7	21

Table 4 Professional affiliation and background of the interviewees

The interviews were in-depth, open-ended interviews with stakeholders of the Faroese fisheries

management system. The aim of the interviews was to get an insight into the social robustness of the Faroese fisheries management system. In order to achieve this, a general understanding of how the system works and of the trade-offs in the system was necessary. Moreover, the interviews were intended to identify day-to-day issues in the management of fisheries and contingency measures that are being taken to counteract threats to the well-being of the resource, such as non-compliant behaviour. The interviews covered the history and development of the Faroese system, the changes in costs and benefits for fisheries management operations associated with the innovation, what indicators they use to monitor and improve outcomes, and what they see as the best practices in implementing, monitoring and enforcing the innovations, and the resulting management measures.

1.1 Social robustness

In the CEVIS working group, five hypotheses were formulated regarding the relations between the management innovation (participatory governance and rights-based management including effort-based management) and the social robustness (stakeholder acceptance and institutional learning). These are the key concepts of our analysis and need further definition:

Social robustness of a fisheries management regime (innovation) will for the purposes of the CEVIS project be defined by two dimensions: acceptance of the regime by its stakeholders, and institutional learning within the regime. While stakeholder acceptance describes (agency) processes at the micro level of individual actors, institutional learning is about processes at the meso level of organizations and institutions.

		Social robustness	
		Stakeholder acceptance	Institutional learning
Management regime /innovation	Rights-based management (incl. effort-based management)	1. Rights-based management systems tend not to have broad stakeholder representation. 2. Commercial fisheries actors' acceptance of a RBM system will be a function of the extent to which: a) the management system is perceived by the fishermen to be practical [and necessary]; b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced; c) which new entrants are facilitated; d) which retirement options are provided for.	4. Rights-based management systems restrict capacity for institutional learning.
	Participatory governance	3.The more diverse stakeholder involvement in the development and/ or operation of a management system, the lower the acceptance of the affected commercial fisheries actors.	5. The more diverse the stakeholders involved in the development and/ or operation of a management system, the more institutional learning takes place.

Table 5 The five working hypotheses of CEVIS

Stakeholder acceptance of a management regime describes the position that fisheries stakeholders take vis-à-vis a management regime. Fisheries stakeholders are groups that have an interest in the decision-making process and that are potentially affected by the decisions. Stakeholder acceptance may be assessed through analysis of: 1) Views expressed by various stakeholders. 2) Participation of the stakeholders in the management regime: attendance, engagement. 3) Actions taken by the stakeholders (against a management regime, e.g. protest, lawsuits) as well as (non-) compliance with the management regime.

Institutional learning is the process in which institutions change in reaction to internal pressures or external changes in ecosystems and socio-economic context. It is no teleological process and may occur unintentionally. When assessing institutional learning in the context of European fisheries management regimes, we may distinguish between process-level and outcome-level learning.

Process-level learning can take place in different ways: Through simple learning (or *adaptation*) and complex learning (or *genuine learning*). Simple learning describes changes in means in order to more effectively achieve given goals, while complex learning describes changes in goals. Complex learning includes the more fundamental questioning and redefinition of underlying values and ends, the new specification of causal relationships and may even encompass 'reflexive learning' as a revision of the very concept of problem solving (the ability to learn how to learn).

Outcome-level learning is defined as the learning processes that address the problem at hand successfully (high problem-solving capacity) and learning processes that do not address problems successfully (low problem-solving capacity).

2.0 The Faroe Islands and their fisheries

The Faroe Islands consist of eighteen smaller islands with a population of some 47,000 of which about 17,000 live in the capital Tórshavn, about 5,000 in Klaksvig, and the rest is scattered around seventeen of the Islands. The islands are situated between Scotland and Iceland in the Northeast Atlantic with a total land area of some 1400 sq. km and a sea area of 274,000 sq. km. The distance from Enniberg on Viðoy in the north to Sumbiarsteinur south of Suðuroy is 118 km, but the coastline of the Faroes is more than 1.100 km. The language of the Faroe Islands, Faroese, is a west Nordic language, which derives from an old Nordic language (www.tinganes.fo). Danish is also an official language and is widely spoken, but not used in the public documents – e.g. the Commercial Fisheries Act only exists in an unofficial Danish version.

The Faroe Islands has been a self-governed territory since 1948 (Home Rule Act, 1948) but remains a part of the Kingdom of Denmark. The relation to Denmark is important in

understanding the fisheries management of the Faroe Islands: The Faroe Islands legislate and govern a wide range of areas in accordance with the Home Rule Act of 1948. These include the conservation and management of living marine resources within the 200-mile fisheries zone, sub-surface resources, trade, fiscal, industrial and environmental policies, transport, communications, culture, education and research (www.tinganes.fo). Hence, when Denmark joined the European Community (later European Union) in 1973, the Faroe Islands chose not to be a part of Denmark's membership as the Faroe Islands wanted to negotiate their own trade and fisheries agreements with the EU and other countries (www.tinganes.fo). This was possible given the Home Rule Act.

When you look at the importance of fisheries on the Faroes, you immediately understand the Faroese wish of being in complete control of the marine resources. The Faroe Islands are to a tremendous degree economically dependent on the fishing and aquaculture industries compared to (almost) any other country in the world. Hence, the fisheries are a significant aspect of Faeroese self-governance, as the Faeroese economy is almost entirely dependent on this industry (Gezelius, 2008): 95 per cent of Faeroese exports and almost 50 per cent of the GDP stem from fisheries and fish farming (Gezelius, 2008). Faroese fisheries are mixed fisheries, but the Faroese EEZ has three main demersal species of fish: Cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), and saithe (*Pollachius virens*).

3.0 Fisheries management on the Faroe Islands

On the Faroe Islands, they have a system for managing their demersal fisheries that is unlike most other fisheries management system. Most fisheries management systems are focusing on the *output* of the fisheries – namely on the fish. Hence, the unit of management is most often the fish. The fisheries rights are distributed in quotas, i.e. shares of total allowable catches (TAC), which designate how many fish the system allows to be caught.

On the Faroe Islands, the focus of the management system is opposite: They have a so-called input controlled system that focuses on the effort that the fishermen apply to fisheries. The fishing right on the Faroe Islands is formulated in number of days, during which the individual fishermen have the right to fish. Hence, the system is rights-based, and the fishing days are tradable within certain restrictions. The fishing-days system of the Faroe Islands has many of the qualities of the individual transferable quotas. Both input and output based fisheries management systems are most often supplemented with a number of technical measures on fishing gear and spatial areas.

3.1 The fishing fleet of the Faroe Islands

The Faroese fishing-days system is based on a segmentation of the fleet. Table 6 shows the

number of vessels in 2007, segmented into the vessel groups for type of regulation. The segmentation is based on size of vessel and gear type. The table shows that the vessel groups with the numbers 2, 3, 4A-line, 4A-trawl, 4B-line, 4T-trawl, 5A, and 5B are under the regulation of the fishing-days system. Each of these groups is annually allocated a number of fishing days per year; these days are allocated to the individual vessel.

Fleet segment and subgroups	Number of licenses	Main regulation tools
1 LST: single trawlers >400 hp	12	Bycatch quota, area closures
2 LPT: pairtrawlers >400 hp	31	Fishing days, area closures
3 LLL: longliners >110 grt	25	Fishing days, area closures
4 LCV: coastal vessels >15 grt		
4A CLL: longliners and jiggers 15–110 grt	22	Fishing days
4B CST: small coastal trawlers <500 hp	21	Fishing days
4T MT: trawlers >55 grt <500 hp	16	Fishing days
5 SCV: coastal vessels <15 grt (longlining and jigging)		
5A FSCV: full-time fishers	140	Fishing days
5B PSCV: part-time fishers	(453)[a]	Fishing days
6 OT: others (e.g. gillnetters)	8	Bycatch limits, fishing depth, number of nets

[a]Issued on request.

Table 6 Definition of fleet categories used in the Faroese effort management system, the associated number of licenses issued, and the main tools for regulating their activities (Jákupsstovu *et al.*, 2007:731)

3.2 Transferability of fishing days

The Faroese fishing vessels can throughout the year trade their fishing days internally in the group. They can both lease out the fishing days for one year or sell them for good. The last three months of the fishing year (from June to August), all commercial fishermen can trade fishing days, but only for the current year.

As one fishing day for a large trawler and small long liner is far from the same with regard to fishing mortality, they have developed a key for transforming the fishing days from one kind of vessel to another (Kunngerð nr. 13 frá 25. Februar 2005 um avhending av fiskidøgum sum broytt við kunngerð nr. 76 frá 13. Juni 2006). Table 7 shows the weights between the vessels. Please note, that the categories of the vessels do not follow the groups of vessels as shown in Table 6, but is more detailed with regard to fishing capacity using three different measures for weighting fishing capacity between the different kinds of vessels.

This trading of fishing days is monitored by the fisheries inspection. There is no official institution for the trading – the connection between buyer and seller is informal, so is the price formation of the fishing days.

From 1996 to about year 2000 no trading took place between the vessels across the groups. This possibility was introduced to ensure that as many fishing days as possible were used. Since then this system has been in place and has not been essentially revised. The system will be revised when the rest of the fisheries management system is to be revised.

	Pair trawler >1500	Pair trawler 1100 - 1499	Pair trawler < 1100	Trawler > 300 kW	Trawler < 300 kW	Long liner >600	Long liner 300 - 599	Long liner 200 - 299	Long liner 120 - 199	Long liner <120
Pair trawler>1500	1,00	1,17	1,40	1,56	1,87	1,40	2,33	3,11	4,00	5,60
Pair trawler 1100 - 1499	0,86	1,00	1,20	1,33	1,60	1,20	2,00	2,67	3,43	4,80
Pair trawler < 1100	0,71	0,83	1,00	1,11	1,33	1,00	1,67	2,22	2,86	4,00
Trawler> 300 kW	0,64	0,75	0,90	1,00	1,20	0,90	1,50	2,00	2,57	3,60
Trawler< 300 kW	0,54	0,63	0,75	0,83	1,00	0,75	1,25	1,67	2,14	3,00
Long liner >600	0,71	0,83	1,00	1,11	1,33	1,00	1,67	2,22	2,86	4,00
Long liner 300 - 599	0,43	0,50	0,60	0,67	0,80	0,60	1,00	1,33	1,71	2,40
Long liner 200 - 299	0,32	0,38	0,45	0,50	0,60	0,45	0,75	1,00	1,29	1,80
Long liner 120 - 199	0,25	0,29	0,35	0,39	0,47	0,35	0,58	0,78	1,00	1,40
Long liner <120	0,18	0,21	0,25	0,28	0,33	0,25	0,42	0,56	0,71	1,00

Table 7 Weights in fishing days between the different kinds of vessels in the last three months of the fishing year. The measure in the table for the pair trawlers is (length*breadth*depth)*HP/1000, for trawlers engine power in kW, for long liners and small long liners length*breadth*depth. (Kunngerð nr. 13 frá 25. Februar 2005 um avhending av fiskidøgum sum broytt við kunngerð nr. 76 frá 13. Juni 2006).

3.3 Technical measures and closed areas

The fishing-days system is supported by a number of technical measures, for instance minimum

mesh sizes, gear restrictions, and restrictions to ensure that the capacity of the fleet does not increase[16].

However, the key component of the Faroese fisheries management system, apart from the fishing–days system, is spatial management of the waters around the Faroe Islands. They have a detailed and complex system of area closures, e.g. within 6 miles (the red line in Figure 1) long liners are not allowed to fish. Figure 2 shows areas that are closed for the trawlers, and Figure 3 shows areas that are closed for spawning season part of the year.

They also have temporary area closures. If for instance 30 % of the catch is under a certain size limit, then the area is closed for two weeks. The fishermen are obliged to report catches of juvenile fish.

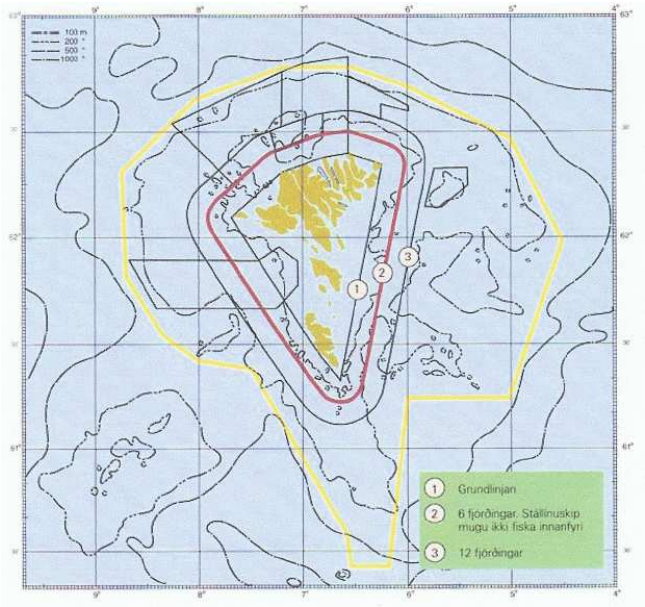

Figure 1 Inside the red line, long liners are not allowed

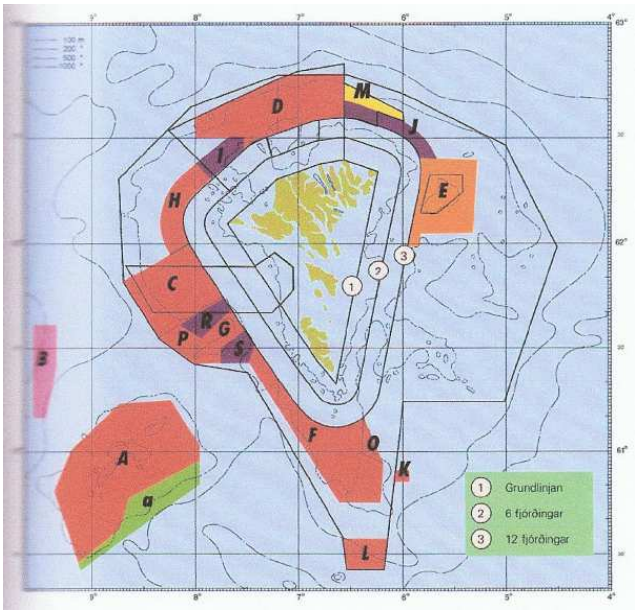

Figure 2 Areas where trawling is not allowed

[16] The development in capacity of the Faroese fleet was most often discussed in the interviews. Most informants agreed that capacity had increased and that the main flaw of the system was the lack of ability to measure and compare capacity over time.

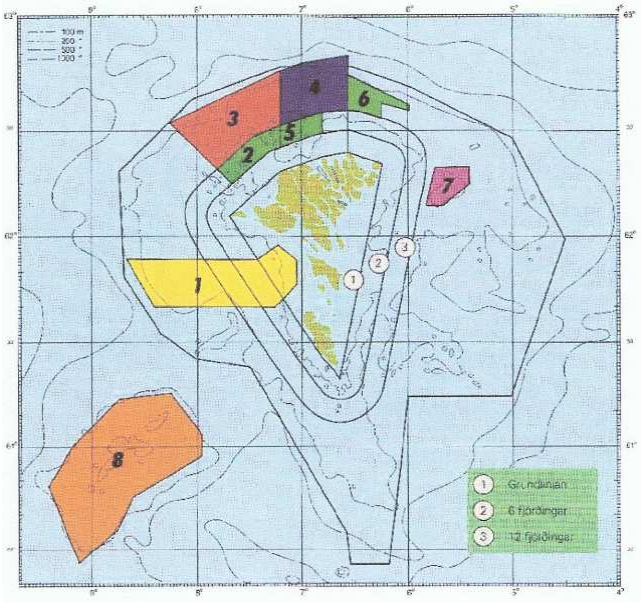

Figure 3 Areas closed for spawning seasons

3.5 Participation in the management system

The structure of the decision-making system on the Faroe Islands is similar to that of other Scandinavian countries, and the Danish system in particular. The system can be characterised as negotiated economy (Christensen *et al.* 2007). The negotiated economy works through an institutional set-up, where advisory boards consisting of stakeholders advise the Minister. The Minister can make some decisions, while others have to go through the Faroese Parliament, *Lagtinget*. As the Faroe Islands are not a member of the European Union, the Faroese Parliament makes the decisions on the number of fishing days, area closures and technical measures.

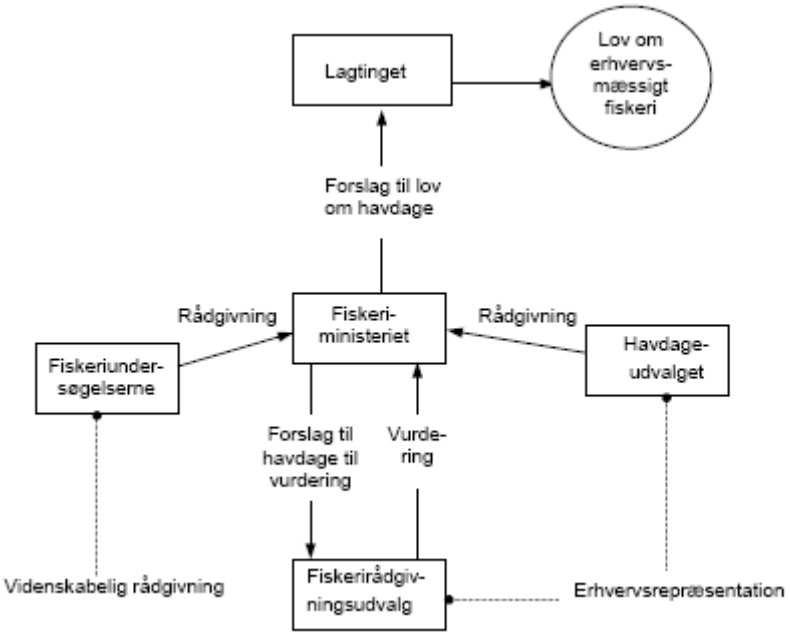

Figure 4 The process of setting the number of sea-days (Løkkegaard et al., 2004:14)

The idea behind the fishing-days system was that the fishing capacity and the number of fishing days should be fixed. The fishermen should absorb the fluctuations of the stocks meaning that they would have some years with good cod fisheries, and when the cod stocks went down then the fishermen would shift to another more lucrative fishery, leaving the cod stock in peace so that it could grow. This idea has partly been abandoned as the fishing capacity has probably increased during the last ten years[17].

Hence, one of the most important decisions for the Minister to make is that of setting the number of fishing days, which takes place in consultation with biologists and active fishermen. An overview of the procedure is sketched in Figure 4.

The board of fishermen is centrally set by the Ministry: §5 stk. 9. of the Faroese Commercial Fisheries Act says: 'The Ministry of Fisheries elects a fishing-days board representing commercial fisheries to give the Ministry an evaluation of stock abundance in the demersal fisheries and suggestions on the number of fishing days to be allocated and on how the fisheries should be planned for the coming year. The board and substitutes are elected for a period of four years. The Ministry of Fisheries makes the rules for election and the work of the board and distributes necessary information for the board to do its work. The Minister of Fisheries elects a chairman, a deputy chairman, and employs a secretary' (Anon., 1994)[18].

[17] This is a highly controversial statement. The officials on the Faroe Islands and a few industry representatives thought that fishing efficiency had gone up since the introduction of the system. Other people from the industry argue that the efficacy has gone down or stayed unchanged as the number of vessels has gone down. Little attention has been paid to measuring the fishing capacity; hence it is difficult to say.

[18] Author's translation from: 'Fiskeriministeriet vælger en fiskedagebestyrelse, som repræsenterer

When setting the number of fishing days, the first step is the biologists' report, which the Ministry receives every year, June 15th. Even though the shift from input control to output control reformed the entire management system the system is still monitoring stock abundance through stock assessments. The biologists' report contains recommendations for the number of fishing days.

This report is given to the fishing-days board. The board only consists of active fishermen (not their organisational representatives). They make a second report based on the biologists' report and experiences from their everyday life at sea.

After the biologists and the fishermen have made their recommendations, the Minister develops a third report based on the previous two reports. Usually he mainly follows the advice given by the fishermen. E.g. for the fishing year 2007/8 the biological recommendation was to cut the number of fishing days by approximately 30 percent. The industry recommended no change in the number of fishing days. The Ministry suggested a reduction of approximately 1 percent.

The report from the Ministry is handed out to the Parliament, which has the final decision-making power – but they usually follow the line of the report produced in the Ministry.

3.6 The stakeholders and their organisation

Before the field trip a definition of stakeholders across the four case studies was made: Stakeholders were defined to be a person in one (or more) of these four groups: 1) *Commercial fisheries interests*: both primary interests (harvesters of all commercial scales) and secondary interest (processors, marketing, other businesses directly depending on the fisheries business, e.g. boat builders, gear suppliers, chandlers etc.). 2) *Fisheries management*: managers and scientists/advisors. 3) *Non-commercial interests*: Conservation NGOs; community and family; recreational/angling interests; consumers etc., and 4) *Other commercial interests related to the marine environment:* aquaculture, oil, energy, tourism etc.

On the Faroe Islands, the breath of the stakeholders is much smaller than in the definition. Apart from stakeholder group number 2), only the people whose work is related to fisheries were organised and played any role at all in the decision-making processes and the public debate. No green organisation or the like play an active role on the Faroe Islands.

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erhvervsmæssigt fiskeri, som giver fiskeriministeriet vurdering om tilstanden i bundfiskeriet og forslag om fiskedage, og hvordan fiskeriet skal tilrettelægges kommende fiskeår. Udvalget og suppleanter vælges for en 4 års periode. Fiskeriministeriet laver regler for valg og udvalgets virke og sørger for nødvendigt materiale så bestyrelsen kan udføre sit arbejde. Fiskeriministeren vælger formand, næstformand og ansætter sekretær'.

In Denmark, most fishermen (across gear type, vessel size, fishing water/species) are organised trough one organisation, Danish Fishermen's Association. This is primarily a political organisation to serve the interests of the Danish fishermen and to assist the fishermen in legal matters. This is different in the Faroese system, which is more similar to the system of Iceland. The fishermen are organised in different associations, which work together when needed or work against each other when disagreeing. The individual fisherman on the Faroes is often member of several associations.

Fundamentally they have three kinds of associations: 1) For vessel owners, e.g. Føroya Reiðarafelag (for the larger vessels), Meginfelag Útróðramanna (for the smaller vessels – this association also has a few members that do not own their own vessel), and many other for the specific gear types. 2) For people employed on the vessel, e.g. Føroya Fiskimannafelagið (like a workers' union for all employed fishermen), Skipara og Navigatørfelagið (for skippers and navigators), Maskinmeistarafelagið (for engineers), Føroya Motorpassarafelag (for engine workers), Felagið Trolbátar (for people working on trawlers). 3) The sales association *Ráfiskaseljarafelagið* (for all fishermen). Apart from these three categories some of the fishermen are also members of the processors union – this is the case when the processing industries and vessels are horizontally integrated.

4.0 Political and historical background for the fishing-days system

Up until 1994 fisheries around the Faroe Islands were regulated through technical measures such as area closures and regulations of mesh sizes. In 1991 and 1993, the most important demersal species were at a historically low level (Løkkegaard *et al.* 2004). At the same time the economy of the Faroe Islands was collapsing and the Danish government stepped in with loans. According to Jákupsstovu *et al.* (2007) and Løkkegaard *et al.* (2004), part of the demands from the Danish Government when giving the loans were that fisheries should be managed so that the usage of the resources could be economically optimised and sustainable. Hence, a board was established to look into how fisheries were best managed on the Faroe Islands. At that time, Iceland and New Zealand had just introduced individual transferable quotas (ITQs) and had success with their management systems. Hence, the key instrument in the management system that the advisory committee came up with was ITQs.

The quota regulations were established in 1994. But the users of the system and some politicians were highly against the system. The main criticism of the system was the problem of single species management of a mixed fishery: The fishermen complained of the amounts of discard that occurred when they hit the quota ceiling of one of the species. Another 'problem' was that the cod surprisingly returned in 1996-1997. The rapid return of the cod was a great surprise to the biologists (and many others) of the Faroe Islands. As the TAC had been based on the low cod stock, the fishermen had very low quotas and very high catch rates.

Already in November 1995, the Faroese government *Landsstyret* set down a board for

evaluation of the possibilities for changing the quota system. The board was composed of representatives from the industry and civil servants. The purpose of the board was: *To evaluate the use of technical measures within the framework of the fisheries political objectives concerning biologic and economic sustainability including an evaluation of advantages and disadvantages of different ways of regulating based on biological, economical, and enforcement criteria*[19] (Løkkegaard *et al.*, 2004, p.10).

The recommendation of the board was to establish an effort-based management system for the demersal fleet segments, supplemented with technical measures and area closures. The suggestion was decided upon by Government and the system was in place for the fishing year 1996/97[20].

Year	Management system	New situation	Institutional learning
Until 1994	Technical measures such as area closures and regulation of mesh sizes	Capacity was high, cod stock low. Overinvestment in the fleet lead to collapse of several banks.	Denmark interfered in Faroese fisheries policy as Denmark demanded that the Faroe Islands set up a management system for their fisheries in return for loans. One can only guess what learning would have happened if this had not taken place.
1994-1996	ITQ system	Political demand from Denmark in return for loans that the Faroe Islands should set up a management system. A Faroese group suggested an ITQ, which was adopted.	Given the mixed fisheries on the Faroe Islands and the mix-match between the TACs and the actual catches, they had to abolish the quota system as the system had no legitimacy among the fishermen.
1996-	Fishing-days system	Two very strong year classes of cod lead to high catch rates and too small quotas. Both fishermen and politicians worked to change the system.	Since the introduction of the fishing-days system, the system has not changed much. The lack of measurement of capacity is often mentioned as the key flaw of the system; but none of the interviewees saw themselves as being the one to open the debate.

5.0 Testing social robustness on hypotheses

[19] Author's translation from Danish: *At vurdere anvendelsen af tekniske bevaringsforanstaltninger inden for rammerne af de fiskeripolitiske målsætninger om biologisk og økonomisk bæredygtighed herunder at vurdere fordele og ulemper ved forskellige reguleringsmetoder ud fra såvel biologiske, økonomiske og kontrolmæssige kriterier*

[20] The fishing year is starting in September and ending in late August.

5.1 H1: Rights-based management systems tend to not have broad stakeholder representation

The thinking behind this hypothesis is that RBM systems create a sense of ownership and rights on the part of a narrowly defined group (e.g. vessel owners) that discourages the involvement of other stakeholders. Hence, RBM systems are mainly concerned with the allocation and management of (individually) assigned fishing rights and are therefore are often perceived to be of little interest for wider stakeholders groups (e.g. conservationists, processors, local communities) to which rights are not allocated. Hence, the perceived need for involvement of stakeholders with broader interests (such as fisheries management, marine conservation, securing the supply chain, and community development) during the development or implementation/operation phases is modest.

The case study on the Faroe Islands confirmed the hypothesis as their fishing-days system is fundamentally a RBM system, and as only a narrow group of stakeholders are included in the decision-making processes. All stakeholders have commercial interests, each of them organised in their own association (e.g. for captains, fishermen on deck, ship-owners, engine people, people who work on shore etc.) and the breath of stakeholder representation is between these groups, which all have commercial interests at stake and, in a European context, would be considered narrow.

So on one hand, the hypothesis is confirmed on the Faroe Islands; on the other hand stakeholder representation has historically always been narrow even before the introduction of the fishing-days system. It is difficult to assess whether it is the RBM system that has created the narrow stakeholder representation or it is due to other factors which perhaps has to do with tradition. It could be based in the tremendous importance of the fisheries on the Faroe Islands and the economical crises that historically have occurred whenever the fisheries were in a bad state.

5.2 H2: Commercial fisheries actors' acceptance of a (rights-based) management system will be a function of the extent to which

a) the management system is perceived by the fishermen to be practical[21] [and necessary];

b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced;

c) new entrants are facilitated;

d) retirement options are provided for.

[21] E.g. is transparent; not too complicated; no necessity to break the rules; easy to monitor so that others are prevented from cheating etc.

The reasoning behind this hypothesis is that stakeholder acceptance is strongly related to a) – that fishermen perceive the management system to be practical and necessary. Acceptance is also strongly correlated with the perceived preservation of economic opportunities by existing users b) and d); and respectively by the maintenance of economic opportunities by potential future users c).

On the Faroe Islands, they have a situation of extraordinary acceptance of the fishing-days system. Some informants rose critical voices to parts of the system (especially that the biologists did not have a strong enough voice and that too little effort had been put into measuring the developments in fishing capacity), but even these informants expressed their overall support to the fishing-days system because of the high degree of compliance, the production of good data, the handling of the mixed fisheries issues etc.

a) The fishermen found the system practical. Large parts of the information they needed appeared on the computer screen. Both people from the fisheries inspection and people from the fisheries argued that it was not possible to cheat the system owing to the extensive satellite monitoring system.

b) The system came in contrast to bad years for the fisheries with low cod stock and bankruptcies among vessel-owners, followed by the ITQ system with too low TAC. Maybe this frustration created a willingness to engage in another system as long as the new system would take the problems of the old system into account. So the introduction of the fishing-days system left all fishermen in a much better economic situation than under the previous system. This could be the reason why the allocation of fishing days did not cause conflicts among fishermen as seen in for instance New Zealand. Furthermore nobody was forced to leave fisheries after the introduction; even the small non-commercial vessels were included and given a common pool of fishing days, which until now has never been completely used up.

c) None of the informants were concerned with facilitation of new entrants. Like in an ITQ system, new entrants have to buy/inherit fishing rights in order to enter the Faroese fisheries.

d) None of the informants were concerned with retirement as an essential part of the system. If a vessel owner wants to retire he can sell his fishing days and vessel. Pension schemes are provided for the employed fisherman (each employer pays 35 DKK per fishing day and the fisherman himself pays 35 DKK per fishing day[22]).

[22] Figures are from January, 2008.

5.3 H3: The more diverse the stakeholder involvement[23] in the development and /or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors

The reasoning behind this hypothesis is that broad stakeholder representation may lead to a questioning of the legitimacy of other stakeholders as well as to frustrations by complex processes.

The case of fishing-days system on the Faroe Islands confirms the hypothesis as there is no broad stakeholder representation in the system and the system enjoys a high degree of acceptance and support from both the users and the managers.

On the Faroe Islands, the fisheries industry is in a very strong position when decisions regarding fisheries management are made. No greens or other interest groups are represented in the decision-making processes. E.g. the board that originally suggested the fishing-days system was composed by the administrative head of the Ministry of Fisheries, the chief biologist of the Faroese Fisheries Laboratory and 3 fishermen representatives (one for the trawlers, one for the long liners, and one for the coastal fishermen). This board was only in function during the establishment of the system. Another example is the fishing-days board ('Havdageudvalget' on Figure 4). This board is composed of a chairman and 5 active fishermen. It is a bit unusual that the board consists of active fishermen rather than of people who represent the fishermen.

The fisheries management system on the Faroe Islands was generally accepted by all the people, who were interviewed. Many informants mentioned two flaws of the system: 1) That the biologists' advice was not taken properly into account when making decisions on the number of fishing days, and 2) that the system had failed to set up a system for monitoring the effort. Even though both flaws are potentially strong enough to undermine the system, they were often considered of less importance in the overall picture.

5.4 H4: Rights-based management systems restrict capacity for institutional learning

The reasoning behind this hypothesis is that creation of property rights will create new expectations and demands for secure investments and, hence, foster resistance to change (path dependency), which might affect the value of investment (e.g. through diluting or abolishing the rights; creating a new pool of rights for other purposes; opening up the system to new entrants; weakening the legal status of the rights). Such lock-in effects can be expected to be particularly strong when there are no sunset-provisions built into the allocation of rights. But even if sunset-provisions are given, rights holders' resistance may prevent changes to the

[23] E.g. greens, processors, communities - but also other parts of the fishing industry.

management system. If institutional learning takes place, it can be expected to be geared towards making rights more exclusive and more easily transferable. Once differences emerge between fishing capacity and available resources, pressures arise to trade the rights (even when trade was not originally intended).

Complex institutional learning has taken place in the fisheries management on the Faroe Islands during the last 15 year. Until the national crisis on the Faroe Islands in the early 1990es, the fisheries were managed by capacity restriction measures and spatial closures. In 1994, the ITQ system was introduced after a Faroese committee had recommended ITQs based on the early experiences on Iceland and New Zealand. As already mentioned, the fishermen and many of the politician were not happy with the system as the size of the cod TACs conflicted with the experiences the fishermen had at sea. The ITQ system was abolished in 1996, when the fishing-days system was introduced.

Hence, the Faroe Islands had a RBM system, which did not restrict the capacity for institutional learning as this could be the only example in the world of an ITQ system that has been abolished. To interpret this abolishment as a quality of the RBM system would be too hasty a conclusion as a number of extraordinary circumstances made it possible to abolish the RBM system: 1) The ITQ system was only in place for two years; and the fishing-days system was developed within this period of time. Hence, the fishermen did not adjust too much to the ITQ system. The lack of capacity adjustment also had to do with the general economic crisis on the Faroe Islands at the time: Nobody had made investments, which meant that nobody got hit too hard when switching system. 2) The stock abundance of cod was tremendous at the time compared to how much cod the ITQ system allowed the fishermen to catch. Hence, everybody would gain fishing rights if switching system.

Since the introduction of the fishing-days system, not much has been changed in the system. Even though most informants agreed that the system had failed to set up a system for monitoring the effort and many informants agreed that an increased focus on the fishing capacity development was required, nobody wanted to take the first step. From this perspective, the fishing-days system has a very low level of ability to ensure simple institutional learning with regard to fishing capacity.

5.5 Hypothesis 5: The more diverse the stakeholders involved in the development and/or operation of a management system, the more institutional learning takes place

The reasoning behind this hypothesis is that the involvement of more diverse stakeholders widens the range of alternative views in deliberations and negotiations. On the other hand, one could expect that through the involvement of highly diverse stakeholders conflicts arise that forestall any significant change. There is a difference in whether the involvement pertains to advice or to decision-making.

On the Faroe Islands the situation is that they do not have a diverse set of stakeholders involved, still significant complex institutional learning has taken place as described under Hypothesis 4: The introduction of the fishing-days system was an example of complex institutional learning that was initiated without a diverse group of stakeholders to point out the weaknesses of the system. On the other hand the lack of accommodation of the flaws of the system, e.g. the black spot with regard to fishing capacity, suggests that the system is slower to progress with simple institutional learning. One can only guess whether the system would have been more open to change if broader groups of stakeholders were active on the Faroe Islands.

6.0 Conclusions

On the Faroe Islands, they have managed to come up with a fisheries management system that has appeared to be overall socially robust:

- The system has been accepted and supported by the the users, but also in general, from the very beginning.
    - The management system is perceived by the fishermen to be practical[24] and necessary.
    - The management system improved everybody's fishing opportunities when the initial allocation took place.
- The fact that the system emerged after an ITQ system demonstrates that the politicians of the Faroe Islands had an open mind to complex institutional learning.
- Yet the system has at least one flaw, which nobody in the system seems to be willing to deal with, namely the lack of monitoring of fishing capacity.
- The commercial stakeholders have a strong voice and can influence the decision-making processes.
- Yet the range of stakeholders is limited and all of them have commercial interests in the fisheries. The case study from the Faroe Islands cannot assess what would happen if a broader range of stakeholders was present on the Faroe Islands.

Note on literature and contacts on the Faroe Islands

The Faroe Islands is a very small field to research into. Even though the Faroese fisheries management system is unique in some ways, very little has been written on it. Making a search under 'Faroe Islands' and 'Fisheries' in ScienceDirect in all 'social science' and 'humanities/arts' books and journals in the 'full text' since 1990 yields only 27 articles and none of them with the Faroe Islands in the heading or the abstract. 25 of these articles only mention the Faroes once

[24] E.g. is transparent; not too complicated; no necessity to break the rules; easy to monitor so that others are prevented from cheating etc.

or twice and usually in a table or foot note. Only two articles, Sen and Nielsen (1996) and Jentoft and McCay (1995), mention the Faroe Islands in more than a subordinate clause. However, none of these are focusing on the Faroes alone, and both of them are written during a turbulent time before the introduction of the fishing-days system.

I have contacted the Faculty of History and Social Sciences at the University of the Faroe Islands (Fróðskaparsetur Føroya). They answered me that their institute had not been engaged in fisheries related research in recent years; and hence, they could not help me. Only four scientific staff members are employed at this faculty all together.

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Appendix 3: Report from North Sea case study

Co-managed rights-based systems in Dutch and UK North Sea fisheries – a case study in social robustness[25]

Franziska Wolff,[26] H. Anne McLay,[27] Bonnie McCay[28]

Introduction

Rights-based management (RBM) – particularly in the form of Individual Transferrable Quotas (ITQs) – is being applied more and more widely in fisheries. Often, the purpose is to enhance a fishery's economic efficiency. As has been shown by a number of studies, such management systems can impact negatively on the social context of a fishery, by drastically reducing the number of fishery participants, disrupting local fishing communities or upsetting stakeholders that view the approach as a privatisation of commons (Symes 2000; McCay 1995). On a social meso-scale, RBM tends to lock in development of a management regime and immunize it against further innovation because the holders of rights, which quickly obtain investment value, resist change (cf. McCay 2000). Participatory governance is a feature of management regimes whereby groups of fishermen and possibly other stakeholders have some power to make decisions in the planning and implementation of management (Gray 2005a; Mikalsen and Jentoft 2008; Symes 2006; Wilson et al. 2003). Co-management is a specific type of participatory governance that involves formalised arrangements between fishing industry groups and government, so that the industry groups have sole or shared authority to make decisions on some matters (Pomeroy et al. 2001). Such a co-managed system, even accompanying rights-based management, can help open and maintain the potential for institutional learning and innovation (cf. Grote and Gbikpi 2002; Kooiman 1993, 2002).

In the following, we will analyse the 'social robustness' of two cases of co-managed RBM systems, that is, fisheries management regimes that combine rights-based management with formal co-management. By social robustness we mean acceptance of a management regime by its stakeholders and the capacity for institutional learning. While stakeholder acceptance describes (agency) processes at the micro level of individual actors, institutional learning is about processes at the societal meso-level of organizations and institutions.

The first case examined is the Dutch system of ITQs which is combined with the 'Biesheuvel' co-management system. The second is the UK's system of sectoral quota allocations and the role of fishermen's Producer Organisations in the management of these allocations. These two European fisheries management regimes are of particular interest not only because they combine RBM with co-management, but also because the respective systems have evolved in from different starting points: the Dutch system started as a pure ITQ regime which over time took on participatory features, while the UK system was a co-management system to start with which is now developing

[25] We would like to thank Norma Schönherr, Öko-Institut, for her comments and support, including in understanding Dutch language sources.
[26] Öko-Institut, Berlin Office, Germany.
[27] FRS Marine Laboratory, Aberdeen, United Kingdom.
[28] Department of Human Ecology, Rutgers University, New Jersey, USA.

more and more into a quasi-ITQ system. This contrast will provide us with interesting opportunities for comparison with regard to social robustness. Our guiding questions will be *the extent to which and why the levels of stakeholder acceptance differ* in the two cases, and *the causes and outcomes of changes in the systems over time (institutional learning)* in the two cases.

In the following (Chapter 2), we will first present the analytical framework within which we will work and which was developed jointly with other researchers as part of an EU-funded research project (CEVIS).[29] The chapter will also provide some background information on the fisheries we are dealing with. We will then elaborate the two cases (Chapter 3) and analyse their social robustness according to the two dimensions laid out – stakeholder acceptance and institutional learning (Chapter 4). On the basis of this analysis, we will discuss a number of hypotheses concerning the social robustness of fisheries management regimes which were also developed within the CEVIS project with a view to being applied to a number of case studies (Chapter 5). Finally, we will draw conclusions from this discussion (Chapter 6).

The empirical basis of our study is two qualitative interview-based case studies. The interviews were carried out in early 2008 at various locations in the Netherlands[30] and the UK (with a focus on Scotland)[31]. We interviewed members of the fishing industry,[32] other industry or intermediate organisations,[33] the fisheries administration,[34] and conservation organisations.

Table 8: Case study interviewees

Professional background of interviewees	Fishermen or represen-tatives	Other industry or intermediate organisations	Fisheries administration	Conservation NGOs	Total
Number of interviewees	19	6	10	2	37

Source: authors.

[29] Research Project "Comparative Evaluations of Innovative Solutions in European Fisheries Management" (CEVIS), funded within the EU's 6th Framework Programme, Project No. 022686. Project results do not necessary reflect the European Commission's views and in no way anticipates its future policy in this area.

[30] Including Den Haag, Den Oever, Urk, Utrecht and Texel.

[31] Including Aberdeen, Edinburgh, Fraserburgh, London and Peterhead.

[32] In the Netherlands, this included managers and members of the following Biesheuvel Groups: Group Nederlandse Visserbond I-III, Group PO Oost, Group PO Wieringen, Group PO Texel; as well as representatives of two fishermens' associations. In the UK case study, members of three Scottish POs (Aberdeen FPO/ AFPO, North East of Scotland Fishermen's Organisation/ NESFO, Scottish Fishermen's Organisation/ SFO), one England-based flag vessel PO (North Sea PO) and representatives of two fishermen associations were interviewed.

[33] In the Netherlands, this included a representative of a fish auction (Visafslag Urk) and two members of the Dutch Fish Board (Productschap Vis). In the UK, a vessel agent and the UK and Scottish marketing organisations (Seafish, Seafood Scotland) were talked to.

[34] This comprised several representatives each of the Dutch, UK and Scottish fisheries ministries and fisheries enforcement agencies.

Background

We will now specify the analytical framework of this report and detail the background of the fisheries whose management systems will be studied later.

The analytical framework: social robustness of fisheries management regimes

We have introduced the concept of social robustness in Section 1 above. For the purpose of this report, the *social robustness* of a fisheries management regime will be defined by two dimensions: acceptance of the regime by its stakeholders and institutional learning within the regime.

More concretely, *stakeholder acceptance* of a fisheries management regime describes the position that stakeholders take vis-à-vis a management regime. Fisheries stakeholders are groups that have an interest in the decision-making process and that are potentially affected by the decisions (Gray 2005a; Wilson et al. 2003). These are, most notably, commercial fisheries interests (both primary and secondary interests); those involved in fisheries management including policy-makers, agency managers, advisors and scientists; and, finally, non-commercial interests such as conservationists, recreational fishermen, and communities.[35] Stakeholder acceptance may be assessed through analysis of attitudes and perceptions on the one hand, and behaviour and action on the other. In particular, we will look at: the views expressed by various stakeholders; (non-) compliance of those governed by the regime; participation of stakeholders in the management regime; and actions taken by the stakeholders in favour or against a management regime (e.g. protest, lawsuits). Stakeholder acceptance depends on a range of factors and is the result of interactions between a fisheries management system and its stakeholders.

By *institutional learning* we mean the process in which institutions change in reaction to internal pressures (e.g. of rights holders or rights managers) or external changes. The latter may occur in the socio-economic context (e.g. pressures by non-rights holding stakeholders or administrators) or in ecosystems. It is not a teleological process. Learning in institutions differs from, but is built on individual learning. It takes place when inferences from experiences that individuals make – and interpret within networks and communities (P. Haas 1992; Sabatier and Jenkins-Smith 1993) – are encoded into organisational routines (Levy 1994). Institutional learning involves the interaction of implicit (tacit) and explicit knowledge (Nonaka 1994). When assessing institutional learning in the context of fisheries management regimes, we distinguish:

- at the process level: between simple learning (or 'adaptation')[36] and complex learning (or genuine 'learning') (Nye 1997)[37]. Simple learning describes changes in means in order to more effectively achieve given goals, while complex learning describes changes in goals. Complex learning includes the more fundamental questioning and redefinition of underlying values and ends, the new specification of causal relationships and may even encompass

[35] Stakeholders furthermore encompass consumers and wider commercial interests related to the marine environment.
[36] Other authors refer to this phenomenon as 'single-loop learning (Argyris/Schon 1978), 'normal' learning (Hedberg 1981), 'adaptation' (E. Haas 1990).
[37] Or 'double-loop' learning (Argyris and Schon 1978), 'meta-level' learning (Hedberg 1981), or simply 'learning' as opposed to 'adaptation' (E. Haas 1990).

'reflexive learning' as a revision of the very concepts of problem solving (the ability to learn how to learn).

- at the outcome-level: between learning process that address the problem at hand successfully (high problem-solving capacity) and learning processes that do not address the problem successfully (low problem-solving capacity).

The dimensions of stakeholder acceptance and institutional learning cover processes at the micro level of individual actors (stakeholder acceptance) and at the meso-level of organizations and institutions (institutional learning). In the first case, the focus is on behaviour and attitudes ('agency') of actors, in the second case on the permeation of pre-existing structures with such agency ('structuration') (Giddens 1984).

Based on these definitions, a number of hypotheses on social robustness were formulated in the CEVIS project. The propositions link the dimensions of stakeholder acceptance and institutional learning in the context of rights-based management systems and forms of participatory governance (including co-management). We will present them below and will discuss them at the empirical material in Chapter 5. Note that some of the hypotheses were formulated with a view to comparing a broader range of case studies within CEVIS, not only the two cases considered in the following sections.[38]

Propositions on stakeholder acceptance

Firstly, we propose that *rights-based management systems tend not to have broad stakeholder representation*. This is, because among other things, RBM systems create a sense of ownership and rights on a part of a narrowly defined group (e.g. vessel owners) that discourages the involvement of other stakeholders. Hence, RBM systems are mainly concerned with the allocation and management of (individually) assigned fishing rights and are therefore are often perceived to be of little interest for wider groups of stakeholders (e.g. conservationists, processors, local communities) to which rights are not allocated, Therefore, there is little perceived need for the involvement in the system's development or implementation/operation of stakeholders with broader interests such as fisheries management, marine conservation, securing the supply chain, and community development.

Our second proposition is that *the more diverse the stakeholder involvement*[39] *in the development and / or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors*. The reasoning behind this hypothesis is that diverse stakeholder representation may lead to a questioning of the legitimacy of other stakeholders as well as to frustration with complex process.

Thirdly, we suggest that *commercial fisheries actors' acceptance of a rights-based management system will be a function of the extent to which a) the management system is perceived by the*

[38] The other case studies are contained in Anne-Sofie Christensen (ed), Detailed study of social robustness in four cases: Baltic Sea, North Sea, Western Shelf, and Faroe Islands. Deliverable D13 of CEVIS (Comparative Evaluations of Innovative Solutions in European Fisheries Management) project.

[39] E.g. greens, processors, communities - but also other parts of the fishing industry.

fishermen to be practical;[40] *b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced; c) provisions for new entrants exist; d) retirement options are provided for*. The reasoning behind this hypothesis is that acceptance is strongly related to the effort that fishermen need to put into making the system work (a above); the perceived preservation of economic opportunities by existing users (b, d above), and whether economic opportunities for potential future users are kept open (c).

Propositions on institutional learning

As regards institutional learning, we assume that *rights-based management systems restrict capacity for institutional learning*. The reasoning behind this hypothesis is that creation of property rights will create new expectations and demands for secure investments and hence foster resistance to change[41] which might affect the value of investment (e.g. by diluting or abolishing the rights; creating a new pool of rights for other purposes; opening up the system to new entrants; weakening the legal status of the rights). Creation of individual rights will thus encourage path dependence[42] and lock-in effects (National Research Council 1999). These can be expected to be particularly strong when there are no sunset-provisions built into the allocation of rights. But even if sunset-provisions are given, rights holders' resistance may prevent changes to the management system.

Finally, we expect that *the more diverse the stakeholders involved in the development and/ or operation of a management system, the more institutional learning takes place*. Involvement of more 'diverse' stakeholders will widen the range of alternative views in deliberations and negotiations (Wilkinson et al. 2003). The 'deeper' the involvement – on a scale ranging from advice to decision-making –, the more likely is institutional learning.

The fisheries

To analyse the combined RBM and co-management systems in the Netherlands and the UK we will geographically focus on the North Sea (ICES Division IV). In particular, the focus is on the plaice and sole fisheries and in addition, for the UK part of the study, on the wider mixed demersal fisheries (whitefish[43]/nephrops) in the northern North Sea. These fisheries were selected because of their economic importance and their relevance in the quota management systems.

The fisheries are managed under the CFP with annual catch quotas (Total Allowable Catch limits, TACs) which are divided into national quotas among EU Member States. These are complemented by technical and capacity control measures: technical measures include the Plaice Box (an all-year closure to protect the nursery areas of plaice), the Sole Border (or '80-mm mesh size derogation area'), and various other measures. Some fleets have been subject to capacity reduction (decommissioning) programmes. In addition, multi-annual management plans are in place for sole

[40] e.g. is transparent; not too complicated; no necessity to break the rules; easy to monitor so that others are prevented from cheating etc.
[41] For a similar argumentation on resistance against the introduction of RBM, see McCay (2000).
[42] By 'path dependence' we mean evolution patterns in which previous decisions determine some of the alternatives available at a given point of time (David 2000).
[43] Apart from plaice and sole this includes cod, haddock, whiting, monkfish and halibut.

and plaice[44] and a cod recovery plan[45] places limits on days at sea. In both countries, rather stringent enforcement regimes exist.

The sole and plaice fishery is a mixed fishery carried out above all with beam-trawlers. Both stocks are considered to be overexploited. The sole stock at risk of being harvested unsustainably, the Total Allowable Catch (TAC) in 2007 was at 12,800t, 75% of which were allocated to the Netherlands and 4% to the UK. The plaice stock is held to be harvested sustainably and its 2007 TAC was 49,000t. Of these, the Netherlands were allotted 38% and the UK 28%. Ecosystem impacts of the fisheries include benthic impact, high levels of bycatch of other flatfish and some roundfish (cod, whiting), and large discards. In the Dutch fishing sector, the sole and plaice sector constitutes the most important part of the national fleet – sole being a high priced species –, and represents 90% of effort in kW-days. The Dutch fleet is dominated by skipper-owners and family businesses. For the UK, the fleet is less important and a large part of the vessels are actually Dutch-owned flag vessels.

The demersal fisheries of the northern North Sea target either a mixture of roundfish species (mainly cod, haddock, and whiting) or Nephrops with a variable bycatch of roundfish. Anglerfish are also an important component of the catch particularly around Shetland and towards the shelf edge. Gear types vary among fisheries – otter trawls, pair trawls, Nephrops trawls are the most important methods but gill nets and seine nets are also used, the latter particularly for haddock. The trawlers range in size from under 10 to over 40 metres and most are owner operated.

Cod recovery measures have dominated the management of demersal fisheries in recent years. These have included reduced TACs, various technical conservation measures and, in the UK, capacity reduction. In 2007 North Sea cod was classified by ICES as being at risk of being harvested unsustainably and suffering reduced reproductive capacity. The TAC for 2008 was set at 8,628t of which the UK has a 39% share. Haddock, which is particularly important to Scotland, is classified as at full reproductive capacity and harvested sustainably. The TAC in 2008 was set at 36,466t of which the UK has an 87% share. The state of the whiting stock is unknown but assessments indicate a declining spawning stock biomass. The TAC for 2008 was set at 17,850t, with a UK quota share of 9,336 tonnes (52%). With the decline in the roundfish fishery, Nephrops have assumed greater importance and has been the single most valuable species landed into Scotland since 2005.

Stock assessments indicate that most of the stocks are stable or increasing and harvesting is set at a level which does not allow for an increase in effort. The UK has an 87% share of the TAC (26,144t), which amounted to 22,644t in 2008. Ecological considerations related to the fisheries include the extent of bycatch, discarding of target and non-target species and the bycatch of cod in Nephrops fisheries. Various technical conservation measures are deployed to reduce these and some fisheries are relatively clean. However, variations in year class strength and the mixed nature of the fisheries combined with management based on single species TACs make it difficult to eliminate discards. Impacts of otter trawling on benthic habitats and biota are also of concern but the gears are

[44] Council Regulation (EC) No 676/2007 of 11 June 2007 establishing a multiannual plan for fisheries exploiting stocks of plaice and sole in the North Sea. The plan stipulates a reduction of fishing mortality rate on plaice and sole by 10% each year, with a maximum TAC variation of 15 % per year until safe biological limits are reached for both stocks

[45] Council Regulation (EC) No 423/2004 of 26 February 2004 establishing measures for the recovery of cod stocks.

not considered to be as damaging as beam trawls.

Description of the cases

When it comes to managing the uptake of national quotas under the CFP, both the Netherlands and the UK are operating 'co-managed RBM systems'. Rights-based management systems include any 'formalised system of allocating individual fishing rights to fishermen, fishing vessels, enterprises, cooperatives or fishing communities' (European Commission 2007). They basically define the rights to use fisheries resources, with greater or lesser degrees of transferability and other dimensions of property rights (cf. Scott 1996). The focus in the cases of our study is on rights to quota shares. Co-management means that industry groups have a partnership with government bodies in which they share or are delegated responsibility and authority for aspects of fisheries management (Gray 2005; Pomeroy et al. 2001; Wilson 2003). In our study, co-management relates to the implementation of individual transferable quotas (ITQs) in the Netherlands and management of sectoral quota allocations in the United Kingdom. In both cases, co-management goes beyond the *market*-based coordination of rights transfers between individual rights holders, which is at the core of many 'pure' ITQ systems. Rather, it involves *network*- or *negotiation*-based coordination (Mayntz 1998; Powell 1990; Vodden et al. 2006; Williamson 1996). In particular, this includes 1) devolved decision-making on the part of groups of rights-holder, pertaining to the setting and enforcement of allocative and other rules (self-governance); and 2) cooperation with government agencies in the development of management plans and in wider aspects of fisheries management.

In the following, we will elaborate upon the Dutch system of ITQs which was created in 1976 and combined in the early 1990s with the 'Biesheuvel' co-management system, and the UK's system of sectoral quota allocations and the role of Producer Organisations in the management of quota and quota uptake. The first UK Production Organisations were established in 1973 (Nautilus Consultants 2006: 3) and took on quota management functions in 1984. We will first outline the characteristics of the quota rights and then the co-management of these rights in each of the cases.

Characteristics of the quota rights

We will first compare the Dutch and UK systems by characterising the fishing rights according to their type, initial allocation, transferability and restrictions on trade and ownership, their security and durability, and further features (cf. Scott 1996).

Most fundamentally, in both cases we are dealing with rights related to output (catch quota) the right to take a share of the national quota. The *initial allocation* of Dutch sole and plaice quota in 1976 was 'grandfathered' on the basis of historical record and after a year was adjusted to include a 50% factor of engine power. In the UK, allocation was and still is based on historical catch data only. From 1984 to 1999, the basis was vessels' catches during the previous three years. However, this 'rolling track record' system was replaced by 'Fixed Quota Allocations' (FQAs) which are determined on the basis of vessels' track records from a single fixed reference period (1994-96, slightly updated in 2002).

In both countries the *transferability* of quota rights is restricted, although in practice this plays a smaller role in the Netherlands. Dutch ITQs can only be traded[46] among owners of EU registered

[46] For the following provisions see Regeling contingentiering zeevis 1997, Hoofdstuk 3, Art. 12-13.

and licensed vessels and subject to ministry approval, which is to be requested within statutory periods. ITQs can be traded as whole units or partially to one or more vessel operators (i.e. quota is divisible). The recipient vessel owners have to hold a quota for the traded species as well as for related species (i.e. ITQs for sole are connected to ITQs for plaice) and must have fished 90% or less of their quota for the traded species at the time of the deal. Selling sole or plaice quota to vessels that do not have such ITQs is therefore not allowed. Fishermen exiting the fishery for good are obliged to sell their ITQ shares within three years, but this requirement can be and is often circumvented. It is also possible to bequeath ITQ shares. In the UK, for vessels over 10m the FQA unit is attached to a license or licence entitlement. Only since 2002 is it possible, in certain circumstances, to transfer FQAs separately from licences, above all as part of a licensing transaction.[47] However, the restriction on the transfer of units from active licences still prevents 'real time' adjustments of FQAs. FQA units may be transferred among others to "dummy licences"[48] held by a Producer Organisation (PO). All or some of the units may be transferred ('divisibility' of rights), and transfers need to be registered with the responsible governmental Fisheries Department.[49] Note that in the UK, unlike in the Netherlands,[50] a proportion of quota shares is held by non-fishing actors, such as professional quota traders, financial institutions and vessel agents.

As regards the *security and durability* of the quota rights, the Dutch ITQs are anchored in a regulation[51] by the Fishery Ministry which stipulates that vessel owners annually receive a quota share equivalent to the percentage they received the previous year. This continuity of rights replaced an annual allocation process in 1997 (Davidse 1997). The annual allocation of ITQs is carried out by the Ministery but ITQs are expected to be automatically renewed. Furthermore, the quota entitlement is accepted by banks as collateral (Anarson 2002: 41). Hence, against the backdrop of the legal concept of 'legitimate expectations', the entitlements can be evaluated as being relatively secure. This is different in the case of the UK Fixed Quota Allocations: while legitimate expectations can be claimed to have built up among FQA holders in the UK as in the Netherlands, the weak legal status of FQAs as property rights has made them subject to controversies (Cabinet Office 2004). Formally, FQAs are governed by rules of the UK Fisheries administrations.[52]

A noteworthy *further feature* of the Dutch system is a 'national reserve' of ca. 5% of national quota that is not turned into ITQs in order to compensate possible overshoots. Since this 'buffer' turned out not to be necessary, the reserve has decreased over the years, is being used for international quota swaps and might be abolished in future. No such system exists in the UK but a certain

[47] Such transfers be done "by the holder of an unattached licence entitlement at any time during the life of the entitlement; by the holder of a vessel licence who is in the process of transferring his licence to someone else, or who is disposing of his vessel while retaining his licence in the form of a licence entitlement" (Defra 2006: 6).
[48] i.e. a non-active licence functioning as a quota holding mechanism.
[49] There are four Fisheries Departments in the UK, one each in England, Scotland, Wales and Northern Ireland.
[50] In the Netherlands, the provision that only owners of licenced vessels which have an allocation for the species in question and for related species are eligible to trade quota (Art. 12, Regeling contingentiering zeevis) de facto excludes non-vessel owning stakeholders from trading.
[51] Regelgeving contingentiering zeevis (Hoofdstuk 2, Art. 10.1).
[52] Quota management is based principally on the exercise of discretionary powers by all UK Ministers acting jointly. No *legislation* exists that specifies how quota is to be managed, with the exception of licensing and enforcement aspects (UK Fisheries Departments 2008: 4).

proportion of the quota is retained and managed by government. Those are the allocations for the so called 'non-sector,' which includes over 10 metre vessels not in PO membership, and for vessels under 10m.

Co-management of the quota rights

How are the quota rights co-managed in the Netherlands and the UK? For both cases, we will address the rationale for introducing co-management, composition of the quota-management groups, their responsibilities and rules, decision-making modalities and organisational structures. Finally, we will set out the remaining powers of the state in quota management.

In the Netherlands, the *rationale* for introducing co-management was to increase legitimacy of and compliance with the RBM system and ultimately with EU quota regulations, in addition to improving economic performance (van Ginkel 2005, Dubbink and van Vliet 1997). Policy-makers hence created extra incentives for the industry to participate in the groups: group members were provided with extra days-at-sea and could trade ITQs during longer periods within a year than non-members. The groups are based on fish Producer Organisations (POs),[53] in which 95% of the fleet was organised in 1993, and within each PO one or more co-management groups are active (Hoefnagel 2005: 175). In the UK, Producer Organisations (POs) that were to take over important co-management functions in the sectoral quota allocation scheme, had existed prior to introduction of the sectoral quota allocation (RBM) system (Goodlad 1998). They originated in European Community marketing legislation as voluntary marketing associations and their initial function was industry self-management of market supply and of withdrawal schemes.[54] From the early 1980s on, the UK fisheries departments made available quota allocations to 'the sector' – i.e. fishing vessels over 10 metres and belonging to fisheries Producer Organisations – in an increasing number of quota stocks (UK Fisheries Departments 2008). The 19 UK POs today manage 96% of the UK quota entitlements at their members' discretion.

In terms of *composition*, the Dutch co-management groups are smaller and more homogenous than the British POs. In the Netherlands, there are nine groups which range in size from 12 to 58 vessels,[55] making up altogether 324 vessels (PVIS 2006: 20). Participants typically come from the same region, are members in the same national fishermen's association (two of which exist in the Netherland), and work with similar types of vessel, gear and species. In the UK, 19 POs accommodate 1,100 vessels, with the largest of them having 258 vessels (as of 2005). The POs differ more strongly than the Dutch groups with regard to regional basis, targeted stocks, fleet segments, group homogeniety and the quota management systems that they have developed (Nautilus Consultants 2006, Phillipson 1999).

As regards *responsibilities and rules*, in both cases control and management of the groups' allocation of quota (and, in the Netherlands, of days-at-sea) are the prime purposes. This includes facilitation and monitoring of quota transfers within and between groups and annual submission to the administration of a joint Fishing Plan (Netherlands), and an Operational Programme/ Catch Plan

[53] In legal terms, however, the groups were only recently merged with the POs.
[54] Council Regulation (EEC) No 2142/70. The new role of POs in managing quotas – at the discretion of Member States – is recognised since 1993 in Article 4.1 of Council Regulation (EEC) No 3759/92.
[55] Group PO Redersvereniging is an exception with 3 vessels, but differs structurally from the other groups.

(UK).[56] While development of internal rules, including sanctions for when members overshoot their quota, was coordinated among the Dutch co-management groups and is hence harmonised, this was not the case in the UK where each PO has developed its own set of rules. A major difference between the Dutch groups and the UK POs is that the Dutch system is ITQ based only, while in the POs four distinct systems have evolved to internally manage the group's quota allocation. They range from common 'pool solutions' to ITQ-style systems as practiced in the Netherlands, with a gradual shift towards the latter. The four systems include (Nautilus Consultants 2006: 13-15):

- pure 'pool systems': FQA units of all members (plus possibly FQAs acquired by the PO itself) are combined. On this basis, monthly catch limits are set for each member, either for each the same, or subject to a formula. This system existed from the beginning of the sectoral allocation system.
- 'pool plus systems': the pool solution dominates but is combined with members managing own 'ring-fenced' individual quota (IQ). The IQ is based on the FQA units equivalent to their track record plus quota fishermen have leased or bought;
- 'pool plus IQs': in these mixed systems some members collaborate in a pool, and others operate IQs only;
- 'IQ-only systems': each vessel fishes its own FQAs, based on its track record, plus purchased or leased IQ. The sum of these make up the PO's allocation. This arrangement corresponds most closely to the Biesheuvel group's ITQ management.

Both in the Netherlands and in the UK, offences against the groups' quota management rules are penalised within the groups.[57] In the UK POs, the strictness and application of disciplinary measures varies more strongly since these are not harmonised among the groups as in the Netherlands. Groups submit annual reports to the administration on the number of non-compliance cases.[58] Typically, groups can cover over-quota fishing through leases by the end of the year. However, in the case that the group overshoots as a whole, public sanctions become effective, with deductions of the groups' quota shares in the previous year.

Both types of co-management groups perform some functions beyond quota management. The Biesheuvel groups have recently acquired co-management responsibility with regard to capacity control and technical issues. They are not directly consulted, however, when it comes to national policy debates on fisheries management. This works indirectly through consultation of the two fishermen's associations the groups are affiliated with. In contrast with this, the British POs are regularly involved into national-level policy debates. Furthermore, a limited number of them have continued the traditional PO engagement in marketing, including the operation of processing facilities.

As regards *decision-making modalities*, in both the Dutch and UK quota-management groups, management decisions are taken by the groups' elected boards, the major difference being that the

[56] These plans are typically considered as administrative requirements more than as definite statements on how the groups will manage their members' activities.

[57] In the Biesheuvel groups, while individual quota overshoots result in heavy fines being paid by the offender to the group, group overshoots require that the group pays a penalty to the research fund of the Dutch Fish Product Board (Productschap Vis).

[58] In the Netherlands, the General Inspection Service in turn notifies the groups if they observe violations when controlling fish auctions, and monitors the steps the groups take.

Dutch groups' board need to have an independent, non-industry chairman. In the smaller Biesheuvel groups there is no formal mechanism to involve members into decision-making apart from the annual general meeting, while in some British POs, occasional (consultative) member meetings are organised by regional liaison offices and regional directors. These *organisational structures* reflect the larger size of the POs and the fact that the connections between the groups' offices and the members are much looser than in the Netherlands. In Scotland, a PO association exists which serves to loosely coordinate the POs; in the Netherlands, the national Fish Product Board (FPB) coordinated the groups during their formation but withdrew from this role. Only indirectly, the FPB's cutter committee exerts a coordinating function as it assembles representatives of all groups. In both countries, (parts of) the co-management groups cooperate through fishermen's organisations, too.

In the Dutch system, the *state* retains a slightly lower role in quota management than in the UK. In both countries, fisheries departments are responsible for the annual allocation process; they need to formally approve of harvesting plans and quota transfers; they monitor quota uptake and are ultimately responsible for enforcing quotas. However, while the Netherlands rely on a private auction duty to complement the groups' quota monitoring, the UK has introduced a functionally equivalent public 'Fish Buyers and Sellers registration'.[59] Both systems make easier the traceability of landed fish and hence monitoring of quota uptake. Also, the UK annual allocation process is less automatised since all right-holders do not automatically receive the same percentage of national quota each year as in the Netherlands. Furthermore, UK fisheries departments directly manage the quota allocations for those fleet segments that are not organised in POs, i.e. the 'non-sector' (over 10 metre vessels not in PO membership) and the under-10 meter vessels.[60]

Analysis of social robustness

We will now present our findings with respect to the social robustness of the Netherlands and UK co-managed RBM systems. This includes an analysis of stakeholder acceptance and of the systems' capacity for institutional learning.

Stakeholder acceptance

First of all we need to clarify who are the stakeholders of the quota management systems analysed. We will distinguish between core stakeholders – those directly involved in the systems' operation – and wider stakeholders, not directly involved in the operation. In both cases, core stakeholders include parts of the fishing industry (ITQ holders in the Netherlands, and the fleet segment organised in POs in the UK) and state actors (fisheries departments, enforcement agencies). Wider stakeholders include other segments of the fishing industry, intermediate organisations and non-commercial interests, above all conservation organisations.

When looking at the core stakeholders, we find that there is a high acceptance of the combined RBM and co-management systems in the Netherlands, and a somewhat lower (but still moderately

[59] For Scotland, see 'The Registration of Fish Buyers and Sellers and Designation of Fish Auction Sites (Scotland) Regulations 2005', Scottish Statutory Instrument 2005 No. 286; analogous regulations exist in England, Wales and Northern Ireland.

[60] This is done by placing mainly monthly catch restrictions per vessel in the licences of the vessels concerned (UK Fisheries Departments 2008: 7).

high) acceptance in the UK. Acceptance among wider stakeholders is more varied and will be detailed in the following paragraphs.[61] We will describe stakeholders' views and perceptions as identified through semi-structured interviews as well as other indicators of their acceptance, such as compliance data.

In the Netherlands, members and managers of the interviewed Biesheuvel groups find that introduction of co-management made quota uptake more efficient. Also, the race for fish – which had not been effectively checked by the 'pure' ITQ system (Smit 1997) – was brought to an end. Informants contend that not only did the stability of expectations and compliance increase, but also that fishing activity is better spread out over the year and black landings are prevented through coordination and self-control in the groups. As a consequence, better fish prices could be achieved. This positive appraisal is confirmed by the fact that some 97% of those that are eligible participate within the Biesheuvel groups (Gray 2005: 127).[62] Note, however, that this may also be a consequence of the incentives set by the government to stimulate participation and the threat of the Dutch parliament to generally limit horsepower if not more than 75% of fishermen organised in the groups. Membership within the Biesheuvel groups is highly stable. This is assessed to not only result from an agreement between the groups not to accept offenders that have left or were expulsed from another group, but also from strong group identities. Relations between the groups are assessed to be generally cooperative though some tensions exist. Aspects that group members criticise refer mostly to the RBM component rather than the co-management dimension of the system. They include practices to avoid the final sale of ITQs when fishermen stop fishing (locally dubbed 'sofa fishermen') and the low level of new entrants to the sector. Though individual of our interviewees pointed to the limits of social control, the groups' self-policing is assessed by most to function well. More than to group fines this is attributed to the social stigma within small groups and small communities if individuals overshoot and thus deprive fellow group members of parts of their quota. Only few incidents of ITQ overfishing, non- or misdeclaration of flatfish to circumvent quota limitations and evasion of the auction duty have become public over the years (for example in 1999 and 2007).

The Dutch Inspection Service confirms that compliance with quota regulations has increased and that violations with regard to engine power, the new remit of the groups, are rare. In both cases, social control and involvement of the groups in rule development are said to play a role, though other factors[63] were also relevant. As a consequence, the national sole and plaice quotas have not been overshot significantly since introduction of the co-management system. This is one of the reasons why fisheries managers support the system as well: not only did it improve state-industry relations, but it reduced the costs of public enforcement.

Among the few Dutch conservation groups that work on quota management issues, the Biesheuvel system itself is accepted to function well with regard to quota management though less so with

[61] Acceptance among wider stakeholders which we did *not* interview can be assumed from the relative lack of media coverage, law suits, and other expressions of critical response to fisheries systems.

[62] Non-members are mainly fishermen with small vessels that do not fish in ITQ fisheries (e.g. shrimp), or fishermen that due to disputes with other fishermen or conflicts within a region prefer to stay outside the groups (Interview information).

[63] Conservation organisations highlight that the Biesheuvel system's improved enforcement provisions coincided with a decline in stocks which may have reduced black landings in a 'natural' way. High fuel prices promote compliance with engine power limitations.

regard to capacity limitation, one of its newer fields of responsibility. However, environmental organisations criticise that the sole and plaice fisheries in general are still unsustainable – a fact that is influenced more by the absolute level of TACs and national quota than by the concrete form of quota management.

In the UK we find that among the interviewed fishermen (members and managers of four POs), the co-managed RBM system is generally accepted, although less unanimously than in the Dutch case. As regards the system's RBM component, some interviewees appreciate the opportunity to fish against their own quota share and buy and lease quota, while others see benefits in the pool system. The pool system provides fishermen with flexibility in terms of quota uptake since regulating quota in a pool system is regarded as less difficult and less expensive than trading quota; small under-or overshoots can be compensated within the PO. It also enables young fishermen to start up. By its proponents, the pool system is hence regarded to be more 'community oriented'. Other fishermen prefer IQ systems as a means to protect their fishing rights as quasi-property. This cannot be granted by the pool system to the same extent where vessels with larger FQAs often have to compensate operators with smaller FQAs. The present quota management arrangements accommodate the preferences of both groups of fishermen, since they are able to move between POs which operate different systems – though they may not always be accepted by some POs if they do not hold sufficient FQAs.

For most of fishermen, the system currently 'works' due to a broader set of measures that include reduced fleet capacity (decommissioning), enhanced enforcement through the fish buyers and sellers registration, expansion of alternative viable fisheries (such as nephrops), and fairly strong market conditions as of 2007. Similar to the Dutch case, criticism on the part of PO members relates mostly to the RBM component of the system, including the problem of FQA-holders not actively fishing (here called 'slipper skippers') and difficulties in facilitating new entrants. In addition, there seems to be unease among some about the leasing and buying of quota (see also Hatcher et al. 2002: 42-46; Anderson 2006: 5-7), which is considered too expensive and for some species not always available when needed. From this perspective, the fixed quota allocation is perceived by some as 'inflexible' as it does not reflect current catching opportunities, although this may in part reflect the absolute level of the TAC. While some parts of industry are concerned about the insecure ownership status of FQA units, members and especially managers of POs that still operate pool systems reject the notion of 'private property' of fisheries resources altogether; they resist further individuation and transferability. A further concern voiced is that quota can be 'bought off' by foreign (including Dutch) flag vessels when these are registered in the UK.

As regards the co-management component, the PO rules and sanctions are generally accepted and PO membership is considered to be relatively stable although, with 67 membership changes in 2007 in Scottish POs, movement between groups is significantly higher than in the Dutch groups. A major motive for a membership change is preference for a different PO mode of quota management.[64] The cooperative working relations between POs are hence potentially undermined by competition for members, especially for fishermen rich in FQA units. Regarding the POs' quota management rules, the major compliance issue is (not necessarily intentional) individual overshooting, which is more problematic in POs that operate pool systems. Overshooting of UK quota as a whole, however, was significantly reduced. Repeated breaches of PO rules are rare, as

[64] A possible other motive might be that the groups' quota management and compliance rules differ in their strictness.

are exclusions from a PO. Self-policing and enforcement of PO rules seem less effective than in the Netherlands: before the introduction of the buyers and sellers registration legislation in 2005, black landings were still widespread and acknowledged if not tacitly tolerated by POs. Self-policing, however, is said to have increased with lower TACs and stronger public enforcement, as non-compliance is increasingly seen as one vessel stealing fishing entitlements of another.

From the perspective of public enforcement agencies, the presently satisfying compliance with the quota management regime is therefore above all due to the buyers/ sellers registration rather than PO self-policing. Generally, however, fisheries managers confirmed that the Producer Organisation system takes a burden off the fisheries administration, but changes are regarded as necessary. In 2004, the Prime Minister's Strategy Unit had published a report (Cabinet Office 2004: 105) which found the current FQA system to be 'confused and confusing', bureaucratic and not sufficiently transparent. Since the uncertain legal status of FQAs would inhibit investment and long-term planning, introduction of fully-fledged ITQs was recommended. As a response, the UK fisheries administrations developed a UK-wide consultation-based Quota Management Change Programme (UK Fisheries Departments 2005). At the time of our research, however, this consultation process had ground to a halt due to the new Scottish Government's opposition to ITQs, or to fully transferable quota allocations.

As regards the management system's acceptance by wider stakeholders, there is a certain tension within industry among the three sectors. The under-10m fleet in particular fears that members of POs and the non-sector fleet could compete for and fish against their allocation, using high-powered so called 'super-under-10m'-vessels. Environmental organisations are not involved in POs and appeared disinterested in the UK quota management system, partly despite participation in the Quota Management Change Programme. Some, however, have developed more general positions on RBM. WWF (2007) for example 'maintains a healthy scepticism about the ability of "rights-based management" *per se* to fix the problems of overcapitalisation and overfishing and sustain fishing communities and livelihoods'. Depending on context (e.g. fisheries characteristics) and design, however, they can be 'valuable operational incentives'.

Evolution of the management system and institutional learning

What is the capacity of the described systems of co-managed RBM to adapt to internal or external pressures and changes? To what extent were observed adaptations intentional ('learning')? Did institutional changes aim at improving the means to achieve given goals (simple learning), or were the goals themselves and underlying assumptions on causal relationships redefined (complex learning)? Could institutional learning contribute, in the perception of stakeholders, to solving the problem it was to address? In the following, we will discuss these questions for the Dutch and UK cases.

The Netherlands: Opening RBM for co-management

For the co-managed RBM system in the Netherlands, we can identify at least four steps of learning after Individual Quotas (IQs) had been introduced for plaice and sole in 1976 – which in itself was a major institutional innovation. The overall direction of institutional change was making RBM more efficient (increased transferability and security of rights) and extending it by co-management.

Table 9: Institutional learning in the Dutch case

Time	Management System	Institutional learning
Till 1976	Open access fishery, no output control	= Baseline
1976	IQ system: Introduction of IQs, transferrable only with vessel	• Complex learning: institutional change to address new goal (externally set by NEAFC) of meeting national quotas and TACs → 'spontaneous' dealing with new challenge under uncertainty • Complex learning as regards equity of initial allocation (1976 vs. 1977)
1985	ITQ system: Introduction of quota transferability	• Simple learning: Internally induced adaptation to fishermen's deviant practices
1988-90	Prototype of co-managed ITQ system: 1st introduction of quota groups	• Complex learning: new approach to counter non-compliance/ quota overshooting and crisis-ridden state-industry relations
1993	Co-managed ITQ system: 2nd introduction of quota groups ('Biesheuvel' system)	• Simple learning: institutionally more sophisticated approach to counter non-compliance, crisis-ridden state-industry relations and reduce overburdening enforcement regime
2004	Broadening of co-management within the Biesheuvel groups	• Simple learning: widening of groups' responsibility from quota management to capacity and technical issues (engine power, nets) as reaction to systems' success

Source: authors.

Summing up the past history of the IQ system, establishment of IQs was a reaction to the introduction through the North East Atlantic Fisheries Commission (NEAFC) of TACs, for sole and place among other species, as of 1975. In order to comply with the required catch reductions (10% for plaice, 40% for sole, cf. Hoefnagel and Smit 1995: 157), the Dutch government delegated the management of national quotas to the Fish Product Board, a chamber-like intermediate sector organisation, which introduced rules to limit effort and landings. However, after the sole fishery had to be closed prematurely in 1975 because the national quota was exhausted, the Fish Product Board returned its quota management responsibilities to the government in 1976. Only then did the Ministry introduce IQs, with the reasoning that these could increase operational certainty and profits by regulating landings (ibid). IQs were transferrable only together with vessels.

This system change can be regarded as an instance of 'complex learning', since new goals – meeting national quotas – had been defined and the introduction of output control itself constituted a major shift in the problem solving philosophy. Though the new goals were 'externally' set (by NEAFC), this happened with the consent of the Dutch government as a NEAFC contracting party. The new challenge and the uncertainty connected with such a major shift were dealt with rather 'spontaneously', in the sense that there were very hardly any model solutions to copy or learn from: at that time, only very few I(T)Q systems existed worldwide. Once the government had introduced the IQ system, a first minor adjustment was the revision of the allocation basis: quota allocations were initially based on historical catch record only, with quota for larger ships being determined by the Ministry. This resulted in significant quota differences between vessels of similar capacity and hence in industry discontent. The allocation was revised a year later to also account for engine power (Smit 2001). Though only a minor change in the system, it can be labelled an instance of 'complex learning', too, because it led to the consideration of a further management goal, namely equity of the initial allocation. While this adjustment met with the satisfaction of the industry

stakeholders and can thus be assessed to have been successful (i.e. addressing the perceived problem), this cannot be said for the overall introduction of IQs: during the 1980s, national quota was constantly exceeded so that neither the goal of output limitation nor the underlying problem of overfishing were addressed satisfactorily.

Once the IQ system – and hence a (still weak) form of RBM – was set up, the first fundamental step of learning was the introduction of IQ transferability. Initially, with weak enforcement, fishermen regarded IQs as limitations rather than rights and as little more than a 'piece of paper' (Davidse 2001: 15). However, their actual relevance increased in the mid 1980s and they started to be informally traded. Reacting to this, policy-makers allowed transferability in 1985, turning the IQs de facto into ITQs. Though it had major consequences on property rights in fisheries, this adaptation to fishermen's deviant practices can be assessed to be an instance of 'simple' learning: it aimed (successfully) at making an existing system work more efficiently, rather than at introducing new goals.

With steady European TAC reductions on the one hand and rising fleet overcapacity on the other, the 1980s were at the same time characterised by massive non-compliance (i.e. landing of 'grey' and 'black' fish), continuous overshooting of the Dutch quota and worsening state-industry relations. Overcapacity was a consequence of high flatfish demand and prices, favourable bank loans, national investment stimulation and the desire of fishermen to become independent and set up their sons with own vessels (Davidse 2001; Dubbink and van Vliet 1997, van Ginkel 2005). The discrepancy between fishers' fishing rights and their fishing capacity, fuelled by weak enforcement, resulted in a situation where the ITQ system did not prevent quota overshoots. Weak monitoring and enforcement, including low fines for detected violations, created the threat that rights-holders could not fully take up their own ITQs when other holders would overfish their quota – a classical Prisoners' Dilemma (Steins and Langstraat 2003). This was worsened by the fact that sole and plaice fishermen from other European countries exceeded their national quotas as well, putting pressure on the Dutch operators to quickly secure their quota shares. Hence, a race for fish continued and market prices decreased as a result of the growing ‚grey' market.

However, after establishment of the European Common Fisheries Policy in 1983, calls intensified for stricter policing and an end to over-quota landings. The Dutch government introduced various measures in the late 1980s to limit capacity and effort, including a licensing and a 'days-at-sea' regime, and efforts to tighten monitoring and enforcement. Continued non-compliance on the part of fishermen, partly with the logistic and administrative support of fish auctions (van Ginkel 2005: 123), increasingly strained the relations between the industry and fisheries administration. This led not only to fisticuffs between fishermen and inspectors but to greater political turmoil (ibid), and was to result in 1990 in the resignation of the Minister for Agriculture and Fisheries.

In order to calm down the situation, a first 'prototype' of co-management groups was created in the late 1980s (Davidse 2001: 26). The idea was to improve fisheries governance by devolving management responsibility to industry, pre-empt industry resistance, re-establish trust and increase the legitimacy of fisheries management. This new problem-solving approach, following a phase of strict command-and-control politics, can be seen as a form of complex learning. It presupposes recognition of the value of participatory approaches for effective governance. Though consociationalism and corporatism are deeply rooted in the Dutch political culture (Lijphart 1968; van Hoefnagel 2005), transferring management responsibility to small groups of fishermen was a

first in the Netherlands.

However, the co-management approach was not well institutionalised: there were two rather large groups (Group East and Group West) which were not yet bound by any statutes or external control. It failed in 1990, when the fisheries crisis peaked. A new and more systematic attempt at co-management was made when the present Biesheuvel co-management groups were introduced in 1993. After the minister's resignation, a tight consultation and discussion process was started between representatives of the Fisheries Ministry, the fishery sector and the trading and processing industry. This took place within a steering group under the chairmanship of former Prime Minister Barend Biesheuvel which was set up in 1991. In its White Paper 'Balanced fisheries' (MLNV 1993), the 'Stuurgroep Biesheuvel' recommended a) distribution of responsibilities between government and fishing industry, and b) cooperation between fishermen themselves within the existing Producer Organisations (POs).

The objectives of the reform were better quota compliance and economic performance as well as, implicitly, improved state-industry relations and reduction of the overburdening enforcement regime. In February 1993, groups were formed to ensure compliance with the group quota and to manage quota transfers within and between the groups. Institutionally, and in contrast with the 'prototype' groups, the Biesheuvel groups were required to have an independent chairman; to develop statutes and a penalty system;[65] to publicly auction landed fish; not to exceed a group size of 100 members; and to achieve at least 75% fishermen participation. Finally, a threat ('shadow of hierarchy') was built-in that co-management would be replaced by compulsory capacity limitation if not enough fishermen participated and if management functions were not fulfilled satisfactorily (a clause called 'stok van Mok').

All these conditions contributed to self-management, social control and the system's overall functioning. In terms of institutional learning, we suggest that the Biesheuvel system represents an institutionally more sophisticated and effective approach to achieve the objectives of the described 'prototype' co-management groups, and hence is an instance of simple learning. The objectives of the system have largely been accomplished, so that the learning can be termed on the whole 'successful'. National sole or plaice quota is not overrun anymore; with landings spread evenly over the year and no black fish market, fish prices and revenues have increased; and industry's confidence in the government is restored (see e.g. Hoefnagel and Smit 1995; LEI-DLO 1996; MNLV 1995 and 2002; Steins and Langstraat 2003). As was elaborated above, however, stakeholders perceive the system to have some downsides, too.[66]

The most recent step of ('simple') institutional learning in the management system is a widening of the groups' responsibilities from quota management to capacity limitation (engine power) and technical measures (gear issues) as of 2004. This reflects the affirmative assessment of the state-industry cooperation by both industry and by the administration, which carried out several evaluations of the Biesheuvel system (e.g. MNLV 1995 and 2002; Stuurgroep Nijpels 2005). The evaluations were generally positive, confirming the system's implementation according to the

[65] The groups' development of internal quota management rules, though devolved, was coordinated initially through the Fish Product Board. Over the years, the Board withdraw from coordinating and supervising the groups.

[66] This includes the existence of non-fishing quota-holders; difficulties for newcomers to enter the fishery; the limits of the system to better address ecological concerns within the given national quotas. Also, ITQ transferability has led to a continuing, though not drastic concentration of rights (Davidse 2001), which was buffered to some extent by the possibility of Dutch flag vessels to accumulate UK sole and plaice quota ('quota hoppers').

steering group recommendations and its positive outcomes. The 'stok von Mok' clause was removed as an acknowledgement of the system's success. The most recent evaluation (Nijpels 2003, 2005) recommended some minor changes in the Biesheuvel groups quota management rules and suggested a strengthening of the private enforcement and control system. This would, according to the Ministry, go hand in hand with reducing the public control of auction duty. Beyond quota management, the new remits of co-management include above all a joint industry-ministry engine power working group (set up 2004). Its aim was to reduce at least 15 percent in engine capacity in the cutter sector. A private policy on engine power was developed on the conditions for engine-power measurements, seals, audits, and sanctions. After initial scepticism, the Biesheuvel groups unanimously adopted the rules. Between 2005 and 2006, engine-power measurements and sealings were implemented on board all vessels (ibid: 27-29; Hoefnagel 2007). A public-private working group on nets aims at an industry commitment to avoid the use of illegal net appliances to catch undersized fish. Finally, sporadic voluntary geographic and temporal (real time) closures had been carried out as of 2002 to spare flatfish during the spawning season and prevent bycatch of juvenile plaice. These initiatives were explicitly supported by the Nijpels (2003, 2005) report. In the upshot, recent changes point towards reducing the state involvement in quota management and broadening the scope of co-management beyond quota management – a learning effect from the Dutch success of co-managed RBM, and possibly a 'retreat of the state' for budgetary and ideological reasons at the same time.

The UK: Using co-management for RBM

In the UK, the starting point of our analysis is the introduction of Producer Organisations (POs) as industry self-governance mechanism. While some distinct steps of institutional learning can be identified, there are significant shifts between these steps, due to the fact that the UK Fisheries Departments renew quota management rules on an annual basis. The overall direction of institutional change was that this structure was built upon when quota management was introduced and that quota allocations increasingly turned into transferable rights.

Table 10: Institutional learning in the UK case

Time	Management System	Institutional learning
Till 1973	Open access fishery, no co-management	= Baseline
1973	Industry self-governance in marketing: First POs established; no link to fisheries management	• Complex learning: New European legal opportunity for industry to control market supply and market jointly • [Complex learning: In parallel, government establishes publicly-run quota management system, based on (weekly, fortnightly etc.) catch limits]
1984-98	Sectoral quota management based on rolling track record quota allocation; In POs: common pool system predominant	• Simple learning: Government devolves quota management functions to POs but goal of fishing within quota limits remains
Since 1999	Sectoral quota management based on fixed quota allocation (FQA): More POs moving away from common pool form of internal FQA allocation	• Simple learning as regards allocation basis to provide more stability and of a more ITQ-like system of allocation and trading; quota trade/market was *not* intended but intensified

Source: authors.

With the accession of the UK to the European Economic Community (EEC, today EU) in 1973, the

first fish Producer Organisation was established in the UK. In EEC law, the PO system enabled fishermen since 1970 to enjoy the benefits of the EU minimum-price scheme and market-support mechanisms and to collaborate in marketing. Insofar as industry organization to control market supply was a radical change in the system (though similar regimes had already been introduced in agriculture), this can be regarded as an instance of complex learning. At this time, there was no direct link between the emerging POs and fisheries management in the UK. Output limits and quota management arrangements had first been put in place through the NEAFC ('complex learning'). Since introduction of the CFP in 1983, most commercial stocks were subject to TACs and national quota. Fisheries were managed by the Fisheries Departments on the basis of daily, weekly, fortnightly or monthly quotas (catch limits). All vessels would receive the same quota, which was varied occasionally depending on vessel-size (Goodlad 2000). While industry was regularly consulted, the ultimate quota decisions on vessel quota limits were taken by government. This lack of involvement in the decision-making process, combined with the negligence of regional or sectoral considerations in the quota allocation process, sparked criticism (ibid).

Criticism was especially pronounced in Shetland, and it was at the request of the Shetland PO[67] in 1984 that the government for the first time vested quota management responsibilities with a PO. In subsequent years and at the industry's request, this decentralised and sectoral quota management system spread widely and was expanded – both in terms of POs involved, and in species, quota and areas covered – until it applied to most demersal and pelagic stocks.[68] By the early 1990s, all of the (then 17) UK POs managed quota allocations on behalf of their members. The allocation was based on the principle that each PO received quota proportional to the catches made by its over 10 meter member vessels in the previous three years ('rolling track record'). Within the POs, pool systems were operated, i.e. joint catch limits set. Since 1994, the groups were allowed to buy up licensed vessels and to "ring-fence" their track record if the benefit remained with the PO. As of 1995, track records were de-linked from the vessels themselves and linked to vessel licences. Hence, when licences are transferred to other vessels, the associated track records move with them. This not only increased the value of licences but also facilitated licence and hence quota trading. In general, POs could swap quota between themselves at any time. In practice, however, under the rolling track record system swapping or 'gifting'[69] of quota could lead to reductions in future quota allocations and was hence risky. Permanent sales in particular were rather complicated (see more in Hatcher et al. 2002: 20).

Summing up, as of 1984 a rather evolutionary (as opposed to 'designed') and bottom-up process of institutional learning took place in which a whole new system of co-governed quota management was created. From the perspective of POs, this means that they adopted completely new goals in addition to supply management and marketing ('complex learning'). From the perspective of the fisheries management regime (which is our main frame of reference in this study), the underlying objective – to sustain stocks by fishing within quota limits – remained the same since TACs and quotas had first introduced. It was 'only' the governance structure by which this objective should be achieved that changed ('simple learning'). The goal itself was not fully achieved since overfish of

[67] 'Shetland Fish Producers Association', SFPA.
[68] From 1995 onwards, POs wishing to manage sectoral allocations for demersal stocks were required to do so for all stocks, while beforehand they could take sectoral allocations for selected stocks and have their members fish against the non-sector's allocations for other stocks. As of 1999, this was also introduced for pelagic stocks.
[69] 'Gifting' is the one way transfer of quota which was allowed as of 1996.

national quota was still common with a number of species and illegal landings were at a high.

A major systematic shift occurred in 1999, when the 'rolling track record' allocation was replaced by a fixed quota allocation (FQA). Following two years of consultation with industry and supported by some but not all parts of industry, annual allocations were linked to a single fixed reference period (1994-96, slightly updated in 2002[70]). Thus, each group (POs, the non-sector and the under 10 meter fleet) would receive a fixed percentage share of national quota irrespective of whether they had fully fished their allocations the previous year. Technically, track records were converted into quota units (in tonnage). The new allocation basis was to provide greater stability in the yearly allocations. Also, pressure should be lowered on fishermen to maintain their track records by utilising their full quota allocations, or to maximise the records through fake records ('paper fishing'). A further aim was to increase the ability to swap or gift quota between POs without suffering a reduction in future quota allocations (WGFQA 1997: 5). Finally, the fixed allocations should relieve Fisheries Departments from the heavy administrative burden of assembling the necessary track record data to calculate annual allocations (UK Fisheries Departments 2008: Annex A).

The move to FQAs was not intended to lead to a free trade of FQAs (UK Fisheries Departments 1997: 3) but the fishing opportunities associated with FQA units can and de facto do move around the industry. Tradability is still limited by the fact that in most cases FQA units have to stay with a vessel's licence. However, in 2002, following a review of the operation of FQAs, it became possible to transfer FQA units separately from licences whenever licence entitlements are created as well as between the creation of an entitlement and its placement on a vessel (UK Fisheries Departments 2002). Hatcher et al. (2002: 21-22) point out that the implications of the 1999 reform for quota trading were 'to simplify short term leases but to complicate deals to sell quota permanently (apart from sales of units for aggregation on the licence market).' The amount of trading (especially leasing) has increased dramatically after 1999 (Hatcher and Read 2001: 6) and again after a round of decommissioning in 2001/02.

As quota trading has intensified, more and more PO members started calling for the right to manage their 'own' FQAs (i.e. the equivalents of their vessels' catch records). Because of this, many PO boards voted to move from pool systems to pool-plus, mixed or IQ-only systems. If a PO management board was not ready to accommodate the wish for individual quota management, fishermen moved to those POs that had enabled individual quota management already. Vessel-owners with large FQA holdings have a stronger incentive to do so, since the pool solution often meant that their allotted catch limit over the whole year was below the track record of their vessels. With those 'larger scale' fishermen retreating, the pure pool systems became increasingly unable to operate and typically moved to pool-plus quota management. At the level of individual operators, fishermen now routinely retain own FQAs when purchasing a new vessel; FQAs, licences and vessels are traded individually rather than as package. Brokers buy up licences and licensed vessels to 'asset strip' them of FQAs (Hatcher and Read 2001: 6). In terms of institutional learning, the move to FQAs was geared towards making the existing quota management system more stable and effective ('simple learning'). Interestingly, the real change – i.e. emergence of a market in quota units – was an *unintended* side-effect of institutional reform.

A future step of institutional learning may be related to the Quota Management Change Process.

[70] Allowing the transfer of FQA units, in order to adjust the holdings of FQA units associated with licenses and thus to account of permanent transfers of quota that may have occurred over the last years.

Though at the time of writing the process was stopped by the Scottish government's opposition to ITQs, some of the discussed changes may be implemented in the future. The process, a highly participatory one, has tackled, among others, the issues of entitlement to quota, trading arrangements and allocation methodology; impact of quota management changes on vulnerable areas of the fishing industry; and the role of POs as well as that of the non-sector and under-10 metre fleet (UK Fisheries Departments 2006). As a possible further option, Scotland may continue resisting ITQs while the rest of the UK may move towards them. This, however, is linked to more fundamental questions regarding the possibilities of regional devolution in the UK.

Evaluating the hypotheses regarding social robustness

Do the described management systems support or discourage the propositions on social robustness, as presented in Chapter 0?

RBM and diversity of stakeholder involvement

Our first proposition was that *rights-based management systems tend not to have broad (diverse) stakeholder involvement.* This expectation is supported by our cases. We find that apart from the fisheries administrations only a narrowly defined core group of industry stakeholders have been and are involved in the development and operation both of the Dutch and the British RBM systems.

In the Netherlands, no industry or non-industry stakeholders apart from the concerned fleet segments had been involved in the development or operation of the management system. In the system's operation, a somewhat special role is that of the independent, non-industry chairman that the co-management groups need to have, since they are not necessarily a member of industry. Often, the chair is a local dignitary. He or she might hence be seen as a community representative, somebody who mediates between the interest of the local community and the fishermen. However, one might also see the chair as a disinterested part of the fishing industry. The latter view is supported by the fact that there exists no formal feedback mechanism to the local communities and that the chair really is mandated to act on behalf of the fishermen.

In the UK, stakeholder involvement extends to the PO-organised segment of the fishing industry only. Non-PO members, both from the so-called 'non-sector' and from the 'under 10m fleet,' are not involved in the system's operation and were not regarded as 'stakeholders' by most of our interviewees. They are, of course, involved in higher level policy review which can affect the PO sector (such as anti-ITQ sentiment). A certain role, however, is played by vessel agents, which act as non-fishing co-owners of vessels and of quota. They may exercise influence on quota management decisions through their business partners, who are PO members, or through the use of 'dummy licences'.[71] Finally, although both in the Netherlands and the UK environmental groups are partly consulted in the wider management of the sole and plaice fishery (e.g. through representation in the North Sea RAC), they were not involved in the development or operation of the quota management system. The cause of the narrow stakeholder representation can be seen in the narrow definition of responsibilities within the management system (management of pre-determined quota shares only), which results in a narrow definition of 'stakeholder'.

[71] See Footnote 48.

Acceptance of RBM and diversity of stakeholder involvement

The third expectation was that *the more diverse the stakeholder involvement in the development and / or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors.*

In both countries, only specific industry segments have participated in the development and operation of the co-managed RBM systems. Stakeholder involvement has thus to be classified as 'non-diverse'. This hypothesis could be rewritten as follows: the less diverse the stakeholder involvement, the higher the level of acceptance on the part of the concerned commercial fisheries actors. Acceptance of the concerned commercial fishermen (i.e. members of the Biesheuvel groups and the POs) was relatively high. In this form, the proposition is confirmed. However, the causality is unclear: we cannot be sure whether the system's acceptance can be attributed to the non-involvement of wider stakeholders or whether it is actually due to other factors.

Acceptance of RBM and characteristics of the RBM system

Our second hypothesis was that *commercial fisheries actors' acceptance of a rights-based management system will be a function of the extent to which a) the management system is perceived by the fishermen to be practical; b) the initial allocation reproduced the status quo of fishing opportunities when introduced; c) which new entrants are facilitated; d) which retirement options are provided for.*

In the Dutch case, we find a high, and in the UK case a moderately high level of acceptance among the fishing industry. In both countries, the systems are considered to be practical (a). The initial ITQ allocation (b) in the Netherlands reproduced the status quo of fishing opportunities, though only after some early adjustment of the initial allocation basis. Similarly, in the UK, both the rolling share system and the fixing of the quota allocation came close to reproducing the fishing opportunities status quo, although the time gap between the onset of FQAs and the qualifying period was substantial. As regards retirement options (d), in both countries pension schemes for fishermen existed independent of the quota management systems. Selling or leasing out of quota rights at the end of a fisherman's professional life provides an additional, 'windfall' income. However, many active fishermen were quite negative about retired quota-holders (so called 'slipper skippers' (UK) or 'sofa fishermen' (NL)) and also opposed to other non-fishing quota-holders. Rejection of this practice was a bit keener in the UK, where there exists a group of quota holders (traders) who are not part of the harvesting side of the fishing industry.[72] The selling of quota shares after retirement was viewed as more legitimate than leasing them out. This points to a broader moral issue about holding and speculating with quota.

One condition of our hypothesis, facilitation of new entrants (c), was not met. Fishermen in both countries expressed concerns about difficulties and costs of entry, though possibly more vehemently in the UK where the costs of leasing quota can be high. These concerns, however, did not however undermine the general acceptance of the system. That this driver appears less important to overall satisfaction may be because it relates to third parties rather than the fishermen themselves. In this

[72] Professional quota traders, banks, vessel-agents. This group is estimated to hold no more than ca. 5% of the available quota shares. Among the listed actors, vessel agents are seen as most legitimate quota holders, since they play an important role in facilitating (i.e. financing) new entrants.

vein, one might argue that new entrants are no immediate concerns to those privileged to belong to the 'club'. A caveat, of course, is sons in family businesses, but in both countries alternative economic opportunities exist (oil jobs in North East Scotland, the service industry in the Netherlands) that may buffer the concern about their future.

RBM and capacity for institutional learning

We held that *rights-based management systems restrict capacity for institutional learning.* As we will show, this hypothesis was not fully supported by empirical evidence and needs specification.

In the Netherlands, several steps of learning can be identified after the original IQ system had been introduced in 1976. The first step of learning was the introduction of the transferability of quota in 1985 (i.e. IQs were turned into ITQs). The change was above all a reaction to the fact that fishermen in the early 1980s had started to trade quota although this had not been legally intended. The next step of learning was the attempt to redesign the ITQs system into a (prototype) participatory ITQ system by introducing for the first time quota management groups between 1988 and 1990. The idea was to counter both the problems of quota overshooting that the ITQ system had not been able to prevent and the crisis-ridden state-industry relations which resulted from these. The attempt failed and only the second time round succeeded, when in 1993 an institutionally more sophisticated approach to quota management groups was developed and the 'Biesheuvel' system emerged. As of the year 2004, the system was even extended when the groups' responsibility was widened from quota management to the control of engine power and technical measures (nets), building upon the system's success.

In summary, the introduction of the co-management system and broadening of its scope in the Netherlands can be regarded as significant step of learning within a rights-based management system. This finding does not support our hypothesis or at least necessitates some modification: learning can take place in RBM systems, in different ways – both through making rights more easily transferable and introducing participatory structures. In our case, institutional change did not overhaul the balance of allocated rights but served to make the system operate more smoothly.

In the UK, the major steps of institutional learning were linking the existing industry self-governance structure of POs with the RBM system and the subsequent change from a sectoral quota management system based on a rolling track record quota allocation (introduced 1984) to a system based on fixed quota allocations (FQA) in 1999. The intention of this change, which was requested by parts of industry, was to provide more stability. Emergence of quota trading and a quota market had not been intended (and intensified only after successive rounds of decommissioning had 'freed' up quota). These changes can not therefore be labelled 'institutional *learning*' which we understand as a conscious and intentional process, but as unintended shifts in the system (evolution) leading to new functions or practices. Interestingly, however, this unintended shift was geared, like in the Netherlands, towards making rights more easily transferrable (and exclusive).

Consequently, the institutional learning that took place was mainly directed toward making the systems work more smoothly which included finding ways for greater accountability and flexibility. In both cases this led to an intensification of the transferability and security of property rights, even though full-fledged ITQs are still resisted in the UK.

Stakeholder diversity and institutional learning

Our final hypothesis was that *the more diverse the stakeholders involved in the development and/ or operation of a management system is, the more institutional learning takes place.* This proposition is not confirmed by our analysis: in both the Dutch and UK cases, stakeholder involvement was quite narrow. Apart from governmental actors it basically encompassed the relevant industry segments only. However, as Section 3.4 showed significant steps of institutional learning did take place. These include widening the Dutch RBM system to co-management and combining the pre-existing UK industry self-governance structure of POs with RBM. Apart from these two ways at arriving at participatory RBM systems, we find institutional changes within the RBM system in both cases to be geared towards making rights more transferrable and exclusive. Non-diverse stakeholder participation has favoured an even stronger movement toward market-based fisheries management.

Conclusions

Both the Dutch and the UK co-managed systems of rights-based management can be considered as socially robust. By this we mean that there is a generalised acceptance among at least industry stakeholders – greater in the case of the Netherlands – and that the systems have managed to evolve in adjustment to stakeholder demands, changing frameworks of fisheries management and, to some extent, ecological requirements. As regards institutional learning, both cases feature significant steps of learning – against our expectation that RBM would per se precludes a lot of institutional alternatives through a narrowing of perspectives, interests, and stakeholders. However, we found that learning within the RBM systems was often geared towards specific forms of institutional alternatives, namely more transferrable and secure rights. As regards the type of institutional learning, more instances of complex learning could be identified in the Netherlands, though distinguishing complex from simple learning is not always easy and there are grey zones between these two ideal types.

Let us now return to our initial questions. Firstly, *to what extent and why do the levels of stakeholder acceptance differ* in the two cases? We found that stakeholder acceptance is higher in the Netherlands, though still moderately high in the case of the UK system of co-managed RBM. The degrees and diversity of stakeholder involvement in the development and operation of the systems are comparable in the two countries, so that they cannot explain the identified variance in acceptance. Similarly, most of the RBM systems' characteristics which we had expected to affect stakeholder acceptance were similar, so that these, too, cannot explain variance.

A major aspect which we had not specifically looked at, however, is the security of property rights and this is a major damper on stakeholder acceptance in the UK – while some want a more secure, ITQ-like title, others are dissatisfied with the current trend of the system towards becoming a more fully-fledged ITQ system. In the Netherlands, the ITQ system is more than twenty years old now and the legal titles are held to be secure. This paradigmatic question hence does not concern fishermen any more today. A further factor explaining the different levels of stakeholder acceptance is the complexity of the overall setting. With the UK PO's larger group sizes and the diversity of species, fleets, vessel sizes, vessel types, and fishing areas in the mixed demersal fisheries, it may be more difficult for the system to work well for all. Finally, different cultures of cooperation may help explaining varying stakeholder acceptance. Cooperation is an inherent feature of the Dutch

neo-corporatist and consociationalist culture, pervading many aspects of social life (Lijphart 1968, Visser 1998). The British POs operate in a generally more competitive, pluralist context of socio-economic governance (Hall and Taylor 2001), which may challenge the groups' self-governance capacity and impact on acceptance of the co-management system.

Our second guiding question was *what caused institutional learning in the two cases to take different directions?* In the Netherlands, a RBM system was combined with co-management, resulting from the need of government to increase the legitimacy of its fisheries management; over time, co-management was widened beyond quota management. In the UK, an industry self-governance structure was combined with RBM into a co-managed system at the request of fishermen. Over the years, this co-managed RBM system strengthened in terms of the tradability of rights and ownership expectations, but not so much with regard to co-management. While the first process can roughly be summed up as a top-down but legitimacy-driven process of institutional learning, the latter was more bottom-up but efficiency-driven (i.e. market-creating). The diversity of species, fleets, vessels, fishing areas, etc. in the UK mixed demersal fishery may halt the evolution to a pure ITQ system and keep open the possibility of other alternatives or the continued 'mixed system'.

Let us finally mention favourable conditions external to the co-managed RBM systems that have fostered the systems' social robustness. Unequitable quota concentrations could so far be avoided, in the Netherlands due to the small businesses structure of the sector and in the UK by limited transferability of rights and the political determination (at least in Scotland) to support the owner-operator structure of fisheries. In addition, in both countries, capacity reduction, days-at-sea schemes and strengthening enforcement frameworks supported the systems' working over the years.

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Appendix 4

Social robustness in the Western Shelf: The case of the Basque Country

Andréa Leme da Silva and Martin Aranda

1. Introduction

The focus of analysis of Work Package 6 is to evaluate the social robustness of fisheries management regimes, and in particular of rights-based management (RBM) and forms of participatory governance. This report focuses on the case of the Western Shelf with focus on the Basque industrial and coastal fisheries. Basque industrial fleets are represented in this report by the industrial trawlers fleet (*altura*) participating in the fisheries of the North East Atlantic Fisheries Commission (NEAFC). The fleet harvests various demersal species, being the most important hake. The management of this fleet is done through a system of individual rights (through effort quotas in the early stage and nowadays through ITQs). This fleet has an active participation in the management process at the local level and has a leading role in the European management context through the South Western Waters Regional Advisory Council (SWWRAC). Basque coastal fisheries (*bajura*) are represented in this report by the purse seiners harvesting anchovy and other pelagics in the Bay of Biscay. This fleet is managed through the fishing guilds (*cofradias*). *Cofradias* have strong territorial rights and are active in participation in the regional management context and at the European level in the SWWRACs and the Pelagic RAC.

To meet our aims, 20 interviews were carried out in the Spanish Basque Country during August and September 2007. Interviewees included members of two industrial fisheries associations: NORDPESC (Pasajes) and OPPAO (Ondarroa); fishermen union associations of coastal sectors from the provinces of Biscaya (harbors of Bermeo and Ondarroa) and Gipuzcoa (harbors of Hondarribia, Getaria, and Pasajes), and Regional Advisory Councils' (RACs) members of the South-Western Waters and North-Western Waters RACs, among others (Table 1).

Table 1. Interviews carried out in the Basque Country, Spain.

Present job / Background	Civil servants (People in Ministry, or inspection)	Researcher	Green	Fishermen (and their representatives)	Total
Biologist/scientist		1	1		2
Social science (anthropology, economy, law)					
Fisherman				17	17

Other				1	1
Total					20

2. Background of fisheries

2.1 Study area

The Spanish Basque Country (*Euskadi*) is located in northern Spain. It has an area of 7,089 square km. The population in the Basque Autonomous Community is 2.1 million inhabitants. Population has had the most significant population growth occurring prior to 1981, after that pick population has declined in 1% until 2003. From 2003 to date, population has shown a rising trend due to immigration from non communitarian countries.

The Basque Autonomous Community is divided in three historical territories (Araba, Biscay, and Gipuzkoa). Vitoria-Gasteiz is the administrative capital where the Basque Government and Parliament are located, whereas Bilbao is the judicial capital, where the headquarters of the Superior Court of Justice are located. There are two official languages in the Basque community: Spanish and Basque (*Euskera*).

Figure 1. Map of the study region – Bay of Biscay, Spain

2.2. Coastal fisheries

The coastal fisheries (locally known as *bajura*) refer to the fleet targeting pelagic and demersal

species. These species including European anchovy (*Engraulis encrachicolus*), Atlantic horse mackerel (*Trachurus trachurus*), blue whiting (*Micromesistius poutassou*), hake (*Merlucius merlucius*) and others. The technology used in the *bajura* sector is diverse, and consists of purse seine, trolling, and hand lines with live bait. The *bajura* fleet is characterized by a wide variety of vessel types, ranging from motorized small boats to middle-size vessels called hake boats. The most important harbors are Bermeo (27.6% of the whole coastal fleet in terms of units), Hondarribia (9.9%), Getaria (9.4%), San Sebastian (9.4%), Pasajes (3%), Ondarroa (20%), and Lekeitio (7.7%) (Arregi *et al.*, 2004) These six ports provide more than 70% of the total coastal fleet, and account for about 40% of the employment in the fishing sector (Figure 2).

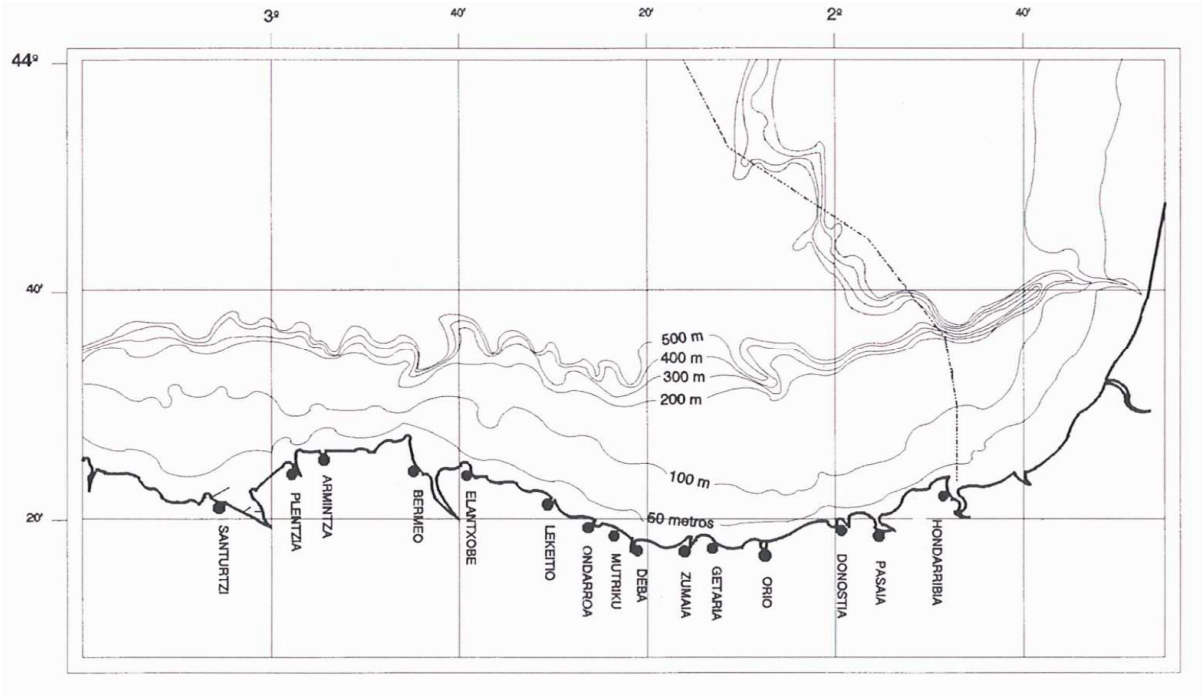

Figure 2: Harbors of Gipuzcoa and Biscay (Source: Basque Government).

Coastal fisheries has a long history in the Basque country, for example, one of its oldest harbors, Getaria was founded in 1209, and was one of the main economic villages of Gipuzcoa during the middle ages. Between 14th and 15th century, Getaria expanded the commercial scope to the commercial fishing. In particular, the fishing rights of navigation were conceded by the monarchy to noble Basque in return to military services. During the 16th to 18th century, Getaria was the main harbor for anchovy and sardine industries. At that time, a great number of guipuzcoanos sailed to Terranova (Canada) and to the Arctic to fish cod and whale. Since the end of the eighteenth century, several factors contributed to the reactivation of the *bajura* sector, like the foundation of *Compañia Sardinera Getaria* in 1764; the end of the Carlist war in 1876; and the emergence of new technologies of fish capture and preservation. In twentieth century, Getaria continued to be one of the main harbors for artisanal fishing of the Basque Country. For further details on social history of fisheries in the Basque coast see Vascos (1925), López Losa (1997, 2000), and Itsas Memoria (2000).

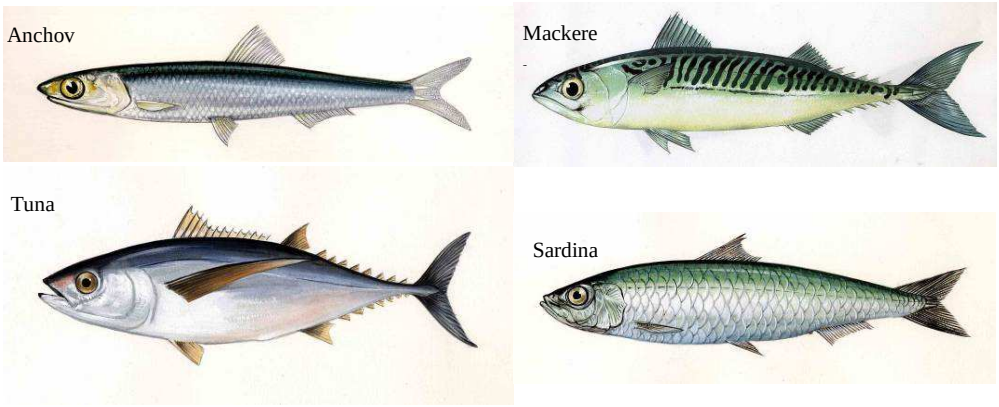

Figure 3: Main species for the coastal fleet - *bajura* (Source: AZTI Tecnalia).

2.3 Industrial fisheries

There are three industrial fishing technologies in the Basque Country: Cod ships (*Bacaladeros)*, tuna clippers with freezing facilities (a*tuneros congeladores*), and demersal trawlers (*altura la fresco*). The *bacaladeros* are bottom trawlers that work in pairs (four pairs, eight vessels), targeting Atlantic cod (*Gadus morhua*) and Greenland halibut (*Reinharditus hippoglossoides*) to be frozen or salted. The a*tuneros congeladores* are purse seiners bigger than 250 TRB. There are currently 27 vessels in the Basque fleet that fish in the Atlantic, Pacific, and Indian oceans, freezing and storing the fish on board. These target tuna species, primarily: albacore (*Tunnus alalunga*); bluefin (*Thunnus thynnus*); yellowtail (*Thunnus albacares*); skipjack (*Katsuwonus pelamis*); bigeye (*Thunnus obesus*). The *Altura al fresco fleet* comprises vessels larger than 100 TRB. It operates within the North East Atlantic Fisheries Commission (NEAFC) geographic limits. They are bottom trawlers that work as individual vessels or in pairs. It is also a small fleet composed of six gill net vessels that target hake (*Merluccius merluccius*), European conger eel (*Conger conger)*, and ling cod (*Molva molva / Molva dypterygia*). The fishing sector in the Basque Country has seen its fleet shrunk to 50% from 1990 to 2002. This reduction has meant 40% contraction in the coastal sector, and 60% reduction in the demersal trawlers. The cod fleet has been reduced in 70%, and the tuna vessels have been reduced in 20% in both number of boats and crew. Despite this reduction over the past 17 years, the fleet is still experiences a substantial renovation, supported by the Basque government.

2.4. Pelagic resources and management: The European anchovy

Anchovy fishing in the Bay of Biscay has traditionally been a Spanish right. After the entry of Spain into the European Community in 1986, the French pelagic trawling fleet gained access to the Biscayan fishing grounds. The initial distribution of shares allocated 90% for Spain and 10% for

France. The Archachon Agreement (ratified in 1992 and reissued in 2003) has considerably softened this distribution, resulting in much larger quota shares for the French fleet. Contentious issues were the fishing techniques of the French fleet (banned in Spain) and its fleet growing up to 150 vessels. The fisheries are now well separated in space and time, and share the TAC granted by the EU. The Arcachon Agreement, however, it is not palatable to the Spanish coastal fishermen.

Since the 1980s the EU placed restrictions on annual catches of anchovy in the Bay of Biscay. TAC applies to the whole ICES Division VIII and is distributed among the French and Spanish fleets via a system of fishing licenses (Del Valle, Astorkiza, Astorkiza, 2000; AZTI, 2006). Traditionally, TAC has been decided on an annual basis by the Council of Fisheries Ministers. This decision was based on scientific advice provided by ICES Advisory Committee on Fisheries Management (ACFM) and the Commissions own advisory body, the Scientific and Technical and Economic Committee on Fisheries (STECF). The Commission makes proposals which are accepted or rejected by the Council of Ministers. This annual procedure, trying to provide for exhaustive political deliberation, may bring various disadvantages for the sector.

In recent years, the ICES repeatedly reported that the anchovy's stock in the Bay of Biscay suffered a reduced reproductive capacity and was outside safe biological limits (SBL). In 2000, ICES recommended the closure of the Anchovy fisheries, because of poor recruitment and low SSB estimates. Despite of this, the Council of Ministers decided to keep the TAC in 33,000t as in previous years.

The fishery of European anchovy had been closed in July 2005 after a collapse of the stock resulting in a sharp decrease of catches by 98% (Regulation EC No 1037/2005). The ban had initially been proposed for a period of three months, although it has been prolonged several times (Regulation EC No 1539/2005). The ban on the anchovy fishery has even been interrupted in spring 2006, which caused considerable discontent in both France and Spain. The Arcachon Agreement forbids that the French fleet target anchovy in spring, while Spanish vessels fish. The resumption of the closure of the fishery at the beginning of the French anchovy season has reluctantly been accepted and some fishermen have illegally targeted anchovy during the ban, which caused severe conflicts between French and Spanish fleet (Berria Info 2005[73]).

After the initial three-month ban set up in July 2005 and prolonged until December 2005, the new TAC has been set up employing a decision-rule mechanism. A cautionary TAC of 5,000 tons has been set up in the beginning of the year that was due to revision in June when new scientific data would be available. A Spawning Stock Biomass (SSB) level of 28,000 tons had been previously defined as within Safe Biological Level (SBL). In the case the biological data available would indicate a lower SSB level; the fishery would automatically be closed. This in fact led to the continuity of the ban in July 2006 as SSB level has been under the threshold of 28,000 tons (AZTI, 2006). It is likely that a similar procedure will be included in future management plans for the stock.

[73] http://www.berria.info/azala.htm

Since anchovy stock was still at peril with a SSB level below the SBL threshold of 21,000 tons (AZTI, 2006), the Council proposed that the fishery remain closed in 2007 (ICES 2007). The fishery was closed with severe economic consequences, especially for Basque fisheries. Since signs of recovery of the stock are not visible, a reopening of the fishing grounds is not in sight for the near future (AZTI, 2006). New approaches to management of this severely damaged stock are urgently needed, including revisable TAC, taking into account natural and human-induced fluctuations of the SSB, and thus, reproductive capacity of anchovy in the Bay of Biscay (ICES 2005a). Information on how anchovy in Community waters is to be managed in the future is scarce. Generally, management instruments like Vessels Monitoring System (VMS) will likely play a role in anchovy management. The European Union has announced in-year management plans for anchovy implying the setting of reversible and flexible TAC based on incoming scientific data (Bay of Biscay anchovy 2005). So far, these plans have not been accessible to the public. A second focal point will certainly be the limitation of fishing effort, which likely exceeds the capacities of the stock in the Bay of Biscay.

Spanish fishermen organizations agree with the closure of anchovy fisheries for the stock recovery plan requested to the European Community in 2005, when stocks showed the first signs of depletion. There has been some conflict between French and Spanish fishermen over the revision of the TAC for anchovy in 2005. Spain supports the continuation of the ban, while France opposes it (Martínez, 2006 ; Schönherr, 2006). After the preliminary reopening of the fishery in spring 2005, the Spanish fleet was able to fish anchovy (although not very successfully). When the fishery was closed again in June the French fishing season had only just begun. There have been calls in favour of abandoning of the Arcachon Agreement.

In 2006, the ministers negotiate with EU a TAC of 5,000 tons to the French and Spanish fleet, despite disagreement of the coastal Spanish sector and scientists recommendations. During 2007, the European Community set up a cautionary TAC of 5.000 tons for accomplishing “scientific experimental” anchovy fisheries. Since Basque coastal fishermen positioned themselves completely against with such cautionary quota, they consensually decided not fishing, instead of that they proposed to evaluate the fishing stocks through biological samples (catch and release).

2.5. Demersal resources and management: Atlantic European hake (Northern stock)

Northern hake is one of the most economically important target species in the Bay of Biscay. The demersal northern hake stock is considered mixed fisheries. The exact fishing techniques may vary from country to country. According to ICES data (2001) Spain accounts for about 61% of all northern hake landings in the EU, while France contributes in 23% to the total landings. The remaining 16% are shared between the UK, Denmark, and Ireland (AZTI, 2006).

Hake stocks are managed by means of an annual TAC and complementary technical measures, including restrictions on mesh sizes and other gears, as well as the deployment of observers on fishing vessels (Commission Regulation (EC) No 1162/2001). The annually fixed TAC for each

species has been replaced by a revisable TAC aiming at a multiannual consistency of quotas. This new procedure has been tested in the context of the Recovery Plan for Hake fisheries in ICES Divisions IX. Quotas are allocated to both French and Spanish fisheries targeting hake. Furthermore, the Commission has tried to reduce fishing effort in both fleets. France uses a special licensing system, while Spain keeps vessel a register, limiting the total number of vessels (OSPAR, 2000, Schönherr, 2006). As hake is caught in mixed fisheries, any management measures taken will have an impact on other commercial and non-commercial species, and the trophic relations between them. However, these factors are not yet sufficiently included in recent management considerations (ICES, 2005b).

The alarming state of hake populations resulted in the issue of an Emergency Plan since June 2001 (AZTI, 2006). After that, a number of new management instruments have been introduced by the 2004 proposal for a Long Term Recovery Plan in order to recover the depleted fish stock based on 'command and control management' of the EU. Currently, efforts have been made to introduce new management schemes, i.e. through the South-Western Regional Advisory Council (SWWRAC) and flexible TAC. This implies a tendency towards more participatory governance and the use of decision-rules in the management of northern hake stocks (AZTI 2006, COM (2003) 347final 2003).

Hake recovery Plan

A similar mechanism is provided in the Recovery Plan for Northern Hake of 2004. Articles 4, 5 and 6 of Regulation EC No 811/2004 are concerned with the procedure to setting TAC for Northern hake in the future. 100,000 tons have been defined as the baseline SSB level against which quotas have to be decided. TAC is still decided on an annual basis by the Council of Ministers but these are initial quotas that can be revised throughout the year. The goal is to reduce fishing mortality to a level equal or below 0.25. Moreover, stability in TAC setting is guaranteed by a clause which states that changes in the quota from one year to the next may not exceed ± 15% of the last year's TAC. A decision-rule mechanism takes over as soon as the SSB level falls below the 100,000 tons threshold. In this case a TAC needs to be adopted for the following year that has to be lower and should result in an increase of mature fish.

Some interviewees considered the recovery plan of hake as alarming und unnecessary. Others considered that the plan recovered the hake stocks. Actually, the main problem, according to the interviewees, concerning hake is the price of the fish. The price of fish in general has not increased since 20 years. Because Spain imports hake from other countries such as South Africa, Namibia, and Argentina it is a tendency to blame imported fish for low domestic prices. Another fact affecting negatively the price of Spanish hake is the presence of a parasite. As a consequence, many fishermen feel that is not cost effective to fish, what is especially true for the smaller fleet.

The industrial sector considers itself as excluded itself from the decisions concerning the measures that had been taken with regard to the recovery plan of hake: *"The recovery plans are good whenever are based purely on scientific criteria, but many of them have a certain tendency of being*

influenced by political aspects". Concerning to the recovery plan of hake, a representative of one producer organization expressed that *"our organisation always had a fear that the recovery plan was not sufficiently supported by scientific information. We have never understood how a recovery plan can be set so swiftly. We considered that hake was not doing so badly. Hake stock has been able to recover only in three years"*. This representative concluded that scientists' projections were *"excessively pessimistic because scientists tend to be cautionary and do not take into account the economic and social repercussions, since there are many people who live from fisheries"*.

3. Description of the management system

3.1 The Rights-Based Management system

3.1.1 From effort quotas to ITQs: The case of Spanish fleet in the NEAFC grounds

An excellent example on the evolution of fishing rights in Spain is given by the case of the offshore fleet (trawlers and long-liners aka industrial fleet) operating in the geographical limits of the Northeast East Atlantic Fisheries Commission (NEAFC)[74]. In 1981, the Ministry of Agriculture and Fisheries (MAPA) passes the order of 12th of June recognizing fishing rights -expressed as days at sea- to individual vessels in areas for which access mechanisms were granted (Gonzalez-Laxe 2007). The starting point for these allocations of rights was a census of the vessels operating in the aforementioned area. This census constituted the basis for allocation of rights. The original list of vessels was 416 boats[75]. Rights were allocated to individual vessels and the total amount of rights that a fishing company could accumulate was given by the sum of the rights of its individual vessels. Rights could be accumulated on vessels of the same company when scrapping one fishing vessel. Transferability of rights to vessels of other companies was not allowed without the selling of the fishing vessel.

In 1992 the MAPA passed the order of 12th of June that allowed accumulation of fishing rights to vessels of the same census. Besides the accumulation of rights the MAPA kept granting a bonus for scrapping. Accumulation of rights was possible among companies and harbors. These attractive conditions allowed the large restructure of the fishing fleet. In 1996, Galicia held 53% of the fleet, while the Basque fleet held 47%. In 2006, Galicia holds 74%, while the Basque Country holds 23% and Cantabria holds the remaining percentage.

In July 1997, the MAPA passed the Law 23/1997 that allows free transference of rights among companies, owning vessels in the same census, without transferring the property of the vessel. The concept of temporality is introduced and the law stated that right are allocated for a non-defined time.

Royal Decrees 1838 (November 1997) and 1915 (December 1997) establishes limits to fishing

[74] ICES areas VI, VII, VIII a, b, d

[75] In 1987 and coinciding with the entry of Spain to the European Community the fleet had shrunk to 300 boats. The "list of the 300" comprises long liners and trawlers enable to fish in Communitarian waters. Nowadays, the fleet is up to 199 boats.

rights, being the maximum 315 days and the minimum level at 210 days. In 2004, the Royal Decree 1596/2004 abolishes the upper limit for accumulation of rights for individual vessels but establishes a maximum limit of 30% of all possibilities in the fishery. In December 2006, the MAPA issues the order 3773/2006 establishing a system of individual transferable quotas (amount of fish) for vessels over 100 GRT operating in the ICES V b, V, VII and VIII a, b, d.

3.1.2 The anchovy fishery in the Bay of Biscay and territorial user rights

The *Cofradias* play a major role in regulating and managing of coastal artisanal fisheries in a co-management regime. There is a historical participatory system culture present on the local and community level, particularly in artisan coastal fisheries (Franqueza, 2004). *Cofradías* have traditionally shaped fisheries management under a common pool regime (Astorkiza, del Valle and Astorkiza 1998) based on strict regulation of extraction of sea resources and the management of access to those resources and the maritime domains where these resources are founded, as well as the marketing of fish[76]. The territorial component is such important that *Cofradias* management of resources can be considered as a territorial user right (TURF). It is a high degree of legitimacy and acceptance of the *Cofradias* among the population because of their traditionally important role in local fisheries management. *Cofradias* claim the right to exploit certain resources in a given area. For exploiting a given resource one must be a member of the *cofradia* (*cofrade*). Since the entry of Spain in the EC, *Cofradias* have had concerns regarding the sharing of the anchovy stocks with the French fleet that exploits the resource using technologies not allowed by the *Cofradias*. They consider the Treaty of Arcachon deleterious to their rights and a threat to the anchovy stock. *Cofradias* has reacted as a single man to face the challenges of the collapse of anchovy and have made their opinion respected through the Basque government and though active precipitation in the Regional Advisory Council first in the Pelagic one and then in the South Western Waters RAC. Capacity of react to threats and support by the civil society and local government may rest on their history and participatory organisation (see 4.2).

3.2 Participatory governance system

The coastal fishing of the Basque Country is regulated by different authorities. The competence of fishing regulation in territorial waters is shared between Spanish State and Autonomous Community Administration. The Autonomous Community (AA.CC) of the Basque Country is responsible for fishing regulations for the interior waters (until 12 nautical miles), while the competence of fishing regulation of the external waters (up to 12 miles) corresponds to the Spanish State. Furthermore, European Union legislation in fishing matters ranks higher than those described previously, i.e., state and autonomic legislation must adjust their decisions to those of the European legislation (Arregi *et al.*, 2004).

Since the entry of Spain into the EU, both the central government and the Autonomous Community

[76] Article 52 of the Spanish constitution on Corporate Administration officially recognises the special role of the *cofradias* in the Spanish constitutional state.

have ceded a part of their decision-making capacity to the Community, accepting certain obligations concerning the adoption of legislation. Generally it remains that the central authorities are responsible for basic legislation, while the AA.CCs hold the competencies for its implementation and enforcement (Schönherr, 2006).

The management of fisheries is generally structured in a centralized way. Notwithstanding, there is a process of decentralization going on, conferring more and more competencies on coastal AA.CCs (Van Hoof et al. 2005, Schönherr, 2006). In the Spanish Basque Country, the extractive sector has been pre-eminent and best represented in decision-making processes. Lately, there have been efforts to coordinate the fisheries policies among the AA.CCs by means of founding the Committee for the Coordination of Fisheries Management in the Western Shelf. The committee held its first meeting in February 2006.

Generally, participation of stakeholders in political decision-making in Spain has resulted in a relatively inefficient and slow process. Political decisions are often based on scientific recommendations without other agents being involved. At the state and autonomous community levels, no real participation of stakeholders occurs. Consequently, measures taken are often perceived as distant and/or alien by the sector (Van Hoof et al. 2005, Schönherr, 2006). Notwithstanding, efforts have been done to strengthen stakeholder representation. Some measures include allocation of subventions to different projects within the fishing sector in order to assure quality and socio-economic viability.[77], the acquisition of new business partners, and the improvement of the representation and participation of fishermen's associations in decision-making both on the national and international level[78] (BOE 05/23/2006 No 8995).

3.2.1 Participation in the Regional Advisory Councils

The management through participatory governance is just starting in the European Union through the Regional Advisory Councils (RAC), in which fishery industry groups are being recently organized to participate as a supplier of advice. The Regional Advisory Councils (RACs) were established as part of the reform of the CFP (Common Fisheries Policy) in 2002. Such measure aims at active participation of stakeholders in the decision-making process in fisheries management in the EU. The Council has created seven RACs[79]. Furthermore, they have decided to establish an Inter-RAC Committee to cope with questions of common interest which demand joint delivery of policy recommendations (DG Fisheries 2006a[80]).

Especially relevant to the Basque fisheries is the South-western waters RAC which has great

[77] The responsible organisation is the Fund for the Regulation and Organisation of the Fisheries and Fish-Farming Products Market "Fondo de Regulación y Organización del Mercado y Productos de la Pesca y Cultivos Mariscos (FROM"), http://from.mapa.es

[78] Funds are also reserved for scientific research and professional training of fishermen, as well as the strengthening of communication and the diffusion of information relevant to the fishing sector.

[79]North Sea RAC (since 2004), Baltic Sea RAC (since 2006), North-western waters RAC (since 2005), Pelagic stocks RAC (since 2005), Mediterranean Sea RAC, the South-western waters RAC, and Distant waters fisheries RAC (2006 and 2007, respectively).

[80] http://ec.europa.eu/fisheries/faq/resources_en.htm#1

importance for the management of anchovy and hake stocks in the Bay of Biscay. This council covers ICES Division VIII, IX and X as well as the waters around the Azores, Madeira and the Canaries (ICES 2006). It is relevant to say that a Basque representative leads this RAC. Another meaningful RAC to the Basque fisheries is the Pelagic RAC which was founded in August 2005 and deals with pelagic resources found in the North and South Western Waters, and the North Sea[81]. In the opinion of some stakeholders, RACs are seen as a good mechanism of participation, as reported by a key boat owner representative: *"We had always complained about a lack of communication with the EU, and many of our ideas have never been considered. My opinion is that RACs have positive and negative aspects. Logically, it has positive aspects, such as enhancing dialog among member states to approach consensus, and to improve knowledge. Within the framework created by the EU and the fisheries industry sector, we convey many opinions on how managing the fisheries. Certainly, some years will be necessary to approach a dialog and to change mind. We must look for a management system that is not only sustainable and respectful, but also equalitarian"*.

RACs are also seen as a good platform for negotiation, a key representative of the Fishing Guild of Hondarribia recalled a negotiation between Spain (Federation of Fishing Guilds of Gipuzcoa) and France through the Pelagic RAC. The Spanish fleet aimed at fishing in the Lagaron, (in the mouth of Garrona river, 130 miles to the North), which is jurisdiction of France. This zone consists on a very rich area of small anchovy, which is used as bait to catch bonito. Spanish coastal fleet proposed to interchange quotas of anchovy for fishing in these areas during some weeks of the year.

3.2.2 Participation in the Cofradias

Fishermen guilds in Spain (so-called *Cofradias*) have a long history. Some of the current *Cofradias* were founded during the XII to XIV century as economic associations under religious bases (Erkoreka Gervasio, 1991). In the beginning, such guilds established agreements between the fishermen community and the King (or the Church) to exploit fisheries resources in specific areas. Under the influence of the French Revolution, different governments tried to abolish the guild system during the XVIII and[82] XIX centuries, which produced disorganization, conflicts and overexploitation related with the free access. Notwithstanding, fishermen guilds in fact did not disappear. *Cofradias* changed its appearance from religious institutions to industrial associations, cooperatives and trade unions (Franquesa, 2004).

Cofradias have a system of representative parity between shipowners (*álcades mayores*) and crew (*álcaldes menores*). The consultative body is represented by the president, vice-president, and directive body. The presidential elections occur every four years. A fisherman becomes *cofrade* after being contracted; however, just after two years he can take part into decisions (e.g., to be a

[81] http://www.pelagic-rac.org

[82] According to Franquesa (2004) an excessive and unreal number of Cofradias are being maintained in Spain. These require amalgamation and reorganization of the Cofradias. According to this author, about 75 Cofradias, instead of 229 in all the Spanish coastal line and islands, could be enough to regulate fishing grounds in Spain.

representative member of the crew). Every boat has a fishermen representative (so called second skipper), who takes part into presidential elections, and participate to the meetings and assemblies. A representative of the *Cofradia* de Hondarribia stated that *"the Cofradia itself does not have changed so much, we follow the same. Each fisherman is a cofrade, and once retired he continues taking part into the Cofradia. We have always dedicated ourselves to the same fishing arts, which knowledge used to be passed from parents to children. Young people do not want to go to the sea anymore, so the fleet deceased, we must bring foreigners. We are now 40 boats, the shipowners are younger, from 27 to 40 years.*

The entry of Spain to the EU added a difficulty; the EU regulations promote Producers Organizations (PO), which differs from *Cofradias* in several features. The PO is voluntary, while the adhesion to *Cofradias* is compulsory to fishing in a given area. Moreover, PO associates only the owners while *Cofradias* associate also the crew, which is particularly important for participation and compliance in any agreement and decision-making process. A practical measure firstly adopted in Gipuzcoa and then extended to all Spain includes the establishment of a legal institution as PO that depends fully on the *Cofradias*. Such kind of apparent PO can solve many of the past conflicts because allows complying the EU requirements and maintain the self-control over the territory.

Presidents of the Federations of Gipuzcoa and Biscay agree that positive internal changes occurring in the *Cofradias* last years include improvements in the administration through implementation of informatics system (e.g., invoices, contracts of member of the crew, fish commerce), staff qualification (e.g., skippers must have skills in the computer science in order to inform which species is captured and where), and renewal of the fishing fleet with EU subsidies. Most of these changes happened to respond to Spanish State and European Community demands.

3.2.3 Participation in the national organizations

The most important POs (producer organizations), fisheries associations and trade unions in Spain at the national level are the National Federation of Fishermen' Guilds (FNCP), the National Organisation of Fisheries Associations (ONAPE) and the Spanish Federation of Fisheries Organisations (FEOPE). Moreover, shipowners' associations and producers' organisations play an important role in the marketing of fish products and the provision of harbour services for industrial and artisanal fisheries, respectively. FNCP represent 225 associations of fishermen primarily active in coastal fishing, ONAPE represents 12 regional deep sea fishing associations, and FEOPE are representative of owners of fishing vessels that operate especially in the Bay of Biscay, the Mediterranean, the Southern Mediterranean and the South Atlantic.

3.2.4 Participation in the industrial fisheries organizations

A producer organization, such as OPPAO, which is based in Ondarroa, is represented by a general consultative body constituted by twelve directors and a president. All of these members are chosen in an electoral process every four years. Only the consultative body takes part into the meetings,

while all the companies participate in the general assemblies once or twice a year.

The industrial sector from the Basque harbor of Pasajes (NORDPESC) takes part into the Cooperative of Vigo (ANASOL), which represents several other industrial fleets. The industrial sector stakeholders have no relationship with the coastal sector (*bajura*). The interviewees believe that national organizations represent the interests of the industrial fleet, but not in the extension that should be, because each fisheries category defends its own interests.

Two main problems have not been solved yet, the low prices of the fish in the market due to globalization of fish trade, and depletion of the fishing stocks. A representative of one Basque producer organizations let us know that *"what will determine the future of the Europe fisheries and ours in particular is the market. The market behaves in a completely anarchical way, with a total freedom. While some countries export fish with little or any sanitary guarantees, a European fisherman is asked to fulfill the criteria of sustainable development, taxes, social security, etc"*. New demands and expectations include alternatives to overcome with the lower prices due to concurrences in a globalize market. One possible solution could be the creation of a "label", which has been discussed between the organizations and the Basque Government. Such label could distinguish fish product quality and inform consumers concerning to the fish origin, fishing gears used, and so on.

3.2.5 Participation of women in fisheries

Women (usually wife, mother, or daughter of the shipowner) have been played a historical role in the *bajura* fisheries of the Basque Country. Traditionally, the men fish and the women market the captures. Besides sewing the fishing nets, these women have done several activities in the harbors, such as organization of the fish prior to be sold, collection of the money, and payment to the crew.

Nowadays, women still play a role in sewing the nets during the seasonal fisheries of the pelagic fish species such as anchovy, Atlantic horse mackerel, sardine, Blue fin Tuna, and mackerel. Small individuals of horse mackerel and anchovy are used as bait for catching tuna fish. Some women also help in organizing, unloading and weighing the fish prior to the trading at the *Cofradias*.

Despite of being involved in many fishing activities, women do not take part into the *Cofradias* neither have any social welfare. One interviewed woman in the Port of Ondarroa reported that: "*Since the beginning nobody wanted us. Now we are organizing a women association in Gipuzcoa, Biscay, and Galicia. It is an artisanal work that we learned in the house of our parents and we have done it for years"*.

4. Analysis of social robustness

4.1 Stakeholder acceptance

4.1.1 How stakeholders see government

Consensually, Basque coastal fishermen do not feel properly represented by the Spanish national state (see, for example, the low acceptability of the Arcachon Agreement). Fishing quota of the *bajura* sector at the Cantabria level is managed by the Spanish State, which negotiates with other fishery sectors a right acquired for historical activity of the coastal fishermen. For example, the Spanish Senate has recently given licenses for the category surface-long line to fish tuna, which has been historically a quota of the purse seine fleet. A similar negotiation has been carried out for mackerel. A Basque Fishing Guild representative pointed out that *"We feel disrespected concerning to the decisions of Madrid (MAPA), as well as concerning to the international agreements especially between France and Spain. Mackerel, for example, is now being fished by the industrial vessels known as the list of the 300 (see note 2), which takes advantages on the species traditionally caught by the coastal fleet"*.

On the other hand, the work of local government regarding fisheries issues is largely accepted by stakeholders both for the coastal and industrial sector. According to the interviews, the Autonomous Government of the Basque Country is involved with fisheries policies, supporting and defending local producer's interests to the Spanish State. Moreover, the local government supports research on fisheries topics.

4.1.2 How stakeholders see rights and their dynamics

Ship-owners of the industrial fleet consider that *status quo* has been negatively altered, since most of the fishing property rights were purchased by Galicia. Factors attributed to the growth of fishing activities in Galicia include mostly subventions to the industrial fishermen organizations for the acquisition of licenses and boats. Furthermore, many ship-owners decided to move from ports of the Basque Country to Galicia, where benefits are better concerning crew salaries running costs and boat maintenance. One interviewed ship-owner of the Basque Port of Ondarroa considers that: *"Privatization of property rights has not done well for us, since some companies that in the previous years did not buy licenses have a very little quota to fish now. After the distribution of quotas, many companies have not been in good situation, since licenses from the Basque country were bought by Galicia. The Port of Pasajes is actually in OPPAO, since the boats there started to disappear. The Port of Ondarroa is also decadent, since many people does not have quota to work all over the year"*. He continues pointing: *"I believe that fishermen have much more force at the Galicia level because they worried about the fishing industry concerning to buy rights and renew the fleet and also because costs are lower there than here"*.

4.2 Evolution of the management system and institutional learning:

Table 1 (input from Astorkiza, del Valle and Astorkiza, 1998) explains the long development of *cofradias* as holders of historical rights on exploitation of pelagic resources and territorial rights.

Cofradias have managed to survive by adapting to changing political conditions and in the last years to collapses of key resources such as anchovy. Moreover, they show openness to the emergence of new management tools such as harvest control rules and are active in the development of management plans. Its capacity of lobbying and strong support from the Basque government ensures that they can react swiftly to threats.

Time	**Management System/ implementation of tools**	**Type of institutional learning**
Middle ages	Emergence of *cofradias* and its territorial rights	= Baseline
French Revolution	Abolishment of *cofradias*.	*Cofradias* transformed to mutual aid societies.
1873-1936	*Cofradias* are forced to accept free enterprise. Emergence of industrial fleets.	
Dictatorship 1936-1975	Part of trade unions. Responsible of representation and training of fishermen.	
Transition to democracy 1976-1983	Recognised by the Constitution as Corporate Administrations.	Introduction of historical rights in the constitutional regime.
1983	Emergence of autonomous communities. Consultative body in collaboration with administrations.	Consolidation of *cofradias* as suppliers of advice based in experience.
1986	Entry of Spain to the EC. France participates in the exploitation of anchovy.	Modernisation of the sector.
2002-to date	Reform of the Common Fisheries Policy. Federation of *Cofradias* participation in the RACs	Active participation in the Communitarian management process.
2005	Collapse of the anchovy stock.	Participation in the development of management plans through RACs platform.

Table 2 explains the development of the RBM in the industrial Spanish fleet operating in the grounds of the NEAFC. Notice that the evolution has taken place along a 25 year period. Evolution has been quite natural. The fact that rights were accumulative from almost the beginning determined that some vessels gain rights from scrapped ones. As a result of incentives to decommission (i.e. the possibility to transfer the rights and gaining a bonus after scrapping), a restructure of the fleet was produce. At that stage, there were more rights than vessels. The introduction of free transferability of effort rights may have balanced rights and vessels. Free transferability between ports and companies may have determined the predominance of Galician

boats. After 25 year, the system has shift from a system of input quotas to output quotas through the implementation of an ITQ system. This ITQ system is not entirely market based as the Icelandic system. Transference of rights is still done among participants belonging to the original census.

Time	Management System/ implementation of tools	Type of institutional learning
before 1981	Open access fishery	= Baseline
1981	Census of the Spanish vessels operating in the in the NEAFC domains.	Concern in identifying the size of the fishing fleet
1981	Allocation of effort rights to individual vessels. Accumulation of right within the same company when scrapping a fishing vessel. Accumulation only possible when selling the vessel.	Rights are understood as a limit on participation in the fishery. Concerns on overcapacity.
1986 Spain in the EC	List of the 300 vessels with right to fish in the NEAFC.	
1992	Rights on effort can be transferable only to vessels of the same census and are attached to a fishing vessel. Accumulation is allowed among different harbours and companies.	The aim of attaching the right to the vessels is understood as a means to get read of redundant capacity.
2005 to date	Participation in the RAC of South-Western Waters (SWWRAC).	Adaptation on new requirements of the improved CFP.
1997	Transference of the rights on effort is allowed without the requirement to transfer the property of the vessel. Limits are established for concentration of rights.	The excess of capacity is apparently eliminated and the transferability may enable that excess of rights on some vessels could be distributed among the rest of boats.
2006	ITQ system is introduced.	Shift from the effort quota to the output quota model. Transference is still only allowed for participants in the fishery (original census),

5. Discussing the hypotheses on social robustness

Hypothesis 1: Rights-based management systems tend not to have broad stakeholder representation.

In the Western Shelf case study, none representation by groups other than fishermen was found in

the two RBM cases studied: ITQs for hake and other demersals and TURFs for the Bay of Biscay anchovy. It is hard, however, to assess whether the RBM system has created the narrow stakeholder representation as proposed in hypotheses 1 or if it is due to other factors. A lack of participation of conservationist could likely be the result of the small or negligible room for non-traditional stakeholders in the management process at national or Community level. Basque green ONGs have views on the fishery issues and convey their opinions to the civil society through the local media. However, they do not have any officially recognised consultative role in the management of Basque fisheries. Although representation is narrow; RBM seems to have built strong and active participation for industrial and coastal fishermen. They have an active consultancy role in fisheries management within the autonomous Basque jurisdiction. They are active in lobbing and through their government they express their needs to the central Spanish government and to Brussels. Furthermore, Basque fishermen are active in four RACs and even have leading roles in some of them.

Hypothesis 2: Commercial fisheries actors' acceptance of a (RB) management system will be a function of the extent to which a) the management system is perceived by the fishermen to be practical [and necessary]; b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced; c) which new entrants are facilitated; d) which retirement options are provided for.

The acceptance of the two kinds of RBM in use in the Basque country is relative. In one hand, the system gathers all the conditions to satisfy fishermen since: (a) the system has clearly established rules and it is accepted since it has been evolved from an open access situation that was deleterious to the resource; (b) the initial allocation was based on historical criteria, having as a starting point a census; (c) It has facilitated new entrants although they are required to buy licenses or rights from vessels from the original census and; (d) The RBM system has given facilities to the fishermen for retirement since they have been allowed to selling the right to fish and also receiving a bonus for scrapping. However, some of the Basque industrial stakeholders interviewed pointed that they do not feel satisfied with the evolution of the RBM system implemented. This unconformity is not result of the management system itself but of the unequal conditions when competing with other fleets such as the Galician. Indeed, the evolution of the RBM based on individual effort quotas has changed the face of fisheries and the specific weight of Basque fleets in the NEAFC area. Basque fleet has shrunk due to transferability (introduced in 1997), which has allowed the Galician fleet to growth in terms of number of vessels and rights. Basque stakeholders see that factors not easily controllable such as lower crew and maintenance costs may have determined the predominance of the Galician fleet. So we need to be careful in taking these expressions of unconformity as a measure of rejection of the RBM system itself.

In the case of the coastal fleet or bajura, factors that theoretically may produce the acceptability of the RBM system are present in the fishery: (a) the management system is perceived to be practical and necessary because Cofradias have the right to partially manage the fishery, for example, by proposing technical measures and advice to managers at regional (Basque Country) and national level (Madrid); (b) the rights allocation reproduced the status quo because Cofradias's rights to

exploit and manage were established by law and are respectful of the historical presence of the Cofradias in these area; (c) new entries are allowed but through Cofradias. Indeed, no one can fish in a given area without prior acceptance by the Cofradia concerned and; d) retirement options have been provided for those wishing to leave the fishery through incentives to decommission. Acceptability of the system, however, is relative since it depends on external factors. For instance, the most referred source of concern is the Arcachon Agreement that allows French pelagic trawlers (technology banned in Spain) to exploit the anchovy stock. They blame the central government of Spain for giving facilities to "intruders" to exploit the aforementioned resources they consider a historical right of Spanish Cofradias. Facilities for entrance of participants using different fishing technologies are definitely unpalatable for the bajura sector As it was pointed in the case of the Basque industrial fleet, acceptance of the RBM system does not necessary rest on the intrinsic characteristics of RBM (see hypothesis 2) but on other factors that are not directly connected to it.

Hypothesis 3: The more diverse stakeholder involvement in the development and/ or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors.

Involvement of stakeholders is narrow in the Basque fisheries on the Western Shelf. As pointed out before, conservationists and other groups are not involved in the management process. The acceptance of stakeholders regarding the Basque government and its intervention in management is high. Low acceptance is found in relation to the second level of management for Basque fisheries, which is the central management by the Spanish government. Basque stakeholders seem to be disconformed with the management by the central government since they think it do not fully take into consideration the needs of the Basque fleet. Basque stakeholders argue that the central government has many fisheries to manage (diverse stakeholder involvement at national level) and cannot assure everybody's satisfection. But the main complain of the Basque fisheries is what they call "low support from the central government" when validating the access of French fleet to anchovy through the widely criticised Arcachon Agreement. Moreover, Basque stakeholder sees the complexity of management in Europe as a problem to face Basque fisheries problems. In this context, the interviewed stakeholders see RACs as a good platform to express their ideas, give their advice and defend their rights, besides being a point of encounter with counterparts of other nationalities in a sort of platform for negotiation. To sum, in the case of the two Basque fisheries studied the hypotheses 3 is confirmed at national and European level but not confirmed at local level.

Hypothesis 4: Rights-based management systems restrict capacity for institutional learning.

In the case of the industrial fleet, it seems that the RBM system has not impeded the fishery to adapt to changes in the fishery system. Thus institutional learning has taken place regardless the RBM mechanisms introduced. Rights have evolved naturally since decommissioning of vessels produced an excess of effort rights (expressed in days at sea) that needed to be transferred to other vessels within the census. The shift to transferability of rights (rights not been attached to the vessel) have allowed a more efficient distribution of rights. The recent introduction of a proper ITQ in the fishery has not been resisted, although seems to be not very palatable for some of the stakeholders

that have seen their effort rights absorved for the most effcient (e.g. Galician fleet). Thus it is likely that right will continue being gathered by the most effcient actors in detriment of the less efficent. Other major change that has been welcomed is the enhancement of partcipation in the managment process at the EU level though RACs . Such a change has been welcomed since RACs are seen as a platform to defend their interests and to deliver advice to managers.

In the case of the coastal fleet targeting anchovy in the Bay of Biscay, the management through rights has not impeded the fishery to adapt to the requirements of Brussels regarding participation in RACs, renewal of the fishing fleet and incorporation of measures on security on board. It is worth pointing out that Cofradias react as a single man to face challenges. They have an active voice when proposing the closure of the anchovy fishery because they see the recovery of this stock fundamental to the sustainability of the fishing activity. In this context, they have questioned the opening of the fishery even for the experimental campaign carried out by commercial vessels in 2007. To sum up, institutional learning seems not to be restricted by the territorial user rights (TURFs) approach since the sense of ownership of the resource encourages stakeholders to participate actively in the RACs and to find alternative and innovative measures to manage the stock. For example, the coastal sector is now involved together with scientists and managers in the development of a management plan for recovering the anchovy stock.

Hypothesis 5: The more diverse the stakeholders involved in the development and/ or operation of a management system, the more institutional learning takes place.

Stakeholders Involvement is quite narrow in the Basque fisheries. Conservationist groups, for example, do not participate and it is not a sport fishing sharing the resources. Besides stakeholders in both industrial and coastal fisheries it could be mentioned a third stakeholder, the government of the Basque country. It could be considered a stakeholder playing a meaningful role for the sake of Basque fisheries, which are conisdered as strategic to the Basque region. From the above it is notable that partcipation is narrow in the managment process of Basque fisheries. However, institutional learning have taken place in the last years in both fisheries This fact does not confirm the hypothesis above. Simple learning has taken place in both fisheries, for example, the swift adaptation to the new requirements of Brussels on modernisation and withdrwal of fishing capacity, involvment in RACs and, in the particular case of the coastal fisheries, institutional learning at complex level when shifting objective from rent maximisation to resource protection. Coastal stakeholders were active in requesting the closure of the anchovy fishery and supportaitve to scientific advice even when it meant the indefinite closure of the fishery. Now they are activly involved in the development of the anchovy managment plan. Moreover, the swift reaction and opposition to what they perceived as a threat (e.g. experimental campaign spring 2007) has proved their high problem capacity.

6. Conclusions

Participation and access rights are not new for Basque fisheries. TURFs for anchovy and other pelagics have a long history in the Bay of Biscay. Participation is found in the traditional

organisation of the *cofradias*. Coastal and industrial Basque fisheries are involved in a wide process of participation. They are active in lobbying and participate actively in advice-giving within the boundaries of regional management and at the European level in the RACs where they have leading roles in the Southern Waters and the Pelagic RAC, in addition, they participate in the Distant Water and North Western Waters RACs. At national level, they see that their efforts to defend their rights encounter a bottle neck due to the Spanish State is not able or willing to take their claims into account due to the diverse national needs it has to address.

Rights on inputs and outputs are also in place for Basque industrial fleets. Since early 1980s input quotas to operate in NEAFC grounds have been distributed among Basque and other regional fleets in the Spanish side of the Western Shelf. Rights have been allocated reproducing the *status quo* and have given facilities and advantages for retirement.

Basque fisheries are complex and we can see that acceptability of rights management have not been as expected (see hypotheses section). The narrowness of actors' representation in the processes may be due not only to the strength of fishermen's rights that could block conservationist to participate. It may be due to the lack of understanding on the role of these groups in management what determines that there is not room for them in the three stages of fisheries management for Basque fisheries: the regional, the national and the Communitarian level. Theoretically, the rights-based management should be accepted due to rights hold historical components and provide exit compensation. However, they are not widely accepted due to other factors (e.g. lower running costs, managerial capacity) that may have determined the predominance of Galician fleet in terms of rights and number of vessels.

Rights in the Basque fisheries in the form of TURFs for the anchovy and other pelagics and individual quotas for the fleet fishing in the NEAFC have not restricted institutional learning since these fleets have been evolving during the last twenty-five year. During the last decade they have adapted to the demands of Communitarian management of fisheries. RACs is seen as platform of participation and understood as a mechanism to speed up communication with Brussels. As a consequence, Basque fleets have representatives in four RACs. The evolution of transferability of rights for the Spanish fleet, the capacity for lobbying of the coastal fisheries and the openness to innovations (e.g. active participation in the design of the management plan for anchovy) show that institutional learning have not be restricted because of rights. It is possible that the ease in adapting to and accepting management innovations is motivated by the risk of collapse that experienced the hake fishery and the collapse experienced by the anchovy fishery. These two factors may have been one of the main components in triggering institutional learning. Institutional learning in this case may have not been caused by the diversity of stakeholders because representation of groups is narrow and involves only fishermen groups. However, it is interesting to see that the regional government can be considered a stakeholder due to the efforts carried out to keep the wellbeing of the fishery. This may be one of the reasons of success for institutional learning in this fishery.

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Appendix 5: Guidelines for interviews

Context/background questions

The aim of the interviews is to test the hypotheses. But a number of explorative questions are needed before we can test the hypotheses; we need to have some sort of basic idea of the field (depending on the literature some of this information can be obtained before going to the field).

- How is the management system setup?
- What is the history/development of the system?
- What have been the ups and downs in history?
- Which fisheries are important in the area?
- Which species and which gear types are more important?
- Which are the relevant institutions?
- How are decisions made?
- What are the processes/institutions behind the decisions?
- Who can influence the process?
- Who are the relevant stakeholders in the case?
- How are the stakeholders organised?
- How/where are they represented?
- You will also need to ask some basic questions on the community (or communities), which is defining empirically the boundaries of your case study
- Economic development / prospect of the fishery
- And so on (please add more in your comments)

Questions about the informant

- Who is the informant?
- Where does he/she work? In what kind of institution? Which role in the institution?
- Personal background/education/ previous jobs

Testing hypotheses

We are going to talk to many different people in the field. And the questions asked have to be asked so they fit the situation (who you are talking to and what you want to know). I haven't made a specific list of possible question but a framework taking a starting point in the hypothesis.

The system below is fairly easy and systematic: Each hypothesis has been broken up to the key-components. Under each component I have made suggestions for a number of questions/ways of

knowing/researching. The suggestions are based on our work in Pasaia. Some of the questions are duplicates; but the hypotheses are overlapping.

HYPOTESIS 1

Rights-based management systems tend not to have broad stakeholder representation

RBM systems…

- The basic questions should make a majority of input we need here.
- what kind of rights are distributed
- how does the system allocate the right
- are the rights transferable / heritable
- what are the consequences of this at the individual / community level?
- how does the RBM system in question operate on a daily basis
- etc

… tend not to have broad stakeholder representation

- Who are the relevant stakeholders in the case? - (or who is involved and who is perceived as relevant?
    - Commercial fisheries interests: primary interests (harvesters – industrial, small-scale, subsistence etc.; gear types; nationality) and secondary interest (processors, marketing, other businesses directly depending on the fisheries business – boat builders, gear suppliers, chandlers…)
    - Fisheries management: managers and scientists/ advisors
    - Non-commercial interests: Conservation NGOs; community and family; recreational/ angling interests; consumers
    - Other commercial interests related to the marine environment: aquaculture; oil, energy, tourism etc.
- How/where are they represented?
- How are the stakeholders organised?
- How do the stakeholders collaborate internally?
- Do the stakeholders respect each other/each others stake?
- What are the processes/institutions behind the decision-making?
- Who is involved in decision-making?
- Who else can influence the process? How?

HYPOTESIS 2

Commercial fisheries actors' acceptance of a (RB) management system will be a function of the extent to which

a) the management system is perceived by the fishermen to be practical[83] *[and necessary]*

b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced

c) new entrants are facilitated

d) retirement options are provided for

Commercial fisheries actors' acceptance of a (RB) management system

- Do the commercial fishermen accept the RBM system?
- Does the system have general support from the fishermen?
- Do they comply with the RBM system's rules?
- Do they engage in it?
- In that case; which parts of the system are they engaged in?

... will be a function of the extent to which a) the management system is perceived by the fishermen to be practical [and necessary];

- Discuss the every day practises with the commercial actors
    - Where do they face obstacles?
    - Where does the system work smoothly?

… b) the management system (in RBM: the initial allocation) reproduced the status quo of fishing opportunities when introduced...

- This is something we should know from our background studies.
- Otherwise we can ask relevant people of the developments.
- Has the initial allocation been made on the basis of historical catch? Was construction of the baseline (years to be included) contentious? Why? (e.g. because it excluded some interested parties)
- Is the equitable? If not why not? Can all fishery participants take part in the RBM system, or are some excluded (e.g. on grounds of vessel size delineation, see Case Study Alaska)? How did those excluded react?
- What are the consequences (possible consequences) of exclusion?

…c) new entrants are facilitated

[83] e.g. is transparent; not too complicated; no necessity to break the rules; easy to monitor so that others are prevented from cheating etc.

- Find out how new entrants are facilitated
- Ask the fishermen how they think issues of new entrants should be facilitated in the system.
- Ask the fishermen if they are happy with the systems for newcomers.

…d) retirement options are provided for

- Find out if the system can provide retirement
- If so, find out how the retirements are provided
- Ask the fishermen how they think issues of retirement should be facilitated in the system.
- Ask the fishermen if they are happy with the systems for retirement
- What happens to the right when somebody dies? (heritable/reallocated?)

HYPOTESIS 3

The more diverse the stakeholder involvement[84] in the development and /or operation of a management system, the lower the acceptance of the concerned commercial fisheries actors.

The more diverse the stakeholder involvement in the development and /or operation of a management system …

- Who are the relevant stakeholders in the case?
    - Commercial fisheries interests: primary interests (harvesters – industrial, small-scale, subsistence etc.; gear types; nationality) and secondary interest (processors, marketing, other businesses directly depending on the fisheries business – boat builders, gear suppliers, chandlers…)
    - Fisheries management: managers and scientists/ advisors
    - Non-commercial interests: Conservation NGOs; community and family; recreational/ angling interests; consumers
    - Other commercial interests related to the marine environment: aquaculture; oil, energy, tourism etc.
- How/where are they represented?
- How are the stakeholders organised?
- How do the stakeholders collaborate internally?
- Do the stakeholders respect each other/each others stake?
- What are the processes/institutions behind the decision-making?
- Who can influence the process?

[84] E.g. greens, processors, communities - but also other parts of the fishing industry.

… the lower the acceptance of the concerned commercial fisheries actors.

- Participation of the stakeholders in the management regime
    - Are the stakeholders engaged
    - Do the stakeholders attend relevant meetings?
- Views expressed by various stakeholders:
    - positive, neutral, negative
    - Do the stakeholders recommend other fishery actors to adopt their system?
    - Future prospects: What changes/ adaptations would they like to see in the system?
- Actions taken by the stakeholders (against a management regime, e.g. protest, lawsuits) as well as (non-) compliance with / infringements of the management regime

HYPOTESIS 4

Rights-based management systems restrict capacity for institutional learning

Rights-based management systems

- Please see under hypothesis 1.

… restrict capacity for institutional

- At the process level:
    - General:
        - What do you consider the most important learning effects in the evolution of the RBM system?
    - Simple learning (i.e. the attempt to more effectively achieve existing objectives):
        - What were the prime objectives that the stakeholders wanted to attain through introducing the RBM system?
        - Was the system changed over time to better achieve these goals? How?
        - What were the causes of these adaptations? Why was the original system not effective in addressing its goals?
        - Were these changes contentious?
        - Did the changes succeed, i.e. indeed lead to a greater attainment of the original objectives (in the perception of the stakeholders)?
    - Complex learning (i.e. changes in goals):
        - Did the stakeholders over time associate the RBM system with new objectives, and how were these institutionalised?/ Has the RBM system changed its objectives?
        - What were the causes of these changes in objectives? (changes in ecosystem, economic/ social/ political/ cultural conditions…)

        - Were these changes contentious?
        - Did the changes succeed, i.e. indeed lead to a greater attainment of the original objectives (in the perception of the stakeholders)?
- At the outcome-level:
    - High vs. low problem-solving capacity:
        - Did the institutional changes 'solve' (in the perception of the stakeholders) the problem successfully or not? *[overlap with above]*

HYPOTESIS 5

The more diverse the stakeholders involved in the development and/or operation of a management system, the more institutional learning takes place

The more diverse the stakeholders involved in the development and/or operation of a management system

- See above

…the more institutional learning takes place

- At the process level
    - What do you consider the most important learning effects in the evolution of the RBM system?
    - Simple learning (i.e. the attempt to more effectively achieve existing objectives):
        - What were the prime objectives that the stakeholders wanted to attain through introducing the RBM system?
        - Was the system changed over time to better achieve these goals? How?
        - What were the causes of these adaptations? Why was the original system not effective in addressing its goals?
        - Were these changes contentious?
        - Did the changes succeed, i.e. indeed lead to a greater attainment of the original objectives (in the perception of the stakeholders)?
    - Complex learning (i.e. changes in goals):
        - Did the stakeholders over time associate the RBM system with new objectives, and how were these institutionalised?/ Has the RBM system changed its objectives?
        - What were the causes of these changes in objectives? (changes in ecosystem, economic/ social/ political/ cultural conditions…)
        - Were these changes contentious?
        - Did the changes succeed, i.e. indeed lead to a greater attainment of the original objectives (in the perception of the stakeholders)?

- At the outcome-level
  - High vs. low problem-solving capacity:
    - Did the institutional changes ‘solve’ (in the perception of the stakeholders) the problem successfully or not? *[overlap with above]*