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Hauling Home the Co-Management of Coastal Fisheries:

A study on institutional barriers to fishermen's involvement
in the management of coastal fisheries on the West Coast of Sweden

Göteborg, 2004

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In memory of my father and brother with whom I spent many wonderful hours fishing.

Abstract

During the last decade, Swedish fisheries have been in turmoil. Faced with depleted resources and demands from a wide spectrum of stakeholders, the Swedish Government recently made clear the need for institutional reform. Within the framework of this reform a more participative fisheries management system is expected to lead to more sustainable outcomes.

This explorative and empirically based study is concerned with fisheries co-management and analyses various institutional aspects of the issues relating to shared fisheries resources and ecosystems in the coastal waters in the coastal waters of the Skagerrak Sea in Western Sweden.

The research applies an actor-oriented approach and a common pool resource theoretical perspective and engages the interdisciplinary debates on collective action, property rights and co-management. In this way, the dynamics of the interrelations between the social and the ecological systems in fisheries are uncovered.

The study provides a critical analysis of the dominant centralised co-management regime, which has dissociated conservation from allocation and tends to block, or at least delay, the emergence of institutions using local fishermen's management capacities. It reveals the significance of space and time in the organisation of coastal fisheries and demonstrates the impact that uniform policies and generic rules can have when applied to the use of common pool resources by a heterogeneous fishing community. It is argued that the lack of attention to the specificities of local coastal fisheries is closely related to the narrow conceptualisation of, and the limited knowledge base used in, fisheries management in general. A trend this, which has been reinforced by the way this management system has been organised and its responses to external factors and has constrained the local fishermen's ability to participate in the management process and secure access to coastal resources.

The study further explores local fishermen's initiatives to become more involved in co-management, analysing their feasibility and uncovering the context of emergence of the ongoing reform. The change consists mainly of the nesting of more pluralistic system of local and regional co-management in an otherwise more centralised co-management regime with corporatist influences.

Keywords: Fisheries, local management, co-management, coastal management, common pool resources, Northern Bohuslän, Swedish fisheries.

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CHAPTER 1

INTRODUCTION

This dissertation is concerned with the topic of natural resource management, specifically regarding fisheries in the coastal waters of the Skagerrak Sea in Western Sweden. It is about the complexity behind the problems confronted by local coastal fishermen in their attempts to share resources and participate in the management of coastal fisheries and ecosystems essential for fish. The study discusses how various aspects of the present institutional regime governing fisheries constrain the local fishermen's ability to take part in the management process and secure access to resources. It further explores local fishermen's initiatives to become more involved in co-management.

1.1 THE SCOPE OF THE PROBLEM

In the last decade, Swedish fisheries have been in turmoil. In most parts of Europe and the world, those concerned with the management of fisheries are confronted with similar problems. Marine capture fisheries have increased from about 19 million tonnes in 1950 to about 80 million tonnes in the mid-1980s. But the annual rate of increase of marine catches decreased almost to zero in the 1990s. The global proportion of overfished stocks has kept increasing for the last 25 years (Garcia et al. 2001).

The following citations illustrate the global character of the problem:

> "About 47 percent of the main stocks or species groups are fully exploited... Another 18 percent of stocks or species groups are reported as overexploited. Prospects for expansion or increased production from these stocks are negligible... The remaining 10 percent of stocks have become significantly depleted... Recovery usually implies drastic and long-lasting reductions in fishing pressure and/or the adoption of other management measures to remove conditions that contributed to the stock's overexploitation and depletion" (FAO 2002).

> "There is a generalised consensus that fishery management policies have failed to maintain harvests at sustainable levels with detrimental effects on fish stocks, catches, employment, income and consumption and that there is a need of reforming policy and changing priorities" (OECD 1997).

Symes (1996:8) has identified three broad tendencies of modernisation that severely affect coastal fisheries and underlie the turbulent condition of fishery management. These are:

> " the penetration of capital through industrial modes of exploitation, formerly identified mainly with the offshore sector and especially with distant water fishing ... but now increasingly evident in the inshore fisheries and in aquaculture;
>
> the appropriation of responsibility for fisheries management from local, industry based institutions and its relocation in the corridors of bureaucratic power in central government departments and supranational authorities like the European Commission;
>
> the globalisation of the food system as a result of which local fisheries no longer enjoy a monopoly of local or national markets but are increasingly engaged in intensive competition with sources of supply across the world."

The list of challenges facing fisheries today at the global level is long. The following challenges have been recently identified in an FAO report: over fishing, with related issues of resource collapse and endangered species; fleet over capacity, with the related issue of subsidies; environmental impact of fishing; illegal, unregulated and unreported fishing (IUU); poor selectivity and discarding; the environmental state of the coastal zone; the integration of fisheries management into coastal zone management; fish trade eco-labelling; the interface between fisheries management bodies and CITES,[1] and the collaboration between regional fishery bodies and regional environmental conventions (Garcia et al. 2001).

The situation described above is also relevant to Sweden. In Sweden, as well as in Europe, efforts have been insufficient in improving the situation with the resource and in counteracting the marginalisation of coastal fishermen. Recent studies and official documents conclude that despite tremendous efforts and good intentions, dominant fisheries management models have been ineffective in delivering sustainable outcomes. Fisheries in the coastal waters of Sweden suffer from problems of unsustainable fishing practices, with fish stocks being depleted and ecosystems deteriorating leading to there being less fish to share, and fewer and more elderly fishermen. Furthermore, recent studies in Sweden suggest that the established fishery management system has tended to privilege the offshore and recreation sectors, thereby further marginalising small-scale coastal fishermen (Hammer 1994; Hultkrantz et al. 1997). In addition with the increasing need for nature based leisure activities for people from the urban areas, the coast has evolved into an area where the values and interests of non-residents frequently predominate. In general, in Swedish coastal areas the relation to nature is shifting from the use of natural resources for production to the use of natural resources for services which is also changing the livelihood strategies of the local residents.

This situation leads to conflicts with disappointed fishermen, managers, researchers and consumers. At the heart of these problems lies the openness of and interconnectedness in the marine ecosystem, the fugitive nature of the fisheries resources, the issue of their sharing and the implications this has on fisheries management.

Faced with all these problems the governments with their fisheries authorities and the fishing industry are expected to foster significant change. But, how? There is no one universally successful management system.

1.2 THE RELEVANT POLICIES

The governing structures of the European Union have declared their intention to promote socio-economic development in regions that are dependent on fisheries, thus giving people, women and men, a prospect of staying in the region and contributing to the long-term survival of these communities (SOU 1998:24; European Commission 1999; European Commission 2003).

In a Swedish context the issue of keeping the rural coastal communities and archipelagos alive is addressed by the Swedish government. The notion of flourishing or living archipelagos - "en levande skärgård" – has become a recurrent theme in Swedish rural, regional and environmental development policies (SOU 1996:153; Glesbygdsverket 1997; SOU 2000:67).

[1] CITES stands for Convention on International Trade of Endangered Species.

In a Swedish policy context, fisheries management is expected to meet the criteria of social, economic and ecological sustainability. Sustainable development principles are formulated in terms of balancing three "E"s: Ecological sustainability, Economic efficiency and social Equity (SOU 1997/98:2). The use of such concepts could lead into a discussion of semantics; however pragmatically, it can be stated that fisheries management should a) safeguard the functionality of the ecosystem and the natural resource base; b) allocate the surplus among stakeholders using it efficiently; and c) guarantee that users share opportunities and the flow of benefits in an equitable way. In Sweden the management of fisheries should also guarantee that fish is a marketable product with accessible prices to society. In this sense the involvement of commercial or professional fishermen in fisheries management – which is the focus of this thesis – is a relevant research issue.

In 1998, and within the framework of the work with the development of an "Environmental Policy for a Sustainable Sweden", the Swedish Government formulated national Environmental Quality Objectives (EQOs) for 15 areas (SOU 1997/98:145). The EQOs describe a vision of Sweden's natural and cultural environment when ecologically sustainable development has been achieved, and set targets indicating the direction and time scale of the actions to be taken to reach it. One of these EQOs is titled "Balanced Marine Environment, Flourishing Coastal Areas and Archipelagos" (Naturvårdsverket 2003).

Within the framework of these national and European policies and objectives coastal ecosystems and small-scale fisheries are expected to continue contributing to the maintenance of coastal settlements at the same time that resource users are expected to care for coastal ecosystems.

The government of Sweden has further stated that an important task for research is to provide knowledge about how to solve environmental problems and assess whether the actions taken are leading to improvements (SOU 1997/98:145).

The above European and Swedish policies presuppose, however, that local producers have access to and control over natural resources in these areas, in other words, that the use and management of the local ecosystem and the "fish" is for the benefit of the local community. Taking this into account, and given the present panorama of depleted coastal resources and marginalised coastal fishermen, the Swedish government has recently declared the need for management reforms and is seeking alternative management approaches. This is a central theme in the lively Swedish debate over the management of fisheries, and to which this study seeks to contribute.

In 2003 the Swedish Parliament adopted two policy documents: one calling for a new marine strategy (SOU 2003:72) and one calling for new strategies for fisheries (SOU 2003/04:51). The documents put emphasis on the development of local coastal fisheries, the consultation and influence of stakeholders, and the testing of local collaborative management initiatives[2]. Collaborative management, referred to in the literature as co-management, is the sharing of responsibility and authority for the management of resources between the government and stakeholders. Both documents recognise deficiencies in the present management systems and highlight the need for increased user and civil society involvement. The Government suggests strengthening the influence of resource users at the local level within the framework of ecological, economic and social development, and in particular with regard to national environmental (EQO), regional and rural political goals. The National Board of Fisheries (NBF) has been commissioned to take the lead and coordinate pilot projects to test local co-management. As time goes on, a more participative fisheries management system, with less elements of coercion and control and increasing responsibility taking by the resource users, is

[2] The Swedish term used in the official documents is that of *lokal samförvaltning* (SOU 2003/04:51).

expected to be the outcome of this process. The aim of this investigation is to contribute to this process.

1.3 THE RESEARCH BACKGROUND, PURPOSE AND QUESTIONS

The research upon which this dissertation is based was conducted within the framework of a larger research program, the Sustainable Coastal Zone Management program[3] (SUCOZOMA) and its sub-program, Competing Interests and Conditions for Conflict Resolution (Glaeser and Píriz 1998; Bruckmeier 1998).

One central objective of SUCOZOMA, was that the research should produce knowledge to better inform decision making. Another was that the research should deal with the analysis and resolution of conflicts of interest surrounding natural resource based development and conservation in the coastal areas of southern Sweden. Multiple-use trends in coastal areas involving natural resource degradation, pollution, and depleted fish stocks were highlighted as critical tendencies deserving special attention. Another central aspect of the program was that the research projects should attempt to be interdisciplinary in character. In all individual projects emphasis should be given to natural resource management issues, the analysis of the established or dominant institutional framework governing the present situation and the analysis of alternatives. Prior to SUCOZOMA little research has occurred in Sweden about these issues.

SUCOZOMA's fundamental premises can be interpreted as follows: first, natural resource conflicts in coastal areas and coastal fisheries development deserve special attention through research; second, to be able to cope with these type of conflicts, some innovation would be required; and finally, the research process and understanding of the problems involved would benefit from an inter-disciplinary approach that involves natural and social science and integrates non-scientific knowledge, particularly the knowledge of those depending on the environmental quality of coastal waters for their livelihood.

There are a number of ways in which natural resource problems and conflicts can be managed and problems in fisheries be studied. Research on fisheries in Sweden has traditionally focused on studying components of the ecosystem with emphasis on "the fish" and only recently upon how society through institutional arrangements conditions the fishermen's abilities to access and safeguard the natural resources and their involvement in management. The involvement of the fishermen in management can be hypothesised as a set of tensions between user groups sharing a common pool of natural resources (*cpr*) and where cooperation and management alternatives emerge as a struggle for increased influence over the management of the ecosystem on which their livelihoods depend. Such issues have since the 1970s been explored by human ecologists and other researchers involved in interdisciplinary studies. Interdisciplinary studies inspired by human ecology traditions can broaden the narrow set of academic approaches and knowledge base shaping fisheries management.

This dissertation discusses problems confronting the shared use of common pool resources and how coastal fishermen from the West Coast of Sweden perceived the prevailing fisheries management regime in the late 1990:s.The main research question is:

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[3] The SUCOZOMA program was launched in late 1997 and became operational in 1998. The Swedish Foundation for Strategic Environmental Research (MISTRA) funded the program.

What constitute barriers to fishermen's involvement in the management of coastal fisheries?

There are three theoretical perspectives in this more recent interdisciplinary and institutional discussion of natural resource management which have inspired the orientation of this study. These are the collective action perspective, the property rights perspective, and the co-management perspective. These perspectives all postulate that for the success of any natural resource management system it is necessary to get fishermen voluntarily involved in the management process. Behind these perspectives lies a shift of research focus from the "fishes" to the "fishermen" and the institutional mechanisms mediating the fisherman's interaction with other fishermen and resource users and with the ecosystem.

This dissertation focuses on exploring what are perceived as barriers to the involvement of fishermen in the management of coastal fisheries in the dominant fisheries management regime. In its search for management alternatives that could promote the involvement of fishermen in the sustainability of local coastal fisheries, this study can be seen as a contribution to better understanding why and how current approaches to fisheries management are undergoing a process of transition in Sweden. Thus the study exposes the context of an ongoing institutional change and develops ideas and concepts, which the literature on natural resource management considers to be critical to the emergence and sustainability of alternative co-management arrangements. Finally, alternative forms of co-management emerging from the local level are examined and their advantages and challenges are discussed. The views of the local coastal fishermen, seen as protagonists in co-management theory, are given particular prominence.

At a more theoretical level the study is further connected with two interrelated debates. One is the debate on interdisciplinary approaches to the management of natural resources. The other is the debate on the need for rethinking the basic assumptions on which conventional fisheries management relies, including those which regard scientific knowledge as the only relevant type of knowledge in a management context. Implicit here is therefore the search for complementary knowledge and alternative management approaches that can contribute to coping with present deficiencies in the management of coastal fisheries with regard to the marginalisation of coastal fishermen. This is central to this investigation.

It is within this ambit that a set of sub questions for further research have been singled out, the literature reviewed and the research method shaped (chapter 4). The sub questions are:

- In what sense are the characteristics of living marine resources – fugitive and freely shared resources – problematic in resource management?
- Why is the fishermen's involvement in the management of the resources an imperative?
- What management alternatives are there?
- What are main characteristics and origins of the Swedish fisheries management system?
- What characterises the local coastal fishermen's *common pool resource* situation?
- What explains the failures of the present regime with regard to the involvement of fishermen?
- Whose interests, knowledge and capacities are articulated in the dominant models?
- What can we learn from the coastal fishermen's experiences and initiatives?
- What measures are needed to get the fishermen involved in the management of coastal fisheries?

1.4 THE OUTLINE OF THE DISSERTATION

The dissertation consists of nine chapters. The chapters are organised in the following way: This short introductory chapter (1) together with chapter 2 set the context from which the dissertation and its research questions have evolved.

Chapter 2 provides a broad description of the development of fisheries in the area of study. This chapter describes the ecosystem, gives an historical background of the fisheries with emphasis on the development of the institutional regime and presents base line information characterising the situation for fisheries in the area of study at the end of the nineties. It highlights the interrelations between the social and the ecological systems, by integrating, whenever possible, the description of the biophysical system, the resource, the technology, the community of users and the institutional setting. A central question pursued in this chapter is how the institutional regime governing coastal fisheries has developed over time.

Chapter 3 is a theoretical chapter where selected pieces of the international literature on the management of fugitive and freely shared resources (common pool resources) are discussed. Concepts relevant to the understanding and discussion of the complexity involved in the management of coastal fisheries and institutional pre-conditions involving ownership and property rights, management and governance are discussed. Out of the description made in chapter 2 and concepts elaborated in chapter 3 a set of sub questions are singled out for further research and the research method is shaped.

Chapter 4 describes the research method which is primarily of qualitative type with emphasis on documents, questionnaire studies, open-ended semi-structured interviews, and attendance of meetings.

Thereafter the bulk of the empirical results are presented in four chapters. In chapter 5 contrasting views of coastal fisheries are considered: a conventional view, expressed in policy documents and development plans, and an alternative view, as articulated by coastal fishermen from the study area. Ideas for reformulating the concept of professional coastal fisheries emerge from the analysis.

Next in chapter 6 the results of two questionnaires addressing the problem of multiple-use in coastal areas are presented and discussed in the light of more qualitative data gathered through interviews and participation in meetings. This chapter explores what it is that precludes the local fishermen from securing access to the resources in a multiple use setting. Internal diversity within the fisheries and other subtractive uses are the key problems identified by the fishermen.

The analysis of problems in certain rules and the interplay between actors influential to fisheries management is undertaken in chapter 7 which is thematically structured and draws mainly from interview material and participation in meetings. This chapter illustrates how fishermen's local knowledge has been filtered out in the management system.

Concluding the empirical analysis, chapter 8 examines two specific case studies. The first case presents the local traditional management system of prawn fishermen in the area of Koster-Väderö and shows how this system has been instrumental in Integrated Coastal Management (ICM), resolving cross sectoral conflicts derived from the proposal to establish a marine reserve. The second case consists of a proposal presented by a group of fishermen from a producers' organisation in Northern Bohuslän, NBPO, in an attempt to resolve appropriation problems derived from the present resource crisis. The cases are discussed in the light of findings from extensive interdisciplinary research on common pool resource management.

In the final chapter, chapter 9, the findings are reviewed and discussed in the light of the common pool resource perspective and their implications for policy.

CHAPTER 2

SETTING THE SCENE

This chapter provides background information on the Swedish coastal fisheries along the Skagerrak Sea in Western Sweden. It describes the ecosystem and the resources, technology, fishermen's community and origins of the present Swedish fisheries management regime. As will be seen in the review of the literature in chapter 3, these are dimensions or sets of variables that have empirically been shown to be important when understanding success and failures in the management of natural resources and are considered necessary for the understanding of further analysis. The context from which the present fisheries management system has evolved cannot be ignored: it is pertinent to the current quest for institutional reform. As a result the present description has a greater historical depth than what is usual in the literature on common pool resources management.

2.1 THE RESOURCE SYSTEM

The coastline of Sweden covers a length of 7,600 km (Bernes and Grundsten 1991).[1] The bio-physical characteristics of the Swedish coast change from North to South and East to West, following gradients of temperature and salinity and alternating open coasts and archipelagos (see figure 2.1). In the Northeast the waters are almost fresh and are icebound for parts of the year. Here, the number of species commercially exploited is low (vendance, whitefish, salmon, trout and herring) and the fisheries are generally small-scale.

To the South, both temperature and salinity increase turning the Baltic proper into a brackish sea, too saline for most freshwater species and too fresh for some marine species. Here, the soils at the edge of the Baltic are fertile and suitable for agriculture.

Compared to the West Coast of Sweden the Baltic Sea has little biological diversity and a low density of local professional fishermen, but it currently sustains an important part of the Swedish cod, herring and sprat fisheries. Since the seventies (see below) fishermen from Southern Bohuslän take the largest proportion of these resources.

On the West Coast, the coastal environment is influenced by the North Sea and the salinity, biotope variation, and biological diversity increase as one moves northwards towards Skagerrak (see arrow figure 2.1). Whereas in the south, Kattegatt and the Sound are characterised by the influence of the brackish Baltic Sea, Skagerrak is, in oceanographic terms, a more stable marine environment. Skagerrak has been less investigated than the Baltic Sea. Crustaceans and molluscs grow abundantly in this area. Skagerrak or "*Viken",* The Bay of the Vikings, is the only truly marine sea bordering Sweden and has been described by Swedish oceanographers, such as Fonselius (1990), as a "North Sea fjord". However, while the North Sea is relatively shallow, with a mean depth of 94 m, Skagerrak has a mean depth of 210-m (Svansson 1975). The amplitude of the tide is insignificant in the area with a rather narrow inter-tidal zone.

In the north, Skagerrak borders Norwegian territory and to the south lies the tip of Denmark and the less saline Kattegat Sea. The southern border of Skagerrak coincides with the convergence of two central permanent currents: the Baltic Current and the Jutland Current. The convergence is commonly represented by an imaginary line between Skagen's lighthouse

[1] This estimation includes fjords, bays, and the perimeters of the major islands.

on the tip of Denmark and the Paternoster lighthouse (the southern point of Tjörn Island) or Marstrand's Island in Sweden[2] (Fonselius 1990; SMHI 1994).

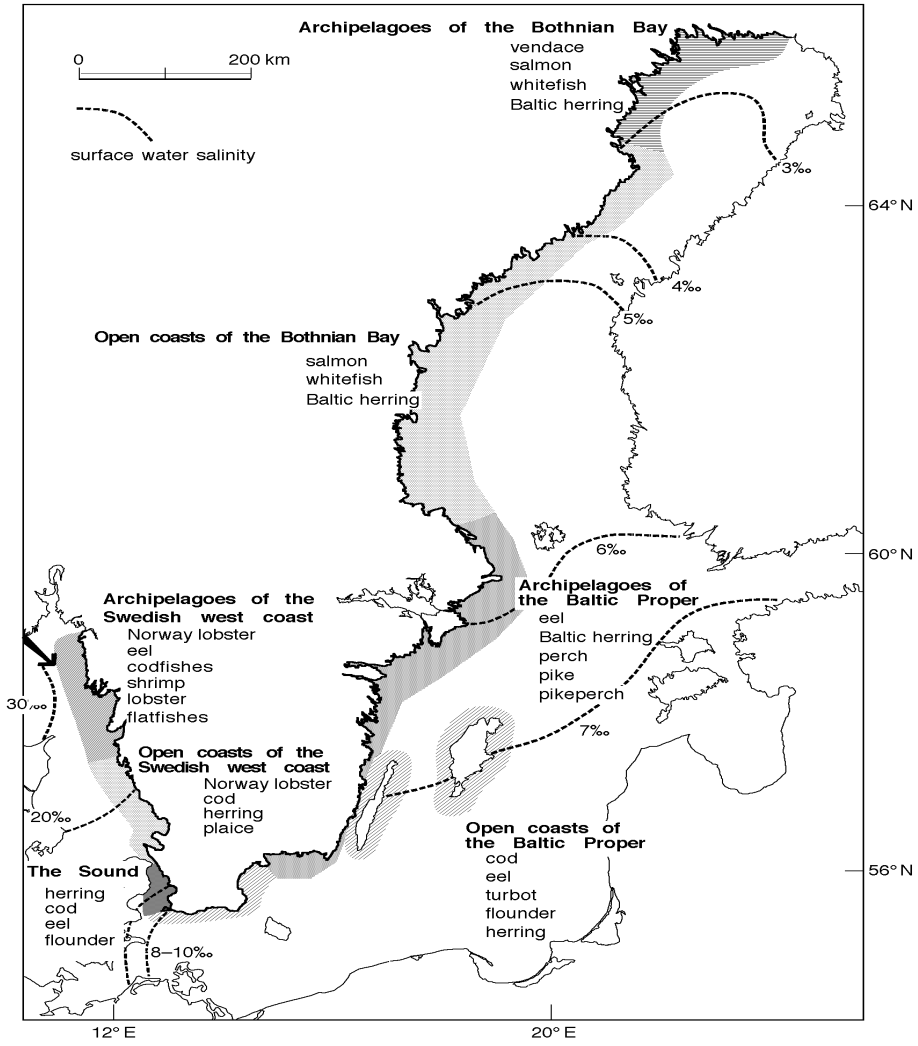

Figure 2.1 The geographic distribution of commercially important species, and salinity gradient on the Swedish coasts (The Skagerrak Sea is indicated with an arrow). (Source: Neuman and Píriz 2000).

Many important aspects of the abundance and diversity of resources in Skagerrak are associated with this border condition and water dynamics in Skagerrak.[3]

[2] Already in 1877 a pioneer oceanographer, S.L. Ekman, suggested a line between Skagens tip and the southern point of the island of Tjörn to be the border between Kattegatt and Skagerrak (Ekman and Pettersson 1893). Physically defined borders are not necessarily used in fisheries management. For example, in the fisheries agreement between Denmark, Norway and Sweden (The Triangle agreement 1967-2002) on equal access to each others' coastal areas (up to 4 nautical miles from the base line) Skagerrak has been defined differently. In this agreement the southern border has been placed further south than the physical one. The line adopted in the agreement is that between Skagen's lighthouse and Tistlarna's lighthouse, south of Göteborg.

The water residence time is relatively low, 3 to 4 months (Rosenberg et al. 1991). Three phenomena have been described as influencing Skagerak's water quality: the Jutland current, which can reach high velocities, brings nutrients from land and takes different directions from Skagen depending on the winds (Fonselius 1990); the fresh water contributions from the Norwegian rivers including Glomma Elv[4] (Rosenberg et al. 1991); and the counterclockwise water circulation, which turns Skagerrak into an important accumulation area for suspended matter and nutrients from the North Sea (Svansson 1975).

Southwest winds predominate in the area and influence the surface Baltic Current that follows the coastal line (Svansson 1975). The inflow of this water is strongest in summer and weakest in winter. Under its influence comparatively low salinity (30 ‰) and high temperature (15 ºC) can be found down to 20m deep where a halocline forms. In the coastal waters, this halocline is rather stable and primary production can start in early spring. Off the coast, the halocline is usually weaker and the water is stabilised by a thermocline (Rosenberg et al. 1991). The flow of waters with different densities and nutrients influences the biological life and the strong pycnoclines along the coast and these are believed to play a physical retention role for larvae and juveniles (Svansson 1985).

The waters of Skagerrak fringe a sinuous scenic coast with an archipelago consisting of more than 5000 islands, fjords, and bays providing refuge to a diverse marine life. Depending on the distance from land and the degree of exposure to marine influence, i.e. winds, waves and saltwater spray, the archipelago is divided into three zones: the inner, the outer, and between these a more heterogeneous intermediate patchy zone. Biological diversity is greatest in this zone (Loo and Rödström 1988). In the inner zone (depth 0-6 m),[5] hard bottoms made of sand and sand mixed with mud, with eelgrass and algae belts as dominant vegetation are representative. Oyster and mussel banks are found in this zone. In less exposed shallow bays eelgrass plains (*Zostera marina*) and seaweeds of the genus Fucus dominate. These communities are known to provide shelter and food to early life stages of crustaceans and fish, but also sea birds and swans (Loo and Rödström 1988).

In slightly exposed areas, the vegetation is more varied (*Fucus vesiculosus, F. spiralis, Ascophyllum nodosum* and *Cladophora glomerata*). In the more exposed areas *Laminaria* dominates (Loo and Rödström 1988). In deeper zones hard bottoms consisting of shells mixed with gravel, sand and sandy clay are representative bottom types and substrates. Shellfish is common in these and deeper waters. Not far from the coast, a deep-sea fjord, known as the Norwegian Trench[6] and also referred to as the Koster-Väderö Fjord, is found. Nilsson (1997) has recently reviewed existing marine biological literature about this area, with a focus on hard-bottom living communities. He concludes that the area most probably has the greatest diversity of marine species in Sweden. The growing marine influence, the water dynamics and the biotope variation are accompanied by the in-flow of larvae and juveniles of gadoids, flatfish, and shellfish from the North Sea. Seals and birds are also part of the marine wildlife preying on fish and shellfish.

The most commonly reported species in Skagerrak's fisheries have been listed in appendix 1 at the end of this thesis. For the purpose of collecting and analysing data about stocks of

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[3] The significance of these currents has been stated by many authors (Svansson 1985; Pleijel 1988; Fonselius 1990; Rosenberg et al. 1991; Sjöberg 1992; Phil and Ulmestrand 1993; Nilsson 1997).

[4] The volume of fresh water discharged by Swedish rivers to the Skagerrak is very small (45 m^3/s) when compared to the volume discharged by Norwegian rivers (2190 m^3/s). The major contributor is Glomma Elv with a mean discharge flow of c.a. 700 m^3/s and a catchment area of about 41, 200 km^2 (Svansson 1975).

[5] The 0-6 m deep zone is classed by the Swedish Law as a zone of national interest deserving special protection.

[6] The Norwegian Trench has been referred in the literature as the Norwegian Rinnej (from German Rinne) and Koster-Väderö Fjord. The fishermen refer to it as "Koster rännan".

commercial species, ICES has referred to Skagerrak and northern Kattegatt as sub-area III[7]. Within this sub-area, ICES grid-grid-squares 4556 and 4656 are representative of the coastal waters of Skagerrak.

An examination of the fishermen's 1997 logbooks[8] done for this study, showed that 52 identified species and a number of non-identified ones were reported in the "catch reports" (landing reports) from these grid-squares. This figure is high compared to the reports from other zones, e.g. the Baltic Sea. Figure 2.2 gives an approximate indication of the degree of permanence in the coastal waters of Skagerrak of adult individuals (spawners) of the species that shown to be commercially important.

Six "mobility" groups can be identified in figure 2.2: bivalves (1), crustaceans (2), flatfishes (3), gadoids (groundfish of the family of cod) (4), small pelagics (5), and eels (6).

Bivalves are permanent attached to a substratum (sessile) and known to be suitable for local management. The species belonging to the second group flow into Skagerrak's coasts in their early larvae phases but as adults they tend to move within a confined area, they are sedentary. This is the case for the deep-sea prawn which has a patchy distribution and migrates vertically in the water column. Flatfish and gadoids together with eel spend their lives as juveniles in Skagerrak's coasts but then move different distances to spawn.

High ← Permanence of adult individuals in the coastal waters of Skagerrak → Low					
Bivalvia	Crustaceans	Flatfishes	Gadoids	Small pelagics	Eels
1	2	3	4	5	6
Mussels		Plaice	Withing	Hake	
	Lobster	Sole	Cod (North Sea stock)	Sprat	
	Crabs	Cod (local stocks)	Cod (Baltic stock)	Herring	
	Nephrops	Turbot	Haddock	Mackerel	
	Deep sea prawns	Common dab	Saithe		
		Flounder	Dogfish		
		Long rough dab	Catfish		Eel

Figure 2.2 An approximation of the level of degree of permanence of adult fish and shellfish in the coastal waters of Skagerrak.

All in all in the Swedish Skagerrak coastal ecosystems are described as diverse, dynamic, and complex. The coasts of Skagerrak are important catchment areas for shellfish and a nursery area for the North Sea finfish stocks. The morphology of the coastal zone with the archipelago and the water dynamics can be viewed as components delivering ecological services. Diversity, dynamics, and complexity of the ecosystem, combined with the uncertainty

[7] ICES has divided the Swedish waters into three main regions: the Gulf of Bothnia comprising ICES Division IIId (sub-areas 30 and 31); the Baltic proper comprising ICES Division IIId (sub-areas 24, 25, 27 and 29N); and the West Coast, including the Sound separating Sweden and Denmark comprising ICES Division III c and b and northern Kattegatt and Skagerrak comprising ICES Division IIIa.

[8] Information about catches comes from two different and complementary sources. One is the fisherman's logbook offering numerical data about daily (or monthly, for the small boats) catches by species, gear and its spatial correspondence with the ICES sub areas and grid-squares or in the best cases the position where the trawl is lifted. The other is the data provided by the first recipient in the market, often a fish auction. This information does not normally include what is caught and discarded, and can therefore neither be used as a measure of biological diversity nor of fishing mortality, these are considerably higher.

derived from the lack of comprehensive assessments complicate the users' and the researchers' ability to assess risks, predict yields and define maximum sustainable outputs. The significance of these characteristics for how coastal people have developed and managed the fisheries cannot be overemphasised.

2.2 HISTORICAL BACKGROUND

2.2.1 Property rights: the tenurial significance of the land, the herring and the archipelago

Historical documents on fishing rights in Swedish waters relate that the Crown was, for a long time, the ultimate owner of the waters and the fish and that the nobility had special privileges in relation to them (SOU 1925:19). The Crown collected taxes in return for the right to fish. Fishing rights in coastal waters were subject to regulation long before the appointment of the first Swedish Director General of fisheries in 1611.

In 1766, due to demands from the nobility and those who served the Crown in exchange for usufruct right to land and housing, a legal distinction was made between the ownership of inshore waters and the rights to fish there. The distinction was between "*det allmänna*" or public property owned by the Crown, and, "*det enskilda*" or private property where the landowner was in command. As regards fishing rights the main interest of the nobility seems to have been in getting access to salmon, eel, lobster and oysters (Hasslöf 1949), resources that were either staple foods for the peasants working on the farms or delicacies for the nobility[9]. These species are either stationary (lobster and oysters) or characterised by seasonal abundance in inland or inshore waters (salmon and eels), making them easy to catch and their situational ownership easier to define (see chapter 3).

The 1766 law, privatising access and usufruct rights to inshore waters and the fish there, was a response to class struggles and its purpose was to deprive the landless of access to the shore[10] (Eklund 1994). On the Baltic side, where land was an important asset and agriculture prevailed, and where spawning fish, particularly salmon, appeared seasonally in the inshore waters, coastal fisheries provided a supplement to agriculture and salmon was eaten by the peasants working on the farms. The right to fish in the inshore waters continued to be linked to the ownership of the land. A similar situation has been described by Eklund (1994) as existing on the coasts of Finland.

Eklund (1994) has portrayed the fishermen from the East Coast as fisher-peasants (*fiskebönderna*), fishermen from the West have been portrayed by Hasslöf (1949) as a crewman in the herring fisheries. In a more recent study carried out by Hazlehurst (1994) in Southern Bohuslän the author has referred to the west coast fishermen as the "boat owners".

Northern Bohuslän has historically been subject to strong cultural influence from Denmark and Norway, and with regard to fisheries still is so. On the one hand, Bohuslän was a Norwegian province until 1658 and for a long time a large proportion of the manpower involved in the herring fisheries of Northern Bohuslän came from Norway. On the other hand, a large proportion of the Swedish catches have historically been landed in Norway and Denmark. To land in Denmark is also common today. In the West traditions of open access had prevailed for a long time due to the Norwegian influence and had previously been recognised by the Crown. This is made clear in the following text in SOU (1925:19) which quotes a passage from1658 whose central message has been translated here below.

[9] Sport fishing was introduced in Sweden by the British in the late 1800:s but the phenomena of sport fishing and fishing for recreation would not expand in Sweden until after the 1930s (Bo Bengtsson, pers.com).

[10] The landless have been referred in Swedish as "backstuge-sittare", "torpare" and "strandsittare".

"...As a result Norwegian law continued to be applied in the non-Norwegian province of Bohuslän..." (own translation).[11]

Most troublesome was the implementation of the privatisation law in Bohuslän. The lack of arable land, the economic significance of the herring and other fisheries' resources – together with outside influence of Norwegian and Danish traditions – influenced people's relations to fishing rights on the West Coast in a markedly different way from that in the East. However, to protect the poor, the landowners' exclusive fishing rights did not include the sea-based fisheries nor the herring and sprat fishing over which people from the parish were considered to hold customary rights. The latter was extremely important for Bohuslän. As a result the privatisation of fishing rights on the West Coast was only partial.

The 1766 law coincided with a boom period for the herring fisheries between 1752 and 1808. During this period the population of Bohuslän increased considerably and the port of Göteborg became the Swedish centre for the export and marketing of fish.

Herring has historically been especially important for the coastal communities of Bohuslän. After 1808, herring catches slumped; land netting and fishing in inshore shallow waters was no longer possible and men migrated from the Bohuslän archipelagos to join other sectors of the economy such as the merchant navy. Between 1877 and 1912 a new herring boom attracted people to the area reversing the population trend again (Haneson and Rencke 1923). Even though this period coincided with a wave of emigration from rural areas this did not much affect the demographics in the archipelagos of Bohuslän, where herring was abundant and good fishing attracted people to the islands. During this period herring was caught both offshore and inshore and once again the archipelagos absorbed some of emigrants from other rural areas (Hazlehurst 1994; Haneson and Rencke 1923).

Lindquist (1999) and Svansson (1999) have discussed the mystery of the herring booms in Bohuslän, for which science has not found convincing explanations. A passage from Otto Pettersson's autobiography quoted by Svansson (1999) reveals the significance that the herring periods must have had for the people in the archipelagos of Bohuslän, even where other fisheries developed.

"...The herring appeared in the fjords of Bohuslän in such a sporadic and enigmatic way, that people compared the phenomenon to a beam of shoals of fish from the sea (en strålning av fiskstim utifrån havet). A fjord, which on one day had been a rich catching field with pound seiners in every bay, the next day, could be completely empty."... (Own translation from Otto Pettersson 1938:5: En sjävbiografi. – W. Quoted in: Svansson 1999:23).

The periods of good herring fisheries lasted for more or less 70 years (Lindquist 1999) and the herring disappeared as quickly as it had appeared. Thus the fishermen from the area had to develop a *modus vivendi* based on a more diversified fishery throughout the year.

However, in spite of the context described above, the 1766 Fisheries Law brought some constraints to the archipelagos in Northern Bohuslän. The decision to privatise fishing rights in the archipelago, where the irregular coastline required the use of diverse criteria to define the boundaries, was preceded and followed by conflicts. The law made a distinction between saltwater fisheries within the skerries (*inomskärs*) and saltwater fisheries outside the skerries (*utomskärs*). This statutory distinction between marine fisheries inside and outside the belt of

[11] The Swedish text reads: "Genom freden i Roskilde 1658 tillförsäkrades genom fredsfördraget invånarna att "*blifva vid deras vanliga rätt, lag och gamla privilegier och friheter oturberade och obehindrade, så vida de icke löpa eller strida contra leges fundamentales af Sveriges krono*". Till följd härav fortfor norsk rätt att tillämpas i den från Norge avskilda provinsen Bohuslän samt Dansk rätt i de till det egentliga Danmark förut hänförda provinserna Skåne, Halland och Blekinge till dess med år 1683 svensk rättsskipning kan anses genomförd i dessa landskap" (SOU 1925:19: p 98).

skerries was open to different interpretations and led to disputes with subsequent demands to change the law. Whereas the exclusive rights of the landowners to waters inside the inner belt of skerries were often accepted, the privatisation of fishing rights in the outer belt of skerries was highly controversial and questioned by the fishing communities from Northern Bohuslän.

In the first decade of the 1900s the fishermen from Northern Bohuslän, notably those around Strömstad, complained to parliament and the Crown. Consequently, an official investigation was ordered. The point of departure for the investigation was that the distinction between what was considered public (*allmänna*) and what was considered private (*enskilt*), based on the concept of "sea-shore", had to be more clearly defined. The different interpretations of this definition had turned into a matter of controversy. The investigation came to focus on the analysis of different actors' interpretations of concepts defining rules in coastal fisheries. The meaning of, on the one hand, customary rights in private waters (expressed at that time in the law as *ålder* or age-old rights), and, on the other hand, conflicts about physical interference of fishing gear were also discussed. Different interpretations of the meaning and ideas of inclusiveness expressed in terms of "inside" or "outside" (*inomskärs* and *utomskärs*) and the tenurial significance given to the archipelago by local fishermen, maritime pilots, civil servants and land-owners are reflected in the minutes from the meetings held in 1911 (SOU 1925:19).

The debates from the early 1900s resulted in a clarification of the boundaries, and exclusive fishing rights were to apply to the fringe covering a distance of 180 meters from the 2 meter depth line (SOU 1925:19). Nevertheless, the controversies about fishing rights on the West Coast continued for many years only to be ended in the 1940s, under the influence of the Fishermen's West Coast Association (SVC) established in 1930. In the 1930s and 40s new claims from the Swedish landowners in relation to the ownership of inshore waters were acknowledged and the distance from the seashore to be disposed on an exclusive basis by the landowner was extended to 300m and a depth of 3m, the current definition[12]. This decision was highly contested by SVC and protests from the West Coast were heard in the Swedish parliament. SVC argued that it was difficult to define property and rights to fish on the basis of distance from land or water depth, because these were dynamic variables that changed naturally.[13]

For the West Coast the whole discussion on the definition of fishing rights based on land ownership ended in 1948 when by petition from SVC a few parliamentarians jointly presented a motion to parliament that exempted the West Coast from the general rule. Following this debate the 1950 Fisheries Law (SFS 1950) made an exemption regarding fishing rights on the West Coast. In this Act access to the inshore and the fishing rights in the provinces of Halland and Bohuslän were disconnected from the ownership of the land. Thus the right to fish in the inshore in the West Coast was open to the public. Fishermen in this area were allowed to move and fish freely in both private and public waters. This right is sometimes referred as "equal access" (Yrkesfiskaren 1994) and as explained by Hasslöf (1949) it was originally adopted to benefit the poor. Only the right to exploit oyster banks in private waters was left in the hands of the land-water owners. The extension of the principle of open or free access to fisheries resources in not only public but also private waters was deemed to require an agency to define and enforce the rules governing fishing in these waters.

[12] Today as a general principle all Swedish waters within 300 m from firm land or inside the 3 metres depth curve, depending on which is the closest to firm land, as well as all waters within 100 m from an island are private waters. Here the owner has the right to fish as much he wants without any duties and reporting responsibilities.

[13] In the West Coast of Sweden tides are not significant.

The following passage quoted by Hasslöf (1949:468),[14] reveals the central message in the argumentation by SVC.

> "The only way to resolve the issue of property rights relations on the West Coast seems to be, according to the association, to declare all fishing on this side of the country free, and to simultaneously give the local authorities, i.e. the County Board Administration (or provincial government) and their fisheries superintendents, the right after consultation with the fisheries associations and other affected actors, to issue rules of conduct" (Own translation).

2.2.2 The fishing community

In Bohuslän, the "coastal society" in the archipelagos was, for long time, synonymous with a fishing community (*fiskeläge).* Here, teams of ten to twenty self-employed, share fishermen[15] (*lottkarlar*), often with strong kinship relations fished together in crews (*fiskelags*) and their relatives were often involved in fishing related land-based activities. The crew also undertook cooperative tasks for the benefit of the local community as a whole. The crew and the fishing community were two important institutions through which collective action was organised. These two institutions, – together with the church, the household and extended family,[16] the local landing harbour and the auction – played important roles in the everyday communication and inter-generational transfer of fishing knowledge and tradition, and so strengthened the coastal fishers' sense of group identity and solidarity.

Although other livelihood related activities such as horticulture, cattle rearing, house construction, transportation, and workshops were very common, fisheries, dominated periodically by herring fisheries, were the basis of the local economy. In Bohuslän co-operatives and producers' organisations[17] were common in the early 1900s. These organisations had multiple purposes. One of the problems these local organisations struggled with was the issue of the low prices paid by the buyers to the fishermen (Hessle and Verständig 1957). They were involved in marketing, collective purchase of oil and fishing supplies, credits, but also social activities towards the fishing community. A non-governmental organisation - the Rural Economy and Agricultural Societies (*Hushållningssällskapen*) – provided extension services to the rural producers including the fishermen and assisted them in organising co-operatives and local economic producers associations, and getting access to loans, for example. This organisation had extension officers in each county and was funded via contributions from the public, the producers and the state.[18]

In times of plentiful supply prices could fall rapidly and the buyers used the opportunity to make "good" deals with certain producers' organisations or unorganised fishermen. This was a

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[14] The Swedish text reads: "Den enda vägen att komma till klarhet och reda i fiskerättsförhållandena på västkusten synes enligt Förbundets mening vara att förklara allt fiske vid denna kust fritt samt giva de lokala myndigheterna, länsstyrelse och fiskeriintendent, rätt att efter hörande av fiskares organisationer samt andra berörda parter utföra de ordningsföreskrifter, som kunna befinnas erforderliga".

[15] Crew members in Swedish fisheries fish for a share in the value of the catch rather than for fixed wages. The boat also gets a share. Attempts before the 1900s to create large fishing companies (like the ones that were developed in Holland and Spain) failed in Sweden.

[16] Hasslöf (1949) describes the involvement of the family in the making of the gear and the processing of the catch.

[17] In the modern literature, producers' organisations or PO are often considered as a new feature in Sweden having their origins in the European Union. However, this type of market-oriented organisation and the concept of PO were common in Sweden long before Sweden joined the European Union (SOU 1922:7; Gerhard 1995). The original POs were often assisted by the Rural Economy and Agricultural Societies. With time the roles of the POs and of the Societies were taken up by the main associations and the state respectively.

[18] The history of Hushållningssällskapen can be found in www.hush.se.

source of friction between the fishermen. The West Coast fishermen have made many attempts to stabilize prices of fish and to avoid the low prices associated with heavy landings and imports.

The literature reveals that fishermen have used different collective strategies to overcome the problems resulting from an unbalanced supply-demand relation and the low prices paid by the buyers. Examples of such strategies are boycotting, co-operative selling, supply control via landing or catch quotas (rations) and caging fish in shallow waters (live storage) for later sale when prices were firmer (see Hessle and Verständig 1957; Gerhard 1995). For example, the introduction of minimum landing sizes (MLS) which precedes the establishment of the FAs in the 1930s, had to do with the effect that smaller sizes had on lowering quayside prices. Similarly, the *raison d'être* of rules developed in the herring fisheries, consisting of minimum landing sizes and weekly landing rations (market share quotas), was to avoid saturating the market. The rules adopted by the fishermen were non-formal arrangements, i.e. far from being institutionalised within the FAs[19] or the Government's structures. From this perspective, one may argue that at the beginning of the 20th century fisheries management in Northern Bohuslän was community driven. Here the fishermen authorised to fish in the coastal zone were those acting in compliance with locally designed rules, the purpose of which was mainly concerned with the allocation of resources between the fishermen.

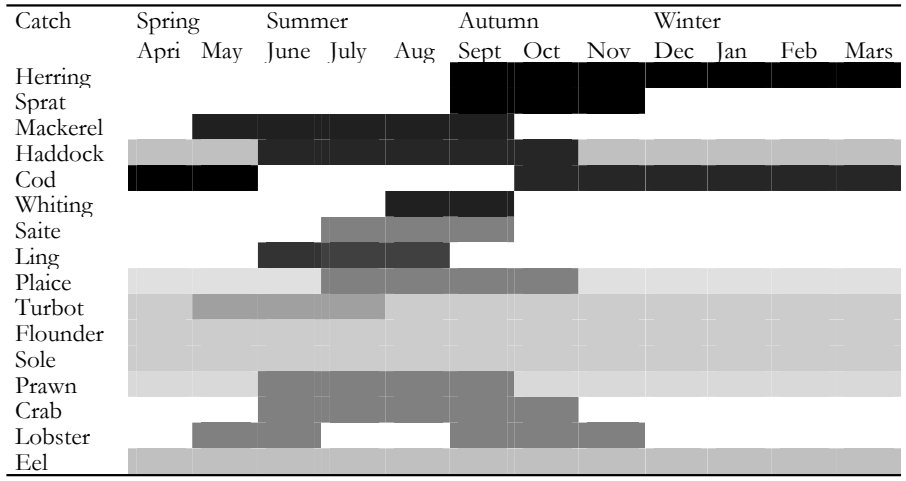
The fishermen's rules were rarely related to issues of resource conservation; they were mainly adopted as an attempt to solve problems of unbalanced supply and demand, the struggle against buyers and to guarantee equity of market shares among fishermen. In their struggle with the market situation the fishermen developed rules limiting input and output. Thus, the bulk of the rules were designed with an explicit economic and social aim, even though many of them may incidentally have a positive conservation effect. The availability of fish and the diversity of the catch was not a problem and the need to limit fisheries for conservation purposes was not as necessary as it is today. Diagram 2.1 is a reconstruction of the most important landings in Northern Bohuslän, as a Swedish fishery scientist described it in the 1920s, when the fisheries for small pelagics, followed by the fisheries for gadoids and flatfish were central to the economy of the coastal communities of the area.

After the 1920s, with the introduction of the engines and new fishing techniques, primary purse seine and the trawl, the geographical scale and the intensity of fisheries expanded considerably. It was from the main port of Göteborg that these new fishing techniques disseminated. The increased use of engines, purse seines and trawls was not conflict free, though. During the same time (1920-1940) the volumes of landed herring increased and so did the post-harvest industry and the export revenues. During this period large quantities of herring were stored on land. The struggle against the dealers for better prices continued and worsened with the increased landings. Problems of physical interference with the prevalent static gear led to conflicts between the local fishermen and those who trawled.

Already at the beginning of the 1900s and in order to give preference to static gear in the Swedish territorial waters, the 4 nautical mile limit was used to exclude mobile fishing gear from coastal waters. This limit was used to allocate space between the communities of authorised fishermen by making a functional (or gear based) distinction. In practice the 4 nautical mile limit became the limit of coastal fisheries. The trawling after deep-sea prawn in Koster-Väderö Fjord, where due to the great depth, static gear could not be used, was exempted from this rule.

[19]The term semi-enforceable is used to refer to the rules that have been adopted within the fishermen's associations. FA's rules are often like a code of conduct and accepted by the administration but seldom transcribe into a legal instrument and are therefore only enforceable upon the members of the association i.e. semi-enforceable.

Diagram 2.1 Seasonal variations in Central/Northern Bohuslän's fisheries in 1920s



The darker the grey colour, the more significant the landing in terms of volumes.
Nephrops was incidentally caught and mussels were collected to be used as fishing bait and oyster were collected in only a few places SOU (1922:7:pp73).

Source: Based on of a qualitative description given by Hessle in SOU (1922:7 pp 69-79).

2.3 THE ORIGINS OF THE CORPORATIST CENTRALISED CO-MANAGEMENT SYSTEM

2.3.1 The Fishermen's Regional Association (SVC)

The Swedish West Coast Fishermen Association (SVC) was established by the initiative of fishery communities in Southern Bohuslän in 1930. At this time it was difficult to find markets for the fish and to negotiate with the fish dealers and, at the same time new technology made expansion possible creating the conditions for a growing industry. This situation was understood to require a unified collective and an organisation able to negotiate and act economically and politically in its name. Many attempts to organise the fishermen at the regional level had been made before the 1930s but with poor results (Gerhard 1995). With its headquarters in the city-harbour of Göteborg, SVC became the base for organised collective action aimed at influencing the post-harvest sector and the political spheres to the benefit of the professional fishermen.

The purpose of SVC was stated as follows:

> "To promote the efficient development of fisheries activities and to represent its members as a fishermen's organisation in their external relations, to act as the central intermediary between members and the authorities and to pursue the professional economic ideals and interests of its members with all available means. It is also the task of the Union to contribute towards eliminating economic and other associated conflicts of interests existing between various groups of branch members within the Union" (Statutes of the Union of Swedish West Coast Fishermen, Quoted in Hessle and Verständig 1957:79).

SVC was organised on the basis of a number of local fishing communities which became the local SVC branches. In contrast to traditional labour unions created during the same period this was an association of self employed fishermen: those who owned the boat and the crews of share fishermen. Besides being organised around the local branches (according to place of residence), the members were also organised according to functional specialities in committees (e.g. trawl committee, herring and deep-sea prawn committee). Although the association acted in the name of all associated fishermen (the whole collective) and had the motto of "solidarity and equal treatment", its mode of organisation weakened the capacity for decision making in the smaller and remote coastal fishery communities.

SVC's congress takes place at least once every third year and is, according to the organisation, the highest decision making body of the organised west coast fishermen. SVC's statute defined the congress as the association's highest decision making organ (Filipson 1980). The territorial set up of the association benefited the interests of fishermen living in areas with a high concentration of fishermen. Representation at the congress of SVC was (and still is) related to the number of members of the local branches. The number of delegates to the congress increased during and directly after the World War II (Filipson 1980). At that time, the number of members needed to send a delegate was 50. With the recession in fisheries, this number was changed to 20. By tradition, the elected chairman of SVC has been a fisherman from the islands in the vicinity of Göteborg in Southern Bohuslän.

The functional set up of the association (into groups by gear or species) would benefit the interests of fishermen who dominated a specific type of fishery. The membership fees to the association were related to the value of the catches. This made SVC economically strong but also dependent on those landing large volumes.

With the establishment of SVC representation became more indirect and the locus of decision making was transferred from the local community to representatives of the association. Thus, SVC took over the regulatory function that previously had been locally organised at the community level. Already in 1932, the association limited the rights of its branches (the local fishery community) to make decisions that could negatively affect other members of the association. Thus, the rules of SVC applied to all its members. Violations were noted and discouraged, but in general, lack of compliance was not punished.

As a result the SVC showed a tendency to promote the interests of fishermen from Southern Bohuslän; they were numerous, had the largest and most mechanised vessels, and their fishing was more specialised. But the system could also benefit specific groups of local fishermen like those from Koster-Väderö who for some decades, were the only fishermen catching prawns on the West Coast. Their local rules could be easily adopted through the prawn fisheries committee of the association. This local management regime is still in operation and will be examined later in chapter 8.

In the following years, in order to solve the problem of low prices and the dominance of the buyers and dealers of the fish, SVC would invest much effort into negotiating minimum prices, regulating minimum sizes, setting weekly quotas (rations) per fisherman and investing capital in storage facilities, processing and marketing. To satisfy all members was not an easy task, and in many cases, the association adopted rules that were controversial within the collective. In 1932, for example, 969 delegates (against 59) approved the rule of Sunday and weekend rest, which prohibited operations on these days, and from 1934 to 1940 the fishermen of the West Coast were allowed to land a maximum of 10 boxes of herring per man/week (Gerhard, 1995). During World War II, for security reasons, trawlers were allowed to operate closer to land and the trawling boundaries were shifted accordingly. Since then, following petitions from the fishermen's associations, the 4 nautical mile limit of the territorial

waters has become subject to incursion. By that time trawling had become important and the established trawling limits were no longer related to the boundaries of the territorial waters.

In Skagerrak, where the archipelago extends seawards and includes deep waters, the 4 nautical mile limit was rapidly changed to allow trawling closer to land and eventually replaced by a 2 nautical mile limit. There is no rule without exceptions and even in this case, at the request of SVC, the authorities subsequently agreed on sanctioned regulations that allowed further trawling encroachment. This allowed mobile (dislocated) fisheries to operate in areas formerly considered the domain of the more small-scale static gear based coastal fisheries, which made the community authorised to fish in coastal waters more heterogeneous. In some cases, the exception were justified, as in the case of authorising trawling for deep sea prawns in deep coastal waters even when these are within the base line.[20]

2.3.2 The State

Until the beginning of the 20th century the involvement of the state in fisheries was mainly a concern of the Crown which posted special experts in marine fisheries to the West Coast.

In 1890, the Board of Agriculture (*Lantbruksstyrelsen*) was established and took over the administration of fisheries. In connection with the establishment of the International Council for the Exploration of the Sea (ICES) in 1902, the Swedish government established the Swedish hydrographic biological commission (Svansson 2001, unpublished manuscript). This commission was an autonomous organisation with its own research vessel and oceanographic laboratory and had the task of studying the seas bordering Sweden from the point of view of fisheries. The development of fishery biological studies took off later in the 1920s and 1930s and was partly funded by private donations to the state (Wramner 1998).

In 1905 the government created the Ministerial Department of Agriculture and a regional structure consisting of 6 districts, each with a district official (*intendent*). The districts dealt with all types of fisheries (fresh, brackish or marine fisheries) and their district boundaries coincided with those of the County Administration. The importance of West Coast fisheries for Sweden was recognised by making Halland, Göteborg and Bohuslän one district, in spite of its comparatively small land territory (Andreasson 2004). The district was subordinated to the Board of Agriculture, and had to coordinate its work with the fishery extension officers working locally under the umbrella of "The Rural Economy and Agricultural Societies" (*Hushållningsällskapen*). The tasks of the district officials were diverse, e.g. to promote fishery development, assist in the organisation of fishermen, encourage the conservation of fish and bodies of waters by the public, collect data, and inform and advise to the public regarding fishery issues (see Andersson 2004:10).

In 1930 (which coincides with the establishment of SVC), the inland fisheries were distinguished from the coastal and marine fisheries, and two specialised "salt water" districts – one for the West Coast and one for the East Coast – were created in addition to the five remaining fresh water districts (Wramner 1998).

Before World War II, the Government had appointed a committee to look into how to best guarantee the fishermen's collective interests and consider the pros and cons of the establishment of a national fishermen's association. The recently created National Food Commission first implemented a general price regulation on the West Coast in 1942. A

[20] The baseline is the imaginary line that connects the most remote land points and islets or follows the low water line, depending on the morphological structure of the shore. According to Swedish law the Swedish sea areas are divided into inner waters (inshore waters), the territorial sea area and the open sea (SFS, 1996:374). Inshore waters are those within the base line, and the territorial sea extends from the base line up to the middle line or the 12 nautical miles.

decision by the Swedish government to stockpile fish and secure fish for the Swedish population during the Second World War gave SVC a good position from which to negotiate compensation for lost income due to low market prices. After the War, the Committee appointed by the Government identified the need to regulate the market and proposed the following: a national association of fishermen for the marketing of fish should be established; an organisation for implementing a general price regulation system (normalisation) for fish and shellfish should be established and public funds allocated for its administration; imports and exports of fish should be centrally regulated; and supervision of the regulatory price system and the fisheries, through a Royal Board of Fisheries, should be established with its headquarters in Stockholm (SOU 1941:19). The intention of the proposal was to moderate market competition, and the adjustment of prices was to be determined by government authorities.

On the Government side, the district officials and the extension officers working in the County Administration were engaged in monitoring the implementation of regulations limiting the volume of landings (rations) and the minimum landing sizes (MLS) so that the established minimum prices could be guaranteed to the fishermen (Gerhard 1995). This arrangement was deemed capable of satisfying both the grass roots interests and the central administration.

This mutual dependency between the fishermen and the State (at the provincial and central level) with the FAs as intermediaries can be characterised as corporatism (Schmitter and Lehmbruch 1979). This model of corporatist management blossomed during the late 1940s and 1950s in Sweden when the state took a more prominent role in all production sectors and the expansion of the semi-industrial fisheries took off (see SOU 2000:1)[21].

2.3.3 The interplay between the State and SVC

Fishing to ensure food security and the presence of the fishing fleet in the Swedish territorial waters were considered important during World War II. By the end of the war, fisheries were perceived as a production sector of strategic importance, and in the West Coast there was a surplus of stored fish. In the post war period the State and the FAs turned the focus on to trade and exports. The national financial deficit, combined with the surplus of stored fish in the country, led to reductions of both the normalised prices and the compensation for low market prices given to the fishermen by the government. This created turbulence among the fishermen and frictions between the government and SVC, which with financial support from the Government had established its own marketing organisation (*Västkustfisk*) and taken over the administration of the landed fish that was not sold (surplus). Although the prices were still set by the Government, these were now less concerned with the food security issue and more concerned with opportunities to export fish and raise the standard of living of the fishermen.

By the end of the 1940s, Swedish exports of small pelagics caught offshore were larger than ever. The concentration of fishermen, vessels and capital to Southern Bohuslän was quite pronounced (Gerhard 1995). After the war, many coastal fishermen from Bohuslän joined the more specialised, semi-industrial offshore herring fishery operating in the North Sea. This fishery was dependent on land based processing facilities. By this time, SVC was involved in marketing and trading. The organisation sold the fish through the auctions and the surplus went to SVCs fillet and fishmeal industries in Tjörn and Orust. Therefore, guaranteeing minimum prices for its members and landing regulations (rations) were no longer necessary mechanisms. Nevertheless, the price regulation methods and the rations, as suggested by Gerhard (1995), had an income levelling effect among the fishermen. The development of the

[21] From a theoretical perspective, the involvement of interest associations in the implementation of public policy falls within the domain of corporatism. In international comparisons Sweden is often placed among those states having a strong degree of corporatism (Williamson 1989; SOU 2000:1).

offshore herring fisheries led to the main actors (the association and the government agencies) becoming less responsive to the needs of the local fisheries communities from other areas such as Northern Bohuslän, which had not experienced a herring boom since 1906 (Svansson 1999).

The fishery policies of the immediate post war period were based on the need to develop an effective and rational fishery and the need for fishermen's households to enjoy a standard of living equal to other groups in Swedish society. This was to be done by developing a technological and efficient fishing fleet, increasing export opportunities and developing a marketing system ensuring a reasonable income for the fishermen all year round.

2.3.4 The National Board of Fisheries (NBF)

As mentioned earlier, during and after World War II the fishery sector was perceived as a strategic national resource. The involvement of the state in production was increased and part of the work that had previously been done by the Rural Economy and Agricultural Societies was taken over by the state. This reduced the public funding for the local Societies which continued working under budgetary pressure. In fisheries, the end of the war also marked the start for international fishery negotiations in the North Sea. Already in 1946, the UK had organised an International Conference on Overfishing, which resulted in the establishment of a Permanent Commission. This Commission, founded in 1953, was the forerunner of NEAFC, and was given additional power and the right to establish stricter conservation and management measures. The Commission worked with the North-East Atlantic Fisheries Convention[22], and the establishment of the North East Atlantic Fisheries Commission (NEAFC). Thus, NEAFC formed the framework for international co-operation in the area of fisheries regulation beyond national fishing limits.

All these international discussions required the involvement of the government, whose remit was also expanded. This time the proposal made for a specific central agency for the administration of fisheries, the (Royal) National Board of Fisheries (NBF) was approved by the parliament in 1948, but the NBF's headquarters were placed on the West Coast, in Göteborg.

NBF had an Executive Board which was, and still is, chaired by a Director General. The members of the Executive Board are nominated by the Government. The number of members has been rather constant (between 6 and 10) but its composition has changed considerably over time. For much of the period, economic interests were strongly represented. Representatives of the Swedish Parliament, the harvest, processing and aquaculture sectors, specific regions where fisheries were commercially important and associations for sports fishermen and consumers have from time to time held seats on the Executive Board.

The National Board of Fisheries essentially became an agency made up of mainly natural scientists and fishery technicians working within the administration and biologists performing assessments of the resource. The NBF was assigned the role of implementing national policies and providing advice and expertise to the Department of Fisheries the Ministry of of Agriculture.[23] The previously autonomous Swedish Hydrographic Biological Commission, which delivered data analyses to ICES, was dissolved and its role assimilated by NBF which focused on collecting and analysing data for stock assessment and the setting of TACs,

[22]North-East Atlantic Fisheries Convention entered into force in 1963 (for more information see http://www.neafc.org.

[23]The government in Sweden makes a distinction between the ministerial level and the public administration authority. The first are small units and define the policy the second can be large and are executive

negotiating quotas, designing and enforcing fishing regulations and delivering financial aid to the private sector for making production and technological modernisation.[24]

NBF's responsibilities for the development of an efficient fishery sector and the exploration and conservation of fish stocks only concerned waters beyond the 4 nautical mile territorial limits. The stocks of three migratory species (eel, salmon and trout), together with the herring (and sprat) fisheries, were identified as the principal stocks deserving the attention of NBF. Thus the role and focus of the new central authority was limited to the fisheries in specific waters (international) and of specific species (migratory). The approaches to these fisheries will be different, with a conservation focus on salmon and trout, and a productivity development approach with focus on herring and sprat.

Thus, the NBF focused on salmon and trout conservation, offshore fisheries, international negotiations and the regulation necessary to develop more efficient modern fisheries, while the management of the fisheries within the territorial waters remained in the hands of the regional districts which worked in close cooperation with the County Administration. This division of responsibilities between the county and the central level reflected among other things an understanding of ecological specificities but at the same time redirected the focus of the central government away from the small-scale fisheries in coastal areas.

2.3.5 The National Association of Swedish Fishermen (SFR)

In the late 1940s, five large regional fishermen's associations, including SVC, each covering different stretches of the coast, were established. Among the regional branches, SVC has always been the largest and economically strongest. However, these regional associations did not always speak in unison, and therefore the need for a single consolidated organisation was often raised in various quarters including the government authorities. The National Federation of Swedish Fishermen (SFR) was created in 1949,[25] with its headquarters in Göteborg. SFR and other representatives of the fishing industry held seats in the executive board of the National Board of Fisheries. The foundations for a centralised corporatist co-management model were established, but it would take ten years for SFR to reach full momentum as an organisation.

2.3.6 The influence of external factors

The sixties and seventies represented a turning point for Swedish fisheries. During this period, the urban areas with their industrial production attracted manpower. Both fishing and farming went through a government supported process of rationalisation and sport and recreation fisheries expanded considerably. The focus of national policies was on increased efficiency in terms of volume of landings and processed fish per unit of financial capital, labour, and time invested. The use of subsidies and the output per unit of effort increased; the well-being of the fishermen and the availability of cheap fish to consumers were considered important aspects of a fishery policy.

Several coastal fishing communities in Bohuslän underwent a process of drastic population loss and the large fishing crews were dissolved. The coastal communities also became less dependent on local coastal fisheries. Up until 1960, the most significant decreases of

[24] Other important bodies of the central administration with specific roles on fishery issues are: the Coastguard, involved in the surveillance of compliance with formal rules mainly fishing methods and landings; and, the Food Administration, involved in the quality control of products.

[25] According to the statutes of the Association (often referred as the Union) even trade organisations could be members.

professional fishermen were recorded along the southern and eastern coasts of Sweden.[26] The decline on the west coast came later in the 1960s (see figure 2.3). Since then, the number of fishermen has decreased steadily. In the archipelagos of Northern Bohuslän, retrenchment, diversification, 2 man crews, and pluriactivity, became strategies of survival. During this time period (1967) the regional administration was reformed and the local extension officers from the Rural Economy and Agricultural Societies became a part of the central state administration under the Agricultural Board and its regional system of county based councils (*lantbruksnämnderna*).

In the late sixties the Atlanto-Scandian herring stocks, subject to severe overexploitation, collapsed with serious repercussions for the Swedish fishing industry. During this period, the powers of NEAFC increased as it was allowed to set total allowable catch limits (TACs) and effort limitations, including the allocation of quotas. The first quota recommendation was on North Sea herring in 1974 and the year after, in 1975, NEAFC's recommendation to ban directed industrial fishery for North Sea herring was accepted (http://neafc.org.se).

The work of SFR was crucial to the Swedish fishermen in the sixties and the seventies when the issue of exemption from fuel taxes was hotly debated, the fishermen's employment benefit funds were created, subsidies for the modernisation of the fleet increased, and the international negotiations on the 200 nautical mile Exclusive Economic Zones (EEZ) took place and the first TAC was introduced. These were issues that in the short term would mainly affect the interests of the large-scale and more specialised fisheries. During this period, the association gained ascendancy as a mediator between the fishermen, the government, and the international community. Consultation between the Government authorities and SFR was intense and occurred both formally, through meetings of NBF's executive board, where the interest groups involved in the commercial sector held seats, and through informal contacts. In the executive board the fishing industry was consulted and informed about the adoption of fishing regulations, policy documents and assessment in progress, statements of referral, action plans and annual requests for funds.

The adoption of TACs and national quotas in the late seventies reinforced the role of SFR, because the issue of resource allocation among the fishermen was regarded as "internal affairs" to be resolved within the collective or associations. Thus, the allocation of resources among the professional fishermen, which is a central task in fisheries management, remained with the associations. Furthermore, government authorities and SFR sat side by side in the international negotiations to determine the Total Allowable Catch (TAC).

2.3.7 Licences for government development grants

In the late 1970s, a licensing system was introduced for professional fishermen. The licence was voluntary and seen as an accessory to the vessel. It was not designed to limit the size of the fishing community but to direct the development of the fleet which was considered to be in need of renewal and modernisation. The licence, which was transferred when the vessel was sold, conferred the right to be considered for government development grants, and the system distinguished between vessel sizes. The grants were approved by the National Board of Fisheries. During this period a capital intensive semi- industrial offshore fishing fleet developed in Göteborg. The main strategy for this modern fishery was one of specialisation and non-dependence on local resources and ecological circumstances. The modern dislocated fishery and its related employment were no longer linked to the local ecosystem.

[26] The recession of fisheries in the southern and eastern coasts of Sweden has been discussed by Eklund (1994) and Hammer (1994).

Licences for boats of 12 m and under were issued by the provincial administration; those for larger vessels were issued by the central authority (NBF). This division between the provincial and the central level indicate that small-scale fisheries were viewed as a regional development concern and the modern larger vessels were viewed as a national concern. For the modern West Coast fleet the situation after the collapse of the Atlanto Scandian herring was aggravated in 1977, when the introduction of the Exclusive Economic Zone (EEZ) led to changed national jurisdiction for fisheries. The Swedish fishermen were excluded from waters of the North Sea, where Swedish offshore fisheries had traditionally operated. The stocks of cod, haddock, plaice and whiting were at the time in good shape[27], and supplies were welcome in both domestic and European markets, so groundfish fisheries expanded considerably. Thus to compensate for the lost fishing waters the offshore industrialised fleet was diverted to the coastal waters and cod fishing in the Baltic Sea. This shift was not seen as positive in the eyes of the fishermen from the East Coast, and SFR acted as a mediator between the various types of fishery and the regional branches in the East and the West.

In 1977 the legal framework of the fishery sector was reformed and the National Board of Fisheries received its own regional structure: the county based fishery councils (*fiskenämnder*) with at least one officer in each county working in cooperation with the County Administration. The members of the executive board of the fishery councils were nominated by the County Administration. The councils took over all the activities previously carried out at the local level under the Board of Agriculture and were integrated with the seven regional districts. In these councils the district officers, the former extension officers, and the County Administration under the umbrella of the National Board of Fisheries dealt with mainly inland and local coastal fisheries issues and water works. Transboundary issues in the large lakes (i.e. the lakes Vänern, Vättern och Hjälmaren-Mälaren) were dealt with jointly by representatives of the executive boards of the fishery councils and the County Administration concerned. Unresolved transboundary issues were forwarded to the NBF. Issues related to the marine semi-industrial fisheries were dealt with centrally by the National Board of Fisheries.

2.3.8 The concentration of regulatory authority to the central level

The late seventies and the early eighties are characterised by increased international involvement in environmental marine issues, even in Sweden. Stock conservation and environmental protection (combating pollution) become more integrated into the fishery policies and this motivated increasing government involvement in fisheries management. In the Baltic and the North Sea regional seas programs, conventions and commissions for the protection of the marine environment were institutionalised. Acting at the regional seas level was perceived to be the most appropriate approach both by the scientists and the administration for dealing with marine environmental questions. In the mid eighties the Swedish landings of cod and other groundfish peaked and the dissolution of the Soviet Union increased the engagement of the government in intergovernmental negotiations in the Baltic Sea.

Regulation of the use of coastal waters was still done at the county level by the fishery councils (*fiskenämnderna*). The system of locally, sometimes regionally enacted rules was complex with different rules addressing fishing of the same species in different parts of the coast. The rules were not always based on scientific facts and the patchy pattern was problematic for the expansion of the modern fisheries in the coastal zone. In this context, it was felt necessary to simplify the regulation addressing coastal fisheries and scaling up the locus of decision-making

[27] Svelle et al (1997) support the hypothesis that the so-called "gadoid outburst" was probably related to the high fishing pressure and disappearance of pelagic species in the 60:s because these pelagic species normally feed on larval and post larval phases of gadoid fishes.

authority.[28] During this period, a debate on the need to centralise all administration for fisheries started (Wramner 1998).

According to an assessment carried out in 1988 by a working group set up at the National Board of Fisheries, including participants from various administrative levels and the fishery sector, the problems and trends of an expanding recreational fishery,[29] rapid advances in fishing technology and increased pressure on coastal resources had made rule-making at the county level dysfunctional (Fiskeristyrelsen 1988). The report argued that the regulatory system at the county level was overloaded and consisted of a mixture of disparate regulations which lacked coherence from a national point of view. The assessment concluded that the provincial regulatory level lacked a "holistic approach", making the adoption of international agreements and the conservation of resource difficult (Fiskeristyrelsen 1988).

2.3.9 The policies of the 1990s

In 1991 and under the influence of the sustainable development debate the national policies were adapted to fit the sustainability issues and the demands for transparency and scientific rigour in the decision-making and the National Board of Fisheries underwent a reform. The NBF was assigned special responsibilities for environmental issues and biological diversity and the composition of the Executive Board was changed. The change consisted in a reduction of the number of members and the exclusion of the economic actors. The members of the new Executive Board came from Stockholm University, the Environmental Protection Agency, and the Swedish Food Workers' Union, and included one Governor from the East Coast and two members of the Swedish Parliament. The new Board was expected to represent the interests of society as a whole. This was the first step to make consultation in co-management less corporatist and more pluralistic. With the entry of Sweden into the European Union, in 1995, the main policy making arena was relocated to the corridors of Brussels and the FAs lost further power of influence.

At the national level, the membership in the EU was preceded by institutional reforms. As part of the preparation process in 1993, a new Fisheries Law was approved by the Swedish Parliament. This law concentrated the fisheries management authority to the National Board of Fisheries. Within the framework of this law, the decisions, procedures and regulations are to be taken with the aim of protecting the health of the stocks (biological grounds). The new law fine-tuned NBF regulatory authority which now involved: fishing for a certain species; use of particular fishing vessels, methods or gear; fishing within certain areas or for specific purposes; and use of gear, bait, vessels etc that may spread pests or diseases (SFS 1993:787). However, as with previous laws, no guidelines were given on how decisions would be taken, who should be consulted and how. This was in effect in the hands of the administration. In Sweden there is no legal instrument delegating regulatory responsibilities to the fishermen or their associations. However, even though the final responsibility for management is considered to rest with the Government, the distributive allocation function of fishery management – or the domain of user-user relations– remains in the hands of the fishermen's associations. Provided the majority of delegates agree, the associations have the possibility of imposing regulations on its members. This formed the basic premise of the Swedish co-management system which at the same time implied a clear separation of the management functions of the state and the fishing industry. Both, indirect regulations seeking to limit input, with emphasis on fishing and gear regulation, as well as direct regulations seeking to control

[28] In a recently published paper Mikalsen and Jentoft (2003) have reported that similar processes occurred in Norway in the 1950s.

[29] In the eighties the landowners were deprived of their right to exclude sports fishermen, but their exclusivity in terms of commercial fisheries was maintained. For a more in-depth discussion about this issue the reader is referred to, for example (Sandström et al 2002).

output by fixing TACs have been central instruments. In Sweden, fisheries regulations issued by the government administration (NBF) should preferentially not have a distributive purpose or aim to allocate resources among various categories of users. This is an old established principle in the Swedish fishery management system[30] where political decisions are to be taken by the Swedish Parliament.

2.3.10 The European level

Since 1995, as a member of the European Union and in line with the Common Fisheries Policy (CFP), Sweden transferred part of its decision making and management authority to the European institutional level. The fishery sector is one where the European authorities have an exclusive mandate. Thus the 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 (in terms of capacity measured in gross tonnage and engine power) and regulation of the market. The regulations sanctioned at the European level concern only commercial fisheries. In an account of the Danish fisheries, Nielsen and Vedsmand (1999) briefly describe the decision-making arrangements within the EU's common waters. Central instruments within the European conservation policy are, in addition to annual TACs and national quotas, the control of harvesting rates, the application of technical measures, such as mesh sizes and gear design, selective gear, and closed seasons and areas. By means of multi annual guidance plans (MAGP) the size of the fleets were intended to be reduced.

A basic principle of the CFP is equal access to EU waters and the living marine resources therein. Thus, in principle, Member State vessels have unqualified rights of access to all Community waters including the coastal waters extending from the baselines to the 12 nautical miles under member states' jurisdiction. However, in order to protect the livelihood of coastal fishermen and safeguard the economic and social wellbeing of fisheries dependent areas, a derogation from the principle of equal access was granted in 1983 whereby Member States retained exclusive access rights in respect of the 12 nautical mile zone, subject to the recognition of historic fishing rights exercised by other Member States. The derogation has recently been renewed until December 2012. In the case of Skagerrak, Denmark and Norway[31] have historic fishing rights up to the 4 nautical mile limits.

In the 12 mile zone, EU member states are also allowed to adopt conservation and management measures, provided these are not less stringent than existing EU legislation and provided the Commission has not already adopted special measures for the area. The measures taken in this zone must also respect historical fishing rights, and, when applied to fishing vessels from other member states must not be discriminatory.

The Law of 1993 introduced a new licensing system which defined who is an authorised professional fisherman. For a long time, entry to commercial fisheries was open to anyone fishing in public waters (*"det allmänna"*). The new licence, in force since 1994, was more restrictive than the previous one. It was obligatory and limited to those fishing for commercial purposes in public waters under the semi-regulated open access regime. With this licence, the definition of professional fisherman changed. Professional fishermen are now, by decree, those fishermen who possess an individual fishing licence and actively fish for their main

[30] See for example texten in (Fiskeristyrelsen 1988) page 10 "Föreskrifter som utfördas av myndighet anses inte få ha till syfte att fördela fisket mellan olika kategorier fiskande så att en grupp gynnas eller andra missgynnas". With the expansion of the recreational fisheries in inland and inshore waters, it was felt necessary in Sweden to allow for a preferential treatment of the professional fishermen.

[31] Norway is not a member of the European Union.

income (Fiskeriverket 1993).[32] The new definition of professional fisherman included share-fishermen – crew members who fish for a share in the value of the catch rather than for fixed wages – as well as those who "own" waters and fish by means of exclusive fishing rights in private waters. These two groups, however, do not need a fishing licence, and the private owners are not obliged to report their catches.

To guarantee resources to those whose main income depends on fishing, the new licence leaves out of the system those fishermen who during the three previous years have failed to show their economic dependence on fishing. Part-time fishermen deriving their main income from activities other than fishing are designated "recreational fishermen" and their fishing and trading rights are constrained. The new licence, unlike the old one, has had a strong impact on the fishing community and clearly favours professional fishermen.

Within the EU – with the intention of guaranteeing fair income to producers, regulating prices and concentrating supply – the establishment of independent producer organisations (POs) was also made possible.[33] The POs are recognised as having a crucial role in the implementation of the CFP in particularly on the stabilisation of the market and conservation aspects (Commission of the European Communities 1994). A PO can also determine the prices below which the fish is withdrawn from the market and the fishermen compensated. Minimum prices are defined and the Producers Organisations (PO) get paid for the landed fish that cannot be sold in the market at that price. Financial aid is available for the processing and storage of excess supply (Phillipson 2002).

At the national level, the central administration and the Producers' Organisations were also expected to jointly develop plans for how the CFP was to be implemented, followed up, and reported with an emphasis on catch plans, to adjust supply to the market demands and in this way obtain the best prices for the catch. In some countries, the role of POs has subsequently been extended to include quota management (i.e. allocation, see for example the case of UK and particularly the Shetlands in chapter 3, box 3.3 b). But in the Swedish fisheries management model internal distributive aspects are to be taken care of by the FAs. Therefore, the POs have only marketing responsibilities.

To conclude, the entry of Sweden into the European Union relocated part of the decision-making locus to Brussels. Yet, the current system presumes considerable discretion for Member States to determine their own management approaches in the coastal zone (Symes and Phillipson 2001). The administrative reforms that in Sweden preceded membership in the European Union led to a concentration of fisheries management authority at the central level, but at the same time opened the system to other interests than those of the fishing industry. The Common Fisheries Policy made the establishment of independent Producer Organisations possible and these in turn would push for institutional reform (see chapter 8).

[32] To be able to apply for a professional fishery licence one has to make from fisheries an annual minimum net income equal to 50% of the basic amount, which is an index established according to the National Insurance Act and at present € c.a. 4.600.

[33] Phillipson (1999; 2002) has introduced the European producers' organisations system and described the role and structure of producers' organisations in UK. According to the European market legislation concerning the market of fishery and aquaculture products (see Council Regulation (EEC) No 2759/92 and its amendments 1891/93 and 3318/94) POs include any recognised organisation or association of such organisations, established on producers' own initiative for the purpose of taking such measures as will ensure that fishing is carried out along rational lines and that conditions for the sale of their products are improved (Article 4). Phillipson (2002) reports that there are a total of 173 POs in the EU and that Finland remains the only coastal fishing member state without a formally recognised PO.

2.4 ENVIRONMENTAL LEGISLATION AND COASTAL MANAGEMENT

In the previous sections the development of coastal fisheries and the institutional systems directly related to fisheries management have been outlined. But there are a number of other institutions and organisations which influence the use of coastal resources affecting the different sectors and levels of decision making in the administration quite profoundly. Efforts to manage the use of coastal resources involve cross-sectoral and vertical political interplay and dialogue, commonly promoted under the concept of integrated coastal zone management (ICZM). At present the coordination and cooperation between different sectoral interests over the use and management of coastal and marine resources in Sweden is incorporated in several different legal Acts and instruments operating at different administrative levels and involving different stakeholders. In 1995, the Swedish Environmental Protection Agency issued a report that describes the Swedish model for coastal zone management (Ackefors and Grip 1995).

In Sweden, the cross-sectoral and vertical dialogue is promoted through various instruments aiding decisions on an *ex-ante* basis. Relevant to fisheries are: the procedure of consultation through referral of proposals to stakeholders (public and private) for comments; meetings, working group and commissions; the Environmental Courts; the Comprehensive Municipal Planning; and the Environmental Impact Assessments (EIAs). Policies and solutions concerned with nature conservation and fisheries issues are commonly exposed to the stakeholders via the first three instruments. The voluntary cooperation between authorities along both horizontal and vertical axes is rather common in Sweden and is based on dialogue, consultation, and joint working groups. With regard to the participation of resource users of state owned waters, the consultation process normally builds on representation. Through the procedure of referral of documents, those who represent particular interests – in the case of the fishermen, the FAs – can elaborate their position and present arguments in favour of or against a particular project or intervention. The Courts are used in specific cases to assess inter-sectoral externalities but also the need for compensatory measures.

The Comprehensive Municipal Plans attempt to direct local development, assess sectoral compatibility and allocate the use of space, and have not therefore been incorporated within the new Environmental Code. EIAs assess environmental compatibility, but have not yet been used to assess fisheries.

Here a short description of some cross sectoral coastal management instruments and procedures is introduced. The focus continues to be on the legal framework and formal management instruments, especially those which address competing interests and the vertical and horizontal integration of management in a multiple use situation.

2.4.1 The Environmental Code

Sweden's environmental legislation was reformed at the end of the 1990s when the pre-existing principal acts were consolidated into an Environmental Code (SFS 1999:808) which came into force in January 1999. The purpose of the Code was to modernise and harmonise environmental law and to develop instruments to drive environmental policy forward. Overall, the Code has adopted a less utilitarian and development oriented approach than the pre-existing individual laws. In the new Code, the roles of the various agencies at the different administrative levels have been clarified, new principles incorporated and rules and instruments dealing with species, biotopes and area protection brought together. The National Environmental Protection Agency (central level), the County Administration (provincial level) and Municipal (local level) administrations play important roles in implementing and enforcing the Code. The Environmental Courts have also been strengthened and environmental quality objectives and standards introduced. Each sectoral authority, including the National Board of Fisheries, has environmental responsibilities and is instructed to set environmental goals and

monitor progress by means of measurable indicators. But, the fishery regulations are sanctioned within the framework of the Fisheries Law (1993) which is not part of the Code. Fisheries regulations are sector based and primarily concerned with issues related to fisheries conservation; they are not intended to apply to the interrelations with other sectors. Instruments that address interrelations (externalities) between sectors – here referred as to integrative instruments – are found, however, in the various chapters of the Code. The fisheries administration is engaged when the issues addressed through these instruments affect fisheries resources.

The *Natural Resources (Management) Act* of 1987, is central to the Swedish resource management system and the Environmental Code. It guides other legislation relating to the regulation of land, water and the physical environment and relates to the concept of 'ecological sustainable development.' The intention of the 1987 Act was to provide a general framework for decisions against which other, more specific, cross-sectoral issues would have to be scrutinised by the County Administration on behalf of the central government. The Act established that 'land, water and the physical environment are to be used in such a way that they ensure long term good husbandry from an ecological, social and socio-economic point of view' (SFS 1987:12, author's translation). Subsequently the Environmental Code has confirmed that:

> ' Land and water areas shall be used for purposes for which they are best suited … Priority shall be given to use that promotes good management from the point of view of public interest … Land and water areas that are particularly vulnerable from an ecological point of view shall, as far as possible, be protected against actions that may damage the natural environment … [and] areas that are important for … commercial fishing or aquaculture shall, as far as possible, be protected against actions that may significantly interfere with the operations of these industries' (SFS 1999:808:iv)

The prioritisation of the natural environment and the protection of natural resource based industries is thus made clear. The notion of sustainable development is included and, through the way in which the Act is constructed, it incorporates the issue of development *versus* conservation.

The remit of the Natural Resources Act extends 3 nautical miles seaward from the baseline, a fringe that is essential to the coastal fisheries. The Natural Resources Act also contains both general and specific management provisions for sectoral development on the one hand, and for the development of geographical areas delimited on the basis of the natural and cultural features, on the other. The prioritised sectors and areas were to be designated by the central authorities as Areas of National Interest and can overlap. Taking the protection of the natural environment into consideration, together with the notion of ecologically sensitive areas of national interest, all shallow coastal waters up to 6 m in depth in unexploited or lightly exploited areas are to be protected. Such areas of national interest are subsequently given special consideration in the application of planning instruments, environmental impact assessments and the Environmental Courts.

The Act further stipulated that certain areas shall be used for particular economic activities of 'national interest'. These include: agriculture and forestry; fishing; the extraction of raw materials such as minerals, peat or sand; industrial production; energy supply and communications; water supply and waste treatment; and national defence. But the Act also stipulated that these economic activities are only to be permitted if they have no detrimental effects on: large, unexploited areas and ecologically sensitive areas; natural and cultural environments of 'national interest' for conservation and research; and areas set aside for outdoor and other recreational activities. The provisions in the Act were not, however, intended to hinder the further development of existing settlements, local industry, or national defence installations. Areas intended for outdoor recreation and land and water of significance to professional fisheries and reindeer herding have to be identified by the central

administration and taken into consideration in, for example, the comprehensive municipal planning process. In Northern Bohuslän, north of Lysekil, various national interests overlap.

The Act also reserved areas where recreation and tourism are to be given priority, many of which are located in coastal areas including those from Lysekil to Strömstad, here referred to as Northern Bohuslän. Here the central administration has the authority to prevent the introduction of certain types of industrial activity. The Act also defines certain activities which require special government permission for their establishment. Among these are heavy chemical industries, oil refineries, and sea platforms for wind power generation. Prior to any major development decision, such as the expansion of wind power, the government will normally commission an appraisal. Through this and other mechanisms, the sectoral, regional, and local organisations representing different stakeholder interests are consulted. Nonetheless the Natural Resources Act has been criticised both for its vague formulation and its subordination of local interests to national interests. These problems are often manifested when Comprehensive Municipal Plans are prepared or the development of new industries considered.

The *Shore Protection Act* of 1964 was originally utilitarian in the sense that it was intended to serve the recreational needs of the Swedish population. This was done by preventing the construction of summer houses within 100-300 m of the shore and in this way securing peoples access to sites for bathing and outdoor recreation. The application of these provisions is devolved to the municipalities, though exemptions from the Act have to be approved by the County Administration. Over time a new interpretation of the Shore Protection Act has evolved that acknowledges the primary function of protecting the shore and allowing the counties to extend the protected zone from 100 to 300 m from the shoreline. This extension has been used particularly in coastal areas classified as unexploited or of special natural or cultural value. Coastal buildings such as workshops needed for the daily operation of the professional fishermen are exempted from this ban on development.

Allemansrätt is the practice which permits the public free access to countryside, land and water even on private property, provided one behaves in a socially acceptable manner. In Sweden *allemansrätt* is not applicable to fishing. Nevertheless, with the development of recreational fisheries and the commercialisation of fishing based tourism, individuals and companies have sought to claim access rights based on *allemansrätt*.

The Shore Protection Act of 1964 and the principle of *allemansrätt* reinforce the special consideration given to outdoor public recreation by the Natural Resources Act

Under the provisions of the Environmental Code, permits are required for all kinds of construction work which might impact the local, regional, or national aquatic environments. These permits are issued by the Environmental Courts, previously known as the Water Courts. The Water Courts were originally developed to regulate the localisation of hydroelectric power plants in riverine locations. One of the main tasks of the regional districts officers in the 1960s and the 1970s when many hydroelectric power plants were constructed was to collect and provide fisheries related information to the courts (Andersson 2004). Today, applications for permits brought before the Environmental Courts involve pipelines, cables, marinas, quarries, roads and so forth. The main task of the Court is to determine the conditions under which these construction activities can best be undertaken with minimal disruption to the environment or to established economic activities.

The National Board of Fisheries may be asked to represent the fisheries sector in this instance. Programmes for monitoring the outcomes of the development in relation to fish and fisheries and compensation for any damage caused are the most common conditions advocated by NBF. Compensation is not necessarily used to mitigate the effects of damage locally where it occurred but rather to enhance fish stocks (primarily eels and salmon) by ranching or restoring

biotopes in general. As a rule, when a major development project is planned by a public authority at national, regional, or local level or by an established private enterprise, a process of informal consultation precedes the application to the Environmental Court. During such a process, where appropriate, the National Board of Fisheries can seek to influence the design and site selection for the development. NBF's officers will collect information from the fishermen's organisations and specialist research centres, and assess its relevance. Some recent cases brought to the attention of the fishermen's associations and the media include proposals involving the construction of a new hydroelectric plant in the north of the country, sea- based wind-power parks on the west coast and underwater cables to transport electricity to and from Europe in the south, all cases related to the energy sector.

2.4.2 Comprehensive Municipal Planning

According to the *Planning and Building Act* of 1987, each municipality is required to prepare a comprehensive plan for the use of land, water and the physical environment. Comprehensive municipal planning in Sweden is commonly praised for the qualities of being decentralised, integrative in both the vertical (across administrative levels) and horizontal (cross sector) sense, problem oriented and based on the democratic process and the long standing principle of public review (Ackefors and Grip 1995; Johansson 1995).

How the municipal planning in the West Coast deals with coastal conflicts and local participation is the object of specific research within SUCOZOMA (see Morf, forthcoming). Hopefully, the present study and the project referred to above will taken together provide a more comprehensive picture of how the Swedish Coastal Management Regime influences local users' access to local natural resources and participation in the management of these resources. It suffices here to mention some shortcomings which influence the resolution of conflicts of use in the coastal zone, and which should be highlighted in this thesis.

The Comprehensive Municipal plan is not a legally binding instrument, but is expected to guide decision making in line with the principles laid down in the Environmental Code and its Natural Resources Act. In general these plans direct new development and do not engage much in redevelopment.

The plans comprise maps and text describing the uses, regulations and recommendations. The plans are intended to encompass territorial waters up to 12 nautical miles from the baseline, but the seaward extension of the plans is often unclear and the criteria chosen for the outer limits vary. Some plans cover the totality of the territorial waters, others refer only to the area within 3 miles of the baseline – in line with the remit of the Natural Resources Act – and still others do not extend beyond the baseline itself. According to an assessment covering all coastal municipal plans (Boverket 1995: p71) 'what happens or could happen on the coast is currently not prioritised in the municipal plans'.

Comprehensive Municipal plans have a spatial development perspective and can be characterised as instruments to enable dialogue between central government and the municipalities concerning the detailed implementation of the Natural Resources Act and which national interests are to take precedence in the development of the particular municipality. The County Administration in fact represents central government interests, and its key tasks are to scrutinise the Municipal plans to ensure that national interests are being respected and focus on any transboundary issues. The latter however are seldom discussed in the plans. An important reflection in the report by Boverket (1995) is that, in general, municipal plans mirror relatively few competing demands on coastal waters, and there is at the municipal level an impression that existing demands seldom result in conflicts of use. Boverket (1995) points out that competing claim over the use of coastal waters are often only

indirectly evident in the text of the plans. The report referred to identified 13 'hidden' conflicts of which 11 involved fisheries.

In most instances, the Comprehensive Municipal Plan is prepared by officials of the municipality, with the support of a committee of locally elected councillors, and experts brought in as consultants. In general, architects tend to be overrepresented in the preparation of the plans, most probably because this instrument is part of the Planning and Building Act and has its origin in urban physical planning. This physical planning and building tradition is believed to contribute to the rather static character of the plans, compared to process oriented concepts such as integrated coastal zone management. It also disconnects the planning process and the formulation of the plans – which are not binding instruments – from the implementation process and evaluation of the eventual outcomes. The latter is problematic when dealing with coastal and transboundary issues.

Ackefors and Grip (1995) argue that, even though Sweden has a long tradition of public reviews, planning remains a top-down process within the Municipalities. In general, planners do not actively seek out the involvement of resource users. During the planning process, open consultative meetings are arranged and the community, in the widest sense, is invited to present its views, which also need to be submitted in written form. The attendance at public meetings is usually rather poor. Once drafted, the plans are exhibited in public for a period of two months during which time the planning process and its outcomes can again be questioned. Safeguarding the interests of fisheries is usually left to the fishermen's associations which will review the draft plans and bring it to the attention of the municipality if a plan appears to threaten essential fish habitats or access to fishing grounds.

More recently, new forms of local participative planning experiences are being tested both within and outside the context of the Comprehensive Municipal Plans. Among these are local Agenda 21 projects which involve citizens in environmental work, LEADER projects, a few in-depth Comprehensive Area Plans prepared at the local level, and consultation through focus groups. These experiences have benefited staff at the municipal and county levels as a learning process in participative management.[34]

2.5 COASTAL FISHERIES IN SKAGERRAK

The coasts of Sweden occupy a prominent role in the life of the Swedish population and the concept of "quality of life" is very much related to access to the coast for recreation and leisure. The archipelagos are discussed mainly in terms of low or negative demographic growth and the valorisation of coastal land for leisure has led to the displacement of people formerly engaged in production. Compared to other economic sectors, the fishery sector in Sweden is no longer as important as in once was, neither in terms of numbers nor national economics[35].

[34] Many of these initiatives appear, however, to be led by local elites or by new residents in the area committed to the protection of the environment, the empowerment of local communities or simply with personal stakes in the plans' outcomes.

[35] The minor economic significance of the Swedish fisheries from a national viewpoint was made clear by one of the informants who stated that the value of the Swedish fishery is, in terms of money, equivalent to the Swedish egg production. Expressions like "nobody would think of the idea of having a national board for the production of eggs"; "there is so much noise about fisheries"; "fishermen have always been troublesome"; "fisheries gets publicity, state attention and funds that are out of proportion"; "how many people are there in the administration? - 1 officer per 10 fishermen - and you cannot resolve the problems;" illustrate that some interviewees could easily forget that fisheries management has to do with renewable resources that theoretically can last for ever and produce food and income to coming generations.

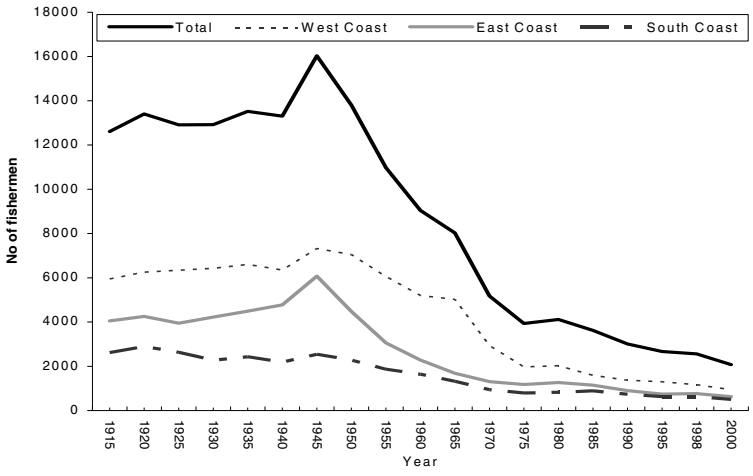


Figure 2.3 Swedish sea fishermen population
Source: SCB (1995); NBF data base (1999).

The total number of professional fishermen in Sweden in 1998 was around 2800, and the fishing fleet in 1998 comprised approximately 2200 vessels, only a third of the number registered in 1970. Figure 2.3 illustrates how, after World War II, between 1945 and 2000, the number of professional fishermen in Sweden declined from around 16,000 to less than 3000 - a reduction of 80%.

Since the sixties the number of fishermen has decreased steadily, and to judge from the current age structure of those employed in the fishing industry, this trend is likely to continue. In the ten years up to 1995, the average age increased from 40 to 44; in the next three years it increased from 44 to 48 (Píriz 2000). There are clear geographical variations in the process of youth recruitment. The older generation is widely distributed along the coast of Sweden, but the ageing of the workforce is less noticeable in and around Göteborg, where the semi-industrial fishery has its base (see table 2.1).

The vessels of the Swedish fishing fleet range from 5 to 50 m in length and up to 2500 gross tonnage (GT) (Gustavsson 1999). 80% of the fleet comprises boats under 12m length with a tonnage below 50 GT – the so-called small-scale, inshore fleet. A further 15 % range between 12 and 24m, but the average age of the craft in this group is around 30 years. These are referred as the traditional or medium-size fleet. Only 5% of the total are above 24m in length, representing the industrial, or large-scale, sector. Geographical variations with regard to the size of the vessels and structure of the fishing fleet are also important in Sweden.

The industrial fleet is concentrated on the more urbanised municipalities of Southern Bohuslän, especially Göteborg and Öckerö, followed by Tjörn. The urban–based fishing interests in places such as Göteborg are increasingly privileged by the prevailing trends and dominant management regime. Fishermen from other areas e.g. the east coast who specialise in small-scale fishing of highly mobile species, be it cod, herring, salmon or eel, are those least likely to be able to absorb the effects of the Common Fisheries Policy.

Table 2.1 Selected data on fishermen and fisheries on the West Coast of Sweden

Municipality	Strömstad	Tanum	Sotenäs	Lysekil	Orust	Tjörn	Öckerö	Göteborg	West
(District)	(SD)	(SD)	(LL)	(LL)	(UA)	(GG)	(GG)	(GG)	Coast
Fishermen	81	139	119	41	31	110	265	316	1102
Male	80	139	119	40	29	107	264	316	1094
Female	1	0	0	1	2	3	1	0	8
Age	54	48	47	48	48	43	41	38	46
Proportion of crafts & catches as % of total on the West Coast									
Crafts	9,0	19,0	12,0	6,5	4,5	12,0	15,5	21,0	99,5
Deep sea	16,7	12,4	28,0	4,3	0,0	13,3	9,1	9,1	92,9
Norway	5,5	17,9	17,3	1,2	0,5	2,5	23,3	7,8	76,0
Eel	2,9	5,9	2,0	8,8	6,1	14,4	4,3	5,9	50,3
Other	0,3	0,7	1,1	2,4	0,6	0,9	19,8	52,3	78,1
Total catch*	25,4	36,9	48,4	16,7	7,2	31,1	56,5	75,1	

The total catch figures for the West Coast also include catches made by fishermen from the province of Halland on the Kattegat Sea. This explains why the totals do not add up to 100%.

Source: Based on the National Board of Fisheries Database (1999)

This thesis focuses on Northern Bohuslän, from Lysekil to Strömstad. Here fisheries together with tourism are important to the local economy and society and are considered a cultural icon. Yet with some exceptions the majority of the coastal communities are now primarily dependent on tourism rather than fisheries, and the remaining local fishermen, who are rarely younger than 40, often operate from small and/or larger but ageing vessels crewed by one or two men.

Table 2.1 provides some relevant figures about the significance of fisheries for the various municipalities of Bohuslän. The heavy line separates the municipalities in the north, which are in focus in this study, from the municipalities of Central and Southern Bohuslän. The table indicates a clear emphasis on deep-sea prawn and Norway lobster, commonly referred in the literature to as *Nephrops,* among the fishermen from Northern Bohuslän. The table also indicates that the fishermen from Göteborg stand for 75% of the catch taken on the West Coast.

A common means of assessing the contribution of fisheries to the local economy and society is to calculate the overall share of the total workforce attributable to fishing related employment. This helps to define the level of so-called fisheries dependence. In the EU where fisheries have only a very small share of the workforce, levels in excess of 1% have been used to define "fishing dependent areas" (FDAs). In Sweden, only 11 out of 85 coastal municipalities qualify even at this low threshold; of these four are located in Northern Bohuslän[36] (see table 2.2).

The high level of fishery dependent employment registered in the Municipality of Sotenäs (25.09 %) is related to the processing industry. Gustavsson (1999) estimated that 50% of the total added value attributable to fish processing in Sweden originates from this area. In Sweden, the medium and large scale processing industry production is almost entirely based

[36] Attempts to measure the regional or even local significance to the socio-economic fabric of communities of fishing related activities are complicated, costly and manpower intensive. This combined with the fact that in rural areas the fisheries are often of small-scale type and fishermen often have a diversified livelihood strategy with a pluri-active and often "non-formal" role in the local economies easily yields low figures and result in what apparently can be unconvincing socio-economic results.

on herring and sprat or imported fish and products from Norway, Canada, Iceland, and Asia (Píriz 2001). Hence, there is no direct relationship between the fish landed by the local fishermen and the bulk of the production in the medium and large processing industries in Sotenäs. The bulk of what is landed in the area is marketed fresh in the Swedish or the European market. Before World War II the fisheries for small pelagics, followed by the fisheries for gadoids and flatfish supported the economies of the coastal communities of Northern Bohuslän (see figure 2.1).

Table 2.2 Relative contribution of the fishery sector in terms of employment in Northern Bohuslän and number of people employed in the main commercial sub-sectors (1997).

Municipality	Dependency rate %	Capture sector	Processing sector	Trade sector
Sotenäs	25.1	119	714	46
Lysekil	4.6	40	222	4
Strömstad	3.9	81	1	16
Tanum	3.7	139	6	3

Source: Gustavsson, (1999); Píriz (2001)

During the seventies and the eighties the cod fisheries expanded and the landings peaked in 1985. In the early nineties, the catches of groundfish declined sharply (see figures 2.4 and 2.5). Moreover, the biodiversity and productivity of shallow bays has been affected by pollution. Many areas that before the sixties and the seventies were open with sandy or muddy bottoms rich in eelgrass and seaweeds, and known to be good nursery and feeding grounds for young flatfish, are today covered with filamentous algae mats and often have low oxygen levels. The structural and functional changes occurring in shallow coastal ecosystems which affect not only the biodiversity but also the economic returns from both tourism and coastal fisheries have been noted by various authors (EU-Life 2001; Phil, 1994; 2001).

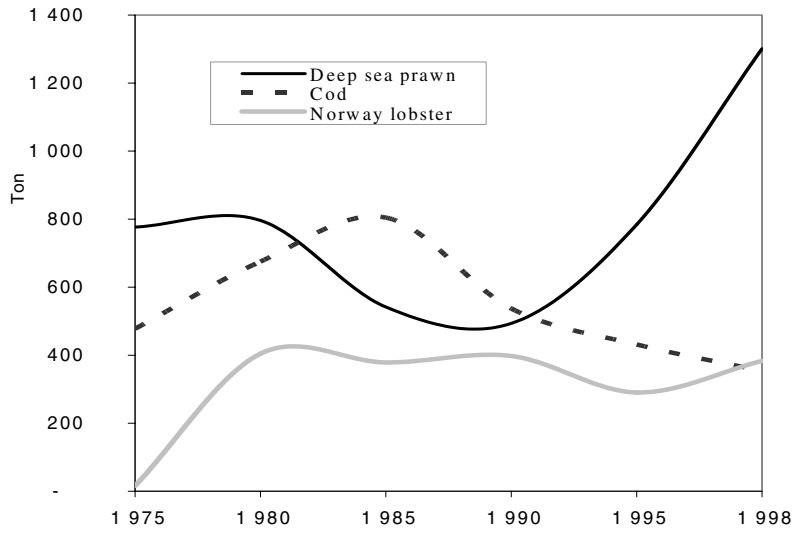


Figure 2.4 Annual landings at Smögen's fish auction (1975-1998)

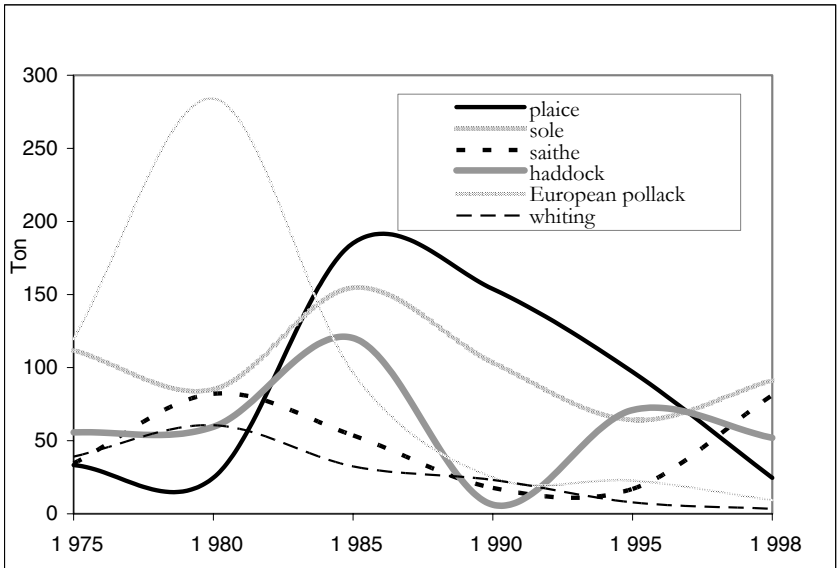


Figure 2.5 Annual landings at Smögen's fish auction (1975-1998)

Today, the shellfish fisheries are considered the pillar of the economy of the local fishermen from Northern Bohuslän (see table 2.1). All other species, where available, are regarded as suplementary. The landings at Smögen's fish auction in the municipality of Sotenäs, illustrate the trends (see figures 2.4 and 2.5[37]). The figures also indicate how the shellfish fisheries have gradually developed to compensate the decline in demersal landings. A similar development trend as the one presented in these figures, where the fisheries for gadoids have collapsed and shellfish have had a stabilising influence, has been reported in other countries e.g. Great Britain and Canada (Hamilton and Butler 2001; Phillipson and Symes 2001).

The *Nephrops* and the deep-sea prawn are the most important shellfish species for the professional fishermen in the area. While the stocks of deep-sea prawn are considered relatively stable, the state of the *Nephrops* stock is more uncertain. The *Nephrops* fisheries are economically important in

Sweden and occupy the third place after herring and cod. Eggert (2001) reports that in 1995, Swedish landings of *Nephrops* exceeded 800 tons, corresponding to a value of circa 7 million Euros. He explains that 40 % of the vessels, responsible for 70% of the total landings, had Göteborg as their main port.

Table 2.3 gives a synoptic view of the state of some biological stocks. The table mirrors the situation for the period 1998-2000 as reported by ICES, which in recent years has recommended fishing stops for several species in particular cod and other gadoids. The table also indicates whether or not there is a TAC allocated to Skagerrak (ICES sub area IIIa) (Svelle et al.1997). It is worth noting that, in contrast to fish stocks, which in the majority of

[37] For reasons of scale, the landings of cod and shellfish in the same auction are presented in a separate figure.

cases are outside or close to Safe Biological Limits (SBL),[38] the lesser fugitive crustaceans appear to be in a better shape.

The situation for the fisheries resources, the deterioration in the quality of coastal waters which serve as nursery grounds for species relevant to all kind of fisheries, the problems posed by the coexistence of different types of fishing activities operating on the same grounds and/or harvesting from a common pool, the competing claims to inshore waters made by a growing range of powerful stakeholders and the external pressures demanding the protection of biotopes and species, suggest that the fisheries sector is confronting severe and deep seated management problems.

In Northern Bohuslän, in contrast to the situation in Southern Bohuslän and on the East Coast, fisheries are more diversified. Here, the majority of the vessels – small-scale and medium size vessels, including old traditional wooden vessels – operate in coastal rather than in offshore waters returning to their home harbours almost every evening. The number of licenced fishermen registered in the municipalities of Northern Bohuslän (from Lysekil to Strömstad) totalled 380 in December 1999, a third of all fishermen registered on the West Coast.

Table 2.3 Information on the status and corresponding TAC of commercially important stocks for the study area (2000).

Species / Stock	Skagerrak TAC	State	Species	Skagerrak TAC	State
Blue mussel (No TAC)	N/A	0	Cod	Yes	6
Crab (No TAC)	N/A	0	Mackerel	No	5
Lobster (No TAC)	N/A	2	Whiting	Yes	4
Deep-sea shrimp	Yes	1	Saithe	No	4
Nephrops	No	3	Hake	No	4
Plaice	Yes	1	Herring	No	3
Sole	Yes	1	Sprat	No	2
Haddock	No	1	Eel	N/A	2

0 Under exploited; 1Within SBL; 2 Unknown; 3 Uncertain; 4 Close to SBL; 5 Outside SBL; 6 Collapsed

Source: Compiled on the basis of the following sources: (Svelle et al. 1997; Sjöstrand 1999; Sjöstrand 2000 pers.com.). N/A means non applicable and refers to the non application of TACs.

Fishermen in the area have adapted their fishing to the ecosystem's high biological diversity by combining different fishing technologies on a seasonal basis. A glance at the logbooks from recent years shows that it is in this area where the number of different gear types reaches its maximum. Neuman and Píriz (2000) used the term "combi-fishermen" to refer to a large number of fishermen, characteristic of this area, who combine gear-types and target a large variety of species on a seasonal basis. Both static gear like fishing pots (traps), creels and fyke-nets and gillnet sets, and mobile gear, mainly otter bottom trawl, combi-bottom-trawl are frequent; purse-seiners also occasionally operate in the area.

Most professional fishermen from Northern Bohuslän are members of SVC, which in 1997 had a total of 6,275 members of which 1,155 were active. SVC in turn is organised in 38 local

[38] In the ICES terminology, when spawning stock size is below the Minimum Biologically Acceptable Limit (MBAL) the stock is considered to be outside Safe Biological Limits. To determine the MBAL, information about the spawning stock size below which the probability of poor recruitment (annual replenishment) increases as spawning stock size decreases is used (Svelle et al 1997).

branches: 23 in Central and Northern Bohuslän, 12 in Southern Bohuslän and 3 in the province of Halland. The number of branches and delegates has decreased considerably. Filipson (1980), reports that there were 178 SVC delegates in 1958 but twenty years later only 78. The number of fishermen (delegates) attending the 1998 SVC congress was 65. That puts the reduction of delegates over the last 40 years at 64%. Since the mid-nineties the fishermen are even organised into producer organisations; in this case SFPO (national) and NBPO (local). As will be made evident in the following chapters, they are also organised into a special interest organisation for coastal fishermen, *Bohuslän's Coastal Fishermen Association* (BKF) and a specific group the *Koster Fjord Group* (KFG). As one may infer from their very presence in the area, the local fishermen have greater opportunities to adapt their fishing to the ecosystem than the more specialised fishermen coming from the South.[39]

2.6 SUMMARY

This chapter has described the origins and present set up of the Swedish fisheries management system with an emphasis on the situation of coastal fisheries on the West Coast. One general conclusion to be drawn from this description is that the present scenario – the state of the fisheries resources, the significance of the coastal fisheries for the archipelago communities, the institutional set up and its management modalities – is the result of process that has evolved over a long time. The system, policies and management strategies have been responsive to and strongly influenced by the context, and also by economic interests. Moreover, many events and decisions formative of the management system and its strategies have had their origins in external factors (wars, herring collapses, EEZ, cod collapses, EU membership). There are "external" in the sense of being problems and decisions outside the control of those living and fishing in the archipelago areas; hereinafter referred as the local coastal fishermen.

The context in which the present situation has evolved can be presented in periods or stages: the World Wars and the inter-war years; 1960-1970s; 1980-1990s. During these periods the coastal communities of Northern Bohuslän have witnessed shifts in the institutional set up and the social and economic dependency on coastal fisheries, and the coastal fishermen have witnessed resource dependency shifts, from small pelagic to groundfish, and from groundfish to crustaceans. Over much of this time span, local fishermen lost influence over the resources and the management of coastal fisheries. The wartime emergencies brought new situations and several temporary measures were taken to adapt to the political and market conditions. After World War II the conditions again changed drastically. The technology developed and the use of trawlers expanded; the fishermen's associations became well established; the struggle with the herring dealers was partially mitigated by SVC's investment in processing and trading; government policies supported the development of more effective and rational export oriented fisheries; the privatization of inshore waters was resolved; the customary right of free access to fisheries resources was legally institutionalized, the exploration of the seas and fishery research expanded. During this period both the state and the fishermen established national organizations, NBF and SFR respectively.

[39] Diversification is a form of adaptive responses to match ecological diversity and dynamics by which economic risks are spread. Specialisation is more oriented towards resource concentration and intensification of investment to one or few modes of resource use (McCay 1978). In fisheries there is a tendency to associate small-scale and local coastal fisheries with diversification and large scale ones with specialisation. Even if it sounds like a reasonable way to present differences between the two, one should pay attention to the fact that in fisheries high-technological mobile units can de facto apply both diversification and specialisation strategies.

Within the ranks of the fishermen the locus of management authority had been transferred from the local community to the fishermen's associations. As branches of the associations, the local fisheries communities could no longer define their own rules, unless these were adopted by the regional association, which now comprised members relying on different modes of production and with different interests. Prior to the centralization process the state was involved at the central and the regional level. While the former concentrated on the regulation and support for the offshore fisheries and the management of fisheries based on specific migratory species, the latter focused on the regulation of the fisheries within the 4 nautical miles.

For last 40 years the state and the fishing industry have collaborated but decisions have been taken at the central level and under corporatists' influences. For many years, this central corporatist co-management system had its own dynamic and rules governing fisheries were taken in a small circle. FAs participated in decision making both formally in the executive of the National Board of Fisheries and informally through consultation. To resolve internal conflicts and secure fair distribution of fishing opportunities among its members was an important task of the FAs. It did not necessarily imply that the decisions taken looked out for all fishermen's interests. For a long time the national policies have been shaped by a utilitarian and industrial approach. Such policies together with the fishermen's associations involvement in processing and trading, the dysfunctionality of traditional management institutions (the fishery community) and institutional arrangements (local rules, trawling limits) that were appropriate before the periods of wars, the collapse of the Atlanto Scandian herring fisheries and the adoption of EEZ made the intrusion of modern modes of production in the coastal areas possible. In times of abundance, the open access regime strengthened the fishing communities, but it became problematic in times of resource shortage. By the end of the 1960s the majority of the large crews in Northern Bohuslän had been dissolved and many fishing communities lost their character of being fisheries dependent.

In the eighties the landings of cod and other related gadoids reached their peak and the administration of fisheries was subjected to an institutional reform. Decision making was completely detached from the local level, and the local fishermen became increasingly dependent upon the associations which, in turn, became increasingly detached from their members and dependent on the state and supra national authorities.

The nineties brought radical changes to the national co-management set up, with, one the one hand, a relocation of part of decision making power to the European level and, on the other hand, a recognistion of new stakeholder and a pluralisation of the formal central consultation process. During this period the central level was strengthened and the FAs loss power of influence.

Nevertheless, questions regarding the internal allocation of resources among the fishermen remained in the hands of the National Fishermen's Association. The situation in the coasts of Skagerrak in the 2000s is characterised by overfished stocks, deteriorating coastal ecosystems, elderly fishermen and new demands from marine conservation policies and movements. In addition, the pressures of other interests claiming access to coastal areas and resources are steadily increasing. The selection of questions in the following theoretical chapter should be seen against the background to this situation.

CHAPTER 3

A THEORETICAL FRAMEWORK FOR FISHERIES CO-MANAGEMENT

Since the 1970s, much of the development of applied science relating to natural resource management has sought to deal with problems of depletion of natural resources. Whereas the analysis of the state of the natural resources is a traditional component supporting fisheries management, the analysis of social resources is poorly applied. This chapter brings together elements from the theoretical discussions on the collaborative management of common pool resources. By doing so the chapter provides some basic thoughts in relation to a number of issues surrounding the main research question.

The chapter introduces basic definitions and concepts which will be used throughout the thesis, and can be seen as providing a conceptual framework helping to identify the various elements that interact in the management of fisheries. But first, two methodological approaches underpinning fisheries management and undergoing a shift are summarized.

3.1 FROM SINGLE FISH STOCKS TO ECOSYSTEMS

Through *fisheries management* the living marine resources are to be kept in good shape (quantitatively and qualitatively) and the harvestable surplus allocated to resource users. As renewable natural resources, fisheries resources can endure over time. This is true, provided consideration is shown for their regeneration capacity or replenishment rate (resource flows) and the processes making that possible (ecological services).

Biology is a discipline that has traditionally contributed with scientific knowledge to fisheries management. As mentioned in chapter 2, scientific advice based on biological principles has been central in the Swedish and European conservation policies, i.e. the TAC and the quotas, mesh size regulations, fishing stops during spawning, nursery area closures, fleet size reduction, regulations restricting the use of less selective gear, and strength control.

The total allowable catches (TAC) for single stocks[1] of commercial species in predetermined geographical areas are assessed by national experts within ICES and its Advisory Committee on Fisheries Management (ACFM). In-depth descriptions of the basic concepts involved in fisheries management and its application to the fisheries in the North Sea and the Skagerrak Sea can be found in, for example, www.ICES.dk; Svelle et al. (1997) and Sjöstrand (1997).

From the 1950s and until very recently fisheries management around the world and in Sweden has relied on the use of fixed rules for achieving constant yields. Conventional management have sought to achieve maximum and constant yields (MSY),[2] which has been referred to as the classic utilitarian approach (Berkes et al. 2003). In this approach MSY was viewed as a target to reach. Besides, until the 1980s, deviations from the scientific advice about the final size of the TACs – agreed outside the scientific sphere, were not unusual in Sweden and within the European Union (EU). In the eighties, the concept of safe biological limits (SBL) was introduced in ICES advice.

Even though today the classic utilitarian view is less dominant and the MSY is understood more as a limit to be avoided (Garcia and De Leiva Moreno 2001), biological models cannot capture the complexity of the marine ecosystems and have proven insufficient to provide a reliable basis for fisheries resource assessment (Garcia 1994). They also are insufficient to

[1] A fish stock may consist of several populations.

[2] The MSY concept assumes however a certain degree of stability in both nature and fisheries.

understand the socio-ecological interrelations derived from the use and management of fisheries resources.

Problems with the basic concepts and the assumptions dominating conventional fisheries management have been discussed for some time and by many authors (see for example: Mc Goodwin 1990; Hammer 1994; Garcia 1994; Hilborn 1996; McGlade 1996; Stokes 1996; Symes 1996; Hildén 1997; Gunderson and Holling 2002; Berkes et al. 2003). Suffice to say, there are some shortcomings in the knowledge base on which the TACs rely. One problematic related to the methods used is that addressing single stocks and commercial fisheries has partly directed the attention of the research towards industrial fisheries.[3] Another is the lack of reliable data, such as for example the knowledge about the species and quantities discarded in many fisheries. Another is the lack of knowledge and consideration of food web relations in the ecosystem. The case of the Newfoundland fisheries in Canada, where the scientific advice was considered among the best available in the world, is an example of how modern management can fail (Hilborn et al. 2003). Dealing with renewable resources means one needs to know about the state of fish populations (genetically differentiable). Population-based fisheries management is in practice difficult. Even when today fish populations can be genetically differentiated through DNA analysis in the laboratories, the age of DNA-selective fishing technology has not yet arrived. In the fishermen's catches populations are always mixed and catches are more a time specific sample.

In the last decade, in the search for better models and new reference points, precautionary coefficients and approaches to multiple species stock assessment have been incorporated in the calculation of the TACs (Garcia 1994). Today the ICES advice is primarily risk-averse, is based on precautionary biological reference points and aims at keeping the risk that the spawning biomass may fall below a minimum limit low (ICES 2003).[4] Nevertheless, as explained in ICES documentation setting targets for fisheries management also involves socio-economic considerations. Therefore, ICES does not propose values for Target Reference Points, and at least until now Management Agencies have not identified management targets based on socio-economic benefits (ICES 2003).

Still, the conventional fisheries management model assumes that if the stocks are assessed and the rules guiding fisheries based on the limiting conditions (TAC) and their implementation properly enforced, then yields will be stable and fisheries can be sustained. A number of problems with the TACs and the use of quotas or output control systems, as these are perceived by the local coastal fishermen from Northern Bohuslän, are discussed in chapter 7.

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[3] Finlayson (1994) who discussed the type of data used in fisheries management in for example Canada, describes how for a long time the main sources of data used in fisheries management have been the industrial fisheries. Thus, there is a risk that capture-oriented research approaches generate information that only serves the needs of particular types of fisheries and groups. In this regard when referring to the European context Symes and Phillipson (2001) explain that research on small-scale coastal fisheries has been largely ignored.

[4] The minimum spawning stock biomass benchmark is described by the symbol B_{lim} (the biomass limit reference point). The value of B_{lim} is set on the basis of historical data, and chosen such that below it, there is a high risk that recruitment will 'be impaired' (seriously decline) and on average be significantly lower than at higher spawning stock biomass (SSB). Below B_{lim} there is a higher risk that the stock could 'collapse'. In ICES terminology 'collapse' does not mean that a stock is at high risk of biological extinction, but does mean that recovery to improved status is likely to be slow, and dependent of effective conservation measures. The fishing mortality rate should not be higher than an upper limit F_{lim} which is the fishing mortality that, if maintained, will drive the stock to the biomass limit. Spawning biomass and fishing mortality can only be estimated with uncertainty. Therefore, operational reference points are required to take account of this. To keep the true risk low that spawning biomass falls below B_{lim}, the estimated spawning biomass should in practice be kept above a higher level that allows for this uncertainty. Therefore, ICES applies a 'buffer zone' by setting a higher spawning biomass reference point B_{pa} (the biomass precautionary approach reference point). (http://www.ices.dk/committe/acfm/comwork/report/2002)

Predator-prey relations between species and multiple-species stock assessment models have also been tried.[5] As opposed to the single species population and fixed maximum sustainable yields (MSY) these new approaches introduce complexity into management. This complicates the management process still further, because multi-species analysis also brings in multiple life cycles and a large number of spatio-temporal scales.

Marine ecosystems are diverse, dynamic and complex. Coastal living marine resources have characteristics making their governance and sustainable management difficult; they are submerged, mobile, fluctuate and are shared by many people. At sea there are no clear cut ecosystems boundaries, and sea-living organisms are generally submerged and fugitive. Even those living organisms which to the observer appear stationary or sessile, often have complex lifecycles with mobile stages where eggs and larvae drift long distances with currents before they settle. The diversity, dynamics and complexity of the coastal ecosystems of Skagerrak described in chapter 2 raise, for example, problems for fishery biology which at present is struggling to cope with single species stocks assessments, and needs to introduce multiple species and ecosystems assessments.

The Ecosystem Principles Advisory Panel[6] and the ICES Working Group on the Ecosystem Effects of Fishing (WG-ECO) explore how ecosystem management can be implemented. The ICES symposium on the Ecosystem Effects of Fishing (in Montpellier 1999) the WG-ECO held a session "Ecosystem management - Can it be made operational" (ICES 1999). The working group concluded that objectives for ecosystem management are needed in addition to those assuring conservation of the target species of fisheries. However, it also concluded that based on present knowledge, in most cases the additional objectives required for conservation of "the ecosystem" would probably simply be a list of objectives regarding an increasing number of single species. Ideas for an ecosystem-based fisheries management (EBFM) are being discussed, but the scientific approaches are still under elaboration (Fifth North Sea Conference Secretariate 1997; Folke 1997; Symes and Pope 2000). The complexity of the marine environment – with many ecological factors still unclear – hampers the attainment of managerial solutions. Ignorance about ecological interrelations and uncertainties inherent in the various assessment methods cannot be totally removed, but they can be clarified and translated into policy decisions which err on the side of caution (Symes 2003).

The adoption of an ecosystem based approach to fisheries management is neither about making stock assessments for an increasing number of species, nor adding more and more species to the stock assessment models and enlarging the list of protected species. It is rather about maintaining biological diversity and ensuring that the functional integrity and dynamics of the ecosystem are properly safeguarded. It is about maintaining the resilience of the coastal ecosystem in the face of natural and man made processes, and its capacity to deliver the full range of environmental goods and services, including a surplus of fish to be commercialised (see for example Folke 1997).

The concept of resilience, introduced by Holling (1973), relates to the magnitude of disturbance that can be absorbed by a system without losing its functional characteristics. Holling has highlighted ecosystem dynamics, complexity and feedback mechanisms and rejected the ideas of linear dynamics and a unique ultimate state of balance in nature, introducing instead the idea of multiple states of equilibrium. The term adaptive management, used by Holling (1973) and co-workers (Folke 1997; Gundersson and Holling 2002; Berkes et

[5] See for example the multi-species virtual population analysis (MSVPA) in Christensen (1995) and its testing within the framework of the EcoPath program (www.ecopath.org).

[6] Recommendations by the Ecosystem Principles Advisory Panel to the United States Congress were mandated by the Sustainable Fisheries Act amendments to the Magnuson-Stevens Fishery Conservation and Management Act (1996).

al. 2003), refers to the design of management regimes to respond to these aspects and interrelated problems of ignorance and uncertainty, and is now widely used to capture the idea of robust flexible management systems that take ecosystem dynamics complexity and feedback mechanisms into consideration. The concept of social resilience is also used to refer to society's capacity to adapt to social and ecological changes without putting at risk the functionality of the ecosystem and social system (Berkes and Folke 1998; Olsson 2003).

Discussing fisheries in ecosystem terms leads one to the problems of scales and system borders and the definition of units for management on physical and ecological grounds, something that always has an element of arbitrariness and cannot be universally resolved. The various definitions of "coastal ecosystem" are an example of this.[7] In the coastal zone, the physiographic conditions, biotopes and ecosystems are far more diverse than those of the open sea. Here, where depths are commonly relatively shallow, factors such as light, solid substrates, nutrients, water turbulence and retention mechanisms, enhances dynamics, biological diversity and productivity and makes it difficult to assign a specific boundary. These characteristics of the coastal ecosystems are essential to sustain fisheries, but at the same time make possible other resource uses.

In the marine environment there is no one given method for defining the co-ordinates or specifying the size of an ecosystem. There is no scientific answer to this, because in an ecological sense the sea can be considered indivisible. In ecology, the ecosystem's spatial and temporal scales are selected by the scientist and will vary from case to case depending on the research problem at hand (O'Neill 1986). This issue of fuzzy boundaries has made many marine scientists in general supportive of large scale management units and strong state intervention which has been shown to be problematic.

It is not easy to find out the boundaries of the ecosystem to be managed in fisheries in terms of the temporal and spatial coordinates of multiple species and their interrelations, particularly if we think about the coordinates of high migratory species like eels and stationary species like crabs as part of the same management unit. The question of how to define ecosystem boundaries for management of fisheries at smaller and large scales has not yet been resolved. O'Neill (1986) has suggested that ecosystems should be seen as hierarchically nested across scales. Pragmatically, and as O'Neill (1986) explains, in the ecosystems there is a wide range of interrelated space-time scales and these must be defined relative to the scale of the problem being addressed. The boundaries of resource users and uses (e.g. fisheries) appropriating resources can also be defined. From this perspective the social dimensions of the time-space framework (in the sense that space and resources are appropriated under different spatial-temporal regimes such as the local, small-scale and the dislocated, industrial fishermen), could be helpful in defining boundaries (see chapter 5).

Sherman, who has coined the concept of Large Marine Ecosystems (LME), suggests that in the sea there are "more or less" permanent structures and processes that can provide critical information for defining management units. The LME are relative large regions (~200,000 km^2) characterised by distinct bathymetry, hydrography, productivity and trophically dependent populations (Sherman et al. 1993).[8] Yet the LME of Sherman are large systems involving a wide range of interrelated space-time scales far from the reality of the local fishermen. Today the LME-framework is being tested as the unit around which supra-national

[7] Oceanographic definitions of coastal zone are the most commonly used. From an oceanographic view point, the outer boundary of the coastal zone coincides with the depth at which the friction of the winds stops influencing the seabed, the depth of frictional influence (see for example Harvey 1976). This is, in practice, a dynamic boundary whose position will vary markedly from place to place and season to season.

[8] The use of LME as unit for management is promoted within for example the Global Environmental Facilities (GEF) program for international waters.

management could be organised. From a coastal fisheries perspective, scaling up the unit of management to the scale of LME makes management rather difficult.

3.2 FROM NON-COOPERATIVE SINGLE FISHERMAN TO SOCIAL ACTORS

While aquatic living resources in a small pond can be sufficiently confined to be governed by a single household or individual, access to coastal and marine ecosystems and resources is rarely limited to single users. The issue of large marine ecosystems with non boundaries and mobile living marine resources opened to common use has alarmed both economists and biologists as "the commons" can lead to resource overuse and depletion. The problems associated with the common use of natural resources, which later came to be called "the tragedy of the commons" by Garret Hardin (1968), was described already in 1833 by William Foster Lloyd and followed up by Scott Gordon in 1954 (Berkes 1989; Ostrom 1990). The term "tragedy" qualifies the outcome in a negative sense, and refers to its implications in terms of resource depletion and users trapped in a downward spiral of production and economic inefficiency.

Traditional analyses according to property rights have classified resources as open access (*res nullius*), [9] public property (*res publica*), common property (*res communis*) and private property (*res privatus*) (Berkes 1989). Property rights are in this traditional view an institutional arrangement defining the nature and locus of ownership in relation to a particular resource. These are well established concepts filled with meaning (in the sense of institutions) which offer information in terms of entitlements and obligations. The point made by Hardin (1968), was that when natural resources are accessible to more than one user, used in common, then they will be depleted, because these users will act in a non-co-operative way to individually draw as much benefit as possible. Typical non-co-operative strategies leading to "tragedies" in fisheries include: "free-riding" and "the race to fish". In a normative fashion, Hardin condemned the use of natural resources on a shared basis to a fate of overuse and depletion, and the collective of fishermen to being non-cooperative single individuals. From his perspective the absence of a full system of ownership (private property) or a system that command and control users behaviour by a strict enforcement of state regulations, have been blamed for resource depletion and degradation in, for example, forestry, aquatic ecosystems and fisheries. A salient deficiency of this model when applied to fisheries management is that it regards the individual as an independent calculating agent who carries the same information about reality as do others, and lives in a world where he cannot but compete to survive.

Thus, "the tragedy of the commons" as originally defined by Hardin for many years directed the attention of economists and policy makers involved in fisheries to the domain of institutional analysis, with a focus on the issue of ownership and the enforcement of state regulations.

In conventional fisheries management, where the resources are considered state property, the fishermen have to implement rules externally designed by the state authorities, the enforcement of which has required a strong state control apparatus. Nevertheless, despite all the efforts, conventional fisheries management models have been ineffective in their aim of achieving sustainability (Commission of the European Communities 2002; European Commission 2003; SOU 2003/04:51). To overcome the shortcomings of the state regulated,

[9] The use of the term "open access" has been sometimes disconcertingly and inaccurately referred to in the literature as equivalent to shared resources, communal /common property and the "commons". Hardin's contribution led to a confusion of terms because when referring to the "commons" he actually meant an open access situation where users did not communicate to clarify rights. Still, more than 30 years later, the clarification of such misunderstandings is needed.

often semi-open access regimes, right-based systems and users' participation in management are currently seen as promising complementary approaches.

To define property rights is to define the bundles of entitlements defining rights and duties in the use of natural resources (Bromley 1991). The ownership of resources and clarification of rights to appropriate them allow normally owner and right holders to plan resource use. Rights and ownership can be individual or collective.

One example is the use of exclusive individual fishing rights in inland and shore waters which has been applied in Sweden for a long time. In some coastal areas of eastern Sweden and in the small lakes the land owner owns fishing rights in the waters adjacent to their land (see chapter 2). This model can be referred to as territorial private fishing rights (TPFR).

Another example is the use of individual ownership of fishing rights which is currently seen by many economists as a promising approach to managing fisheries. The ownership of fishing rights are alleged to allow the owner to plan resource use, care for the resources and harvest in the economically most efficient way (OECD 1997; Arnason 2004). The application of individual rights to harvestable surplus or quotas of specific fish stocks is being tested through individual transferable quotas (ITQ). Based on this approach fishery administrations around the world (e.g. Iceland, Chile, Australia, New Zealand, The Netherlands and Argentina) are being advised to parcel out the harvestable surplus of a specific fish stocks to individuals or firms.[10]

The experience with ITQs varies and so do the opinions about them. The experiences from Australia and New Zealand appear to be good. But the reports on the experiences with ITQs in Iceland are, for example, divergent. On the one hand, Arnason (2004) concludes that the results of the study of ITQ from an economic perspective are encouraging. The efficiency of the fisheries and the economic profits generated by the fisheries, as measured by the quota price, has increased dramatically. On the other hand Durrenberger and Pálsson (1985) report that the implementation of ITQs in Iceland has also made it possible for economically strong quota owners to buy quotas increasing their individual shares of the resources, thus reducing the number and diversity of fishermen, especially of the small-scale operators.

Some authors suggest that the sense of property given by the ITQ becomes an incentive for the holders of rights to provide for (conserve) the resource (stocks and flows) and the ecosystem (Arnason 2004), while others (Hanna et al. 1996; Berkes et al. 1998; Jentof et al. 1998; Ostrom 1999a) indicate that private property may certainly permit the owners to increase economic efficiency of natural resource use but not necessarily lead to resource conservation. But, when used alone, IQs and ITQs disregard the opportunities to be found in the social (collective) system level.

While IQs and ITQs appear, for example, to be interesting for highly specialised ocean fisheries (Arnason 2004) with low bycatch (e.g. pelagic fisheries), they seem to be less appropriate for fisheries operating in ecosystems where biological diversity and bycatch are high. One should remember that the IQ and ITQs are output-based regulations predefined by the state, and as such have to rely on the quantitative assessment of stocks and the determination of the fishable surplus (TAC). This method, as was discussed above, still suffers from some deficiencies. IQs and the ITQs that are designed on the basis of single stock assessments disregard interrelations in the eco-system.

[10] Such a tendency can also be seen in documentation prepared by the World Bank and the United Nations Food and Agriculture Organisation (FAO).

In the current situation with deteriorated ecosystems and depleted stocks as a general problem, fisheries scientists and managers have acknowledged the weak knowledge base both at a conceptual, theoretical and practical level. The top-down and centralised command and control system, as well as the privatisation of output quotas seem to have led to problems of distribution with strong resource concentration to a few, discards of large quantities of fish and high grading,[11] and low levels of compliance.

Since Hardin (1968), more than 30 years of scientific empirical research has shown that individuals can co-operate and find ways to improve their joint long-term benefits and the outcome with regard to the natural resources and in this way overcome "tragedies of the commons" (Ostrom et al. 1994; Ostrom 1992). The idea that resource users' choices and behaviour are always driven by an individual economic rationality has garnered much criticism, particularly from anthropologists.[12] The critics argued that Hardin and his followers failed to take into consideration that individuals are social creatures, and, *de facto* do devise norms and rules of behaviour to govern the use of the resources held in common, even when their consumption is on an individual basis (Berkes 1989; Ostrom 1990). These ideas did not for example consider that in most cases, in rural areas in particular, people who normally share a natural resource system also share a common history and place of living. They have cultural similarities and may also have some common goals, and when they meet common problems can communicate and encourage each other to improve the situation. It should be mentioned here that the so-called new institutionalism (or "*post Hardinian*" institutionalism), has discarded the neo-classical assumption of economic, calculated rationality and, instead, assumes a situation of bounded rationality as the driving force behind individual behaviour (Steins 1999). From this debate evolved the idea of fishermen driven by a purposive rational behaviour that is bound up with the prevailing societal systems, i.e. a rationality that though strategic, is socially embedded and hence evolves with changing social values and communication among people.

Many studies have demonstrated that those who organise the use of natural resources on the basis of their local social and environmental contexts are very likely to take collective action and forge institutional agreements to resolve problems derived from the sharing of resources and thereby avoid tragedies (Ruddle 1987; Ostrom 1990; Baland and Platteau 1996; Ostrom and Schlager 1996). The study of traditional local fisheries management has revealed, for example, that the allocation of rights does not necessarily involve the parcelling of resources into individual property. It can involve for example access and usufruct rights to a fishing ground for a collective of firms or individuals. The allocation of rights to a specific area on the basis of or fishing ground has been referred to as territorial use rights in fisheries (TURFs), and remind of the allocations of use rights made on land. In the cases of TURF reported in the literature, the holders of rights are commonly locals attached to the area but formal ownership does commonly not apply. Some lobster fisheries in the US (Berkes 1989a) and in inshore fisheries in Japan (see box 3.3a) have been managed on the basis of collective territorial use rights. The studies indicate that the effectiveness of collective TURF as a model has only been tested with good results for relatively sedentary species, i.e. those that remain within the confines of the area (Christy 1982; Arnason 2004), so its ability to suit more mobile resources has been questioned.

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[11] Large individuals of a given species usually attract a higher market price than smaller individuals. This can lead to so-called "high grading" whereby large fish are retained in preference to smaller fish.

[12] Godelier (1972) is a well-known anthropologist who criticised the neo-classical school of economics for assuming that individuals only tend to maximise their economic satisfactions and behave as a sort of eternal *homo oeconomicus*. In their contestation of the view of economic rationality as a universal and intrinsically human factor, many anthropologists have discussed the role of cultural aspects such as trust, kinship relations, religion and taboos. These aspects are often found in fisheries.

In many places around the world common property regimes have developed without the influence of outside intervention (Christy 1982; Baland and Platteau 1996; Berkes et al. 1989). Common property inspired regimes are regimes where a pre-defined (by themselves or by the state) group of people, because they are users having a particular characteristic (e.g. fishermen holding a licence and residing in a certain community) have specific access, appropriation, management and exclusion rights to the resource in question. In Sweden in the small lakes particularly, groups of landowners holding territorial private fishing rights (TPFR) have organised voluntarily around water management associations to draw advantage of their own collective action. In this way they both protect the resources and make business out of their individual rights.

The case of prawn fisheries discussed in chapter 8 can be seen as an example where TURF have evolved without the influence from outside intervention and is now evolving further with the consent of the authorities.

Many concepts used in the natural resource management debate convey to the idea that resource users can *de facto* take into consideration other aspects than the maximisation of economic profit, and can involve their social and communicative capacities in management. The capacities mobilised are often referred to as "soft" assets, social capital, social resources, social endowments and social networks (Coleman 1988; Murdoch 1994; Scoones 1998; Falk and Kilpatrick 2000) and their recognition is seen as a pre-condition for the local users to be influential in management. The type of management promoting involvement of the users and their social capacities is commonly referred to as co-management, participative management or local management.

Such ideas underpin emerging and modern legislative frameworks, codes and declarations such as the Convention on Biological Diversity (CBD) (1993), the FAO Code of Conduct for Responsible Fishing (1995); the Habitats and Species Directives,[13;14] and The Malawi Principles[15] amongst others.

To conclude, over the last decade, facing the failures of conventional management systems, new tendencies in the development of applied science relating to natural resource management have emerged. Natural and social systems are seen as complex systems in themselves and the management of environmental problems further involves the additional complexity derived from the interaction between the two systems (Berkes et al. 2003:2).

The shift in perspective from discrete stocks and fishermen to ecological and social systems suggests that fisheries management needs new interdisciplinary conceptual frameworks. In this thesis conventional fisheries management is problematised by looking at fisheries resources as common pool resources, and institutions as mediating interactions between the social and natural systems. It is proposed that improving the performance of the management of coastal fisheries requires an emphasis on the clarification of property rights, users' capacity to take collective action and their involvement in co-management. These three notions are seen as central to the management of complex common pool resources and referred to in the following as the common pool resource management perspective.

3.3 THE COMMON POOL RESOURCE

The concept of common pool resources (*cpr*) has been coined by the scientific community to refer to resources having two characteristics critical to their governance and management in a

[13] Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.

[14] Council Directive 79/409/EEC on the Conservation of Wild Birds.

[15] From the CBD Workshop on the Ecosystem Approach, Lilongwe, Malawi. 26-28 January 1998.

sustainable way. First, the exclusion of beneficiaries from access and use is costly, that is, the system has low excludability and the limitation of rights of actual users is a difficult matter to deal with. Second, when harvesting, users subtract from each others' potential harvests, that is, the yield of the resource system suffers from high substractibility (Ruddle 1987; Ostrom 1990; Baland and Platteau 1996; Ostrom and Schlager 1996).

Here, the acronym *cpr* is used to differentiate the common pool resource situation from that of common property resources (often referred as to CPR). Common property refers to the status of collective ownership. By extension CPR can refer to a resource for which a group has been allocated a bundle of rights of use, management and exclusion. In contrast to CPR, the concept of *cpr* does not imply any information about the state of property, regime of rights or management model involved. Moreover, when one realises that fisheries resources are common pool resources, one also understands that the definition of rights of property, in the sense of ownership, is not sufficient for the management of fisheries.

Fisheries, where resources mobility and substractibility are high and resource storage, noticeability[16] and exclusion are difficult, are associated with typical *cpr* problems. The complexity inherent in the coastal systems, with high biological diversity and dynamics, combined with the *cpr* characteristics of the resources and the fact that society uses and manage the marine environment in various ways, drastically reduces the ability of users, researchers and managers to have a complete picture and predict outcomes of use and management. Fisheries resources and coastal ecosystems can be seen as complex *cpr* and the management of fisheries can be seen as the management of a complex *cpr* system.

3.3.1 Problems and dilemmas derived from the use of common resource pools

No matter what type of common pool resource is involved, resource users will experience a variety of problems. Ostrom et al. (1994) have categorised *cpr* problems as problems related to a) the appropriation or use of resources and b) the provision for or conservation of the resources (box 3.1).

Appropriation problems involve the allocation of potential yields (stocks and flows). Appropriation problems involve appropriation externalities which arise from excessive harvesting and are closely related to the high subtractability characterising the resources. Appropriation problems may also relate to the assignment of space, as in the case of crowding and races to the best fishing grounds. They may also involve technological externalities due, for example, to physical interference when fishing. The assignment problems are closely related to the low excludability characterising large and open systems. Technological externalities are, on the other hand, related both to the issue of subtractibility and the issue of excludability. The characteristics of mobility and fluctuation of the fisheries resource make fisheries a *cpr* where solving these problems becomes difficult. Schlager (1990) has found that fishermen are more prone to solve technological externalities and assignment problems than appropriation externalities.

Provision problems relate to the productivity of the resource system, ultimately the resource flows and ecological services. To provide, in this context, means to contribute to maintaining the production capacity of the *cpr* or avoiding its degradation. Provision problems relate to lack of motivation and deficiencies of investment in development, maintenance and protection of the ecological dimensions of the common pool resource system. Lack of motivation to contribute for the conservation of marine ecosystems can be related to, for example, ignorance about the dynamic and complex interrelations in the ecosystem and the

[16] The concept of noticeability is used to refer to the difficulties involved in the user's ability to observe and monitor what other users do.

users' uncertainty with regard to the current state, spatial distribution and abundance of the resources. It can also relate to the conviction that other users take large advantage (i.e. free ride) of ones conservation efforts. That is, it relates to the users' lack of information about the state of the resource and the effects that other users may have on these in other places and at different times. Information about the use and state of resources in fisheries is certainly not symmetric.

Box 3.1 Type of *cpr* problems

Appropriation Problems	***Provision Problems***
Appropriation externalities	Development failures
Technological externalities	Maintenance problems
Assignment problems	Degradation problems

Source: Ostrom et al. (1994)

The diversity and dynamics of the coastal resources and ecosystems make coastal fisheries a special *cpr* system with regard to appropriation and provision problems. The likelihood that a coastal fisherman will be able to capture the benefits that may derive from his efforts to husband (provide for) coastal resources under multiple uses is lower than is the case for users that husband, for example, a forest. In the marine ecosystem changes in relation to natural resources may happen in different places and times, without our noticing them or considering them a problem requiring action. Among those changes that we do regard as problems, some may occur naturally. Some problems may have their sources in changes in attitudes, i.e. the attribution of new meanings or values to things, making them part of new experiences, such as our attitudes towards recreation and fish as food.[17] The coastal fishermen's perception of their common pool resources situation is one of the questions addressed in this thesis (chapter 6).

The *cpr* characteristics of fisheries resources complicate the issue of sustainability in fisheries. When situations of high demand, overfishing, and degraded ecosystems prevail – which is often the case in coastal areas – these conditions can transform *cpr* problems into disagreements over access to, use of and control over natural resources, commonly referred to as natural resource conflicts. But not all *cpr* situations produce tragic outcomes, exposing users to the dilemma of choosing between individual or group interest. Ostrom et al. (1994) clarify that even when in *cpr* situations individuals' choices may lead to tragic situations – where the outcome is not rational from the perspective of the group – not all situations where individuals jointly appropriate and/or contribute to the maintenance of production capacity of the *cpr* will evolve into tragic situations with dilemmas.

First, some *cpr* situations may not induce resource users (e.g. fishermen) to adopt individual strategies that produce "suboptimal" outcomes. Second, in other *cpr* situations users may have already adopted rules to cope with the problems derived from the common use (Ostrom et al. 1994). The extent to which the conditions become critical to users, requiring changes in the

[17] One can illustrate this by means of the meaning given to salmon and salmon fisheries (including the cultivated fishery) in Sweden, which has changed considerable in less than hundred years. From being considered a fishery for mainly local subsistence, the salmon industry developed and became heavily commercial with extensive export plans. It later became increasingly valued as a recreational resource eventually becoming identified with international sports and leisure tourism. Similarly, the perception of seals by urban youth and by the rural fishermen may be different. These different meanings exist side by side and may lead to controversies.

rules in use, and the users' degree of ability to change these, will vary from one *cpr* situation to another (Ostrom 1990) and is therefore an empirical question.

In the case of coastal fisheries, a suboptimal situation can be the result of a combination of internal and external factors, and the institutional frame or governance regime needed to cope with the problems can be a combination of rules and rights.

With the term "external or contextual factors" most authors refer to aspects affecting the *cpr* situation and the decisions taken there. External factors can be almost any force, event or "thing" affecting a situation confronted by an individual or group of individuals (community) which cannot be influenced by the individual or group of individuals. They can also be any process formative of the *cpr* situation and the dilemma but beyond the control of the chosen community of study. Thus the term "contextual factor" refers to changes having their origin in arenas to which the community of users under study do not have access or power of influence.

External factors influence the supply and demand side of production systems such as fisheries, and can determine whether a fishery is viable or not (Edwards and Steins 1998; Ostrom et al. 1994). For example the scarcity and price of oil, or poor land transport facilities to the auctions can be seen as contextual factors that have historically constrained the development of fisheries everywhere. These are examples of contextual factors affecting the supply side. A contextual factor can also be a situation of changes in demographics with a concentration of population on urban centres or changes in consumption patterns, substitutes or a situation of war. These are examples that can affect the demand side. World-wide, fishermen have developed individual and collective strategies to adapt to contextual factors such as fluctuations in the market (examples of this have been accounted for in chapters 2 and 8). Adaptations of the technical type include, for example, the storage of fish in cages, while economic adaptations include the establishment of cartels. Compensation models have also been devised, mainly through financial support from the state (see chapter 2).

By examining what the coastal fishermen from Northern Bohuslän perceive to be factors leading to "suboptimal" outcomes and their experiences and ideas with regard to feasible institutional alternatives (see chapter 8), this thesis addresses the issue of barriers to fishermen's involvement in the management of coastal resources.

3.3.2 Frameworks for the analysis of common pool resource situations

Much work has been conducted on the development of analytical frameworks to describe central elements and their interrelations in the management of common pool resources. Such frameworks help to direct attention to the more important variables in a common pool resource situation, that is, those more likely to affect decisions about the institutional regime governing the use and management of the resource pool and whether change is necessary or desirable (Edwards and Steins 1998a).

The first frameworks were inevitably rather simple and focused on variables influencing internal relations (see for example the framework by Oakerson 1992). With the growing debate on environmental degradation and resource depletion, studies of common pool resource management have grown quickly. The list of disciplines and sub disciplines that have contributed to the further development of new frameworks is long – ecology, sociology, social anthropology, political science, public administration, geography, environmental economics, and human ecology.

Wade (1987); Ostrom (1990); Oakerson (1992); Thomson et al. (1992); Ostrom et al. (1994); Baland and Platteau (1996) Edwards and Steins (1998a); Folke et al. (1998), Berkes and Folke (1998) are some of the authors who have applied and developed such frameworks providing

guidance about what ought to be described and why, in order to understand the emergence of rules coping with problems in the *cpr* situation.

Common to these frameworks is that the analyst:

- starts with the diagnosis of an outcome or problem and lets the analysis work backwards;
- describes the characteristics of the biophysical environment, the technology available, "the community" and the rules at work and analyses their relationship to the incentives and disincentives faced by users managing the resources;
- applies qualitative methods;
- examines the perceptions of resource users.

These steps can also be found in the analysis undertaken in this thesis.

These types of frameworks are the results of empirical case studies and have also guided the design of further empirical case studies.

The first generation of empirical studies contributing to theory building for common pool resource management focused on long-lasting self management regimes in rural areas in less developed countries and the internal relations of users of single and often stationary resources. Steins (1999) points out that in most *cpr* studies multiple use situations are not considered and that the analytical frameworks developed on the basis of single *cpr* situations are therefore insufficient to describe problems in coastal areas.

In general, in the first generation of *cpr* research, the focus has been on the resource users' interrelations at the local level. The focus was on the structure and function of enduring resource management institutions without paying much attention to their context of emergence. McKean (1997), Steins (1999) and Agrawal (2003) are authors that have highlighted the significance of contextual factors. These authors assert that the absence of analysis of external or contextual factors in the first generation of frameworks has seriously limited our understanding of the context of emergence of collective action and institutions.

As discussed by Agrawal (2003) in many cases these frameworks clearly show the background and preferences of the particular scholar involved. Wade (1987) has described the empirical characteristics of the setting for cases of successful forestry management in India. Ostrom (1990) has prepared a synthesis of many and varied case studies from various places. Baland and Platteau (1996) have made a comprehensive review of the literature and a synthesis of the results of specific cases. These authors all concur in considering that the characteristics of the resources, the users of the resources and the rules in use will influence the users' ability to design new rules. All refer to the importance of rules defining resources and users, allocation and social equity elements, authority to take decisions, monitoring and enforcement, arenas and mechanisms for internal negotiations and negotiations with the state.

In these frameworks, most *cpr* scholars have emphasised that in order for one to be able to make a critical analysis of the management of natural resources the components of the ecosystem and the social system must be analysed together. Institutions in the sense of set ups for decision making, decision making processes and rules are seen as the mechanism to address problematic *cpr* situations, and are examined through institutional analysis.

The framework developed by Ostrom and co-workers (Ostrom et al. 1994)[18] is frequently referred to in the literature and includes the analysis of the attributes of three main constituent

[18] The Institutional Analysis Development Framework (IAD) has been used in political theory and policy analysis under the strong influence of scholars from Indiana University (Ostrom 1990).

parts or set of variables in the *cpr* situation. The three sets of variables central to their framework are: 1) the biophysical environment and material assets as technology, 2) the community of users, and 3) the institutional arrangements or rules at work. In the framework guiding this study the elements in the first constituent have been separated and the significance of external factors (e.g. relations with the state and the market forces) highlighted (see fig 3.1).

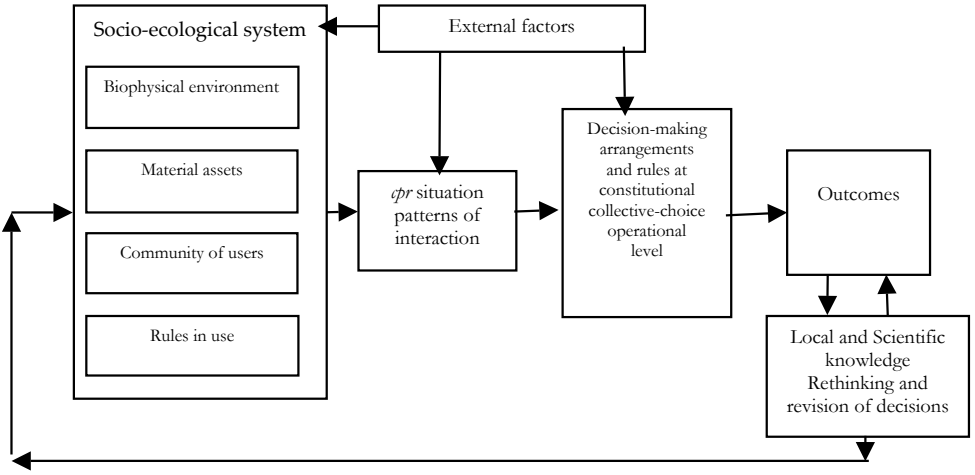

Figure 3.1 **A framework for analysis of common pool resource situation and factors influencing the emergence of institutional change**
Source: Adapted from Ostrom et al. (1994:37).

The term "institution" can be used in many ways and its use deserves further clarification. The first distinction to be made is that between institutions and organisations. Following North (1990) organisations are groups of individuals bound by some common purpose. North (1990) uses the concept of institution in the sense of the rules of the game framing the arena within which the players (individuals, groups, organisations, and state administration) can play. Scott (1995) uses the concept in a wider sense. In his view institutions consist of cognitive, normative and regulatory structures and activities that provide stability and meaning to social behaviour. In his definition different types of knowledge (e.g. scientific and practical) and/or perceptions can play different institutional roles.

Following Ostrom (1990), institutions are defined here as:

> "The set of working rules that are used to determine who is eligible to make decisions in some area, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what payoffs will be assigned to individuals dependent on their actions" (Ostrom 1990:51).

Institutions shape the interests of those interacting, and are at the same time shaped by them and the arrangements they lead to. The concept of institutional arrangement is more frequently used and refers to the basic idea of formal and informal agreements or rules specially designed to frame *cpr* users' behaviour. Both institutions and institutional arrangements structure people's decisions, actions, and interactions - with both the ecosystem and the social system.

Ostrom (1990) has classified the set of rules (formal or informal) that determine what actions are allowed or constrained in a *cpr* setting into three levels:

1. the operational level of the daily use of the *cpr*, and determining the interactions both between the users and the resource and among the users;
2. the collective level, or the level which defines who can access and harvest the *cpr* and how;
3. the constitutional level, or level which defines who is eligible to formulate the rules and how these are to be formulated.

All fishermen follow operational rules defined by themselves or by external actors involving day to day decisions on where they are going to fish, at which time, and whether or not they will use a particular type of gear. Collective rules can be designed and applied by users, their representatives and/or external authorities and include agreements about how operational rules are to work, be used and enforced. These rules thus define how the resource will be managed and define policies for its allocation and use. Constitutional rules govern the *process* of creating rules. These are the rules defining who is eligible to determine the collective rules that in turn affect the set of operational rules and day to day decisions (Ostrom 1990). *Cpr* users may or may not participate in the elaboration of rules at these various levels, when they do we refer to as co-management.

Rights are the result of rules developed to clarify and enforce authority between individuals as regards actions and resources. The issue of who participates in the design of which type of rules and how has to do with the chosen modality of management. Rules and rights may be formal and codified (*the jure*) or informal and uncodified (*de facto*). Fishermen's rules are often referred to in the literature as informal rules. Several authors refer to institutions at the various conventional administrative levels: local, national, regional, international and global. Institutional change has often been seen as coming from outside the community of users rather than from within, as a means to force "traditional actors" to adapt to new contexts and scientific knowledge. As will be shown in this thesis, this is not always the case. The variety of rules and rights and their variation in space and time as well as the level of decision at which rules are taken, are also a source of institutional differentiation.

The thesis also makes reference to the institutional regime governing a situation or governance regime (Young 2000; Kooiman 1993). A regime can be conceived as the complex of institutions (norms and knowledge base, procedures, institutional arrangements, property rights) that jointly define the resource outcome, in other words the composite of institutional factors governing a *cpr* situation. The concept of governance regime goes beyond the concept of management system and can be useful when one wants to understand complex interactions in fisheries involving a variety of knowledge, behaviours, arrangements and procedures involved in the governance of the use of a common pool of resources. In the concept of governance regimes, in addition to the day to day operational and collective institutional level instruments, the values, images and views which guide the dominant discourses are also likely to influence the outcomes (Kooiman 2001).

3.4 CONDITIONS CONDUCIVE TO COLLECTIVE ACTION

Both Wade (1986) and Ostrom (1990) argue that it is likely that self-governing processes and collective action for managing common pool resources will emerge when users face a dilemma and certain preconditions are present. These authors have identified conditions of a resource (R) and resource users (U) that are most conducive to local users self-organising, taking collective action and developing arrangements that take them out of a *cpr* dilemma. The

attributes of the resource (R) and the users (U) as summarised by Ostrom (1999) are described below:

Attributes of the Resources:

R.1. Feasible improvement: The resource is not at the point of deterioration such that it is useless to organise or so under-utilised that little advantage results from organising.

R.2. Indicators: Reliable and valid information about the general condition of the resource is available at reasonable costs.

R.3. Predictability: The availability of resource units is relatively predictable.

R.4. Spatial extent: The resource is sufficiently small. Given the transportation and communication technology in use, that users can develop accurate knowledge of external boundaries and internal microenvironments.

Attribute of the Users:

U.1 Salience: Users are dependent on the resource for a major portion of their livelihood or other variables of importance to them.

U.2. Common understanding: Users have a shared image of the resource and how their actions affect each other and the resource.

U.3. Discount rate: Users have a sufficiently low discount rate in relation to future benefits to be achieved from the resource.

U.4. Distribution of interests: Users with higher economic and political assets are similarly affected by a current pattern of use.

U.5. Trust: Users trust each other to keep promises and relate to one another with reciprocity.

U.6. Autonomy: Users are able to determine access and harvesting rules without external authorities countermanding them.

U.7. Prior organisational experience: Users have learned at least minimal skills of organisation through participation in other local associations or learning about ways that neighbouring groups have organised (Ostrom 1999:3).

The presence of all or some of these conditions is understood to facilitate the emergence of users' collective action in a situation of dilemma, and their involvement in the development and enforcement of rules or management institutions. When reviewing *cpr* studies Baland and Platteau (1996) are of the opinion that among those studying common pool resource management there is a consensus that to be able to solve dilemmas the user group must be relatively small, live close to the *cpr*, and be free to set access and management rules in their own way. In the *cpr* approach those sharing history, gender, language, degree of dependency, technology and distance from the *cpr* as well as rules and types of rights may find it easier to co-operate. Ostrom explains that each setting will require different and particular rules, specially designed to take advantage of specific attributes or confront specific problems (Ostrom 1990).

In chapter 8, case studies will tested against these theoretical ideals for robust common pool resources co-management institutions and the likelihood of emergence of institutional change in Northern Bohuslän will be analysed against the preconditions listed above and using this nomenclature.

Certainly, when fishermen sharing those characteristics and meeting the conditions listed above will found cooperation easy. But what may not be so easy is just to find such fishing communities and conditions in the coasts of industrialised countries where the traditional inshore fisheries sector has been influenced by processes of modernisation and social change

in coastal areas referred to in the previous chapters. All these processes have made the boundaries between traditional inshore fisheries and modern offshore fisheries less and less clear (Symes and Phillipson 2001), at least with regard to the sharing of fishing grounds and their legal rights. In chapter 5, different definitions of coastal fisheries are examined and compared.

Schlager et al. (1994) have made use of a group of variables to distinguish between groups and subgroups of fishermen. According to these authors fishermen belong to the same group of users or "fishing community" when they fish in the same fishing ground and are relatively similar with regard to their:

i) legal rights to appropriate fish,
ii) withdrawal (extraction) rate of fish,
iii) exposure to variation in the supply of fish,
iv) level of dependency on fish extracted from the *cpr* system, and
v) use of the fish they harvest.

Heterogeneity in type of resource, livelihood strategies and assets (e.g. technology) as well as heterogeneities stemming from the social and cultural setting or from institutional aspects such as formal or informal rights will position users differently. This will influence resource users' perceptions of what is problematic and in need of institutional change. Heterogeneity does also stems from the multiple use situations. As stated by Steins (1999), various activities may relate to the coastal *cpr* differently and affect a single fishery differently, but most will, in one way or another, further reduce the coastal fisherman's ability to define and influence decisions about the use of the *cpr*. Based on this reasoning, Steins (1999) goes on to argue that the trend towards increased multiple use is a process that increases the alienation of traditional users.

In her synthesis of case studies from different parts of the world, Ostrom (1990) has formulated eight design principles or preconditions that characterise robust and long lasting institutions governing the use of complex common pool resources (see box 3.2) such as fisheries.

Ostrom's principles are very attractive and have been endorsed in a prescriptive way by both researchers and development agencies (Steins 1999). They work better at the local level where the social and ecological interactions and the effects of the rules can be observed and continuously adapted. As earlier discussed, ecologically speaking the sea can be seen as a pool of resources where the clarification of boundaries (principle 1 in box 3.2) is not an easy task. However, Oakerson (1992) has emphasised that physical limits in nature provide critical information for devising rules. He refers to local features and specificities of the bio-physical system that can be perceived (constructed) as limiting conditions and can help us in determining the exclusion of non authorised users from the system. Oakerson (1992) refers to the "excludability of nature". Tangible physiographic barriers such as chains of islands, fjords or bays have been reported to perform excludability functions in the coastal zones and therefore are useful in the management of coastal fisheries. The tenurial significance of the archipelago for the local communities and fishermen in Northern Bohuslän was discussed in chapter 2.

The concept of resource storage capacity discussed by Schlager et al. (1994) can be linked to the ideas of Oakerson (1992) about the perception of the bio-physical system as limiting conditions. Schlager et al. (1994) discuss for example the challenge that mobility and the presence and absence of concentration of resource flows allowing storage poses for the construction of workable rules. The authors assert that in contrast to the case of agriculture (where seed can be stored in silos), resource systems having a low storage capacity challenges

Box 3.2 Design principles for long-enduring *cpr* institutions

1. Clearly defined boundaries. Individuals or households with rights to withdraw (extract) resource units from the *cpr* must be clearly defined, as must the boundaries of the *cpr* itself
2. Congruence between appropriation and provision rules and local conditions. Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labour, material, and/or money.
3. Collective-choice arrangements. Most individuals affected by the operational rules can participate in modifying the operational rules.
4. Monitoring. Monitors, who actively audit *cpr* conditions and appropriator behaviour, are accountable to the appropriators or are the appropriators.
5. Graduated sanctions. Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offence) by other appropriators, by officials accountable to these appropriators, or by both.
6. Conflict-resolution mechanisms. Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.
7. Minimal recognition of rights to organise. The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.

For *cpr*s that are parts of larger systems
8. Nested enterprises. Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.

Source: Ostrom (1990: 90).

the user's willingness to provide for the resource and get involved in any management system. From their perspective in the world of fisheries, aquaculture would then have the effect of increasing motivation for management. It should be noted that processes allowing storage (facilitating the allocation of appropriation) not only involve man-made processes, such as aquaculture. Migratory resources can seasonally concentrate in the coastal zone, as for example cod in the coastal areas of Lofoten, in Northern Norway and previously herring in the archipelago of Bohuslän. Similarly shellfish larvae drift with currents and commonly settle according to a particular pattern and concentrate on specific areas.

This type of concentration of fish stocks to confined areas in space and time can facilitate their management, particularly if fishing is restricted to the concentration areas. Many biological processes have a resource concentration effect and these often occur in the coastal zone connected to physical processes and structures (concentrations to spawn, larval drifts due to currents and retention due to water stratification, nurseries in sheltered semi enclosed areas, feeding concentrations in upwellings and on hard substrates). These patterns are commonly studied under fisheries hydrography, but the knowledge of coastal water dynamics has been little used to direct fisheries management.[19]

Chapter 2 discussed how the physical limits of the archipelago, the high storage capacity of the ecosystem and the herring were viewed as factors determining a bundle of property rights. Information about the morphology of the sea floor and how this is interpreted by fishermen, an issue which is little discussed in the literature, was found to play an exclusion role in the local management by the prawn fishermen of Northern Bohuslän (see case 1 in chapter 8). It is more difficult, on the other hand, to find in the water column critical information for devising rules to see how oceanographic phenomena, such as pseudo tangible structures, could play a similar exclusion function. Imaginary lines can only solve this. In contrast to, for example, the excludability that an archipelago area can play, in the open sea, the level of

[19] Proposals to take more consideration of physical processes in the design of fisheries management have been there for some time (Cushing 1975; Laevastu and Hayes 1982; Svansson 1985).

"natural exclusion", in the sense of limiting conditions that enable exclusion based on information about nature, is in general very low. The nature of the open sea partially weakens Oakerson's statement about the existence of information in nature, and forces one to use arbitrary sets of boundary conditions such as imaginary lines or vessel size to exclude people (see chapter 5).

When dealing with large marine ecosystems and mobile resources such as fisheries, there is a need to structure the management system so that the management of the parts or subunits does not negatively affect other units. To take this type of large complex systems into consideration Ostrom makes use of the concept "nested enterprises" (see box 3.2) to refer to a system where the procedures, rules and rights ruling the various subsystems work at the same time. Elaborations on the eighth principle, which is particularly interesting for fisheries, are rather recent, though. McKean (1996a) has introduced the concept "resource federalism" to refer to nested common property regimes for very large ecological systems. She suggests that a small collective can manage a subsection of the resource but federations of these collectives can be called into action if externalities among subsections arise. This is a system in which small units operate independently as long as they do not affect each other, but amalgamate into larger wholes to cope with problems that cannot be handled within single units (McKean 1996a).

3.5 PROPERTY RIGHTS AND THE GOVERNANCE OF *cpr*

Rights of access to natural resources on land are normally defined by additional rights derived from the ownership of the land; if you own the land you normally own the plants and the trees growing there as well. Thus in natural resource management, the concept of property rights has been used to include both the type ownership and the rights derived from it in terms of access, and thus serves the purpose of excluding potential users.

The concept of property is, however, less applicable to fisheries resources, where the substrate (water), the resources, the resource flows, and the ecological services are transient, and the social interdependency derived from the use of the resource base is comparatively higher than on land. In the highly dynamic marine ecosystems, *de jure* property often in the hands of the state hardly coincides with the definition of *de facto* appropriation of resources. This partly explains why fisheries resources are commonly considered state property and the responsibility of their management is ultimately placed in the hands of the state.

A salient deficiency in the traditional classification of property rights introduced before (see 3.2) is the idea of attributes inherent in the resource defining the type of property, when in reality there is nothing in nature binding natural resources to one or another type of property. Property is by definition a man-made construction, a social choice. But it is also clear that certain natural resources may lend themselves better than others to definition in terms of property. From this perspective the conventional categorisation of resources as property, in the sense of ownership and authority of exclusion previously introduced in section 3.2, seems to be difficult to apply in fisheries.

Property is an important element in the management of natural resources but the bundle of entitlements derived from ownership is not universal and can vary with the type of *cpr* and the rules and management modality that apply.

In addition, the characteristics of fisheries imply that instruments other than *de jure* rights of property can be used to appropriate natural resources. Capital investment, technological development, market relations, storage capacity, individual skills, local knowledge, involvement in management and agreements on rules of use are some of these instruments. These can be seen as means of expanding access to and control of natural resources, or means

of governing common pool resources. However, the issue of mobilisation of other instruments than formal property rights mediating the appropriation and concentration of common pool resources is poorly discussed in the *cpr* literature on fisheries. In this context, Giddens' (1997) distinction between allocative and authoritative resources could be used to better understand the mediation of resources and governance of the *cpr* by, for example, artefacts. Allocative resources can refer to those having physical existence, tangible assets. Natural resources, material means such as technical and storage capacities are, together with the produced goods (e.g. canned herring), examples of allocative resources. Authoritative resources are those used in the process of gaining access and control over allocative resources, including natural resources. Political processes, the organisation of decision-making, the working rules or social agreements allocating the use of space and time, and local knowledge, are examples of authoritative resources. These apparently different types of resource not only interact and strengthen each other but can also exchange roles. For instance, with changes in the context, a resource having an allocative function today may become functionally authoritative tomorrow. The emphasis in Giddens' classification is, given the premise that resources are defined in relation to human needs, more on the resource's function as a means to appropriate resources. Following his line of reasoning one may argue that in fisheries control over the situation is gained through allocative and authoritative resources enabling and reinforcing each others' functionality (Giddens 1997).

The nature of resources and of people's perceptions of them can *per se* also offer information (in the sense of Oakerson) of allocative and authoritative types (in the sense of Giddens): a lake or an enclosed bay can be perceived as carrying different allocative and authoritative information or properties than the sea. To conclude, one can argue that in complex and transient *cpr* systems such as coastal marine fisheries a comparatively large variety of resources (in a wide sense) and processes can fulfil allocative and authoritative functions. Which resources play a significant role will vary with the socio-ecological context, the different property rights and the management system in place.

The institutional debate has gone beyond the traditional analysis of property rights in the sense of resource ownership, and has assembled new concepts to sort out the authority emanating from different notions of rights with regard to the governance of the *cpr*. Ostrom and Schlager (1996) have defined property rights as: "an enforceable authority to undertake particular actions related to a specific domain"; rights are the result of rules.

These authors have developed a typology of rights together with the characteristics (positions) of different rights holders (see table 3.1). These are the rights to access, to harvest or extract, to manage, to exclude and to alienate. Their typology can be used to make distinctions in fisheries. These positions have to do with the power of authority of the user in the *cpr* situation. Thus, they regard "access" and "withdrawal" to be operational-level rights related to the use of *cpr*. Access is defined as the right to enter a defined physical area and enjoy non-subtractive benefits (e.g. sailing), and withdrawal as the right to extract resource units or products of a resource (e.g. catch fish). Management, exclusion and alienation are conceived by the authors as collective choice rights. Through these rights, the way in which future rights can be exercised is to be defined. In contrast to the authorised entrants and users, the claimants, proprietors and owners have formal rights to mobilise authoritative resources (Giddens' terminology). Claimants, proprietors and owners are able to limit the allocative resources used by the authorised entrants and users.

In Ostrom and Schlager's classification "management right" is the right to regulate internal use patterns and transform the resource by making improvements. An exclusion right is the right to determine who will have right of access and who will not, and how that right may be transferred. Finally, alienation is considered the right to sell or lease either or both of the above collective-choice rights (Ostrom and Schlager 1996: 133).

There is an essential difference between the first two types of rights (access and extraction) and the latter three (management, exclusion and alienation). A heavy line has been drawn to represent this in table 3.1. It is the authority to devise future rights, which makes the management rights so powerful and therefore a collective choice. Where the authority of management is placed is therefore a critical matter.

This can be clarified through an example. A fisherman who has a professional licence authorising him to harvest on the basis of a national quota in Skagerrak in Western Sweden holds only two types of rights: the right of access to Skagerrak and the right to withdraw/extract fish. Formally, he has little management authority, cannot exclude others, nor sell his licence or share of the national quota. On the other hand, he can mobilise allocative resources to appropriate more resources. In many parts of Eastern Sweden, on the other hand, where inshore waters are privately owned, the owner of the land/water will have the right to grant others access to and harvest rights in the private area. Here the landowners on the East Coast of Sweden held a monopoly of access, withdrawal or extraction, management, exclusion and alienation rights. Today with the expansion of recreation, the rights of the owner of the water have been constrained with regard to sports fishermen using fishing rods, who cannot be excluded. With regard to commercial fisheries the owner of the land/water can hold almost the entire bundle of rights listed in table 3.1. He/she can authorise others' access to the private waters and the fish there, he/she can authorise the extraction of resources, he/she can exclude professional fishermen from fishing there and finally he/she can transfer all these rights by selling his piece of land. But, in the marine ecosystem he/she cannot prevent the ecosystem being affected by other users or cross scale resource subtraction from happening. However, the fugitive characteristics of the fisheries resource and the right to management confined in space and time, implies that in neither case will the owner be able to define and govern the outcome. To do that, the owner must be able to influence events outside the local scale of management, (see Ostrom's eighth principle). Situations of multiple use, where different uses and users affect each other, will also bring about complexity. The "right" to pollute coastal waters can, for example, deprive any owner of exclusive fishing rights of his ability to benefit from his bundle of rights. As discussed by Edwards and Steins (1998) to assume that a group of fishermen holding individual rights will have monopoly of use of a mobile resource and be able to govern its state, is rather unrealistic. Aspects related to the subtractive characteristics of the *cpr* such as fisheries cannot be solved through property rights.

Table 3.1 Bundle of rights associated with *cpr* users

	Owner	Proprietor	Claimant	Authorised user	Authorised entrant
Access	√	√	√	√	√
Withdrawal/extraction	√	√	√	√	
Management	√	√	√		
Exclusion	√	√			
Alienation	√				

Source: Ostrom and Schlager (1996:133)

Awareness of this complexity has a direct bearing on the debate concerning governance, which relates to the broader view of governing as opposed to the narrower perspective of government as the main decision making political entity (Kooiman, 1993). The concept of governance is interesting because it embraces the outcome of both use and management. It

captures in one term, the idea of the outcome being the result of a combination of factors, processes and actors.

This suggests that the modality of management and the knowledge used in management are important factors determining who has a chance to be influential in the governance of the resources and who does not. As previously mentioned, the findings by Ostrom and co-researchers, which is based on extensive research in the field and testing in the laboratory, have often been endorsed in a prescriptive way triggering decentralisation of authority to the local governments and processes of full or partial devolution of political power to the users. In more recent studies Ostrom (1999a:525) has discussed the advantages and limitations of a fully decentralised system, where all responsibility for making decisions related to smaller-scale common pool resources is localised.

The advantages and limitations of such systems discussed by Ostrom are listed in table 3.2.

Table 3.2 Advantages and limitations of independent local governance of common pool resources

Advantages	Limits
Use of local knowledge	Some appropriators will not organise
Inclusion of trustworthy participants	Some self-organised efforts will fail
Reliance on dis-aggregated knowledge	Local tyrannies may prevail
Better adapted rules	Stagnation may occur
Lower enforcement costs	Inappropriate discrimination may result from the use of identity tags
Redundancy	Access to scientific information may be limited
	Conflict may arise among appropriators
	Appropriators may be unable to cope with larger-scale common-pool resources

Source Ostrom (1999a:526-527)

Some may put the question of why the state (in the sense of a government administration) may be needed at all. Why not devolve all authority and decision making with regard to the management of natural resources to the local level? Actually a basic assumption that supports the intertwining of the state and the user community in management in fisheries is that local communities, by themselves, are very limited in their capacity to manage common pools, and particularly fugitive resources. In general, those viewing fisheries in this way question the capacity of the central government or the individual users to be able to resolve common pool resource problems in fisheries on their own, and to extend the boundaries of authority in management. Certainly the increasing understanding of the interactive characteristics of fisheries means that problems encountered by those depending on fisheries can not be resolved by users at the local level of by governments at the central level. *Cpr* problems in fisheries can only be dealt with collectively within and across spatial scales and levels of social organisation, and that multiple users and managers must co-operate.

Ostrom (1999a:528) uses the concept "polycentric multi-layered system" to refer to systems linked across scales involving higher levels of government as well as local systems. This type of systems she means mirrors better complexity and is able to cope even more effectively with tragedies of the commons. In these systems citizens are able to organise not just one but multiple governing authorities at differing scales and where each unit may design and enforce rules within a circumscribed scope of authority for a specified geographical area.

While some analysts, e.g. Ostrom and co-researchers, have focused on self-management studies and analyse "intra-use'" community forms of interaction and rules, others, e.g. Jentoft, McCay and co-researchers, have focused on co-management studies and analyse forms of interaction between the government and the community of users, and more recently other social actors such as researchers and the nature conservation movement. When dealing with fisheries management both approaches seem to be needed, internal organisation for users' collective action (or self-management of local resources by local users) and the more open notion of participatory management involving the world of external relations in resource management. The interdependency and transboundary aspects of the fish stocks and the expansion of multiple interests following the intervention of new claimants and outsiders, require the involvement of the government across scales. This comprises the difference between the concepts of self-management and local co-management and what following Ostrom (1999a) could be referred to as nested polycentric participatory management or co-management.

This section touches on the fundamental characteristic of coastal fisheries being a composite of heterogeneous groups of resource users with different needs, rights and management capacities. Further it supports the argument that what makes it possible for certain fishermen to dominate is their ability to successfully mobilise and combine allocative and authoritative resources and rights. In situations where the availability of resources is critical, specific combinations of resources, in a wide sense, will compete with other. The extent to which the fishermen are able to combine freely will very much depend on the prevailing management system or institutional regime. When rules and rights in fisheries are discussed, analysts often distance themselves from the management through which decisions about rules and rights emerge. In view of this, and having already reviewed aspects critical to their collective action, the following section will focus on modalities of management and on co-management in particular.

3.6 MODALITIES OF MANAGEMENT

As previously mentioned, through *fisheries management* the living marine resources are intended to be kept in good shape (quantitatively and qualitatively) and the harvestable surplus allocated to resource users. Central aspects of fisheries management are who is to be involved in defining the management system, how the resources and the users' community are defined for the purpose of taking management decisions, the scale of the management unit, the prevailing regime of rights, and finally the degree of transfer of decision making power, authority, administrative responsibilities and resources to partners in co-management.

McCay (1996) identifies the following modalities of management:

i) *Laissez-faire* or "no management", allegedly associated with open access is prone to "tragedies of the commons" in situations of high pressure on resources.

ii) Market regulation, which enables market mechanisms and should be distinguished from private property, even though the latter allows market regulation to work more efficiently.

iii) Communal governance associated with local users' governance, irrespective of the rights and property involved.

iv) State governance associated with a central role taken by the state. This is commonly the case when the resources are considered public property and are treated as open access, but may also occur in the case of private property.

v) International governance referring to international organisations involved in regional and global *cpr* issues (McCay 1996:115)

McCay (1996) highlights the difference between property rights and management systems. Her typology seems useful even though in practice these management types are seldom present in fisheries in a pure form. They can actually exist simultaneously and be found irrespective of the rights and property involved, but their functionality will vary with different property rights.

With the exception of the "*Laissez-faire* or no-management" modality, these modalities of management are not necessarily mutually exclusive. Crean (1999) argues that under the influence of contextual forces different forms of management shift back and forth, from the local to the central locus, from community-based management to centralised government management. The Swedish case studied in this thesis illustrates how the different types of management modalities can appear in mixed forms, apply to different tasks, embrace different scales, and undergo continuous transformation. Communal governance can, for example, be transformed into a more *Laissez-faire* modality. Market mechanisms may be present wherever the locus of management authority is placed, and should be seen as possible in all the remaining management models.

In spite of this when discussing models for the management of fisheries the debate is often polarised between two possible forms: complete command and control exercised by the central government or complete command and control exercise by the individual (via the privatisation of rights) or a group via self-management. But the *cpr* studies suggest that the governance of fisheries is distributed, which means that the involvement of both the state and users in management or collaborative management is a precondition for its effectiveness.

3.6.1 Features and experiences of co-management

Although there is no formal definition of co-management, the term was coined to denote a situation where the management capacities of the resource users and the government are pooled, and both are involved in the decision-making, implementation, monitoring and control of resource use. In fisheries the co-management of resource use is essential. The rules will only work if resource users understand them and are willing to implement them. In co-management non-scientific, local knowledge can be articulated and incorporated in the regulatory decision making processes.[20]

According to Jentoft (1989) the expected advantage of co-management is that, when users obtain more management responsibility in functional terms, they are likely to behave more responsibly in moral terms. But the reasons why the state enters into collaborative arrangements with different economic actors or users can differ. Whereas in co-management theory the role of economic actors is seen as important in sustaining resources in the long term, in corporatist theory the state enters into collaborative arrangements in order to gain a measure of influence over the behaviour of economic actors in production through their interest associations (Williamson 1989). As will be seen in this thesis approaches to co-management in Sweden are changing from corporatist, central co-management to more pluralistic, local co-management.

Based on the analysis of some co-management cases and fundaments of social theory, certain institutional preconditions have been identified as crucial to any co-management regime (see for example Jentoft et al. 1998). As a partnership where resource users are to be involved, co-management involves some of the key issues already discussed above with regard to the users' property rights and the conditions needed for them to self organise and take collective action.

[20] Within the framework of the Convention on Biological Diversity (article 8(j)), the governments and Contracting Parties have undertaken a program to enable the involvement of local communities in decision making and policy planning and the articulation of traditional knowledge with regard to natural resource use and management.

In general Ostrom's (1990) design principles for robust institutions presented in box 3.2 above, can also be applied to a discussion of institutions for co-management.

Co-management can be seen as a process that pools resources and looks for compromise between the two extreme forms of management: state driven and self-driven management. In the words of Kooiman (2001) "next to doing things alone, things can be more effectively done together". Co-management is thus about interrelations between people and Jentoft et al., (1998) have highlighted the importance of trust, referring to co-management as an ongoing collaborative and communicative process, where resource users, together with government representatives and other actors, share an entrepreneurial and creative role. Co-management, the authors explain, is not so much about the rules *per se* as about the communicative and collaborative process through which these rules are formed: who participates, how debates are structured, how knowledge is employed, how conflicts of interest are addressed and how agreements are reached.

Fisheries management involves a multitude of tasks related to the conservation and allocation of resources, and some or all of them can, in theory, be accommodated in co-management practices (Sen and Nielsen 1996). One key question in co-management is thus what tasks can be more effectively performed with the involvement of whom, and at which level? As concluded by Jentoft and McCay (1995), co-management may take place at different levels of decision making, and at these levels involve users, stakeholders, and the state differently. Ostrom's (1990) conceptual distinction of operative, collective and constitutional levels of rules seems useful even when dealing with co-management, because it helps to distinguish between the different levels or orders (1st, 2nd and 3rd order) of decision making that have to be approached through management. If the involvement of users only pertains to the implementation of rules that are designed by others, the result will not match the users' knowledge about their own situation (Meinzen-Dick et al. 2002) and will lead to little participation or involvement.

Since the types of arrangements in co-management can differ, they are often portrayed as a spectrum of the degree of involvement of the partners from government driven management to user or community driven management (see for example Sen and Nielsen 1996). The locus of authority in co-management can vary from the local to the supra-national, a wide range of actors can be involved and their degree of participation can vary from task to task.

The arrangements can refer to the sharing of authority and responsibility between government and user groups, today also extended to stakeholders (Berkes et al. 1991; Baland and Platteau 1996; Hanna 1998; Jentoft et al. 1998). The term "stakeholders" has a different meaning than the term "user group". It is used here to refer to individuals or groups whose position (as proprietors, claimants, etc) in relation to fisheries results in them being likely to affect or be affected by the use and management (or non-management) of fisheries. What makes a group, or even an individual, a stakeholder has to do with its involvement in the issue in question, and the recognition of its legitimacy to argue for or against a change proposed by the dominant regime. In a country like Sweden, with long standing democratic traditions, the role stakeholders can play in the formation of the fisheries of the future is not to be disregarded. Still, some stakeholders may have influential power while others may not, and some may be more aware of their influence than others. In chapter 6, where problems in the *common pool resource* situation found by the local coastal fishermen from Northern Bohuslän are explored, some stakeholders are identified. In chapter 7, the issue of an increasing number of stakeholders influencing the management of the coastal fisheries in Northern Bohuslän is discussed.

Although the co-management of fisheries in its varied forms is widely used, the discussion on co-management experiences in Europe is rather recent, and the cases reported relatively few.

Box 3.3: a Cases of co-management reported in the literature

The Japanese case. Ruddle (1987) has described the Japanese fisheries management in coastal areas where the regulatory locus of authority is placed at the national and regional levels but which grants fishermies cooperatives associations or FCA at the local level decision making power and special rights. The system is based on collective territorial use rights (TURF), which were historical practices and are now legally protected. Three types of rights have been created. These are temporary (5-10 years) and cannot be commercially transferred: joint fishery rights given to a collective (FCA), confine rights of access to an area to more local activities such as small-scale fisheries, aquaculture and rights vested in the individual. To join fisheries every FCA has an exclusive management area or sea territory. The FCA has the responsibility of allocating the quotas assigned by the regional authority and participates in the design and enforcement of local operational rules within the area. The FCA has to enforce the national fisheries regulations, which involve area specific conservation measures such as minimum size, closed areas and closed seasons. Fishing licences in coastal areas are issued by the FCAs and can be inherited within the family (assuming residence in the area) in case of decease. The cooperative assembly also has the power to expel a member. Those getting a licence operate under free competition and the FCAs can close a fishery and authorise individual fishermen to switch fisheries depending on changing environmental, technological or social circumstances. The cooperatives are also involved in the coordination of other activities supporting the fisheries such as supplies, fuel and credits. When it comes to rights for offshore, large-scale fisheries, fishing licences can be allocated to individual fishermen (boat owners) by the government authorities. In this case territorial rights do not apply. The government also has retained the definition of the TACs.

The Norwegian Lofoten case. Jentoft (1989) has described the emergence of the Lofoten co-management system. In the late 1890s, due to crowding and growing numbers of fishermen participating in the Lofoten cod fisheries, where the Arctic cod has its spawning grounds, the Norwegian government enacted special legislation. The new legislation delegated responsibility for the regulation of the fishery to the fishermen. The Lofoten system is an exception in Norway where co-management is based on consultative arrangements. According to Jentoft (1989) the system under which the local fishermen of Lofoten have been given exclusive rights by the government can be considered a success. Special district committees of fishermen representing different gear groups were set up to make the rules for the fishery. The rules defined fishing times; which gear is allowed on which fishing grounds; and how much space should be reserved for which gear. In addition to elected fishermen inspectors, a public enforcement agency was locally established to ensure that the rules enacted by the fishermen were being obeyed.

Box 3.3:a and 3.3:b present in a synoptic form some instances of co-management in fisheries, which are generally held to be successful in the literature.

The cases are examples where the process of clarifying rights and authority in management has been advantageous from the view points of conservation and social equity. It should be noted here that some of these cases have also been discussed from the perspective of self-organisation and collective action. Self-organisation strengthens co-management.

In all cases, the need for co-management seems to have evolved from fisheries specific conflicts and involved reorganisation. The examples of co-management mentioned in box 3.3:a seem to have emerged to mitigate conflicts of spatial and resource distribution (social equity), due to user and gear crowding. The examples of co-management mentioned in box 3.3:b are more recent and have emerged to mitigate conflicts of resource distribution due to scarce resources (social equity and conservation).

Common to all the solutions found in these cases are processes of making distinctions among users, users' re-organisation, assignation and specification of users' rights, definition of procedures for decision making and the form of representation, adaptation of rules to the local socio-ecological situation and enhancement of users' participation in monitoring and control – all applied within spatial boundaries. The point made by Ostrom and Schlager (1996) about the need for influence at the collective and constitutional level of choice or decision-making seems to have been considered in all the cases. As earlier mentioned this is crucial to resource users because it allows them to take part in the definition of future collective rights (Ostrom and Schlager 1996) and enhances their ability to make long-term plans with regard to the use of the resources.

Another common factor is that some responsibilities have been delegated to the fishermen's organisations. In the Japanese and Norwegian cases, organised fishermen are granted by law

considerable management authority within a geographical area, where they can take constitutional decisions, define the collective share of quotas and determine specific conservation rules.

In the Japanese and the Norwegian cases the fishermen can authorise entrance and are involved in control. In the case of UK the producers' organisations have quota allocation responsibilities. In all cases, the fishermen seem to been involved in delivering data and monitoring the total catch.

A significant aspect is that in all cases the organisations involved in co-management have had a certain degree of autonomy. Besides, the scale of organisation to which responsibilities has been delegated, in all cases, appear to be the local level. The latter allows for individual participation and the organisations at the local level to take the form of multi-purpose organisations which saves transaction costs. This reinforces fishermen's cooperation both around the organisation of activities that benefit them in the short term and in the management functions (Jentoft 1989). All cases seem to have empowered small-scale fishermen and led to the adaptation of rules to local circumstances, but the authority for defining fishing boundaries has remained in the hands of the state and the fishermen.

In all the above examples except the Canadian case, which is actually under development, the wider "stakeholders" community has apparently not been involved in the definition of, for example, allocative rules. In the Canadian case, the emergence of co-management required the organisation of stakeholders at the regional and local levels and a process of decentralisation. This suggests a distinction between the type of co-management that involves pooling resources or partnership involving only single users' groups (professional fishermen) and the government and the type of co-management that involves pooling the government and a wider constellation of stakeholders (multiple-users, researchers, NGOs). The multiple use situations found in coastal areas also call for horizontal (or inter-sectoral) co-ordination, or a form of co-management involving multiple users groups.

Steins (1999) has suggested the use of "platforms" for resource use negotiation.[21] She suggests that situations of increased complexity require the re-negotiation of institutional frameworks and that this can be achieved by establishing local platforms for resource use negotiation which can play an important role in facilitating collective action among multiple-user groups (Steins 1999).

The examples of co-management involving multiple users reported in the literature are few in number. In Steins' example, professionals have focused on consensus building and worked closely with stakeholders in establishing a process involving mutual understanding and win-win agreements. These experiences sound interesting for Sweden.

[21] The concept of "platforms for resource use negotiation" was introduced by Röling at the Department of Communication and Innovation Studies at Wageningen Agricultural University (Röling 1994; Röling and Jiggins 1998).

Box 3.3: b Cases of co-management reported in the literature

The Canadian case. Canada is often used as an example of failures. More recently Baland and Platteau (1996) have reported on the emergence of new experiences. In the Canadian Atlantic fishery, the so-called Maritime Fishermen's Union (MFU) started in the mid-1970s as a militant fishermen's organization that wanted to break the dominance of inshore fishery by big commercial companies and defend their way of life. MFU has as members mainly fishermen who own and operate small and medium size fishing vessels (less than 14 metres in length) and covers a very long coastline on eastern Canada. The fishermen concerned rely primarily on lobster fishing, but they also catch other species. Their communities have usually been quite successful in regulating access to the fishing grounds for lobsters as well as in enforcing state conservation measures for that species. The co-management of lobster has been considered a success and an "advisory committee" model based on multiple-stakeholders for decision making or consultative co-management has evolved on the East Coast. Newfoundland, where 70 per cent of the cod fishery is found, was originally excluded, however. The MFU intends to strengthen its role by co-managing other fish resources, which are more problematic than lobsters. The process has triggered a deconcentration of functions from the central to the regional offices of the Ministry and a devolution to the MFU of the tasks of distributing the fishing licences and enforcing specific regional quotas set on the basis of conservation considerations.

The UK case. The emergence of co-management cases in the UK has been described by Crean (1999) and Symes (2001). In **England and Wales**, management has devolved to the Sea Fisheries Committees (SFC) which have existed since the 1880s. SFC:s are empowered to, within the 6 nautical miles, establish bylaws and regulating orders, subject to approval of the ministerial authorities. The accession of UK to the EEC in 1973 led to the establishment of POs essentially to improve the marketing of their members' catches. Here the POs have no territorial rights but have assumed a co-management function vis-à-vis the management of quotas. POs are responsible for the distribution of quotas among their members as well as the enforcement of the quotas and the system which in practice has resulted in positive discrimination of the small-scale fisheries. In **Shetland** the Shetland Fish Producer Organisation (SFPO) has taken a leading position in the promotion of community held fish quota as well as spatial and time based regulations. In 1996 the Shetland Fishermen's Association (SFA) established a management group for shellfish involving a wider group of stakeholders, the Shetland Shellfish Management Organisation consisting of representatives of local Government, processors, environmental groups and scientists as well as the SFA. The group set out objectives within the 6 mile fringe of the coast and has worked intensively with the regulation of the shellfish fisheries. Since the mid 1990s, taking advantage of the opportunity to purchase fish quota in association with the decommissioning of vessels, the fish producers' organization (SFPO) in conjunction with the Islands Council, has purchased whitefish quota allocated to Shetland and created a collective pool of fish quota. The quota is then leased back to individual boats enabling young fishermen to enter the industry without buying expensive quota as well as preventing quota from being sold out of the area. Crean (1999) describes that Shetland's fisheries professionals have been able to generate a momentum from which a community based management regime is evolving from within the European regime, which is still subservient to centralised control. Symes (2001) asserts further that in these cases an important fine-tuning of European and national legislation occurs where fishermen are able to create their own menu of regulations adapted to the local circumstances. Both authors note the coexistence of co-management at different levels.

The lessons of such cases of co-management suggest the importance of clarifying certain institutional variables that will influence the nature of the co-management regime and probably also the outcome. In all the above mentioned cases, the local level has been given a role under different conditions. Ostrom (1990) has pointed out that for the local governance to survive, external government authorities should not challenge the right of local appropriators to design their own rules. What emerges is that assistance and support by the government administration and external organisations is necessary if collective action and local co-management systems are to both emerge and survive. Local governance appears to require a clear commitment from both the government and the fishermen. Yet the role that external actors (outside the fisheries sector) may play in the emergence of local governance institutions, is poorly discussed in the *cpr* literature.

Most co-management systems seem to have been triggered by natural resource conflicts and to have evolved from the existing management system, and they have been formed according to a specific political system and democratic tradition. The locus of authority in co-management can vary from the local to the supra-national, and a wide range of actors can be involved. When an established central co-management system is to be reformed by shifting locus or involving new stakeholders, the relations of power in the governance of the common

pool are altered and special attention must be paid to supportive instruments and legislation. The exact choice or form of co-management will therefore be problem- and scale-site specific.

In a centralised co-management of fisheries the negotiations between the government authorities and the fishermen often occur through indirect representation of the fishermen at the central level. Centralised co-management can evolve as a response to the state's needs for intervention in production, rather than as an understanding of the capacities to be found among the local users. Such co-management will be referred to here as centralised-corporate co-management (Williamson 1989). Central co-management can involve devolution (or transfer of power and responsibilities for the performance of specific functions) to fishermen's organisations, but not necessarily a reallocation of the locus of authority to the local level.

Problems that can arise when fishermen's organisations take part in designing, implementing and enforcing fishery regulations through representation have been discussed by Jentoft (1989), who suggests that in general members tend to identify themselves with smaller rather than larger organisations. He reports that in large organisations, where the participation in decision-making process is organised though indirect representation, free riding and conflicts occur more often (Jentoft 1989). His conclusions are supported by Pollnac (1988) who states that there are cases where fishermen's organisations failed because they grew so large that members no longer felt that the group was their own. Moreover, specific local issues may not lend themselves to discussion within a large organisation. The description made in chapter 2 was illustrative of this problematic and its impact on the local coastal fishermen from Northern Bohuslän. Here, centralised forms of co-management based on indirect representation seem to have contributed to the marginalisation of the local coastal fishermen and the local communities from the management of fisheries resources.

It is interesting to note that in the management of other common pools (such as forestry and watersheds), management reforms have been moving in the direction of more decentralised co-management forms. The transfer of rights and responsibilities has been referred to as decentralisation and devolution. Within the government, decentralisation may only mean the delegation (sometimes the term deconcentration is also used in the literature) of functions to local or regional units of the central government authority. An example of delegation in Swedish fisheries management is the transfer of research and monitoring responsibilities within the National Board of Fisheries, from the central office to the coastal laboratories. The term delegation is meant to capture the idea of the transfer of some authority and decision making power to, for example local offices, while maintaining at the central level the right to take back the decisions and delegated power. One may say that in the Canadian case above the authorities have delegated certain responsibilities to the lobster fishermen and the consultative advisory bodies, even though this process has taken time.

A decentralisation process transfers both decision-making authority and accountability to lower levels of government. When the transfer of power and authority to perform certain functions is transferred from the government to the fishermen or from the central government to the local government without reference back to the central government, then the transfer is political, not only administrative, and is called devolution. The Japanese and the Norwegian cases can partly be seen as examples of decentralisation involving devolution.

But decentralisation can also be needed within the users' organisations, which seems to be the case in Sweden. This suggests that a distinction needs to be made between centralised –often of corporate type – co-management working through indirect representation, and local co-management, often of community-based type and participative, even though these may coexist and occur in mixed forms.

Decentralisation, devolution and co-management do commonly evolve as complementary programs and can reinforce each other. Co-management at the local and other levels can help to overcome some of the limitations of self-management discussed by Ostrom (1999a) (see table 3.2). In contrast to the term self-management, local co-management does not imply that the local level has an independent role to play in the management of natural resources in relation to the regional and the central level. Local co-management means that the rules are designed and agreed jointly by the users and the authorities in cooperation with other relevant stakeholders and closer to the local users i.e. the local dimension is legitimised in the management system. Local constellations of co-management can better adapt to the diversity, dynamics and complexity derived from the use of an ecosystem than central constellations (Ostrom 1990). Problems manifested at the local level can be dealt with more quickly and effectively through local organisations than through recourse to central organisations.

However, in fisheries management the transition towards co-management and the processes of decentralisation have been slower than in other sectors such as forestry. This has to do with the impact that such a step may have on the social interrelations resulting from the use of a very complex common pool resources system. Even though today most management experts recognise that the effectiveness of any fisheries management model will depend on the extent to which the model is legitimised by the fishermen, in the case of fisheries and mainly due to their characteristic of being a transient *cpr,* the authorities have taken up a cautious attitude. Which powers and functions should remain in the hands of the central government and which will be entrusted to the local level, have to be clarified in a continuous learning process of institutional adaptation.

In the case of complex *cpr* such as coastal fisheries, both the local and other levels – the users, the stakeholders and the state – appear to be necessary for co-management to be effective. Co-management in fisheries needs to address issues at and beyond the local community level. It has been mentioned earlier that self and community-based fisheries management tends to be more difficult due to the complexity of fisheries. But arrangements of community-based co-management can be seen as an integral part of co-management at larger scales. In a nested system the shortcomings of local institutions can be overcome.

The nature of the resource base "recommends" the clarification of users' rights, the organisation of collective action, and the institutionalisation of *co*-management in multiple layers.

3.7 SUMMARY AND CONCLUSIONS

This chapter reviewed a set of concepts, frameworks and conditions that provide a deeper understanding of the social relations in the use and management of common pool resources systems.

A common perspective until very recently was to seek disciplinary solutions to environmental problems. The literature describing fisheries in Sweden seldom reflects on how society, through institutional arrangements, conditions fishermen's involvement in management. Conventional scientific approaches have treated the environment as discrete boxes of single resources, the yields of which could be individually maximised (Berkes and Folke 1998) and the resource users as driven by an individual economic rationality. Today it is admitted that these models display conceptual, theoretical and practical problems and there is an emerging consensus about the complexity lying behind these problems. Natural and social systems are seen as complex systems in themselves, and the management of environmental problems further involves the additional complexity derived from the interaction between the two systems (Berkes et al. 2003:2).

The chapter has elaborated certain characteristics of common pool resources that are critical to the management of coastal fisheries. Coastal fisheries have been presented as complex and transient *cpr*, for which there is no one given property rights system, and where resource appropriation rights can be secured in different ways. The characteristics of the resource make collective action and co-management a must in fisheries. Accordingly, the search for answers to the fishery crisis requires a focus on institutional analysis and reform.

When account is taken of the empirically grounded *cpr* studies, Hardin (1968) seems to have made theory out of a "constructed dilemma" which in reality may or may not arise. Thus the *cpr* debate is about the "contextualisation" of Hardin's ideas, the appreciation of collective choice and the conditions needed for the emergence of collective action and institutional change. When applied to fisheries the postulate is that the local coastal fishermen are particularly prone to take collective action and take an active part in the management of coastal common pool resources. These statements make the *cpr* studies discussed in the literature also relevant for the study of the management of local coastal fisheries in Sweden.

In the search for alternatives to state driven command and control or privatisation modalities, fisheries co-management is discussed and presented as an alternative form of management where rights and collective action are seen as integral parts. Elinor Ostrom and co-researchers have formulated design principles or preconditions that characterize robust and long-lasting institutions governing the use of common pool resources. In the case of complex and transient *cpr* such as coastal fisheries more inclusive nested institutions across scales seem to be needed.

Most case studies in the literature are derived from long lasting self management regimes in rural areas in less developed countries. The weakness of these first studies has among others been highlighted by authors discussing fisheries and coastal management and related problems and the role of contextual factors (see for example Schlager et al.1994; McKean 1997; Edwards and Steins 1998; Steins 1999; and Agrawal 2003).

Despite these methodological shortcomings resulting from the context-dependence of the case studies reviewed in the literature, it is proposed here that the conceptual apparatus, principles and ideas developed by *cpr* scholars can generate new insights for coastal fisheries management. They do not appear to lose relevance in the analysis of multiple-use *cpr* situations in western countries: firstly, because there is no way to describe the entire complexity of a multiple *cpr* situation; and secondly, because the users, individually or collectively, will act in accordance with their perception of the situation and based on their own knowledge and experience, independent of the level of complexity around them. From this perspective, it is the resource users' perceptions of reality, and the information they choose to bring to bear on their decisions which counts, regardless of whether they are valid or not. It follows that understanding the perceptions of problems and solutions in the *cpr* situation is crucial to the analysis of fisheries.

As asserted by McKean (1997) few studies seem to have engaged in the problems and processes by which these regimes are created. Thus from a critical perspective she invites researchers to advance the research agenda by incorporating complexity. This can be done by paying more systematic attention to the management of *cpr* in western countries and by shifting the analytical approach from single to complex *cpr* systems like coastal fisheries. It can also be done by focusing on the users' external relations in co-management rather than on their internal relations within groups of users. The analysis of the literature indicates that, from an institutional perspective, the management of natural resources needs to refer to at least four central dimensions: 1) the type of resource whether common pool or not and the particularities of the common pool resources including mobility and storage capacity, 2) the bundle of property rights that applies, 3) the particularities of the community of users and its

capacity to make collective action work, and 4) the modality of management. All these aspects will influence the outcome of fisheries management in ecological and social terms and need to be addressed. In addition there is the issue of external or contextual factors. Thus, fisheries management involves several dimensions that go beyond the determination of total allowable catches and the definition of who owns the resources.

Common pool resources systems like coastal fisheries imply dimensions with a high degree of variation with multiple users making use of different livelihood assets, with actors and their knowledge, bundles of users' property rights and diverse management styles. In all these dimensions in the coastal zone there is in the field setting a tendency towards increasing heterogeneity. Consequently, the nature of the resource base in fisheries and the social implications of its use and management suggest the clarification of users' property rights, the organisation of users in collective action, and the institutionalisation of (*co*-) management in multiple layers, i.e. a nested polycentric co-management. The debate on institutions can help to translate the *cpr* debate into alternative proposals for management of common pool resources such as fisheries.

The c*pr* school of thought has been criticised for being romantic and conservative. The study of ongoing experiences and new management regimes emerging within a turbulent fishery in a country such as Sweden, is a promising and less travelled approach. When looking at fisheries as a common pool resource and bearing in mind the description of the context of emergence of the dominant management system and the present critical situation with the fisheries resources described in the introduction, the goal of securing long-term access to resources for the Northern Bohuslän coastal fishermen can be studied from the *cpr* perspective of their possessing rights of management. An examination of what the local coastal fishermen from Northern Bohuslän perceive to be barriers to co-management in their complex *cpr* situation is a logical next step.

CHAPTER 4

RESEARCH PERSPECTIVE AND METHOD

This chapter describes the methods used in carrying out the study. More details about methodological aspects are provided in the empirical chapters.

4.1 THE RESEARCH PERSPECTIVE AND CONTEXT

As stated in chapter 3, in the search for solutions to the problem of resource depletion Swedish fisheries management has relied mainly on scientific knowledge concerning the state of the fish stocks, the biology of the species and the functioning of the ecosystems. In this study, fishing is seen as depending on common pool resources and the institutional regime mediating the interaction between resource users and the ecosystem. Consequently, an appropriate way to go about the study of barriers to and conditions for increased involvement of fishermen in management is to scrutinise how the management regime relates to the issue. Prior to SUCOZOMA little research had been conducted in Sweden on these issues.

The study of fisheries in the light of the common pool resource perspective would include social components and incorporate fishermen's (non-scientific) knowledge. Such a study can no longer respond to particular scientific disciplines or knowledge forms. The *cpr* perspective therefore suggests a research approach based on both social and natural sciences and the integration of practical or tacit knowledge. The perceptions of problems and solutions by resource users must be captured and understood, because regardless of whether these could be considered as "real or false", "right or wrong", they will contribute to the understanding of the *cpr* situation, the search for and implementation of solutions, and ultimately the fishery of the future. Implicit in the research perspective then, is that this is critical to the level of incorporation of other types of knowledge and scientific method supplying fisheries management.

This study is essentially exploratory and based on substantial empirical fieldwork. It lets empirical data, facts and the theoretical discussion cross-fertilise. It seeks primary to involve the opinions of selected informants who can best answer the key research questions and to build a picture based on their ideas. By making local coastal fishermen, seen as protagonists in the *cpr* co-management debate, the focus of attention and by gathering together their experiences on problems relating to the use of *cpr*, the investigation is adopting an actor oriented, bottom-up perspective. This implies that the investigation evolves from the analysis of actor-defined issues. One obvious benefit of gathering fishermen's knowledge in this way is the likelihood that when incorporated into designs of institutional change, it could provide the basis for improved co-management.

This approach provides the rationale for selecting a qualitative perspective. In a qualitative methodology, inductive logic prevails where the "context-bound" reality constructed by the informants gives information on patterns and helps explain a phenomenon (Creswell 1994). The phenomenon that is explained here is that of the emergence of new fisheries management policies and institutions. It follows that the thesis is the result of processes of interpretation.

The research project took place in Sweden between 1998 and 2003, with some interruptions. The research coincided in time with a period of emerging problems in the fishery sector with resource depletion, conflicts between resource users, the destabilisation of the central co-management system, the involvement of new stakeholders and the search for new alternatives for coastal fisheries management. The understanding of processes of institutional change does

not lend to the use of case studies of photographic style. On the contrary this requires the understanding of the historical context (Yin 1989).

4.2 THE METHOD

In the following sections, the methods used in carrying out the study are briefly discussed with special reference to the empirical work. Methodological considerations are discussed more in detail in some of the chapters.

The study involved several research tasks, methods, key informants and types of data. These are synthesised in appendix 2. The research methods used were reviews of literature and documents, questionnaire based surveys, open-ended semi-structured in-depth interviews, personal attendance at meetings and informal consultations. The collection of empirical data mainly took place from March 1998 - March 2001. Simply put, the data consisted of written and oral material.

4.2.1 The analysis of written material

In addition to the questionnaires prepared within the framework of this study, three types of written documentation have been used. The first type consists of documents, reports and scientific articles, public administration and fishermen's organisations. The second consists of figures on catches and landings based on fishermen's logbooks as well as other type of socio-economic statistics. The third consists of correspondence between different stakeholders.

The review of scientific literature focused on the topics of natural resource management, coastal management and fisheries management. The purpose of the review was to gain knowledge of theoretical perspectives and concepts as well as results from other studies and countries that could be used to understand problems with the use and management of coastal fisheries resources in Sweden. Ethnographic and historical studies and sectoral assessments from the beginning of the 1900s were used to describe the historical development.

To understand which questions were considered important by policy makers, fishery policy documents, assessments and legal acts produced by the Swedish state administration in the second half the 20th century were examined. Motions presented in the Swedish Parliament addressing fishery-related issues in the mid-nineties were also examined. Regulations and policy documents produced by the European Commission in the nineties were analysed.

Project reports and Municipal Plans were consulted to check coastal development trends in the specific study area.

In addition to these official documents, reports and minutes produced by the Fishermen's Associations were studied. These reports contained relevant historical data and accounts. The fishermen's associations' journal "*Yrkesfiskaren*" for the period 1994-1999 proved a good source of information about the positioning of the FAs in relation to several issues discussed in this thesis.

On a more informal level, correspondence between fishermen and other stakeholders (e.g. their associations and the administration) provided an important source of data in preparing the case studies in chapter 8. In the case of the prawn fishermen the material analysed was found in personal files, containing letters from the 1930s to 1998, made available by two local representatives of the fishermen's associations. Similarly, correspondence from the NBPO, since its establishment in 1994, gave important insights into the PO's proposals for the resolution of appropriation issues (see chapter 8).

In order to describe the fisheries in the area of study, data sources for catches and landings were used. Two sources of different but complementary types were examined: the catch database based derived on fishermen's logbooks at the NBF, and information from the fish auction. The fisherman's logbooks offer numerical data on daily (or monthly for the small boats) catches by species, gear and position with reference to the base line, the territorial waters and the ICES sub areas and grid squares. The credibility of the fishermen's reports can be questioned and so the reliability of this type of data which may suffer from errors in the data storage system. The alternative data source is the first recipient in the market, often a fish auction. In both cases the information does not include data on discards, and cannot therefore provide a measure of biological diversity or fish mortality. All these considerations normally pose methodological problems in quantitative studies. In this study, however, the data is not used to draw quantitative conclusions but merely to support other scientific results and the qualitative discussion.

4.2.2 The questionnaires

Two questionnaires were designed to investigate what professional coastal fishermen in Bohuslän regarded as problems pertaining to fishing in a multiple use context and provide a snapshot of the recent and current situations. In both cases the questionnaires comprised multiple-choice questions together with some open questions (see chapter 6 for details).

The set of factors offered in the multiple use answers was based on problems affecting fisheries in the coastal zone as a) identified by staff of SVC, the National Board of Fisheries and the Provincial Government in preparatory interviews and consultations, b) discussed in the Fishermen's official journal *Yrkesfiskaren* during the period 1994-1997, and c) taken up in the comprehensive plan of the Municipalities in the area. The coastal management reports prepared by Ackefors and Grip, 1995 and Boverket, 1995 were also used for problem identification and the design of the questionnaires. The questionnaires were "pre-tested" with two fishermen, two fishery officers, and one social scientist.

The questionnaires addressed two different groups of coastal fishermen. The answers to the open questions offered new insights into perceived problems, some of which had not been included in the multiple-choice questions but which were useful in generating new questions and in designing the second phase of investigation.

The first questionnaire focused on problems found in a specific area in the Väderö archipelago outside Fjällbacka in the Municipality of Tanum and within the ICES grid square 4656. To identify those fishing in the area the questionnaire was sent to the 208 fishermen who had reported operations there during 1997 in their logbooks. Out of 48 respondents who stated that they indeed had fished there during 1997, only 33 fishermen, all domiciled in the study area itself, completed this questionnaire. Thus in the first questionnaire (the Väderö questionnaire) the study group consisted of 33 fishermen living in the study area and sharing a small fishing area.

The Väderö questionnaire consisted of two parts, one prepared for this study and one prepared by the Coastal Laboratories of the National Board of Fisheries (NBF). The fact that this questionnaire was part of another investigation requires further comment. Sending the questions together with another questionnaire was advantageous because it reduced project costs and provided access to additional data, but disadvantageous because it delayed the data processing for this particular study. Furthermore, the use of the Coastal Laboratories of the National Board of Fisheries as the channel to establish contact with the fishermen was undertaken with some apprehension, because of the possible inference by the fishermen that they were being interrogated by the central authority. To overcome this problem, a covering letter emphasised the importance of gaining knowledge about the fishermen's understanding of problems. The respondents were also invited to contact the investigator by telephone if there were any questions or unclear issues. Telephone calls received during the weeks after

posting the questionnaires revealed enthusiasm and a willingness to contribute rather than doubts over the project's authenticity.

The second questionnaire was distributed to all delegates attending the 1998 congress of the Swedish West Coast Fishermen's Association (SVC) and those considering themselves coastal fishermen were invited to respond. Forty (40) fishermen, out of 65 registered participants, answered the questions and returned the questionnaire the same day. In this second study group, the fisherman's role as a representative in the fishing community was the important variable.

Considering that the respondents did not constitute a random sample but a predetermined study group who decided to answer the questionnaires, statistical methods for treating sampling errors were not applicable. Further, considering the size of the groups the use of more advanced statistical testing to check significance was not deemed necessary. Simple frequency procedures were applied.

The use of questionnaires involves certain methodological problems. Chambers (1997) among others is of the opinion that questionnaires can restrict communication and reinforce the researcher's preconceived ideas and views of reality. Through questionnaires, he argues, the researcher constructs and simplifies reality in the process of first pre-selecting questions and then interpreting answers. In this case, also the small size of the samples could be an issue. To overcome this weakness, Bernard (1995) suggests the combination of questionnaires with, for example, interviews, in a two step process. When combined with other research tools questionnaires allow triangulation and increase the degree of reliability of the study as whole. In this case the answers to the questionnaires were valuable in informing the design of the interviews. More details about the questionnaires are given in chapter 6.

4.2.3 The interviews, meetings and informal consultations

The informants

The informants can be broadly categorised as either belonging to the fishing community or not. The latter category consisted of staff working directly or indirectly with fishery issues, within or outwith the fishery administration. The categorisation presented in table 4.1 shows the actor's institutional affiliation.

All informants are in one way or another dependent on fisheries, either for their income or their professional career.[1] The interviews were central to the study. The majority of the fishermen interviewed were economically dependent on shellfish, and resided in Northern Bohuslän. It was never intended that the interviewees and the questionnaire respondents should be one and the same persons.

The non-fishermen included civil servants involved in the decision making process and working with fisheries related issues at different levels in the state administration. Local entrepreneurs and managers from the local processing industry and fish auctions, scientist, project leaders, and staff working in the other sectors' organisations (such as farmers' and boat owners') were also interviewed but mainly to discuss specific issues emerging from the interviews with the fishermen.

[1] The role of belonging to a small group of professionals with a similar background has been discussed by among others Finlayson (1994) and Dietz et al. (1989). Dietz et al. (1989), suggest that participants in environmental policy debates tend to subscribe to definitions of conflicts that legitimate the resources they value, i.e. their jobs, the professions of which they are members and the disciplines they represent. In this way the policy supported by their employers and the paradigm directing the disciplines behind that profession becomes dominant. This is an argument for more disciplinary pluralism in fishery management that so far is dominated by biologists and, to a lesser extent, economists.

The interviews

The questionnaires used in the first phase of this investigation generated important information about what were or were not major problems perceived by the coastal fishermen, particularly shellfish fishermen, and supplied much factual information about their fishing activities. A total of 68 open-ended, semi-structured, in-depth interviews were conducted during the period from September 1998 to March 2001. The open-ended, semi-structured, in-depth interview is a more flexible method than the questionnaire, and can give the interviewee the opportunity to relate their experiences, opinions and aspirations. In addition the researcher has the opportunity to follow up issues that arise during the conversation. In this case the use of the method was based on practical guidelines prepared by Townsley (1993) which provides advice on communication with fishermen. The questions on which the semi-structured interviews were based can be seen in appendix 3. In total 29 professional fishermen and 37 non-fishermen were interviewed in sessions lasting between one and two hours. The interviews with the fishermen were generally conducted onboard the vessel or in the fisherman's home.

A large majority of the fishermen interviewed were active in the coastal waters of Skagerrak, in Central and Northern Bohuslän, extending from Southern Tjörn to the Norwegian boarder, and in the municipalities of Öckerö (2), Tjörn (2), Orust (2) Lysekil (2), Sotenäs (8), Tanum (5), Strömstad (8). All but three defined themselves as coastal fishermen, while three others regarded themselves as partly coastal fishermen partly offshore fishermen (i.e. fishing coastal waters from time to time). Their vessels varied between 9 to 24 m (median value = 16) in length and their catches were diverse, but with a clear focus on shellfish. The average age of the fishermen was 49, which is a bit low by comparison with the regional average of 53. More details about the fishermen interviewed are given in chapters 5, 7 and 8.

Interviewees were selected in various ways. A number of local leaders from Northern Bohuslän were contacted by phone and visited and these initial contacts provided suggestions of further interviewees. Attending fishermen's meetings also proved useful in establishing initial contact with fishermen and follow their debate. So as not to exclude those who normally do not attend such meetings a final selection of potential interviewees was made from the register of fishermen held by the NBF. Several interviews were subsequently followed, in most cases through less formal contacts and repeated meetings or by phone, and in a few instance a second interview.

Interviews began with a description of the fishing activities undertaken using a time-line approach (Townsley 1993). In general, each interview was allowed to take its own course in order to maximise the individual responses. Most questions were open ended and their exact formulation varied according to the expertise of the interviewee, the nature of the information sought and how the conversation was developing. The information generated was used in part to rephrase, change a particular question or open up a new line of enquiry in an ensuing interview.

The interviews with the non-fishermen were held at the interviewee's place of work. The interviewees consisted mainly of staff working at the fisheries department of the Ministry of Agriculture, the public authority for fisheries or National Board of Fisheries, the county board administrations of Göteborg and Bohuslän, the municipalities and NGOs.

The interviews were documented through written notes. Only in six interviews was a tape recorder used, as tape-recording generally appeared to inhibit the respondent.

The notes from the interviews mainly comprised a record of statement made by the respondents, together with any numerical data and drawings made available during the

encounter. As a rule, interviews with fishermen generated more text and covered a wider variety of themes than those with non-fishermen.

One limitation of this method is that not all interviewees were equally articulate, involved and informed. Although several interviews provided interacting information relating to personal situations (disputes, conflicts, etc), this information has not been reported in the thesis.

The meetings

The proceedings from 26 meetings were recorded for use as research material. The meetings were helpful in illuminating the divergent interests and divisions between various stakeholders and within the collective of fishermen. The convenors of the meetings were diverse and are listed in table 4.1. Notes were taken from four types of meetings dealing with: 1) the preparation of a plan for the sustainable development and conservation of the archipelagos of Bohuslän; 2) the conservation of marine-life resources in the area of Koster–Väderö; 3) the process of negotiation regarding the establishment of a marine reserve in Koster-Väderö; and 4) fishermen's meetings organised by fishermen's associations and local organisations.

The informal consultations

Informal discussions proved a useful complement to the more formal meetings and interviews and were used partly to collect specific information, often in order to triangulate information collected by other means. Through these various means, changes in the argumentation of different actors in different situations could be observed. Opportunities for informal discussion presented themselves in several ways, often related to participation in special events and meetings. Travel to and from meetings provided a good opportunity to discuss different issues. Visiting the area and talking with local people and fishermen in the quayside was also a means to becoming better acquainted with issues and developments in the study area. On occasions, informal consultation took a more contrived form whereby specific questions were put to persons without previously informing them that they were in fact being "interviewed". This form of consultation usually involved approaching the target expert (by phone or face to face) to ask an opinion on a particular matter.

4.2.4 Presentation of the material

The results of the interviews and meetings are presented in the form of illustrative quotations. When several interviews, statements from meetings and consultations show the same line of argumentation, these are illustrated in the thesis by quotations usually presented in a box. When the material is used to contrast different argumentations the quotations are presented as an integral part of the text. The text in the quotations is a rough translation of the Swedish text made by the author. To provide information about the nature of sources but without identifying the individuals concerned, two digits and one record number are given in the text. The first digit describes the method or situation from which the opinion is gathered (see table 4.1): in-depth interview (0), informal consultations (1) and meetings (2). The second digit describes whether or not the interviewee is a fisherman (0) or not (1). Thus a quotation followed by (1.0#31) means that the method for gathering the information was an informal talk and the source a fisherman and that this was the source of data nr 31.

Table 4.1 Data about interviews, informal consultations and meetings

Type of Informants (N = total sample; M = male; F = female)	Interviews			Informal consultation			Meetings
	N	M	F	N	M	F	N
Total	68	59	9	59	46	13	26
1. Fishery sector							
Licensed fishermen	29	29	0	22	21	1	
Fishermen's Wives	0	0	0	5	0	5	1
Fishermen's Associations (central/regional)	2	2	0	0	0	0	4
Fishermen's Organisations (local)*	(2)	(2)	0	2	2	0	4
National Board of Fisheries (national)	4	2	2	9	7	2	1
Fisheries division County Board Administration (provincial)	3	3	0	0	0	0	0
Fishery department (ministerial cabinet)	3	2	1	1	1	0	0
Fishery biologists (Research Institutes)	2	2	0	5	5	0	0
2. Nature conservation							
Environment Protection Authority (national)	1	0	1	2	1	1	2
Environmental department (ministerial cabinet)	1		1				2
County Board Administration Nature-conservation authority (provincial)	3	2	1	2	2	0	7
Scientists	2	2	0	3	2	1	1
Conservation NGOs	1	0	1	1	1	0	1
3. Connected to fishery							
Fishing auction's staff	2	2	0	0	0	0	0
Processing industry, managers	3	3	0	0	0	0	0
Educators involved in fisheries	2	2	0	0	0	0	0
Local entrepreneurs, fishery related (local)	0	0	0	3	2	1	0
Project leaders, fishery related (local)	1	0	1	2	1	1	2
4. Other actors at the local level							
Municipal staff, planners (local), harbour	2	2	0	1	1	0	1
Users associations, other sectors	2	2	0	1	0	1	
Local entrepreneurs (coastal related)	3	2	1				

*The local fishermen leaders are active fisherman and part of this sample (33).

4.3 THE SELECTION OF STUDY AREA

Coastal archipelagos are found in the eastern and western parts of southern Sweden. In deciding between a case study on the East or West coast a number of criteria were taken into consideration. Since complexity, dynamics and diversity of both the natural system and the social system are aspects often referred in the literature as influencing the management of common pool resources (Kooiman 1993; Becker and Ostrom 1995; McGlade 1996; Berkes and Folke 1998), an area having these characteristics had to be found. The area of study should thus combine the attributes of highest diversity in terms of species, fishing technology and users, particularly the fishing community. In the Baltic Sea diversity in terms of species is known to be low. Furthermore, fisheries in the area selected should be significant in economic terms for a significant number of fishermen. A first screening made by means of plotting all licensed fishermen's post-codes on the Swedish map showed that in Sweden fishermen are either concentrated in small pockets or highly dispersed along the coast. The pocket-like distribution pattern was more frequent on the West Coast, while the dispersed pattern was more characteristic of the East Coast. As the coasts of Skagerrak fulfils these criteria, it was therefore selected as the area for empirical studies.

Based on such criteria, the chosen area of study involves the municipalities on the shores of Skagerrak (from south to north Tjörn, Orust, Lysekil, Sotenäs, Tanum, and Strömstad) with focus on the area referred to as Northern Bohuslän, from Lysekil to Strömstad. In fishery statistics terms the area of study coincides with the grid squares 4556 and 4656 of the International Council for the Exploration of the Sea (ICES).

4.4 SOME LIMITATIONS OF THE STUDY

Like any study, this one has a number of limitations; some limitations related to the specific methods have been presented above or are mentioned in connection with the specific chapters. In the following additional limitations are accounted for.

Selection of the study area: the geographical scope

Any form of case study must acknowledge the constraints imposed by the fact that the results are site specific. As a result any attempt to extrapolate the findings from the thesis to the East Coast of Sweden, in general, must be done with caution. The ecosystem, the tenure system, and the social and cultural characteristics in which coastal fisheries are embedded, are likely to be very different.

Selection of informants: the social scope

The scope of the study is also limited in social terms through its focus on local coastal fishermen. Other forms of contemporary fisheries e.g. subsistence and recreational fisheries, lie outside its scope.

Nor does the thesis adopt a gender perspective analysis. However, the extractive phase of the fishing economy in Sweden is strongly gendered. Writing about fishing in the coastal waters of Sweden is to write about fishermen. Fishing is in general a male activity, while women involved in fisheries are commonly engaged in shore-based activities. This study does not deal directly with the problems or opportunities of women in the sector. For complementary information about women's participation and constraints in the Swedish fishery sector, the reader is referred to Píriz (2001).

Lack of ecological and economic analysis

The list of factors that influence the state of the marine living resources and ecosystems and how fishermen relate to these and to other fishermen and actors is both long and complex. Comprehensive studies are therefore difficult. The present study emphasizes the institutional aspects of fisheries management with a focus on fishermen's involvement. Even when the characteristics of the ecosystem and some facts of local economic dependence on fisheries are considered, the underlying ecological and economical relations have been neither investigated nor deeply discussed. This emphasis on institutional aspects should not be interpreted as an expression of disregard for ecological and economic aspects. Other studies and projects in SUCOZOMA (see for example Söderqvist et al. 2000; Gustavsson and Johnsson 2000; Ogemark et al. 2000; Karås et al. 2001; Eggert 2001; Elmgren et al. 2001; Sandström et al. 2002; Saulamo and Neuman 2002) focus specifically on ecological and economic aspects of the Swedish fisheries and management alternatives. More importantly, by focusing on institutional aspects attention is drawn to mechanisms connecting the social to the ecological system, thus illuminating the significance of social-ecological interrelations in the management of fisheries.

Methodologically related limitations

In a qualitative study the only reality that is valid is that constructed by the individuals who participate in the research situation. The data consists of "stories" and my interpretation of these. Implicitly, therefore, the questions posed, the research method and the interpretations of results should be seen in the light of the researcher's own values, pre-understandings of problems, academic background and professional experiences.

The mainstream paradigm in fisheries management maintains that knowledge about measurable variables in the fish stocks and the fishermen's effort are sufficient to resolve management problems. It further maintains that a fisherman will act on the basis of a calculated profit, independently of the context embedding him. I regard these variables as interacting, and the fisherman as benefit driven, contextually bounded, based on experience and guided by social norms, processes, and demands negotiated through continuous communicative processes.

Prior to the present study my main professional experiences were with fisheries development and environmental conservation problems in less developed coastal states. More specifically, I worked with the monitoring and evaluation of projects concerned with coastal management and the sustainable development of coastal fisheries. Through my previous work I came to understand the nature of weak public institutions and the distances between the policies, the research informing fisheries management and the reality of the people fishing coastal waters. I also learned the importance of developing institutions that make local fishing communities "the guardians" of the coastal ecosystems. This and the normative approach of the SUCOZOMA program are two aspects that have influenced the choice of methodology deployed in this thesis.

CHAPTER 5

WHAT IS MEANT BY COASTAL FISHERIES?

Several authors (Ostrom 1990; Baland and Platteau 1996; Ostrom and Schlager 1996) have shown that the management of common pool resources needs clear boundaries for the community of users and the resources. The very idea of defining socio-ecological boundaries is central to the management of common pool resources and research issues related to coastal fisheries management. This poses a research problem from the outset: the need to find feasible definitions. The present chapter discusses the issue of boundary setting for professional coastal fisheries by examining different views: a conventional view, as conceptualised in institutional arrangements, sectoral policy documents, and development plans and an alternative view, as articulated by coastal fishermen from Northern Bohuslän during interviews undertaken in 1998-2001.

Before examining the various existing definitions and boundaries there is first a need to summarise the variables that could de facto be used to describe fisheries in the coastal waters of western Sweden.

5.1 POSSIBLE VARIABLES FOR DESCRIBING FISHERIES IN SWEDISH COASTAL WATERS

Table 5.1 presents a synopsis of descriptive variables that could be used to characterise fisheries in the Swedish coastal waters (4 nautical miles). Some of these variables are used more frequently than others to characterise coastal fisheries (see for example Pitcher and Pauly 1998). The list of descriptors in table 5.1 indicates that "coastal fisheries" is a much more heterogeneous activity than the basic descriptors found in the literature might suggest.

Fisheries can serve as a source of income, for subsistence or recreation; the focus in this thesis is on income generating coastal fisheries commonly referred to in Sweden as professional fishing (yrkesfiske).

Several different basic terms can be used to characterise fisheries, though each may describe quite different attributes. Among the terms denoting the location of fisheries, the most commonly used are "inshore" and "coastal" which contrast with "offshore" and "high-sea" fisheries. From a physical viewpoint, the outer boundary of the coastal zone coincides with the depth at which the largest waves begin to influence the seabed. This is, in practice, a dynamic boundary whose position will vary markedly from place to place and season to season. In the less exposed coastal areas in Sweden, this boundary is considered to occur at depths from 30-50 m (Sjöberg 1992). In the archipelagos of Northern Bohuslän however – where the 200 + m deep Norway trench (Koster fjord) is found– depths vary considerably. Despite such depths, no one in Sweden would question that this archipelago, even including the trench, is a part of the coastal zone. Some pragmatism is therefore needed to define what is meant by "coastal" for the purpose of management in fisheries, and this is commonly achieved through the use of arbitrary lines. According to Symes (1999), the 12 nautical mile territorial limit would appear to provide a useful universal legal definition, embracing most small-scale fisheries and shellfish stocks and aligned with the national territorial limits.

The term "artisanal" has been used to label the fisheries that are based on simple technology[1] whereas "traditional" fisheries have been used to describe those based on local knowledge

[1] In France, the term "artisanal" can also apply to a type of ownership of the vessel and the fishing enterprise (Thom 1998).

transferred from generation to generation. These terms are often used in contrast with more "modern", "industrial" fisheries. Here, these terms have been used to denote the organisation of production (i.e. large volumes of catch, dislocated, capital and technology intensive). In Sweden, the term "industrial" fishery has also been used to refer to fisheries directed towards indirect human consumption (foderfiske), identifying the end use of the product rather than the organisation of production.

The distinction between "small-scale" and "large scale" fisheries seems to be an important and universal one (Thomson 1980; Mc Goodwin 1990). The term "small-scale" is considered useful for the purpose of describing fishermen who share a similar ecological, economic, and social environment. Small-scale fishermen share locations and problems, and their capital commitments and levels of production are relatively low compared to other fisheries. Thomson (1980) has compared small and large-scale fisheries at the global level, and the differences between these two types in terms of environmental losses and social gains.

These then are some of the variables that can be used to describe coastal fisheries. Although the diversity of terminology may be confusing, they mostly point in the same direction, identifying coastal fisheries by their spatial location, temporal scale, level of capital investment, technological sophistication, and social relations.

Arguments supporting better opportunities for small-scale coastal fisheries and fishery dependent regions are also found within the European Union's Common Fisheries Policy[2]. Symes and Phillipson have compiled and analysed national studies about the management of small-scale fisheries in the inshore waters of Europe. In their analysis they found that small-scale fisheries have tended to receive less attention within the wider critiques of fisheries management. As a result, there is notable lack of material for comparative analysis or upon which to found effective policy decisions and development (Symes and Phillipson 2001).

In Sweden, the term coastal fisheries ("kustfiske") is commonly used, and, as previously stated in chapter 1, coastal fisheries are supported within Swedish national and regional policies, especially for their potential contribution to the maintenance of a living archipelago (Glesbygdsverket 1997; SOU 2000:67; SOU 1996:153). The list of policy documents and motions to the Swedish parliament that in the late 1990s highlighted the importance of sustaining fisheries for the sake of supporting and developing local coastal communities and the archipelagos is long and wide-ranging.[3]

In Sweden the term "coastal fisheries" has been used in an ambivalent and ambiguous sense. In the debate the different participants (politicians, fishery officials, scientists, fisheries associations, and fishermen) often discuss coastal fisheries issues, but there is no common definition of what they mean by coastal fisheries. In the Swedish parliamentary debate, for example, "coastal fisheries" is either discussed generically, as linked to employment and the local economy of rural communities, or it is used as a synonym for small-scale fisheries and fishing based on static gear. In this way, in the political discourse, coastal fishermen are generally placed in the same category as local small-scale fishermen. In line with this reasoning, one may assume that the coastal waters and resources de facto are the domain of the local small-scale professional fishermen, which is not necessarily the case.

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[2] See for example: Commission of the European Communities 1995; Commission of the European Communities 1997; Commission of the European Communities 1998; Commission of the European Communities 2002.

[3] See for example: (Commission of the European Communities 1995; Miljödepartementet 1996; Regeringen 1996; Commission of the European Communities 1997b; Glesbygdsverket 1997; Ericsson D -Christian Democrat party- 1997; Lager P-Green party- 1997; Lindvall G. - Moderate party - 1997; Lönnroth - Left party - 1997; Regeringen 1997; Commission of the European Communities 1998; SOU 1996:153; SOU 2000:67.

What coastal fisheries are today is the result of an ongoing process of adaptation to the changing social and ecological circumstances and decades-long influence of diverse external and internal factors (see chapter 2).

Table 5.1 List of variables that could be used to capture the degree of variability of fisheries within the Swedish coastal zone

Type of Variable	Degree of variability			
Water environment	Fresh	Brackish	Marine	
Coastal morphology	Fjords & Bays	Archipelagos	Banks	Open Sea
Functionality of the fishing area	Reproduction	Nursery	Feeding	
Fishing specialisation	Low	High		
Resource stocks	Molluscs	Crustacean	Finfish	Diadromous
Behaviour of the target resource	Sessile	Migratory	Demersal	Pelagic
Purpose	Commercial	Subsistence	Recreation	Sport
Economic dependency	Specialised	Polyvalent		
Dedication	Full-time	Part-time		
Frequency	Year around	Seasonal	Sporadic	
Time at sea	Daily tours	2-3 days	Weekly tours	Shift based
Relation to fishing	Life style	Business		
Relation to resource	Optimising	Maximising		
Capital involved	Small	Medium	Large	
Size of the boat	< 12m	< 15m	< 18m	< 24m
Gear employed	Stationary	Active		
Technological level used	Artisanal	Mechanised	High technology	
Size of crew	1 man	2-3 men	4-6	
Production organisation	Traditional	Industrial		
Processing	Fresh	Frozen	Processed	Reduced
Destination of product	Human consumption	Animal fodder		
Type of enterprise	Individual	Family Owned	Company	
Distance from land	Base line	3 nm	4 nm	12 nm
Distance from home	Local	Dislocated		
Relation to port	Permanent local ties	Temporary no local ties	Mixed	
Social relations	Multiple stranded	Single stranded		
Ownership of Water	Private	Public		
Management authority	Centralised	Delegated		
Locus of management authority	Individual	Collective	FAs - State	EEC - State
Bundle of rights	Access	Withdraw	Management	Exclusion
Access Regime	Closed	Exclusive	Common	Open
Participation in decision making	Direct	Indirect	No -participation	
Nature of conflicts	Intra-sectoral	Inter-sectoral		

5.2 COASTAL FISHERIES IN FORMAL INSTITUTIONAL ARRANGEMENTS

In fishery terms, Swedish law defines coastal waters ("kustvattenområden") as all waters within the base line (i.e. the inner waters) and the territorial sea out to 4 nautical miles (SFS 1993; Fiskeriverket 1993a Fiskeriverket 1993b[4]). However, there is nothing in this definition that precludes various types of fishing taking place in these waters and targeting the same species.

[4] From a juridical perspective, the Swedish seas are juridical divided into inner waters, territorial sea, and open sea SFS (1996). Inner waters are those within the base line. Depending on the physical structure of the shore, the base line links the outer points of the land (islands and islets) or follows the low water mark. The Swedish territorial sea, previously considered to cover waters up to the 4 miles, now extends from the base line to the 12 nautical mile limits (or the middle line).

As described in chapter 2, the development of fisheries in the coastal waters of Northern Bohuslän has occurred within a particular institutional framework. One way to clarify the meaning of coastal fisheries is to establish a set of boundary rules. Boundary rules affect the types of participants with whom others interact (Ostrom 1999a). There are four institutional arrangements that can be identified as playing a clear boundary role effect in the sense of exclusion of participants from the coastal waters of Sweden with regard to fisheries. These are the fishing licensing system, the exclusive rights to fish in private inshore waters, the preferential access (and management) rights of Member States in Community Waters, and the trawling limit. Each of these four arrangements can be used to define boundary terms as will be discussed in some detail below.

5.2.1 Preferential access and management rights in EU coastal waters

Within the European institutional framework, the 12 nautical mile limits have recently (once again) been given special significance in terms of fisheries management. This is a consequence of the derogation from the principle of equal access to Community waters, which reserves full access to these waters for the coastal state's own fishing vessels (Commission of the European Communities 2002). Moreover, the principle of preferential access reserves access to waters within this zone (beyond the 4 nautical miles) to neighbour states having traditional rights to EU coastal waters. As mentioned before, in the case of Skagerrak, the Swedish fishermen have been granted exclusive fishing rights to the coastal waters up to 4 nautical miles and share common rights with professional fishermen from Denmark and Norway from the 4 nautical mile limit and seawards. This arrangement thus defines the community of professionals operating in these two areas and privileges the Swedish fishermen with regard to the 4 nautical mile area, but does not help to make distinctions within the authorised community of Swedish fishermen in the area.

5.2.2 Property right-based boundaries

The exclusion of potential users from access to coastal resources is probably the oldest arrangement that has contributed to the definition of the coastal fishing community in Sweden.

As described in chapter 2, in 1766 the Crown withdrew its claim to near-shore waters and transferred the right of exclusion to the owners of the land. This system of private waters, to which exclusive or territorial private fishing rights are attached, still applies on the Southern East Coast and in the inland waters of Sweden (with the exception of the two major lakes, Vänern and Vättern). With this privatisation of coastal waters, the right to define the authorised fishing community was vested with the individual landowner. The owner of the land was not always a local resident, and he or she could transfer the rights to outsiders for cash or services. Furthermore, exclusive rights holders were exempted from the obligation to provide records of their catches. The latter remains a factor contributing to uncertainty in the management of the Swedish coastal fisheries.

Before 1766, the fishing community was defined by the parish, that is, by grouping people according to their place of residence and possession of a common history and culture. In the case of private fisheries differences between individuals in relation to the ownership of the shore-land were thus highlighted; i.e. the landless and those whose property did not border the sea, were excluded. The relatively well-defined inshore fishing community in eastern Sweden can be contrasted with the fishing communities with free access on the West Coast. Here, the fishing community was not considered to be in need of boundaries, and the institutional arrangements defining exclusive rights to inshore fisheries in private waters were not applicable.

5.2.3 The fishing licence

Boundaries for fishing can be drawn by means of licences that authorise the right to fish. The rights assigned to the authorised fishing community can be conditioned by more or less specific rules. As recently as in 1994 a new type of licensing system was introduced (SFS 1993:787) This more restrictive licence aimed at limiting the number of resource users in the public waters under the hitherto open access regime. Those fishermen who for the three previous years had failed to satisfy the new definition of professional status on the criterion of economic dependence on fishing, were not issued a licence and were excluded from the right to fish with certain gear and for commercial purposes.

The introduction of the new licence was justified on the grounds of resource conservation and distributive policies at the national and European level.[5] The main arguments for the introduction of the new licence were: the problem of scarce resources and the need to adapt catches to availability (by reducing the number of fishermen); the need to strengthen the rights of those fishermen who were substantially dependent on fisheries; and finally, the need to control the entry of non-Swedish fishermen into Swedish territorial waters, something that would happen when Sweden became a member of the European Union. The new licensing system was expected to lead to a situation where fewer fishermen would result in reduced catches, and that it would somehow be easier to adjust the total allowable catches (TAC).

As described in chapter 2 and will be discussed later (chapter 7), the arguments for the excluding role of the licence have not been forthcoming. In Sweden, the number of professional fishermen has decreased considerably, but the catches have increased as a result of the concentration of the industry into fewer but stronger hands.

From a comparative *cpr* perspective, the definition of the fishing community by means of licensing systems that convey exclusive fishing rights to a group of individuals is a sound step (see chapter 3). But, to be effective, it needs to be accompanied by a process where the allocation of rights and internal distributive rules among the authorised individuals or groups of users are explicit. The new licence defined the community of professionals but did not make any distinction between them; in this sense it was generic or unspecific.

5.2.4 The trawling limit as a functional boundary

With the technological developments of the diesel engine and the trawl it became necessary to limit trawling, and the trawling limit was set to match the limit of territorial waters, at that time located at 4 nautical miles (see chapter 2).

The original intention of the trawling limit was to resolve problems of physical interference between static and mobile gear. The trawling limit was introduced to make a functional (or gear based) distinction among all fishermen (professionals and non-professionals) and to allocate space between people fishing inside or outside the 4 nautical miles. This institutional arrangement gave preference to fishermen operating static gear within the Swedish territorial waters. The 4 nautical miles limit was considered the formal boundary of coastal fisheries; methodologically trawling was deemed antithetical.

However, after World War II, trawling became much more widespread. Since the 1940s, following petitions from the SVC, on grounds of food security and safety, trawling was permitted within the 4 nautical miles limit. This and further exceptions to the original 4

[5] An examination of applications for new fishing licences that were rejected by the National Board of Fisheries in 2000, showed that in most cases the administration justified the rejection on conservation grounds (Píriz 2001). In most cases, these grounds were related to the present fishing pressure on one single species, namely cod. This type of generalised argument could be interpreted as managers considering all species biologically equivalent to cod and their particular characteristics as without management significance.

nautical mile limit debate (see chapter 2) legitimising operations of mobile gear and non-local (dislocated) fisheries in areas formerly considered to be the domain of the small-scale, local coastal fisheries, caused the trawling line to become dysfunctional. One consequence of this was that the heterogeneity of the authorised professional fishing community increased.[6]

Fishery regulations in Sweden have confirmed the extension of coastal waters to 4 nautical miles. They could be referred to as the institutionalised "spatial boundaries" of coastal fisheries in the sense that they define their ecological space. These boundaries have been further complemented by institutional arrangements aimed at defining the community of users.

The institutional arrangements described above were found to be formative of the spatial and social boundaries of coastal fisheries in Sweden, though only partially. The continuing derogation of the principles of equal access to European waters was a clear indication – on the part of the European Community – of a willingness to act pragmatically in favour of small-scale professional fisheries. Licensing systems, property rights, and physical and functional limits are instruments commonly used to make distinctions in fisheries. However, their use in western Sweden – in the sense of a generic licence system, an open access principle, and a dysfunctional trawling limit – has not really clarified the boundaries between the different professional fishing communities. The way these institutional arrangements have been used has served to make distinctions between different kinds of fisheries (professional and recreational) and between Swedish and non- Swedish professional fishermen, but has not helped to clarify the terms within the heterogeneous community of Swedish fishermen operating in coastal waters. On the contrary, it has made the identification of discrete groups more difficult, and contributed to obscuring the internal diversity within the fishing industry, which from a common pool resource management perspective would have been relevant to the management of fisheries.

In the next section, therefore, definitions of professional coastal fisheries as presented in policy documents and development plans are examined. By exploring such operational definitions of coastal fisheries one can see how the central actors involved in fisheries management have conceptualised it.

5.3 COASTAL FISHERIES AS CONCEPTUALISED IN POLICY DOCUMENTS

Operational definitions of coastal fishing can be found in sectoral assessments commissioned by the Swedish government aimed at directing policy and management decisions. Operational definitions can also be found in national sector development plans. Within the CFP, the latter have mainly been used as an instrument to guide the allocation of financial aid to individual firms and in this way direct investment.

In table 5.2 some of the changes to operational definitions of coastal fisheries during the second half of the 20th Century are indicated.

[6] It is relevant to mention here that a proposal for re-establishing the 4 nautical mile trawling limit has very recently been prepared and approved by the National Board of Fisheries. As a general rule the proposal extends the position of the trawling limit to 4 nm but permits the operation of smaller trawlers (< 20 m in length) in various areas including the deeper waters of Northern Bohuslän provided these make use of specific selective gear. This proposal can be seen as an attempt to revive the functionality of the original trawling limit while taking into consideration the fact that the use of trawlers in the last decades has expanded considerably even among small-scale local coastal fishermen. This time the functionality of such trawling limits is not so much about physical interference between static and mobile gear; it is about the appropriation of resources from the common coastal pool.

Table 5.2 The conceptualisation of professional coastal fisheries in Swedish sectoral assessments

Period/ historical events	Source	Definition of coastal fisheries	Type of definition
Before World War II	Report regarding the promotion of the fishery industry (SOU 1922:7)	All fishing within territorial waters (4nm). The trawling limit (4nm) was used to limit trawling.	Spatial Functional
1960-70s Technological developments. The Atlanto Scandian herring collapsed. Offshore fleet incursions into the coast.	Assessment of future fishery sector (SOU 1977:74)	All fishing within territorial waters (4nm). On the South and the East coast trawling was exempted from the definition. *Note*: When production is calculated within and without the 4nautical miles all captures of "migratory" stocks and deep sea prawns are transferred to the so called sea fisheries.	Spatial (Functional)
1980s EEZ established. Territorial seas extended to 12 nautical miles. The outburst of cod; intensification of coastal fishing.	Assessment of a better professional fisheries (Jordbruksdepartementet 1984:6)	Coastal fisheries are not defined. But a differentiation is made between sea fisheries and archipelago fisheries and their relation to the ownership of the water. Sea fisheries are considered all fisheries occurring in public waters "*det allmänna*". The archipelago-fisheries on the West Coast are referred to as free fisheries independently of the state of ownership of the waters.	Rights-based approach
1990s Preparing for EU. Community waters embracing all marine waters beyond the base line (under derogation within the 12nautical miles). Many fish stocks depleted. Environmental NGOs mobilised. Internal conflicts in fisheries.	Assessment of the Swedish Fisheries (SOU 1993:103)	All catches made within the base line from vessels of 12 m and under were derived to coastal fisheries. In addition, all *Nephrops* catches made with creels; all catches in the Bothnian Bay; all catches made with purse-seiner; all catches of whitefish, vendace, pike, pike-perch, perch and trout within the base-line independent of the vessel's size were also derived to coastal fisheries. Deep-sea prawn fishery was explicitly excluded from the definition.	Spatial Structural Functional Resource-based

Before World War I, "coastal fisheries" were synonymous with all fishing taking place within territorial waters, i.e. within 4 nautical miles of the baseline (SOU 1922:7) but the trawling line gave precedence to static gear based fisheries in these waters.

In a sectoral assessment (SOU 1977:74) commissioned by the Government in 1975 and published in 1977,[7] coastal fisheries on the West Coast were conceptualised on the basis of a spatial definition, and included all fisheries within the territorial waters (4 nautical miles) irrespective of the actual mode of fishing or gear used. On the South and East coasts the same spatial definition was used, but here trawling was excluded from the allowable activities. Such functional specification was not considered necessary on the West Coast. This conceptualisa-

[7] 1977 was the year when the 200 nautical mile economic zone was internationally recognized.

tion of coastal fisheries on the West Coast was therefore more inclusive than the previous one, which excluded trawling from the 4 nautical mile limits.

At the beginning of the 1980s, following the adoption of the 200 nautical mile EEZ and the extension of the territorial waters to 12 nautical miles (UNCLOS 1982), the government presented an assessment of the situation to the parliament (Jordbruksdepartementet 1984:6). The report recognised the increasing pressure on coastal resources and the need to create better opportunities for professional fishermen in territorial waters. It focused, however, on the issue of distributing available resources (quotas) between fishermen fishing for different purposes (income, subsistence and recreation) and between fishermen fishing under exclusive fishing rights regimes in private waters or under free access regimes in public waters. With respect to the West Coast, the report distinguished between open sea and archipelago fisheries. The former were characterised as all fisheries occurring in public waters (*det allmänna*) and the latter as free fisheries independent of the ownership status of the waters. It recognised the existence of a heterogeneous fishing community in coastal waters but did not define coastal fisheries.

The Swedish fishery of the eighties was characterised by an expanding cod fishery, where small scale and offshore vessels fished side by side in coastal waters and were profitable. The situation experienced with the cod at that time does not seem to have required any specific attention being paid to the differences between these two types of fisheries.

In the early nineties, when Sweden was preparing to join the EU, a review titled *The fisheries sector, its state and development possibilities* (SOU 1993:103), was published. Here the conceptualisation of coastal fisheries was based on a combination of spatial, structural, functional and resource based criteria. With the exception of deep water prawns; all fish caught within the base line by vessels of 12 m and under were deemed to be derived from coastal fisheries.[8] All catches of *Nephrops* with creels were included in the definition, independently of place and the size of the vessel. Similarly, most fisheries of fresh and brackish water species on the Baltic coast were included independently of location and size of the vessel used.

The 1990s definition of coastal fisheries has several explanations. One was the need for the national authorities (NBF) to legitimise the European common access policy and to facilitate the implementation of the CFP, which embraces all marine waters beyond the base line, at the same time as dealing with the intersection of European and national regulations in coastal fisheries. The race to fish was a recurrent problem and landings of cod and related species had decreased considerably. There was also a need to distinguish small-scale fisheries from other fisheries in order to facilitate the adoption of specific policies to assist their development. The assessment predicted an increasing economic importance for coastal fisheries and proposed that a special program be designed for their development. The assessment also recognised that in order to provide specific assistance to these fisheries it was necessary to complement the spatial, "ecological" boundaries with boundaries based on structural, functional criteria and resources (the vessel, the resource, and the gear).

5.4 COASTAL FISHERIES AS CONCEPTUALISED IN DEVELOPMENT PLANS

Throughout Europe, national structural[9] plans have been adopted in order to determine how the European structural goals (i.e. reduction of fleet capacity) are to be reached at the national

[8] In general there is a direct relation between the size of the vessel and the gear employed, and in Sweden fishermen operating from vessels of less than 12 m often operate static gear. Under the last few years a trend towards small trawlers is being noticed (see chapter 7).

[9] Structural refers here to the structure of the fleet.

level. In the context of the Swedish Action Plan for the structure of the fleet (Commission of the European Communities 1997), all vessels smaller than 12 metres (excluding trawlers and purse-seines) were excluded from the capacity reduction targets and referred to as coastal fisheries.

In the late 1990s and early 21st century, under strong public criticism of the inefficiency of the Common Fisheries Policy (CFP) including its impact on the small-scale coastal fisheries and fishery dependent areas (FDA), the Commission started a process of reformulating the CFP.[10] In the evolving European policies differential management in relation to small-scale coastal fisheries was possible[11] and funds could be redirected for collective measures taken by this group. This was seen as an opportunity to promote collective action and rebalance the concentration of funding on modern fisheries.

In the process of revising the criteria for the preparation of the national development plans and the financial aid aimed at their implementation, the need to define small-scale coastal fisheries increased in Europe and in Sweden. To agree on a European definition of small-scale coastal fisheries was not easy, and in Sweden there were different opinions about where the vessel-size boundaries should be set.

Table 5.3 shows the vessels sizes that were discussed and the significance of these different definitions in terms of inclusiveness or vessels involved in Sweden. The first definition suggested by the Commission limited the definition to fishing vessels up to 12 m in length, excluding trawlers. In Sweden, the 12 m limit has long been used to distinguish between small and large vessels.[12] The number of vessels with an overall length ≤ 12 m operating trawl fisheries is not negligible. The total number of registered vessels involved in the Swedish professional fisheries was 2135 in 1999; of these 1764 (82 %) were 12 m or under,[13] which should be compared to the figure 1584 given in table 5.3. In terms of volume, the landings from ≤ 12 m vessels accounted for 4 - 5% of total landings in Sweden. In terms of value they account for about 20%, with virtually all landings going for human consumption.

The Commission's proposal was contested by the delegation of the Swedish government (among others), which proposed an extension in vessel length to 15 m and the inclusion of trawlers in the definition. A small producer organisation of local fishermen in Northern Bohuslän (see chapter 8) argued, on the other hand, that 16 m (including trawlers and purse seines) was a more appropriate threshold.

The representatives of the FAs found that defining coastal fisheries was pointless; three quotations taken from interviews explain how defining coastal fisheries was considered not only pointless but potentially dangerous.

"We do not need to define coastal fisheries because all Swedish fishermen are coastal fishermen. Seen in a European context, we are all coastal fishermen here in Sweden, our fleet is rather small" {1.1 #26}.

"In Sweden, we do no have distant fisheries, we are all coastal fishermen" {2.1 #95}.

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[10] For a critique of the inefficiency of the CFP over the last 20 years the reader is referred to the European Union's Fisheries Department's own website: http://www.europa.eu.int/comm/fisheries.

[11] See for example the green paper about the reform of the CFP (Commission of the European Communities 2001) and Council Regulation (EC) 2371/2002.

[12] This generic rule goes back to a regulation established not for the purpose of describing fishing activities, but to register vessels from the merchant fleet. According to the regulation (SFS 1891) vessels larger than 12 m were mortgageable, i.e. the owners had the right to use them as guarantee for the repayment of loans.

[13] At the risk of creating confusion it should be mentioned that one fisherman may own more than one vessel.

"There is no reason to define coastal fisheries because, within certain given structures, coastal fisheries and technology in particular change all the time. Definitions are dangerous because, when used, they can create a status quo and constrain development" {0.1#28}.

Table 5.3 Different proposals for a definition of professional small-scale coastal fisheries in relation to the development plans

Source	*Definition*
MAGP IV: *Swedish Action Plan* for the structure of the fleet (Commission European 1997)	Fishing from vessels of an overall length of less than 12 metres, excluding trawlers and purse-seines. *Note:* This definition is estimated to include circa 1584 vessels or 74 % of the national fleet.
First proposal for MAGP V by the Commission (Commission of the European Communities 1998)	Fishing carried out by vessels of an overall length of less than 12 metres, excluding trawlers. *Note*: This definition is estimated to include circa 1631 vessels or 76 % of the national fleet.
Swedish Delegation (Source: interviews)	Fishing carried out by vessels of an overall length of less than 15 metres. *Note:* This definition is estimated to include circa 1896 vessels or 88 % of the national fleet.
Northern Bohuslän PO (Source: interviews)	Fishing carried out by vessels of an overall length of less than 16 metres. *Note:* This definition is estimated to include circa 1910 vessels or 89 % of the national fleet.
National Fishermen's Association (Yrkesfiskaren 1999)	"If coastal fisheries are to be classified in small-scale coastal fisheries, these should include vessels of an overall length of at least 18 metres". *Note:* This definition is estimated to include circa 1964 vessels or 92 % of the national fleet.
Final proposal for MAGP V by the Commission (Commission of the European Communities 1998a;b)	Fishing carried out by vessels of an overall length of less than 12 metres. *Note:* This definition is estimated to include circa 1764 vessels or 83 % of the national fleet.

The National Fishermen's Association (SFR), contested the Swedish Government's proposal and questioned the views from Northern Bohuslän. SFR argued that 18 m (including trawlers and purse seines) was a more appropriate size (Yrkesfiskaren 1999). The option of ≤18 m preferred by the fishermen's association would include only 18% more vessels than the initial definition proposed by the Commission. However, when compared in terms of volumes of catch the percentage increases considerably. From the perspective of the FAs, the promotion of a more inclusive definition would enable more FA members to benefit from the structural funds made available to Sweden for the development of "small-scale" coastal fisheries in the European Community, and probably also give them a say in the development of future coastal fisheries management strategies.

The new plans, the debate and different proposals created some turbulence among the Swedish fishermen and in the ambit of decision making. By making special reference to small-scale coastal fisheries, the new plans indirectly recognised the presence of a small and a large-scale fishery in the European coastal waters. By recognising this, the heterogeneity in coastal fisheries was made explicit. The approach was new to Sweden where, as previously mentioned, definitions had followed a spatial criteria and not made distinctions between professional fishermen.

Still the central variable in the definition of coastal fisheries in these plans was the size of the vessel - an asset or physical capital – which made the structural-functional approach a rather generic one. From a *cpr* perspective, where the clarification of social and ecological boundaries adapted to the context is considered an important condition for effective management, attempts to define the social boundaries of coastal fisheries with reference to vessel size might appear counter-productive. The definition of small-scale coastal fisheries on the basis of vessel size raises practical problems at the local level, where the financial system cannot provide incentives for cooperation between neighbours fishing from boats of different sizes. One may argue that if the central idea was to promote collective action for the conservation of the coastal habitats and the fish stocks, then the definition should not have excluded local fishermen fishing from larger vessels in the coastal zone.

Moreover, the plans are prepared to direct public and private investment, and investment in physical capital, e.g. the vessel and the gear, had been viewed as a strategy benefiting everyone.[14] Inherent in directing public investment to the vessel is the problem of technological change and its implications for fishing efficiency. Such an approach is not only inappropriate in addressing needs and capacities of a diverse fishing industry but, as will be discussed later, it is also highly problematic, because in a common pool resource system the increase in efficiency by one unit/fisherman affects the efficiency of another unit/fishermen (see chapter 3).

To summarise, the issue of boundaries has been matter for formal discussion for the last four decades. The need to redefine coastal fisheries seems to have been influenced by changes in the state of the resources and contextual factors, and institutional arrangements at the international level (wars, EEZ, herring collapse, EU membership). Until the 1990s, the dominant approach sought to make the definition of coastal fisheries more inclusive. This has certainly led to the use of generic institutional arrangements, which have contributed to making the boundaries between distinct types of professional fisheries in coastal waters more blurred.

Until the early 1990s, the use of spatial variables was dominant in defining the boundaries of coastal fisheries. In the nineties the size of the window through which the authorities conceptualised coastal fisheries was drastically reduced to cover fisheries within the base line. Since then, the concept of territorial waters has lost its importance; the 4 nautical mile limits found in the Swedish fishing law lost their relevance, and the 12 nautical mile limits adopted by the European Commission have not been used.

For the management of coastal fisheries to be successful, the spatial definitions – be they the zone within the base line, the 4 nautical miles or the 12 nautical miles– must be accompanied by a definition of the community of users governing them. In a sense the definition from the 1990s comes closest to the theoretical ideal of clear boundaries. However, as will be made evident in the analysis of the coastal fishermen's views, this definition was far from achieving a good approximation of reality.

[14] Chambers (1997), refers to this type of "one instrument fits all" approach as one that is rather common within the national administrations which, by standardising what in reality is highly diverse, save administrative costs and efforts. Standardisation, he argues, not only minimises administration but also protects against accusations of political favouritism (Chambers 1997). His reasoning seems to be relevant to the Swedish case.

5.5 COASTAL FISHERIES AS PERCEIVED BY COASTAL FISHERMEN

5.5.1 Some methodological considerations

In this section, the analysis turns to the opinions of the coastal fishermen themselves. Twenty-eight (28) fishermen from the West Coast of Sweden were interviewed in-depth.[15] Here some specific information about the fishermen interviewed is provided. This information is also valid for the following chapters where further results from these interviews will be presented.

The interviewed fishermen were residents of the following Municipalities Öckerö (2), Tjörn (2), Orust (2) Lysekil (2), Sotenäs (8), Tanum (4), Strömstad (8). All but three defined themselves as coastal fishermen, while the rest regarded themselves as partly coastal fishermen partly offshore fishermen (i.e. fishing coastal waters from time to time). Their catches were diverse, and the fishermen could be classified as shellfish and "combi" fishermen (see Neuman and Píriz 2000). Their vessels varied between 9 and 24 m (median value = 16) in length and their catches were diverse but with a clear focus on shellfish. The average age of the fishermen interviewed was 49 which compared to the regional average of 53 (LL and SD), is a bit low (see Píriz 2000). All but one fisherman, the youngest (26), had fished for 15 years or more. All but one had grown up in a family of fishermen in the area, and all but three were married. The wives of the fishermen interviewed were either retired or employed in the public sector at the municipal level.[16]

The interviews with the fishermen began by letting the informant describe his fishing activities through the construction of a time-line (Townsley 1993). Then the time-lines were used to ask the fishermen about the social and ecological variables conditioning the fisheries. The interviews also included questions such as: do you regard yourself a coastal fisherman and why? When does a fisherman stop being a coastal fisherman? But the emphasis was on exploring what they saw as central problems in Swedish fisheries and the current management system, and their ability to influence and promote change.

5.5.2 Spatial boundary dynamics

Among the fishermen who defined themselves as "coastal fishermen" (22 out of 28 interviewed), no one fished exclusively within the base line, less than one third (6) fished exclusively within the 4 nautical mile limits, and less than half (8) fished within the 6 nautical mile limits. About one-third (8) indicated they sometimes extended their range of activity up to the 12 nautical mile limits and beyond. The majority of coastal fishermen interviewed (15) operated within the 12 nautical mile limits, which supports the argument of Symes (1999).

Among those interviewed, there was no agreement regarding which distance from land that should be used to define the spatial limits of coastal fisheries. However, when explicitly asked to choose what they thought would be the best spatial indicator, the majority of the interviews chose a distance between 6 to 12 nautical miles. A number of fishermen specifically argued for a broad and variable zone from 6-12 nautical miles depending on "*the weather, what you fish and the vessel and gear you have*", rather than a single definition. One fisherman, with experience of a wide range of small-scale fisheries, extended his concept of "coastal fisheries" to 25 nautical miles, to an area where old vessels have been dumped, and where he planned to long line for

[15] In the following, texts excerpted from the interviews are presented as quotations. The quotations are written in italics and are followed by a code – e.g. {0.0 # 31} – referring to the method (0=interviews) and the source (0=fisherman); the last number (31) represents one informant.

[16] The wives of the fishermen interviewed worked as home assistants, social workers, kitchen assistants, teachers, nurses, clerks and accountants, all female dominated occupations suffering from institutionalised value discrimination. That is the discrimination that exists when different evaluation scales are present, with female dominated work being rated lower than male dominated work, even though the requirements in terms of skills, education and responsibility are the same (see Píriz 2001).

mackerel. In this instance the preference expressed reflects not only experience but also future aspirations. The use of the base line as a generic boundary for defining coastal fisheries does not seem to find any empirical support among the coastal fishermen interviewed in this study.

Logbooks show that both small vessels and vessels of 12 m and above do operate within and beyond the base line. The number of vessels that reported operations within the base line on at least one occasion during in 1998 was 1073. Of these, 822 (77%) had a size of ≤ 12 m. These generic definitions of coastal or inshore fisheries have little relevance to practising fishermen. In their view the boundaries of coastal fisheries are both fluid and dynamic and associated with the type of fishing and specific mode of operation.

5.5.3 Fishing in home waters, time and social relations on land

When referring to the location of their fishing activity, the fishermen referred to "*fishing in home waters*" (*hemma vatten*) rather than using the term "coastal waters". Fishing in "*home waters*", together with "*we, who overnight at home*" and "*we, living here*" were the most typical and recurrent expressions used as a descriptor to distinguish themselves from other fishermen. These terms were used to contrast themselves with the fishermen operating offshore or residing outside Northern Bohuslän.

But, where do the waters stop being "home waters"? How far from shore were the limits of their "home waters"? A common view among the fishermen was that the North Sea, the Kattegat and the Baltic Sea were neither home nor coastal waters. For the fishermen living in Strömstad, on the very border with Norway, Norwegian waters were regarded as "home waters". Crossing national frontiers and entering Norwegian waters was very common among those trawling for prawns. Those with experience of fishing inshore waters far from their home port – for example on the Swedish East Coast – questioned the idea of regarding such fisheries as coastal fisheries because these waters were certainly not "home waters".

In the fishermen's accounts *hemma vatten* embraced waters that, in terms of distance, allowed them to return to the local port on a daily basis and to spend the night at home. Some prawn and combi-fishermen prolonged their time at sea, and in their definition of coastal fisherman those returning home within two to three days are included. Expressions like "*we sleep at home*" or *"we are back before Friday and spend the weekend at home*" were frequently used to contrast their life styles with those spending longer periods –"*an entire week*" – away from home.[17;18]

The use of time as one important descriptor of coastal fisheries but also as a management instrument to limit output in fisheries was important to all the local fishermen interviewed. It made sense to all fishermen interviewed. For the older men it meant an opportunity to slow down due to health, tiredness and demands from the

"Old lady who worries and is alone at home taking care of the grandchildren" {0.0#10}.

The fathers of young families preferred to return home daily or after only a couple of days away and to avoid fishing on weekends in order to be able to

"Join their kids at the football game" {0.0#13}.

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[17] Time is important when handling the catch. The quality of e.g. crustaceans is dependent on time. Prawns are often pre-cooked in salt water onboard and can therefore last few days. *Nephrops*, on the other hand, have to be landed alive to be sold as fresh. To keep the *Nephrops* fresh on board for some days, the more industrialised vessels use additives such as sodium sulphite.

[18] The people working in the local fish auctions also made a similar categorisation of coastal fisheries. From their perspective there are three types of fishermen working in the area: those landing daily 4-5 days a week, those landing every 2-3 nights and those landing weekly or less frequently. The latter group was not regarded as coastal fishermen.

Most fishermen justified their time at sea by referring to both their social relations on land and their productive and reproductive roles.[19] In other words, the fishermen organised their fishing in terms of their life as a whole. Fishing in *hemma vatten* and returning home frequently was important for the youngest fishermen (26-34) not only because it allowed them to follow the rhythm of other family members and meet friends, but also because in these waters one can operate a relatively cheap, second hand vessel quite efficiently.[20]

"Even we want to go to the cinema and spend a weekend in Stockholm" {0.0#16}.

"One should be able to buy a boat and not be in debt to your mother in law" {0.0#24}.

The possible strategies discussed by the coastal fishermen to tackle the situation with scarce fisheries resources were: i) to extend operations in space and time; ii) to invest in or change the vessel; iii) to change from stationary gear to small trawls; iv) to diversify the target species; v) to diversify business structure within and outside the fishery sector; and vi) retrenchment.

Increasing time at sea and fishing far from land were two possible ways of increasing catches. However, fishing in more distant waters was regarded as undesirable because the costs involved had to be offset by increased catches, for which there was little scope. In general, the accounts of the coastal fishermen reflected a preference for continuing to fish the local (home) waters and not be forced into fishing more distant waters. Extending their use of time and space, i.e. giving up daily landings, and fishing further offshore, ran counter to their way of living and was not viewed as an alternative to being coastal fishermen.

The concept of *hemma vatten*, which is essentially an expression of social space rather than distance, is based on a range that permits a particular organisation of the use of time. This has a bearing on two ideas important in *cpr* theory (see chapter 3). First, that human interaction with the eco-system should be understood in the light of social relations and social structure; and second, that the use and management of fisheries is an issue for both natural and social science.

Landing the catch regularly all year round at local harbours was considered central to the survival of coastal fisheries and to other fishing related activities, generating employment, such as fish auctions.[21] The people employed in land based fishing related activities, though small in number, were regarded as crucial to maintaining local communities on a year round basis and hence a concern of the whole local community.[22;23] To survive, the facilities on land require a certain level of activity and a minimum number of fishing units in the area. From this perspective, most interviewees were willing to see more local fishermen living in the area, notwithstanding the lack of fish. In their opinion, the number of local fishermen had in many places already reached a critical minimum threshold to sustain both the fisheries and the related activities on land. A willingness to make individual sacrifices for the well-being of the local community was central to their way of thinking.

The development plans discussed above made use of the vessel as the central variable to distinguish between fishermen (see section 5.5). When coastal fishermen were explicitly asked

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[19] I use the term reproductive role here to contrast it from productive role. By reproductive role I mean non-income generating activities such as taking care of the children, making dinner.

[20] As will become evident in chapter 6 with the establishment of a market for vessel tonnage the availability of relatively low price second hand vessels has changed in Sweden.

[21] Traditionally the fish auctions had been owned and managed by the Municipalities but in many places the auctions have closed due to low supply of fish. The Smögen's auction is still owned by the Municipality, with 8 employees (1998). The fish auction in Strömstad with 4 employees (1998) is now owned by a group of fishermen. The biggest auction in Sweden, the auction of Göteborg is owned by SVC.

[22] The conversion factor used in Sweden to estimate fishing related employment is 1.5.

[23] In the case of the prawn fisheries, all year round landings were seen as the only way to compete with the import of Norwegian industrial prawn fisheries (see chapter 8).

about an appropriate vessel size they were of the opinion that fishermen operating vessels larger than 22-24 metres should not be authorised to work coastal waters. But reserving fisheries resources in home waters for local fishermen was more important than the size of the vessel *per se*.

When the views of the coastal fishermen are compared with those who did not identify themselves as coastal fishermen and fished waters "far from home", there are some major differences. Such fishermen operate larger vessels and are not dependent on the existence of local harbours for landing. They referred to time in terms of nights on board rather than nights spent at home. The vessel and modern technology held an important place when comparing themselves with local coastal fishermen. For them the vessel was both means of production and a cultural space where knowledge and experience are exchanged. This is supportive of Hazelhurst (1994), who has studied "the prototypical fisherman" from an island in the vicinity of Göteborg in Southern Bohuslän, and concluded that in this group it is the vessel that forms the location of shared experiences and learned work routines.[24]

Thus the main difference between the two types of fishermen was perhaps that local coastal fishermen, depending on home waters, followed a fishing strategy shaped by and adapted to patterns of social relations on land rather than relations on board the vessel. As will be discussed in chapter 7, from the perspective of resource appropriation, the vessel mediates property rights.

5.5.4 The issue of "lack of fish"

Analysis of interviews indicated that coastal fishermen were confronting a problem with scarce resources. The most common expressions among the fishermen interviewed were "*the fish are gone*", "*we lack the fish*", "*there are no fish left*". Statements made by local coastal fishermen presented in box 5.1 below illustrate how they perceived themselves to be affected by the shortage of fish in their home waters. For this reason and the relatively good market for shellfish, the dominant pattern of the fishery in the area of study has shifted from fin-fish to crustaceans. A large majority of the local fishermen interviewed had previously caught both fish and shellfish but were now dependent on catching shellfish.

As expected, the lack of fish was seen to exert an effect on income. Even when declining income was mentioned as a problem, among the shellfish fishermen, the issue of low income could with little difficulty be interpreted as their main problem.[25] According to the interviewees, the reduced income due to the "lack of fish" has been partly offset by the abundance and by high demand of shellfish, particularly for the Norwegian lobster (*Nephrops*). For those relying on prawns the situation is more critical.

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[24] Hazlehurst (1994) is interested in cultural cognition and how cultural knowledge is organized in the Swedish offshore fisheries, referred to as "big fishing". Hazlehurst's portrayal of the prototypical offshore fisherman from Southern Bohuslän includes a gambling nature due to uncertainty, true commitment and being success oriented, collectiveness, competition and hard work, ownership of a vessel, proficiency and technological advances, religion and morality, shared income, kin, gender and man's role.

[25] The questions about income were only put indirectly to the interviewees; no actual income figures were discussed. At the time of writing this thesis the quotas for fin fish had been drastically reduced and the prices of shellfish in the market had drastically changed. As a result the shellfish fishermen faced both appropriation and economic problems.

Box 5.1 Coastal fishermen's statements about the lack of fish

"Twenty years ago, I used to alternate fish and shrimp, but today there is only shrimp left. In the eighties I got 70-80 kg of marketable fish per day that was sold at the local market and gave me 50,000 to 70,000 Sw. cr. per year. The average today is 5-7 kg per day, ten times less! What has saved us here is the increased price of *Nephrops*" {0.0#21}. [Economic dimension]

"Variety in fishing means health and makes fisheries more interesting. Catching large fish is fun and you have something to show and talk about when you reach harbour" {0.0#7} "When there are big fish, fishing gets more exciting. Have you ever got a 30-kg cod? Only then you can know the feeling?" {0.0#12}. [Recreation]

"Before, we could fish cod and other species with nets close inshore, now we have to be at sea longer periods; when there are fish one can be at home more" {0.0#7}. [Social-Household relations]

"Ordinary people cannot afford to eat *Nephrops* or prawns once a week and we cannot offer them an alternative from the sea so the alternative is to eat chicken and pork fed on fish, this is a shame" {0.0#24}. [Food security and Bio-ethics]

"If we do not have fish to catch we lose shares in the domestic market, then we lose the local auction, and if we lose the auction we are finished. We'd then have to close the harbour and the related business and would have to leave the business; this impacts our families and the entire community" {0.0#11}. [Community fishery dependency, Living archipelago]

"Although the absence of fish indicates that something is wrong with the health of the marine environment, nobody cares. Tell me why should the fish swim into coastal waters? When the plankton die very fast, the shallow areas lack oxygen, the small fish that should have been natural feed for the ground fish are used to make fishmeal... everything is going wrong".{0.0#18}. [Environmental problems, Management failure]

"My father left me a profession and abundant fish in the water; to my son I can leave nothing" {0.0#131}.[Intergenerational equity]

"Soon we will disappear from the map; you will only have tourist resorts 3 months a year, the "Mallorca of Sweden". Isn't that what you people from the cities actually want? You can eat lobsters from China and prawns from Norway anyway" {0.0#12}.[Views of life]

Source: Interviews (1998-2001)

The comparatively good economic situation of the *Nephrops* fishermen was cited by many non-fishermen interviewed as a reason for questioning the credibility of local shellfish fishermen from Central and Northern Bohuslän, who, according to them, had no legitimate grounds for complaint. Fishermen as well as non-fishermen corroborated this in statements like the following.

> "Even when our [a *Nephrops* fisherman] economy is not bad and our children lack nothing...."{0.0#13}.
>
> "If your monthly salary at the University is around 20,000 Sw. cr. before taxes as you said, then I earn considerably more than you do"{0.0#47}.
>
> "Although it is a fact that the situation with the fish in coastal areas is critical, shellfish fishermen have never earned so much money as they do now. Today shellfish fishermen [meaning *Nephrops* fishermen] are making more money than ever. Because, on the one hand, the shellfish stocks are stable and shellfish thrives in the absence of the fish, its natural predator, and, on the other hand, the European market pays very high prices for the shellfish"{0.1#28}.

The statements in box 5.1 indicate that for the local fishermen "fish" has different meanings and "the lack of fish" means more than the lack of money. Local fishermen have traditionally organised their fisheries on the basis of seasonal variations (see chapter 2). Thus the problem of shortage of fish is not only associated with the loss of economic benefits, but also relates to the state of the environment, the need for specialisation, opportunities for their children, recreation and fun, communication and social relations, gaining professional respect, staying close to home and spending more time on land. The need to recognise that fishermen obtain more from their profession than money – something that is probably valid for most professions – has been highlighted by social scientists (Pollnac 1988; Hazlehurst 1994; Hart and Pitcher 1998; Jentoft 1998). Hart and Pitcher (1998) argue further that fisheries management regimes should recognise this and examine the role that the social context and other cultural factors play in influencing fishermen's decisions.

5.5.5 The coastal fishermen's time-space knowledge

The fishermen possessed rich time-space information about the home waters and the dynamics of biological resources there, especially about fisheries hydrographics, i.e. dealing with the relation between variations in the abundance and distribution of fish and variations in the physical environment.

As illustrated in box 5.2, the coastal fishermen related their shellfish fishing experience to light, winds, currents, depth, atmospheric pressure, and temperature. For example, spawning was associated with weather and temperature, feeding with depth, motion with light and the colour of the water. Similarly, the handling of gear was referred to as being adjusted to the morphology of the bottom, the predominant winds, the phases and light of the moon, and the currents. Two parameters often used by the fishermen to indicate their fishing location were depth and migration patterns of the various species fished. A few referred to coastal fishing as extending to depths of 50 fathoms of water (90 m) while the majority reported that they fished to depths down to 80 - 100 fathoms of water (160-180 m) "*where the cod turn around*".

Box 5.2 Time-space information provided by the coastal fishermen

- **Deep sea prawn fisheries**

Best time:	January – February, when the prawn goes up to spawn.
Worst time:	Summer, when the prawn sheds its shell.
Best sites:	The prawn appears in patches and does not move long distances. Also one should return to where one found it the week before. The deeper the prawns are found the larger is the proportion of large individuals.
Critical variable:	The depth.
Best winds:	South-west and south-north directions.
Bad winds:	Northeast and southeast.
The moon:	During full moon the water runs faster and it is more difficult to manoeuvre the trawl. On the other hand there is abundant fish.
Associated species:	Whiting, "skoläst", jellyfish, rays cod and mackerel.

- ***Nephrops* fisheries**

Best time:	January – February and when the water is brown and then September.
Worst time:	March – April – May, due to atmospheric pressure.
Best sites:	In summer and autumn depths of 50m; in winter depths of 80m; in spring depths of 150m.
Critical variable:	The light.
Best winds:	North either east or west. "We normally say that land wind is good for *Nephrops* and sea wind good for fish".
Bad winds:	South.
The moon:	During full moon you can fish later in the night.
Associated species:	Small flatfish, shells, molluscs, and starfish.

Source: Interviews (1998-2001)

Regarding the issue of the lack of fish, the information provided by the fishermen from the area of study was frequently on *gadoid* fisheries and ecology, with a focus on cod. The fishermen were aware that *gadoids* mature at a relatively late age, from 2 years onwards, and that this characteristic makes them more vulnerable to environmental changes and fishing than, for example, small pelagics.

Fishermen related that these species have:

"Two distinct phases in their juvenile life on the coasts of Skagerrak, one inshore during the first year and the second in deeper coastal waters during the second year. During the 3rd year, when these reach a size of approximately 30 cm they migrate back to the North Sea to spawn" {0.0 #23}.

Some fishermen referred to three stocks of cod: the local, which they said had collapsed; the Baltic stock, which was in a better shape; and finally the North Sea stock, which they inferred would collapse in a very near future.

"The Baltic cod reaches Skagerrak by means of the Baltic Current but returns fast to the Baltic Sea to spawn" {0.0 #13}.

"The North Sea cod and other ground fish entered on the Jutland Current in spring (April-May) as juveniles and spend the first winter close to land" {0.0 #14}.

The richness of the fishermen's knowledge about the fish and the ecosystem, on which their livelihood depends, has long been asserted by anthropologists. The interviews with scientists and officials showed that such information is not systematically collected in Sweden. Combining such information with scientific data and analysis may offer potential for improving the effectiveness of management.

To conclude this section, the difference between the institutional reality and the fishermen's perceptions is evident. The coastal fisheries in home waters exhibit properties resulting from the complexity and dynamics of both the biophysical and the social context. An analysis of the accounts of the coastal fishermen from Northern Bohuslän indicate that a coastal fisherman was a local resident, who fishes near home (no farther than 6-12 nautical miles from the base-line), fishes various species and uses a mix of gear, lands his (diverse) catch in the local port, rests and lets the ecosystem rest during the night and on weekends, possesses knowledge about the local ecosystem and the social system, trusts other local fishermen and does not invest in the vessel more than he can earn.

5.6 SUMMARY AND CONCLUSIONS

A growing body of research indicates that for common pool resources management to succeed certain basic conditions to enable and effectively sustain collective action have to be in place. The clarification of ecological and social boundaries is one such condition. From that perspective the clarification of "who" is authorized to fish "how much of what", "how" and "when" in coastal waters becomes relevant.

In this chapter definitions of coastal fisheries as conceptualized in the dominant fisheries management regime and as articulated by the fishermen have been examined. The arrangements comprising the institutional framework were described. On the West Coast, these only partially contributed to delimiting boundaries of professional coastal fisheries. This is one illustration of how professional coastal fishermen are treated as a single entity, a view deeply rooted in the prevailing regime, and not merely among administrative staff preparing plans and assessments.

The analysis of policy documents and development plans showed that the dominant regime has opted for generic definitions. From a *cpr* perspective to do so is questionable. The various operational definitions have attempted to mirror the empirical situation, but the need to define

the boundaries has evolved as a reaction to institutional changes decided outside the fishermen's context. These operational definitions, whether based on spatial, structural and/or functional approaches, rely on measurable variables: distance from land and vessel size. As will be seen in chapter 6, from the *cpr* management perspective, to describe the spatial boundaries of coastal fisheries at sea is a step forward, but not on its own sufficient. At sea, the use of spatial definitions alone is problematic because wherever the limits are set there will always be transboundary problems and a degree of mis-match between artificial boundaries and nature's complexity. Indeed, the ecological nature – indivisible and fugitive – of the common pool resources system on which fishing activities are based, limit our ability to rely on spatial delimitation alone for the purpose of management.

The conventional definitions of coastal fisheries draw upon structural and spatial characteristics but ignored the fact that the coastal area is also a place for living, and that people sharing home waters may also share social networks on land and a feeling of interdependence with the wider local community. It is well known that, as in many other places, residents in the Swedish rural coastal areas (including fishermen and their families) normally meet to resolve local problems related to youth education, cultural and religious activities, developing basic infrastructure, harbour and provision services, etc. This type of experience based on interpersonal relations and communication can strengthen the fishermen's ability to communicate and help in resolving problems associated with the local coastal fisheries.

Vessel size seems to be an insufficient way to distinguish among fishermen whose livelihood assets differ. The size of the vessel does not reflect political, social, or cultural boundaries. As will be evident in chapter 7, the focus on the vessel has *de facto* favoured those whose livelihoods are not dependent on the local ecosystem and for whom the vessel is the main instrument for securing fishing rights.

From the foregoing analysis, it can be argued that one important aspect of the management of coastal fisheries is to find complementary variables supporting the definition of operational boundaries. Significantly, the conventional definitions show weaknesses with regard to the consideration of the social dynamics/parameters of coastal fisheries and the congruence between these and the boundaries of the ecosystem, which condition the management of common pool resources. As a consequence their utility for management practice is low. By doing so, the dominant regime has for many years supported a development towards increasing heterogeneity of the authorised professional fishing community in coastal waters. Together with more general development trends, e.g. recreation, the lack of distinctions has contributed to the notion of local fishing community having lost its relevance. In the light of the *cpr* perspective, such development has probably led to management opportunities being lost.

The chapter opened with a question: what is meant by coastal fisheries? Even though the answer remains somewhat elusive, there were clear differences between the institutional reality, with its conventional definitions, and the fishermen's perceptions of their own fisheries. Both attempts to outline universal definitions and use of labels such as "coastal fisheries" or "coastal fishermen" in fisheries management are problematic. First, because coastal fisheries conceal a high degree of diversity, and, second because such labels insinuate that there is a consensus about the characteristics that form the basis for their recognition. If coastal fisheries are to serve the living archipelago policy they have to be accorded distinctive modes of management and be further specified. Some fundamental differences, that have been lost in the conventional definitions but which are articulated by the fishermen, should indeed receive more attention.

The interviews indicated that the term "coastal" was not only an ecosystem-related geographical term having little to do with arbitrary lines, but also and perhaps more importantly, an expression of "locality" and of relations between the fishing community and the community on land. These facets of the term are important dimensions in the theoretical approach of *cpr* management (see chapter 3). The descriptive variables of coastal fisheries articulated by the fishermen during the interviews included more variables than those normally used in policy documents and plans.

In the fishermen's descriptions coastal fisheries are about individuals and small crews sleeping and landing at home, fishing more or less close to land in different ways and involving various species, depending on for example changes in the weather. Coastal fisheries are also about household dynamics, jobs in the local community, changing demands from the market and shared opportunities. As will become evident later on, coastal fisheries are also about individuals making use of different individual and collective strategies to secure access to the resources. These results are supportive of Jentoft (1998; 1998a) who has emphasised that fisheries management should not only be related to markets, efficiency and quotas, but also, among other things, to households, gender, communities, power, equity, democracy and knowledge.

In the fishermen's accounts, there are fundamental differences between the actual community fishing coastal waters and those fishing *home waters*. The distinctions are not so much about measurable variables or scales in terms of vessels, but more about locality, social relations on land, and the use of time. To use time as a management instrument would clearly be in their interest. All in all, it can be argued that the concept of local coastal fisheries as a sub-system in fisheries does not seem to be well institutionalised in the dominant regime governing fisheries on the West Coast of Sweden. This deficiency constitutes a barrier to the involvement local coastal fishermen in the management of coastal fisheries.

CHAPTER 6

THE COASTAL FISHERMEN'S *CPR* SITUATION

Over the past hundred years the coastal economy has evolved from simple commodity production based on farming, fishing and forestry to considerable commercial diversity. First, the coastal zone became the location of industrial, land-based activities that were not directly dependent on marine living resources for their existence but whose coastal location proved to be economically efficient through savings in costs of assembling the basic components, distributing the finished goods or disposing of waste materials. A more diffuse and somewhat later development was the use of the coastal zone for permanent or seasonal residence; large tracts of Sweden's coastline became extensions of the living space for the expanding urban population.

With industrialisation and the increasing need for nature-based leisure activities mainly for people from the urban areas, the coastal zone has evolved over time into an area where the values and interests of non-residents frequently predominate. In such a situation there is always a risk that the needs of local, small scale coastal fishermen for structuring their profession become lost in intra- and inter-sectoral trade-offs. As stated by Steins (1999), different activities may relate to the coastal *cpr* differently and affect a single fishery differently, but most will, in one way or another, further reduce the coastal fisherman's ability to define and influence decisions about the use of the *cpr*. Steins (1999) has argued that the trend towards increased multiple use is a process that increases the alienation of traditional users, and Schlager and Blomquist (1999) have argued that heterogeneity among users in terms of property rights and technology renders collective action and co-operation difficult (see chapter 3).

The present chapter explores what the fishermen considered to threaten their current fisheries seen as a complex common pool situation, i.e. with multiple uses and users. Its purpose is to explore the fishermen's awareness of the interdependencies that exist between these multiple uses and the local fishermen's ability to access fisheries resources and influence their governance.

The fishermen's perceptions of who or what are likely to have an impact on the state of the resources and their fisheries are critical to their willingness to conserve the resources and the ecosystem, their trustworthiness and involvement in the management system and their understanding of who should have a role in co-management of coastal fisheries.

6.1 SOME METHODOLOGICAL CONSIDERATIONS

The chapter presents the results of two questionnaires. The surveys were carried out in 1998 and investigated what professional coastal fishermen in Bohuslän regarded as problems pertaining to fishing in a multiple use context. No account is taken of the perceptions of other resource users or how professional coastal fisheries may affect their activities.

Some aspects of the questionnaires have already been discussed in chapter 4. The Väderö survey was in the form of a postal questionnaire consisting of two parts.[1] The first part was prepared by the Coastal Laboratories of the National Board of Fisheries (NBF) in order to assess the fisheries in the same area, in terms of total catch by species and gear and types of fishery (professional as well as recreational). The results have been published elsewhere

[1] The questionnaires were by ordinary mail in early 1998 with paid return envelopes. A reminder letter was send to those that had not returned the questionnaire within 2 weeks.

(Lagenfelt and Svedäng 1999). The second part comprised a single sheet with six questions (five closed and one open) specially designed for this study. It addressed 48 fishermen who indicated they had fished in a small but highly diverse fishing area within the base line, around the Väderö archipelago outside the town of Fjällbacka in the Municipality of Tanum (see figure 6.1). Responses from 33 fishermen were received and analysed.

The second questionnaire addressed delegates to the 1998 congress of the Swedish West Coast Fishermen's Association (SVC) and consisted of two pages. In this second study group, the fisherman's role as a representative was the important variable, as this latter group may or may not live in the study area and/or interact locally. In this case the fishermen were left to decide whether they were coastal fishermen or not. 40 fishermen, out of 65 registered participants, answered the questions and returned the questionnaire the same day. Unlike the first questionnaire, respondents were attending a meeting and the time they had to fill in the questionnaire was inevitably limited. For this reason, this questionnaire was less comprehensive and the respondents were, for example, not asked to rank reported factors.

Finally, the discussion of the problems deemed critical by the coastal fishermen in their common pool resource situation was further informed by facts and information from secondary sources, and data gathered through meetings and interviews. Information on the latter methods can be found in chapter 4.

6.2 THE VÄDERÖ ARCHIPELAGO STUDY

6.2.1 The Väderö Archipelago area

The Väderö Archipelago is located in the coastal waters of Skagerrak in the municipality of Tanum, in northern Bohuslän (see figure 6.1). In the archipelago where the southernmost part of the Norwegian Trench (referred to as Koster Trench or Väderö-Koster Fjord) meets the most western group of Swedish islands, the baseline[2] was far enough from land to account for a significant diversity in terms of biotopes and fisheries. Several economic activities and interests converge in the area and, some of these – professional fisheries, defence, outdoor recreation and nature conservation– are regarded as being of national significance.[3] In terms of fisheries statistics the area falls within the ICES's grid-square 4656, referred to in chapter 2. The selection of this area was based on the criterion that the area should combine the attributes of high diversity in terms of biophysical environment, resources, and fishing technology.

The examination of catch data from this grid-square (4656) based on the fishermen's 1997 catch log-books (see chapter 4), showed that they included more than 50 identified species, and a number of non-identified ones (see chapter 2). A recent review of the biological knowledge for the area has concluded that Sweden's biotope variation and marine biological diversity probably reaches its maximum in Northern Bohuslän (Nilsson 1997).

Most studies addressing user communities' use of common pool resources are based on geographical residence or the community of place; in the present study however the selection is based on a shared fishing area. The data analysed in this investigation are derived from the responses of professional fishermen who have reported fishing activities within the base-line,

[2] Together with the ICES grid-squares, the base line, the 4 nautical miles line and the 12 nautical miles lines are used to provide a spatial point of reference in the fishermen logbooks.

[3] The Natural Resources Act (1987) now integrated in the Swedish Environmental Code (1999) includes both general and specific management provisions for sectoral development and for the development of geographical areas delimited on the basis of the natural and cultural features. Thus prioritised sectors and areas can be designated by the central authorities as Areas of National Interest.

in a delimited area of ca 90 km² (Latitude: N 58° 40'; S 58° 33'; Longitude: W 11° 05') (see fig 6.1).

Table 6.1	The study group Väderö Questionnaire	
Received the questionnaire (fishing units)		208
Returned both parts of the questionnaire		180
Indicated having fished in the Väderö area marked in the		48
Completed this part of the questionnaire		36
Had fished in the area more than two consecutive years		33

Source: Väderö-questionnaire 1998

6.2.2 The study group

To reach those fishing in the area, the questionnaire was sent to all professional fishermen (all male) who in 1997 had reported operations to the National Board of Fisheries in ICES grid-square 4656. According to the catch logbooks 208 vessels had reported operations in this grid-square during 1997. But the ICES grid-square was larger than the study area in this survey and consequently the fishermen reporting catches there formed an interim group from which it was still necessary to identify those who had actually fished the Väderö area.

Table 6.1 describes the process of response and selection. The table shows that 180 (87%) returned the questionnaire but only 48 (or 26%) stated that they had de facto fished the Väderö area indicated in the questionnaire. Only those fishermen who had fished the area around Väderö (see figure 6.1), were invited to respond the questionnaire. Respondents were asked to state whether they had fished the area for a number of consecutive years and from what date (year). When the respondents' level of completion of both questionnaires and their fishing experience in the defined area were taken into consideration, the effective study group ("sample" size) was reduced to 33 fishermen, all domiciled in the study area itself .[4]

The average time spent fishing in the area was relatively high, 21 years (median 13 years). Three of the fishermen have been fishing in the area for almost 50 years.[5] The respondent with the longest experience in the area had been fishing since 1935 (with a focus on eel and lobster). None of the respondents had started fishing in the area between 1943 and 1974. In the mid and late eighties, however, fishing the area apparently became more popular. Among those who reported that they have fished the area since the eighties there was a clear tendency to target *Nephrops* by means of creels. Five fishermen had started fishing the area relatively recently (in the early-and mid-nineties). They were mainly fishing for *Nephrops* and deep-sea prawn. Overall, a majority of those who answered the questionnaire have fished the area for many years and should be well acquainted with the local conditions.

[4] The number of vessels that operate in an area cannot be used to represent the number of fishermen involved in the fishery; the number will depend on the composition of the crew and whether one and the same fisherman owns one or more units.

[5] The licence register of the National Board of Fisheries shows that West Coast fishermen fishing eel and prawn are in general older than other fishermen. *Nephrops*' fisheries are more recent phenomenon. In the eighties, many fishermen have shifted from fish fisheries to *Nephrops*' fisheries.

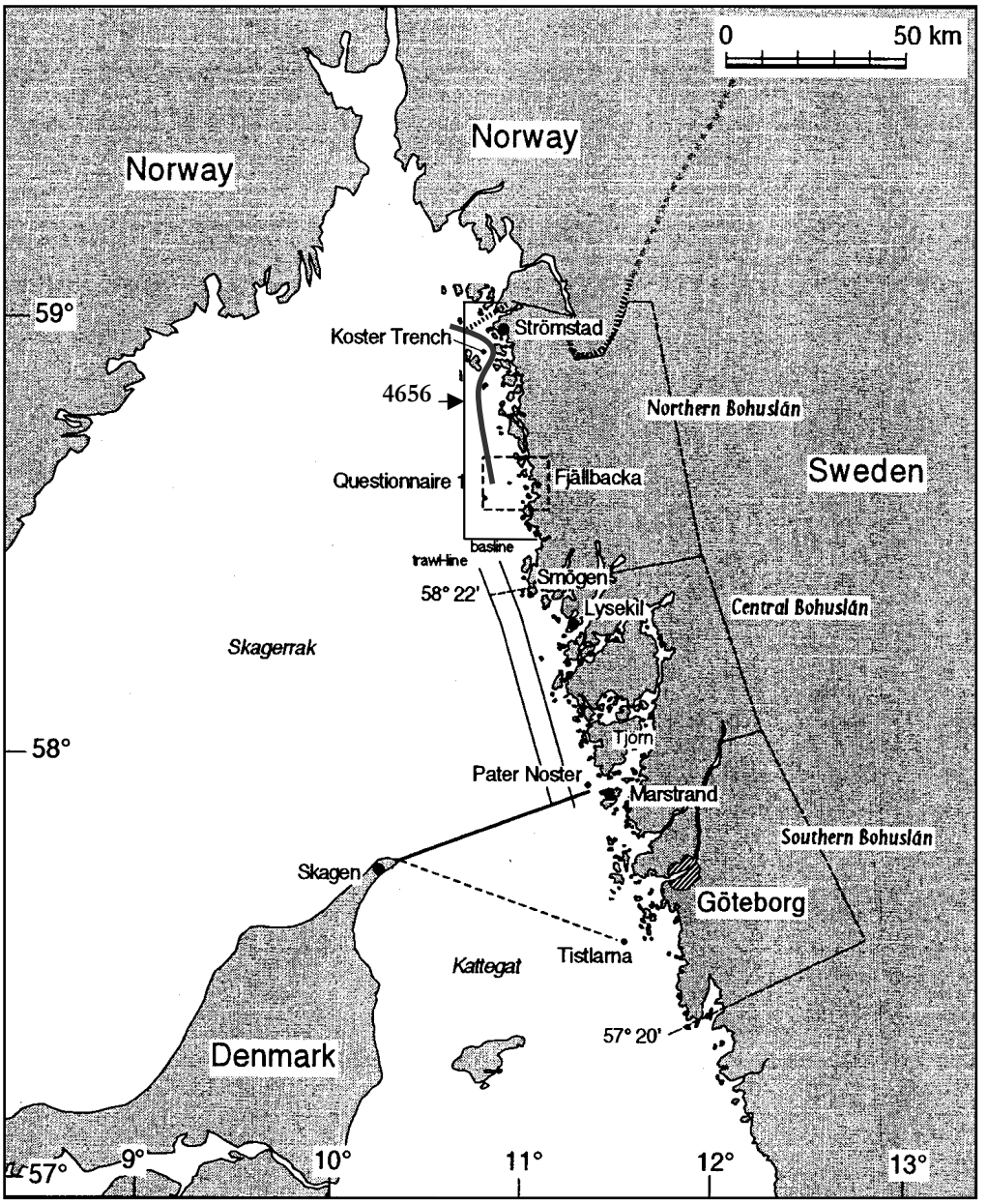

Figure 6.1 Map of the West Coast indicating the area for the Väderö-questionnaire (Questionnaire 1 marked with dotted line in the ICES-grid square 4656).

6.2.3 The fisheries in the Väderö Archipelago

The results of the first part of the questionnaire based on the answers of 48 fishermen reported by Lagenfelt and Svedäng (1999), are useful in helping to provide more detailed description of fishing activities in the area. As table 6.2 indicates, catches from the designated area only represent a small proportion of the total harvest reported from grid-quare 4656, suggesting that in this area most catches are taken beyond the base line, and that the state of the resources within the designated area will be influenced by what happens outside this area. As a group, shellfish was more frequently mentioned than finfish. The table also shows that, in terms of weight, shellfish dominated throughout the area. *Nephrops* and deep-sea prawn, and to a lesser extent lobster, are all relatively stationary stocks, but their abundance in this area depends on the inflows of larvae and juveniles from the North Sea.

It may be also inferred that stocks of ground and flatfish, traditionally part of the fisheries in this region, were not abundant during that year (1997). According to the interviewed fishermen, with the disappearance of predatory ground fish shellfish have grown more abundant.

Table 6.2 Respondents reported catches in the Väderö questionnaire and its relation to the logbook reported catch in ICES' Square 4656 (ton).

Species	Catches reported by respondents (N=48)	Reported catch in log-books Square 4656 N=208)	Väderö respondents % of catch
Total	168,8	960	18%
Deep sea prawn	89,6	229	39%
Nephrops	36,8	100,6	37%
Herring	15	17,5	86%
Dogfish	14	21,7	65%
Eel	5,3	27,5	19%
Mackerel	2,9	12,6	23%
Lobster	1,9	0,8	238%*
Sole	1,5	0,3	500%*
Cod	1,08	7,9	14%
Haddock	0,5	2	25%
Plaice	0,09	0,09	100%
Crab	0,07	16,6	0%
Whiting	0,05	0,2	25%

Note: * Shows inconsistence with the reporting

Sources: Lagenfelt and Svedäng (1999) and National Board of Fisheries database.

The majority of the respondents to the questionnaire could be characterised as combi-fishermen,[6] reporting mixed gear-types and a variety of species caught. However, when trawling was used this gear determined the dominant mode in terms of catches. Several fishermen reported a clear specialisation in terms of catch, in the sense of reporting only one species. This was more frequent among those fishing shellfish by means of trawl, eel by means of fyke-nets or herring. Among the species that were absent from the fishermen's report, but which according to Lagenfelt and Svedäng (1999) should be present, were pollack, saithe,

[6] Fishermen in the area have adapted their fishing to the ecosystem's high biological diversity by combining different fishing technologies on a seasonal basis. Diversification is a strategy to spread economic risk by matching ecological diversity and dynamics. Specialisation is more oriented towards resource concentration and intensification of investment to one or few modes of resource use (McCay 1978). In fisheries there is a tendency to associate small-scale and local coastal fisheries to diversification and large scale to specialisation. Even when it sounds to be a reasonable way to present differences between the two, one should pay attention to the fact that in fisheries high-technological mobile units can de facto apply both strategies: diversification and specialisation.

turbot, flounder, sprat, garfish and brown trout. The reported catches of cod, whiting, mackerel, crab, eel and salmon were low when compared to earlier data.

As we saw earlier in chapter 2, figures 2.4, and 2.5, tracked the changes in landed fish at the fish auction in Smögen displaying a marked decline in many of the historically important species, mainly groundfish. Both table 6.2 and figures 2.4, and 2.5, corroborate the view that fisheries for small pelagics have completely lost significance for local fishermen and that a switch has occurred from groundfish to shellfish fisheries. In contrast to the absence of groundfish in the fishermen's reports, the absence of other certain species such as salmon, trout, garfish, and crab in the professional fishermen's reports was less a cause for surprise. Commercial fishing for these species is not well developed in the area.[7] The extremely low reporting of eel and flat fish species was more remarkable, though the situation of the eel stocks throughout Europe has been reported as critical (Fiskeriverket 2001). Nevertheless, the level of diversity, in terms of species, was high when compared to other areas of Sweden.[8]

The data from the present survey and the logbook data for the respective ICES-grid-square show how important shellfish are. Table 6.2 reveals some inconsistencies between the respondents' information, for sole and lobster catches, and what has been reported in the logbooks. Lobster, a non-quota regulated resource, is heavily fished on a seasonal basis by both professional and recreational fisheries, highly valued by relatives and well rewarded on the informal market. These are factors which may encourage misreporting.

As a group, static gear - with an emphasis on pots (traps), creels and fyke-nets and gillnet sets - was mentioned more frequently than mobile gear. But the most common single type of gear was the trawl. 86% of the informants indicated they have used some type of static gear and 64% some type of active gear (otter bottom trawl, combi-bottom-trawl and trolling). More than 50% of the fishermen combined static and active gear. For example, those fishing *Nephrops* with trawl and belonging to the active gear group could make seasonal use of static gear for lobster, eel or crab by means of pots. Still, their dominant fishery was *Nephrops*.

Typical combinations as regards catch and gear were:

- Deep-sea prawn and *Nephrops*, fished by means of active gear (trawling)
- Deep-sea prawn and mixed fish fished by means of active gear (trawling).
- *Nephrops* and fish fished by means of active gear (trawling).
- *Nephrops*, lobster and mixed fish fished by means of static gear.
- Lobster, eel and mixed fish, fished by means of static gear.

Clearly, despite the relatively small size of the area, the diversity of species and habitats involved is reflected in the coexistence of various fishing techniques, adapted to work different depths and types of sea bottom. Traditionally diversity in small-scale fisheries has provided a means of insurance against the natural fluctuations in local abundance of resources that characterises the coastal waters.

Changes in the respondents' fisheries

Respondents were asked to indicate whether they had experienced changes in their fishing practices and catches from the area in recent years. 30 fishermen out of the 33 respondents indicated that there had been some change, while only three indicated no change. They were

[7] Recreational fishermen commonly mention these species in the reported catches (Lagenfelt and Svedäng 1999).
[8] For comparisons see Lagenfelt and Svedäng (1999) and Neuman and Píriz (2000).

then invited to indicate the nature of these changes by selecting from a pre-selected range of answers (see table 6.3).

Table 6.3 Respondents' perceived changes with respect to their fisheries in the Väderö-area.

Q: *Have you experienced changes in your fishing from the area in the last few years?*

N	Nº of respondents	*Yes*	*No*	Left blank
33	33	30	3	0

Q: *If yes, have you experienced any of the following changes?*

Type of change	Increased	Decreased	No change	Left blank
Volume of catch	9	11	8	2
Catch diversity	0	15	10	5
Area covered	10	1	11	7
Time at sea	9	2	11	8
Costs	12	1	7	10

Source: Väderö-questionnaire 1998

The answers indicate that the issue of diversity loss is a phenomenon not only observed by marine scientists but also perceived by the fishermen. The only other observable trend was that the area covered when fishing, the time spent at sea and the costs of fishing have not diminished, further underlining the fact that decline in diversity reflects resource availability rather than any conscious reduction in fishing effort. In general in fisheries increases in the use of resources (capital, time, space) are either associated with expansion due to abundance or with compensation for poor availability of fish. In coastal fisheries, increased time spent at sea is often related to less catch per unit of effort. In this case, two informants said that time at sea, expenditures or area covered had decreased (table 6.3). But they also indicated "there was no fish available, that seals and poaching were problematic" and "that it did not make sense to fish" (see table 6.4). Thus, in this case, the poor availability of fish had probably resulted in a reduction of fishing operations in the area.

Those who indicated that in their experience catch volume had decreased were involved in fishing *Nephrops* with static gear. This group also noted that the fishing area and time at sea had increased. Likewise reports of increased fishing costs came mainly from static gear fishermen. By contrast, those who reported improved or unchanged situations were involved in trawling for prawn alone or combined trawling for *Nephrops*. There was consistency in their answers to the effect that species diversity and operating costs had not changed significantly in recent years.

It is well known in fisheries, that coastal fishermen have their "preferred fishing spots". Fishermen were asked whether they had stopped fishing any of their preferred locations within the area and to offer any reasons why. Ten of the 33 informants stated they had abandoned favourite fishing sites. Their answers are presented in box 6.1 and indicate some of the problems that the local coastal fishermen are facing: shortage of fish due to poor water quality, natural predators and other fisheries. These responses are consistent with the results in chapters 5 and 7.

Box 6.1 Reasons for abandon "preferred fishing spots"

Q: *Have you stopped fishing in any of your "preferred spots" within the area?*

N	Nº of respondents	*Yes*	*No*	Left blank
33	33	10	23	0

Q: *If yes, please explain why*

- New rules in fisheries and threatened fish stocks due to eel fyke - net fishery (static gear & active gear).
- Most fish is finished due to seals and cormorants. As soon as you start hand-lining mackerel the seals arrive (static gear).
- There is no food fish left (*matfisk*), it does not make sense to fish there (static gear).
- Poor water quality, too many pleasure boats, gear poaching, abundant of algae and seals (static gear)
- There is no more fish to get there, so I gave up fishing. Plankton survives only 10 days after hatching (static gear).
- Catch of fish (flat - or round fish) has diminished or run out completely (active gear).
- Prawn and flatfish is gone, *Nephrops* creels hinder access during long periods (active gear).
- The size of the prawns has diminished considerably (active gear).
- Too many large trawlers have started fishing there too (active gear).
- I have stopped fishing on some patches where the bottoms are dead, with oxygen deficiency due to nutrient overload. There are dead bottoms in Jore and Rödhammar fjords (active gear).

Source: Väderö-questionnaire 1998

6.2.4 Problems faced by the respondents in the present *cpr* situation

In order to find out what the fishermen themselves regarded as problematic they were asked to answer the following question: When fishing in the area, have you found obstacles that you relate to any of the factors here below? A list of twenty-two possible factors was given (table 6.4). The respondents were asked to add new factors to the list where necessary. The results are presented in table 6.4. Thirty-one of the 33 informants stated that there were obstacles to their fishery. They were also asked to assign a value, from 1 to 5, to each factor. In the scale used to assess the factor 1 represented not problematic, and 5 a severe problem (see note in table 6.4).

The assignation of values of 3-5, denoting what could be interpreted to be the more serious category of problems, accounted for only a third of the answers. In the table a bold line has been drawn where the degree of disturbance seems to become weak. The results suggest that most fishermen did not consider the majority of listed factors as representing serious problems. Reasoning in this way is interesting considering that the factors presented in the questionnaire were selected on the basis of the analysis of the fisherman association's newspaper, Yrkesfiskaren, and consultations with various actors involved in the management of the coastal zone and the fisheries. Yet only six informants made use of the opportunity to include additional factors namely: trawling (3 respondents),[9] poaching and theft (1 respondent), divers (1 respondent), bureaucracy (1 respondent) and abandoned mussel farms (1 respondent). These were assigned the values 5, 5, 5; 5; 4; 4; and 4 respectively. These additional answers have been included in tables 6.4 under the pre-identified factors: "other fishing" (trawling), "control" (poaching), "summer visitors" (diving), "fishing regulations" (bureaucracy) and "fish farms" (mussel farms) respectively. As a result of this, "fish farms" was reformulated as aquaculture.

[9] It is worth mentioning here that the three respondents who assigned 5 to trawling under the item "Other factors" fished for *Nephrops* with creels.

Table 6.4 The respondents' assessment of factors affecting their fisheries

Q: *When fishing in the area, have you found obstacles that you relate to any of the factors on the list?*

N	Nº of respondents	*Yes*	*No*	Left blank
33	32	31	1	1

Q: *If yes, please assign a value to the factors presented in the list.*

Factors	**1**	**2**	**3**	**4**	**5**
Seals	2	1	2	6	7
Cormorants	3	0	8	1	3
Recreation boats	3	5	2	2	3
Other fisheries (trawling)	4	6	1	1	3
Summer visitors	4	6	0	1	3
Marine reserves	6	0	0	0	3
Nutrient discharge	2	1	2	1	2
Fishery regulations	3	1	3	1	1
Fisheries with static gear	7	1	3	2	1
Maritime transport	5	2	1	0	1
Control	5	0	0	0	1
Water quality	2	2	1	1	0
Fishery with hand gear	6	4	0	1	0
Windmills	6	0	0	1	0
Aquaculture	7	0	0	1	0
Military activities	6	1	2	0	0
Bottom artefacts	6	2	1	0	0
Oil industry	6	0	0	0	0
Industrial facilities	6	0	0	0	0
Shore protection Act	6	2	0	0	0
Dredging	7	0	0	0	0
Landowners	6	1	0	0	0
Total number of mentions	108	35	26	17	28

Note: For further analysis, the values 4 and 5 are assumed to represent what was perceived as a severe problem, value 3 to represent a moderate negative attitude, value 2 to represent a weak negative attitude and finally value 1 is assumed to represent that the factor is not problematic at all.

Source: Väderö-questionnaire 1998

Table 6.4 presents the frequency of values assigned to all factors. Even with the inclusion of these additional factors, the notion of "serious problems" still only accounts for a third of all responses. In table 6.5 all factors from above the dark line in table 6.4 and assigned values 5 are presented. The factors in table 6.5 have been arranged according to frequency of assigned values 4 and 5.

Turning to those factors which are considered problematic by the coastal fishermen, a number can be grouped together as related to the same phenomena or derived from a common source: 1) seals and cormorants; 2) leisure boats, summer guests and sea based transport; 3) fisheries with static gear and other fisheries;[10] 4) nutrient discharges; 5) fishery regulations, marine reserves and control (see table 6.6). These will be discussed in section 6.5 below.

[10] The term "other fisheries" is vague and makes the interpretation difficult.

Table 6.5 Frequency of values 5 and 4 assigned to the factors.			
Factors/Value	**4**	**5**	**∑**
Seals	6	7	13
Recreation boats	2	3	5
Cormorants	1	3	4
Other fisheries (trawling)	1	3	4
Summer visitors	1	3	4
Marine reserves	0	3	3
Nutrient discharge	1	2	3
Fisheries with static gear	2	1	3
Fishery regulations	1	1	2
Maritime transport	0	1	1
Control	0	1	1

Source: Väderö-questionnaire 1998

Table 6.6 The problematic factors in an aggregated form	
Factors	**∑ 4+5**
1) Competition within the ecosystem	17
2) Sea based recreational activities	10
3) Competing fisheries	7
4) Institutional arrangements	6
5) Deterioration of the ecosystem	3

Source: Väderö-questionnaire 1998

6.2.5 Problems of the future

Respondents were also asked to indicate whether they believed any of the current less problematic factors might become a threat in the future. Seventeen respondents answered this question by assigning an *X* to one or more of the listed factors to indicate possible future threats (see table 6.7).

Those who responded each selected between one and three factors. The pattern found in the answers broadly accords with the responses to the questions in table 6.4. Once again factors that had ranked high in the list of current issues (wildlife species and pollution) also appeared as future threats. Sea-based recreational activities were, on the other hand, not seen as a potential threat; fresh water quality on the other hand, was of greater concern. Those who trawled for shellfish –the most numerous group of respondents– perceived marine reserves and fishery regulations as future problems. Marine reserves (not so widely regarded as a present threat in table 6.4) were seen as a more significant future problem along with fishery regulations.

Table 6.7 Potential threats to fisheries as indicated by professional fishermen fishing in the area of Väderö.

Q: If you see there are factors on this list that are unproblematic today but you think will be problematic in future please mark this/these factors with an "X".

N	Nº of respondents	Left blank
33	17	16

Potential threats	Nº of answers
Marine reserves	6
Nutrient discharge	4
Water quality	4
Fishery regulations	4
Seals	3
Oil industry	2
Cormorants	2
Control	2
Bottom artefacts	2
Fishery with static gear	1
Fishery with hand gear (angling)	1
Other fisheries	1
Summer visitors	1
Industrial facilities	1

Note: Only factors identified by the respondents have been included.
Source: Väderö-questionnaire 1998

6.2.6 Communicating concerns: patterns of interaction in the search for solutions

To identify to whom they turned for solutions to the problems they faced, the fishermen were asked to nominate one or more actors from a prepared list of 33 (or to add any actor not mentioned on the given list). The list included organisations and actors directly involved in fisheries as well as those involved in coastal environmental protection, community development and political representation (see table 6.8). As a complement this question was expected to provide information on the networks that fishermen use and their willingness to discuss their professional concerns within such networks. It was also hoped that information on inter- and intra-sectoral communication at local, regional and national levels might give some indication of how they would rate potential actors in a co-management perspectives.

All 33 fishermen responded to this question, but almost half claimed that they had not contacted anyone on the list to discuss any of the problems, even though they may have perceived them as severe and in fact assigned them a value 4 or 5 in table 6.4. Less than half the actors on the list were selected by the respondents. With the exception of one fisherman, who communicated with 14 actors[11], the majority of those indicating they had already discussed the issue with someone actually selected between 3 and 5 actors from an effective

[11] The fisherman who claimed to have contacted 14 actors from the list trawled for shellfish and had selected marine reserves as his sole choice of existing problem. As an exception this is highly interesting because it illustrates just how extensive the network of influential actors can be in relation to a specific issue. It also suggests that the growing diversity of activities and interests in the coastal zone implies that the network of contacts that fishermen have to consider in searching for solutions to *cpr* problems is becoming very much more extensive. Simply put, this exceptional case exposes elements of the spectrum of actors that are influential to the management of coastal fisheries, which is increasing.

list of 17 out of the original list of 33. Colleagues in the fishing industry proved the most common choice.

No additional actors were put forward by the respondents, and the following listed actors were not selected: Local Development Association; owner of private fishing rights; Water Owners Association; Environmental NGO; EU-project; Fishery Division of the County Board Administration; Fisheries controller; Subsistence Fishermen's Association; Fish farmers Association; Processing Industry Association; Sport-fishermen Association; Coastguards; Environmental Protection Agency; Member of the European Commission. Moreover a third of the actors listed on table 6.8 were mentioned only once or twice. By far the majority made exclusive use of colleagues and family members. Apart from family members and professional colleagues, the most frequent contacts were with the fishermen's association at local and/or regional levels, SVC in particular. Indeed, rather surprising was the apparent reluctance to use other, more formal channels.

In general the fishermen kept their search for solutions within the fishery sector and at the local level. This suggests that discussing local fishing problems directly with the Swedish National Fishermen's Association (SFR) or the National Board of Fisheries (NBF), the two organisations that were the pillars in the Swedish central co-management, was not common. No communication appears to occur with resource users in other sectors, and contacts with authorities outside the fishery sector were very uncommon.

The lack of communication between the fishermen and other resource users over the state of the coastal environment may be explained by the facts that problems contained within the fisheries sector were prioritised and possible sources of mediation readily identifiable in the form of the fisheries associations. The mode of working of sectoral organisations may inhibit the development of more broadly constructed arenas for discussions involving a range of different stakeholders.

Those who accounted for the widest network of contacted actors were the fishermen using active gear (trawl) who ranked marine reserves as a potentially severe present and future threat. By contrast, those fishing with static gear either contacted no one or used a very narrow network consisting mainly of colleagues or relatives. One can speculate that the narrow network of those fishing with static gear can partly be explained by the characteristics of the problems confronted– seals, leisure boats, and eutrophication – and partly by the organisation of their fisheries. These problems involve boundary-less, "fuzzy" communities of users whose identification and circumscription is rather complicated. Fixed gear fishermen tend to be more dispersed, and often work alone or with a close relative. In the particular case of the eel fisheries, the catches are not delivered to the local auction but are collected directly by the buyers. As a result, eel fishermen have a rather narrow ecological and social space of action in their professional lives.

The results also indicated that static gear fishermen may have less access to influential arenas of negotiation than those engaged in trawl fishing. This in turn prompts the question as to what issues are considered crucial by delegates to the regional association, SVC: do they, in fact, coincide with those identified by local fishermen in Väderö, and how? This question was addressed in the second questionnaire.

Table 6.8 Actors with whom fishermen have discussed what they perceived to be severe problems.

Q: *Have you contacted any person or organization to discuss problems you have assigned a value of 5 or X in the question above?*

N	Nº of respondents	*Yes*	*No*	Left blank
33	33	17	16	0

Q: *If yes, please identify among the instances listed here below or nominate yourself.*

Actor	**Nº of answers**
Colleague	16
Family member	10
Swedish West Coast Fishermen's Association	7
Local Coastal Fishermen's Association	4
Producers' Organisation.	3
Institute of Marine Research, (NBF–Lysekil)	3
Swedish National Fishermen's Association (SFR)	2
Fish merchant	2
Municipal Officer	2
County Administration, Nature Conservation	2
Other scientists	2
Media	1
Local politician	1
Fish auction	1
National Board of Fisheries	1
Member of the Swedish Parliament	1
Ministerial Fisheries Department	1

Source: Väderö-questionnaire 1998

6.3 AN INQUIRY WITH LOCAL REPRESENTATIVES

Chapter 2 described how the fishermen's associations (FAs) came to play a potentially influential role in fisheries management and in the resolution of specific problems identified by members. The opinions of the delegates to the regional association therefore merit separate analysis. Accordingly, a second but less comprehensive questionnaire was distributed among fishermen attending the 1998 annual congress of the Swedish West Coast Fishermen's Association (SVC). Its purpose was to examine the perceptions of problems by the delegates and the extent to which their perceptions conformed to the problems perceived by the local fishermen from the Väderö archipelago area.

According to its statutes, each local SVC branch has the right to send to the congress one delegate for each 20 active members.[12] With the recession in fisheries some branches may be unable to fulfil the minimum criterion of 20 active members. It is in the South, in the surroundings of Göteborg, that local branches with the largest number of members and most young fishermen are found. It is also the base for the semi-industrial fishing vessels. The system of representation is significant. Indeed, scrutiny of SVC's 1998 list of active members indicated that as many as 19 out of 38 branches failed to reach the threshold for nominating a delegate to the 1998 congress. Three branches from Southern Bohuslän, 11 from central

[12] Membership in the Association is open to all fishermen, vessel owners, and crew members alike on equal terms. In 1997, SVC had a total of 6,275 members of whom 1,155 were active fishermen.

Bohuslän and 5 from northern Bohuslän ought therefore to be disqualified.

In other words, the system benefits the representation of fishermen living close together in concentrations, or a "pocket-like" distribution. Such conditions occur around the main landing harbours and fish auctions. This will tend to favour certain types of fishing that rely on good harbour facilities and auctions, which is not the case for, for example, the eel fisheries. This problem can take on an extreme dimension when it is appreciated that the crews of two semi-industrial vessels can together generate sufficient members to appoint one delegate. While crew members can easily meet together and prioritise the same problems, this is probably not the case for 20 fishermen fishing alone or in pairs.

6.3.1 The study group and problems of representation

The 1998 congress took place in the coastal city of Varberg in the province of Halland, south of Göteborg, and the delegates came from the entire West Coast of Sweden. Those who attend the congress are normally delegates nominated by their local branches. SVC was at that time organised in 38 local branches: 23 in Central and Northern Bohuslän, 12 in Southern Bohuslän and 3 in the province of Halland.

Of the 65 registered participants, 40 (62%) identifying themselves as coastal fishermen completed the questionnaire. Table 6.9 displays some of the basic descriptors of these 40 respondents and their fishing activities. When the data presented in table 6.9 are compared to data from the fishermen responding to the Väderö questionnaire, some differences immediately become evident. Among the delegates who filled in the questionnaire, only a small minority (20%) deploy static gear; the majority fish outside the trawling limits and roughly two-thirds are involved in trips involving more than 24 hours absence from the home port. All this points to a distribution skewed towards larger fishing vessels rather than the small scale, inshore units. Nevertheless all respondents, despite these differences, defined themselves as "coastal fishermen" posing once again the question of how professional coastal fisheries are conceptualised in the dominant management regime (see chapter 5).

The common denominator throughout all the regional modalities was trawling for shellfish with a focus on *Nephrops*. The composition of the delegates was heterogeneous in terms of residence, size of the vessel, crew, and fishing pattern. In terms of fishing type, there was evidence of fairly distinctive regional specialisation; trawling for finfish and *Nephrops* were characteristics of the representatives from Southern Bohuslän, who often operated with crews consisting of more than three men, and who were at sea for more than 24 hours; trawling for deep sea prawns and *Nephrops* were characteristics of the representatives from Northern Bohuslän, who operated with smaller crews and for periods of three days or less.

Table 6.9 also provides information on the area of residence of the informants. Their geographical representation was rather balanced, and the geographical range of residence was expected to generate differences in terms of the identification of problems. Therefore, place of residence was considered a useful variable to categorise the fishermen's definition of problems.

6.3.2 Problems associated by the respondents with the multiple-use situation

In order to investigate what the delegates perceived to be problems in the multiple use situation, the questionnaire offered a list of 19 possible factors (see table 6.10) and respondents were asked to select a maximum of 5 factors constraining coastal fisheries in the West Coast. Most respondents chose to answer with 3-5 factors which explains the high number of responses. The responses of the delegates have been grouped according to the delegates' origin: north or south.

Table 6.9 Basic attributes of fishing activities of the responding SVC-delegates (N=40)

Attribute	Variability/range in the attribute Nº of answers			Left blank
Area of residence	North* 23		South** 13	4
Type of fishing gear	Active 31	Active & Static 6	Static 2	1
Fishing operations in relation to the trawling line	Outside 26	Within & Outside 8	Within 4	2
Fishing operations in relation to the belt of sherries (base-line)	Outside 30		Within 8	2
Days at sea	24 hours 13	1-3 days 15	> 3 days 12	0
Size of the crew	> 3 men 16	2-3 men 13	1 man 4	7

Note: *North includes: Central & Northern Bohuslän; **South includes Halland and Southern Bohuslän.

Source: SVC-questionnaire 1998

Some of the factors listed differed slightly from those used in the Väderö questionnaire and the selection procedure was simpler.[13] Therefore direct comparisons can only be made with caution. Responses in table 6.10 do not appear to reveal a very different set of priority problems than those previously assigned by local fishermen from Väderö. The common problems are: competition from within the ecosystem, the deterioration of the ecosystem, different fishing practices and institutional arrangements.

Perhaps, not all that surprisingly, responses from the North did in fact coincide well with those identified by the local fishermen in Väderö. Again, the fishermen were given the opportunity to add any relevant factors to the list. Only one fisherman from the South chose to use the option, adding the name of a particular producers' organisation from Northern Boshulän (NBPO) pursuing ideas on the devolution of management to the local level (see chapter 8).

Likewise, concerns about industry related activities were common to all delegates. However, while problems of competition within the ecosystem – seals and cormorants, nutrient discharges and demands from nature conservation – remained a concern for the delegates from the North, they were less frequently mentioned by those from the South. For delegates from the South, on the other hand, much more frequent problems were industrial pollution and nutrient discharges, followed by industry-related activities such as dredging, and sports fishing (anglers). This is only to be expected, as industrial and urban activities on the West Coast increase towards Göteborg in Southern Bohuslän. Thus, delegates from the South clearly brought into the debate problems from their own immediate area, strengthening the significance of spatial variables and of local ties in the definition of problems. By contrast,

[13] The list of factors in this questionnaire included a few new factors that could be relevant to fishermen living in more urban and industrialised areas (mussel farms and harbour activities) and excluded some factors which were shown irrelevant for the area (landowner, shore protection act, bottom artefacts). Finally some wording was adapted; fisheries, was better specified by making use of the terms trawling, subsistence fishery, sport-fisheries and other coastal fisheries. Marine reserve was changed to "nature conservation in the form of protected areas" and fishery regulations specified as capture limitations to protect stocks. Finally the term "leisure boats" was divided into two: "tourism development" and "sea-based transport".

concern over subsistence[14] fisheries, defined as "*husbehovsfiske*" are more uniformly experienced throughout the West Coast, though concerns over sports fishing appeared to harden in the South of the region. Issues related to nature conservation and the establishment of marine reserves feature rather less prominently and are regionally differentiated.

Table 6.10 The responding SVC delegates' assessment of problems

Q: *Which of the following activities do you think have a conflict relation with coastal fisheries? Select among these a maximum of five (5) you consider to be the most urgent ones to be resolved. You are welcome to add new factors.*

Factor	Nº of answers	South*	North**	Undefined Area of residence
N° of respondents	40	13	23	4
Nutrient discharges	25	10	11	4
Discharges industrial activities	25	12	9	4
Seals	24	4	17	3
Subsistence fisheries	21	7	12	2
Sport-fishing	16	8	6	2
Nature conservation, protected areas	16	5	9	2
Dredging	15	8	5	2
Cormorants	12	3	8	1
Diverse sea based transport	8	4	4	0
Fishery regulations	7	3	3	1
Trawling	6	1	4	1
Spills from vessels	5	2	3	0
Other coastal fishery	4	2	2	0
Defence activities	3	1	2	0
Mussel farms	2	0	1	1
Fish farms	2	0	2	0
Harbour activities and constructions	3	1	1	1
Tourism development	1	1	0	0
Wind power	1	0	1	0
Other (*NBPO*)	1	0	0	1
Total	197	72	100	25

*South includes: Halland & Southern Bohuslän; **North includes: Central & Northern Bohuslän.

Source: SVC-questionnaire 1998

What is perhaps notable in the fishermen's selection of factors is an apparent lack of concern for the problems posed by fishery regulations, though this situation changes appreciably once the delegates are asked to answer in their own words questions on the perceived threats to their own fishing activities (see table 6.11). In an attempt to confirm and amplify the results presented in table 6.10, the informants were asked to express in their own words what they considered as the main threats to their own fishing activity. The factors identified by the respondents are listed in table 6.11.

[14] The term subsistence comes from agriculture (subsistence crop). In fisheries, it is commonly used to refer to a type of fishery where the fisherman and his family consume most of the catch, leaving little to be marketed in the local community.

Table 6.11 Problematic factors as formulated by the respondents

Q: *Could you give examples of problems that you regard are threatening your own fisheries?*

N	**Nº of respondents**	**Left blank**
40	32	8

Factor Mentioned	**Nº of answers**	Factor Mentioned	**Nº of answers**
Quotas	7	EU	2
Marine Reserves	5	Foreigners	2
TAC	4	Authorities	2
NBPO	4	Complicated rules	1
Expenses	4	Ignorance among decision makers	1
Lack of fish	3	Biologists	1
Bureaucrats	3	Poor youth recruitment	1
Fish prices	2	Poor co-operation among fishermen	1
Control	2	Poachers	1
Rations	2	Import of prawn	1

Source: SVC-questionnaire 1998

32 fishermen provided 57 responses; most respondents mentioned between 1-3 factors. In some instances the respondents chose merely to repeat factors from the list provided, notably nutrients discharge (5), subsistence fisheries (3), seals (2) and maritime transport (1). But as many as 29 fishermen chose to formulate the factors in their own terms.

What emerges is a somewhat different picture than that previously generated. In particular, issues relating to fisheries management become more prominent; both in terms of concern over specific regulations to allocate resources (e.g. quotas) and in terms of the process of decision making and the actors directly involved. In a sense, the fishermen left the world of multiple-use activities, which had dominated the multiple choice list of factors presented to them, and emphasised institutional issues.

The respondents indicated that the rules and the actors are very much part of the problem. Quotas, marine reserves, TACs, rations, control, and complicated rules are all directly related to the management instruments. The first three were more frequently mentioned by the shellfish fishermen from the North (the study area); the next three by fishermen from the South. Eight respondents drew attention to actors involved in the debate and design of management instruments, i.e. authorities, NBPO, bureaucrats, the EU, decision-makers, biologists, and Swedish and foreign fishermen.

By doing this, the respondents revealed which actors they considered to be influential in a situation where the governance of fisheries is distributed and engages many actors. Also in the Väderö case, elements of the socio-political network through which modern governance of fisheries is distributed were exposed, but actors identified by the delegates were not these included in the narrow network of the local fishermen from Väderö. One may also argue that when discussing the critical involvement of others in the management of fisheries, the delegates also revealed problems related to their own low degree of influence over management.

NBPO, a Producers' Organization bringing together shellfish fishermen from Northern Bohuslän, seemed to be controversial. NBPO had questioned the legitimacy and effectiveness of the current national management regime and opened up the debate on alternative management regimes. This issue will be analysed in detail in chapter 8.

6.4 DISCUSSING CRITICAL FACTORS IN THE *CPR* SITUATION OF THE FISHERMEN FROM NORTHERN BOHUSLÄN.

The discussion now focuses on those factors deemed critical by fishermen from Northern Bohuslän and identified in the tables.

6.4.1 Seals and Cormorants

Fishermen, especially those fishing with static gear, believe seals to be the most serious problem affecting the coastal fisheries. In Sweden, the population of seals and the relationship of human society to what is often regarded as charismatic species has undergone drastic change[15].

> "Thirty years ago the Swedish fishermen were paid a bounty for each seal they shot" {0.1#146}.

In 1974, following recommendations from the Helsinki Commission (HELCOM), general seal hunting was prohibited in Sweden[16]. In the seventies and the eighties, seals became endangered species and protection measures were adopted. In the Baltic Sea seal populations were threatened by biocides (DDT and PCBs) polluting the waters while on the West Coast the threat came mainly from a viral epidemic.[17]

Debates addressing seal related issues have occurred from time to time in the Swedish Parliament throughout the last 20 years. While the issue of seal management has continued to be debated the type and magnitude of the problem has altered with changes in the number of seals. The debate in parliament has gone from a spirit of "saving the seals" from extinction, to a spirit of "demonising seals" as a consequence of their population explosion and the increasing damage and cost.[18]

In the mid nineties the seal populations had recovered and become a substantial problem for small-scale local coastal fishermen. The fishermen's association was therefore strongly in favour of hunting as a solution to the problems caused by the increased number of seals. Today, however, seals are protected by international conservation policies. Indeed nothing seems to energise the marine conservation movement as much as the protection of seals. Furthermore, for the tourism sector and the sea-based leisure community, seals are important natural resources. Few cases that better exemplify a value-laden conflict.

That in the last decade seals have caused severe problems to the fishermen in the Baltic Sea is a well-known fact. On the other hand, Lunneryd (1999) reports that about 1000 grey seals die every year in the Baltic entangled in fishing gear.

Not only the fishermen, but also the seals and the state are in trouble: the seals because they often become trapped in the gear, and the state and tax payers because they must compensate the fishermen for losses valued at millions of Swedish crowns and support the development of

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[15] Three different species of seals are found in Swedish waters: the ringed seal (*Pusa hispida*), the grey seal (*Halicoerus gripus*) and the harbour seal (*Phoca vitulina*). The first two occur in The Baltic Sea and the latter occurs in The Skagerrak.

[16] "Protective hunting" was permitted until 1987 (Olsson 1996).

[17] Phocine distemper.

[18] In Sweden the fishermen are compensated for damaged gear. Estimates made by the National Board of Fisheries on the total annual economic losses throughout Sweden in terms of lost catch, damaged gear and state compensation, refer to figures exceeding 30 millions of Swedish Crowns (Westerberg et al. 2000).

new, more selective fishing gear. Estimates put the harbour seal population in Kattegatt and Skagerrak at 5,000 individuals in the early 1990s and 15,000 individuals in 1998 (Lunneryd 2001). In Skagerrak, where the seals (harbour seal) are numerically fewer - about 1700 animals according to Lunneryd (2001) - and where the fisheries are focused on shellfish species the damage to fishing and the loss of seals through incidental capture is less pronounced. Scientists argue that, in general, the number of seals is still comparatively low compared to at the turn of the century, and that there should still be scope for the populations to grow (Lunneryd 1999; Westerberg 1999). According to the fishermen from Northern Bohuslän, seals were previously not considered a problem in this area, partly because they were less in number, partly because there was more fish available and partly because more fishermen were fishing at greater distances from the shore.

> "Today they are around here (meaning the inshore) and as soon as you set the net, they come" {0.0#139}.

Those fishing with static gear reported that the harbour seal searches for food in the fyke-nets used in the eel fisheries where by-catches of juvenile cod and flatfish occur. The fishermen reported that seals also poach the long lines used, for example, in mackerel fishing.

Westerberg (1999) and Lunneryd (2001) confirm that seals mainly affect eel fishermen making use of fyke-nets. They also speculate that the increasing problem with the seals in this case may be related to changes in food availability in offshore waters, which force seals to forage in shallow areas where the eel fishery takes place. The authors' hypothesis is consistent with the overfishing of both small-pelagics and the gadoid and the ecological shift to crustaceans. Such reasoning links the issue of seals met by the small-scale fishermen to the fishing patterns of larger-scale modern fisheries, and shifts attention from the seals as being the problem, to the modern fishery practices and their management.

The fact that in the questionnaires fishermen operating active gear also reported the seals to be a problem was somewhat unexpected. Even when the interviews revealed that many fishermen from Northern Bohuslän actually combined gear their focus was on shellfish and they did not report as many damaged set of gear as those from the Baltic. This may indicate that the fishermen from Northern Bohuslän were already saturated with problems and that the issue of the seals was "the straw that broke the camel's back".

Shellfish fishermen were, in general, concerned about the harbour seal as consumers of fish (ca 4-6 kg fish per individual and day). They claimed that seals consumed at least as much or more cod and groundfish than was allocated to the Swedish fishermen in the quotas. Similar observations have been made by Lunneryd (2001).

Studies by Härkönen and Heide-Jørgensen (1991) confirm an average daily intake of 4 kg per day and cod as the most important food item in the diet of the harbour seal. The same authors had earlier indicated that the total fish consumption by harbour seals of commercially important species in 1989 did not exceed 1 % of the catches by the fisheries in the entire Skagerrak. As discussed by Lynneryd (2001), the calculations of Härkönen and Heide-Jørgensen (1991) are based on different figures. The fishermen exclude catches of small pelagics made by the more industrial fisheries in the entire Skagerrak, which are included in the scientists' calculations. This underlines the problem of shortcomings in the methods used to assess stocks, on the one hand, and the ideas advanced by ecologists and the representatives of conservation NGOs, on the other hand:

> "The consumption of resources by seals should be accounted for by multi-species stock assessments and reflected in the TACs" {1.1#69}.

As seals have their specific feeding grounds, reduced TACs could alleviate the pressure on the fish stocks in general, but not necessarily alleviate the situation for the local fishermen.

Lunneryd (2001) argues that one way to solve the conflict between the seals and the fisheries might be to reduce the seal population and to treat seals as a natural resource. However, any hunting to reduce the seal population must be done within safe biological limits and the size of the minimum viable population of seals, in theory, can only be determined on biological grounds. Yet the size of the population and its historical development is still subject to debate and different estimates lead to different arguments concerning strategies. Consequently, the debate has been plagued by methodological problems and different expert findings on the state of health of the seal populations. This uncertainty has made the decision-making process, normally grounded in scientific results, more difficult.

In the case of wildlife conservation, the situation becomes complex, and the authorities often rely on scientific facts while the more critical value laden issues are often downplayed. The tactic of focusing on facts and figures and characterising the issue as "seals versus fishermen" can play into the hand of the fishermen, because it obscures the value debate to which today's society is highly sensitive. The latter is illustrated in the following excerpt from an interview.

> "In 1995 a working group, comprising the National Environmental Protection Agency, the National Board of Fisheries, the National Museum of Natural History and the Swedish Society for Nature Conservation,[19] was established to consider the seal problem and seek solutions. But the Swedish Society for Nature Conservation was unwilling to discuss any solution which might involve restoring the hunting of seals, and left the group at an early stage" {0.1#34}.

In the above case, the conservation NGO was not prepared to discuss the possibility of seals being hunted or harvest. This "putting the seals first" position was not found among interviewees resident in the study area.

In 2002, a limited cull of seals was permitted on the East Coast. On the West Coast, a new viral epidemic had spread rapidly drastically affecting the mortality of harbour seals. This might be expected to have decreased the uptake of cod for some time. If there is a simple relationship between the number of seals and the availability of cod in coastal areas then the reduced number of seals due to viral epidemics ought to lead to a rise in cod stocks both in the 1990s and again for a few years after 2002. However, the analysis made by Lunneryd (2001) with regard to possible positive effects on the cod stocks after the viral epidemic of 1998 showed no clear relationship. During that period the seal problem on the West Coast had lost much of its immediacy but it quickly returned when the epidemic was over.

Each definition of a problem embodies presumptions about who or what caused the problem, and who or what must change (or be changed) to solve it (Dietz et al 1989). In Sweden when it comes to the advocacy of nature's rights and the ascription of values to nature, the central government plays a leading role. The central government represented by the National Environmental Protection Agency (SNV) and the County Board Administration are involved in policy implementation and control. Nature conservation initiatives are often triggered by international agreements or by pressure from established national or international nature conservation NGOs. The fishermen and their associations cannot do much more than lobby and petition the authorities. This is commonly done along sectoral lines and the fishermen's experience of negotiation and collaborative management with actors outside their particular sector seems to be poor. Meetings with authorities other than those representing the fisheries

[19] In Swedish Naturskyddsförening.

sector were unusual. Besides, in the interviews fishermen expressed a feeling that the NGOs engaged in nature conservation and sports fishing organisations had far more capacity to influence government authorities than the fishing industry's own associations.

The scientific literature on natural resource conflicts relates mainly to conflicts of interest between resource users,[20] or between them and people chosen to represent wildlife,[21] not between users and wildlife. The natural resource *per se* is only involved in the discussion of conflicts as a right or an interest of actual or potential resource users. In Sweden, there is a tendency to discuss the situation in terms of problems and with the support of scientific figures, which is easier than discussing in terms of conflicts.[22] Moreover, in the Swedish debate and documentation on the issue of seals, this is often referred to as a problem affecting fisheries or as a conflict between the seals and the fisheries or the fishermen. In this case one may argue that from the perspective of the fishermen the problems are caused by seals and cormorants; they eat the fish and damage the gear. As a result, the conflict is partially hidden, because, when defining the problem as a conflict between seals and fishermen, one is actually taking part in a process which obscures who the *de facto* claimants are, their different positions and characteristics. The very title of the project proposal "Conflicts between seals and fishery in the Baltic" submitted by the Swedish EPA to the HELCOM – Commission (Statens Naturvårdsverk 1994) is evidence of how the situation is formally presented. In such a proposal, there are no discernible claimants directly opposing the coastal fishermen, only wildlife.

Cormorants have also increased in number, affecting fishermen in much the same way as seals. Nevertheless, the debate about the cormorants has been less heated. In contrast to the seals, cormorants are seldom seen as symbols of natural beauty requiring conservation, and Swedish society's approach to them is more influenced by an anthropocentric perspective[23]. Furthermore, cormorants are unpopular even outside the fishery sector, because of the damage they cause to the trees where they nest.[24]

Before Sweden became member of EU, shooting of cormorants was permitted seasonally from August to February. When Sweden joined the European Union cormorants (both *Phalacrocorax carbo carbo* and *Phalacrocorax carbo sinensis*) whose populations were previously regulated by hunting and by puncturing the eggs, came under the protection of the Habitats and Birds Directives. The region most affected by cormorants is that of Kalmar on the Baltic coast in the south-eastern part of Sweden. Due to complaints from fishermen from the area, the provincial government of Kalmar decided to permit limited shooting (protective hunting) during 1998 and 1999. Cormorants were to be hunted only near fishing gear between August and March, while their eggs could be punctured between January and July.

Seen from the perspective of many conservation NGOs, seals, cormorants and biological diversity have an intrinsic value, while the fishing crisis results from the dominance of a more anthropocentric perspective. But the intrinsic value of wildlife does not seem to be absolute.

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[20] See for example Bavinck (2001) for a discussion on conflicts between fishermen; and Dietz et al (1989) for a discussion of how professionals position themselves in terms of resource conflicts.

[21] Steins (1999) has reported on a successful case in the Wadden Sea where birds were at stake.

[22] The "seals versus fishermen conflict" and the point of whether this is to be seen as a "conflict" has been a matter of discussion both in Sweden and within the SUCOZOMA program. This discussion has been partly reported by Bruckmeier (1999) who comments that this is a conflict constituted by different conflicts and complicated definitions of interest; the controversy moves back and forth between science and politics.

[23] To enter a discussion about the anthropocentric and biocentric perspectives goes beyond the scope of this thesis. For a discussion about these perspectives the reader is referred to, for example, Merchant (1997).

[24] In Sweden the cormorants were introduced by man and became established in the late fifties, after having been absent as a breeding species for almost 50 years due to human persecution, and have during the last 10 years rapidly increased (Engström 1998).

While, theoretically, the seal and cormorant problems can both be merged as problems in the ecosystem, in terms of the strength of feeling they generate among people they do not merit comparison. On the contrary, by comparing the ways in which society relates to cormorants and seals, one can understand how perceptions of nature influence our ways of resolving this type of problem. As Susskind and Weinstein (1980) have observed, a factor contributing to the complexity of this type of dispute is the inseparable conjunction and mixing of values and facts.

The consumption of fish by seals and cormorants can be seen as appropriation problems involving appropriation externalities and, indirectly, technological externalities (see chapter 3). Issues of this kind involving interaction with the ecosystem are not discussed in the common pool resource management debate but can become a disincentive for co-operation to resolve other problems in the commons and generate provision problems. Expressions like the following were frequent in the interviews.

> "Why should I do this and that, when the seals will bring me to ruin anyhow"
>
> {1.0# 139}.

Seals and cormorants are both common pool resources and users of the common pool. *Cpr* theoretical perspectives and frameworks address relations between human user groups and the necessary conditions for collective action and co-operative behaviour to resolve problems of interdependency through the use of shared ecosystems; they do not account for interdependencies within the ecosystems themselves. It is useful to highlight here that, although "putting seals first"- a biocentric perspective - is attractive, it is not sufficient because it does not help to resolve aspects of distribution which are critical in the management of common pool resources. Unless one takes further steps in the analysis of the seals issue, linking it to changes in the ecosystem and the effects of this on different fishery patterns, as Westerberg (1999) and Lunneryd (2001) try to do, the *cpr* theoretical debate has little to contribute.

6.4.2 Boat based activities

Over time, with increasing nature based leisure activities undertaken by people mainly from urban areas, the coast has evolved into an area where the values and interests of non-residents frequently predominate. In the Environmental Code (following the former Swedish Natural Resource Act) the coastal areas of Central and Northern Bohuslän have been formally defined as areas of national interest for nature conservation, professional fisheries and outdoor recreation.

The increasing number of boats is considered to have negative ecological effects due to oil pollution and other spills, sewage and solid waste disposal, antifouling leakage, noise, and disturbance of birds and other habitats (Naturvårdsverket 1992). From this perspective boat based activities involve degradation problems from which provision problems arise. Being activities that subtract indirectly from the ecosystems, these could also be discussed from the perspective of activities leading to appropriation externalities. However, recreational activities, because they are non-extractive in purpose, are normally presented as non-consumptive, and their interaction with fisheries is discussed in terms of assignment problems. In the interviews the fishermen did not discuss in terms of possible indirect subtraction made by recreational boating. The problem was mainly related to physical interference or technological externalities in the inshore waters affecting those fishing with static gear. Similar results were found in the Väderö questionnaire study. This type of problems is often solved through space allocation.

The interviews indicated that in general locals did respect fishing spots where nets were laid, and the direction of current transport activities could be influenced through local planning. The problem was mainly related to visitors.

Today the number of leisure boats (motor and sailing) in Sweden has passed the one million mark, and the sea-based leisure community is discussed in terms of a people's movement (Sveriges Turistråd, 1987). Coastal waters are openly accessible to yachts and sailing boats, *"errant"* authorised entrants. These normally anchor in natural refuges or in private or municipally run marinas. In the interviews, the fishermen reported damage to nets when visitors sought to anchor in natural harbours and increasing problems with lobster poaching during the summer season.[25]

Eggert and Ulmestrand (2000) have referred to the interaction between creel fishermen and the leisure community as partly explaining the reductions in reported landings of the creel fisheries of *Nephrops* during July. In one interview, a *Nephrops* creel fisherman explained that during the summer he normally switched from static gear to night trawling, not necessarily due to the congestion but rather on account of the biology of *Nephrops* in relation to the phases of the moon. Several shellfish fishermen indicated that during summer the harbours become overcrowded and that this made their job more difficult. In most cases rules have already been adopted to cope with problems of assigning space in landing ports. Petitions from the fishermen's local organisations addressed to the harbour office or the Municipality had in most cases been successful.

In other countries multiple use problems in harbours are dealt with through an umbrella organisation involving multiple users which co-ordinate the relationships between the various activities (see Steins 1999). In Sweden, the process of consultation of multiple-use stakeholder around the harbours is often processed by the Municipalities' technical committees dealing with harbour development, or through the physical planning process. As a result, most harbours have given priority to fisheries and organised the use of space by different users groups. The comprehensive municipal plan of Tanum, for example, states that in the harbours economic activities such as maritime transport and fisheries should be given priority (Tanums Kommun 1990). In the same way, the comprehensive municipal plan of Strömstad recommends that priority be given to fishing rather than to sailing or tourism (Strömstad-Kommun 1997). This creates a conflict situation as space in the harbours is limited and the financial contribution from the recreational boats is significant for the Municipality.

The Swedish planning and negotiation systems seem to be satisfactory when allocating space on land and at fixed facilities such as harbours, but weaker in handling *cpr* problems and conflicts derived from the use of space at sea.[26] This is particularly valid when *cpr* problems involve mobile resources and errant users such as recreational boat owners, whose behaviour is guided by general social norms but not collectively agreed rules.

The literature reports that fishermen often solve internal assignment problems and technological externalities, where only fishermen are involved, on the basis of informal agreements (Acheson 1989; Berkes 1989; Schlager and Ostrom 1993). The interviews indicated that fishermen take the initiative of making informal agreements on a cross-sectoral basis. In the interviews, fishermen gave an example of how the problem of damage to their

[25] Anchoring is often free out in the archipelago. The use and services provided by marinas involve a fee. These are normally owned by the municipality, a sailing society or privately.

[26] Ackefors and Grip (1995); Boverket (1995); Morf (1999) are among other authors that, in one or another way, have discussed how these plans relate to coastal issues and resource conflicts. They show that what happens or could happen on the seaside of the coast is currently not prioritised in the municipal plans. The plans and the legal system in Sweden are still very much oriented to resolve problems on land. Within the framework of SUCOZOMA, specific research on this set of problems is carried on by Morf (1999).

trawl nets from large granite blocks lost at sea during transport (bottom artefacts) had been locally resolved (see box 6.1).

The probability that the fishermen could make use of similar informal local mechanisms to negotiate and solve problems derived from the interaction with the sea-based leisure community where the sources of the problem may be difficult to identify seems to be rather low. In the interviews the planners indicated that the involvement of the "leisure community" in the municipal planning process is a difficult matter to deal with, mainly due to its transitory character and lack of readily identifiable representatives.

The fishermen felt that influencing the recreational boat based user groups lay far beyond their own, their association, or the fishing authorities' capacities. The group was perceived as too influential, too powerful in both political and economic terms, and yet highly diffuse. Indeed, the sea-based leisure "movement" cannot be referred as a "community", at least not in terms of spatial unity, social structure and shared set of norms. With whom should the fishermen negotiate when there is no discrete group of users?

Box 6.1 Resolving cross-sectoral problems having clearly identified sources and coordinates

Sea transport of granite blocks from the otherwise dormant quarries increased in the early 1990s and continued during the period of construction of the Öresund Bridge linking Sweden and Denmark. According to the fishermen interviewed, exchange of views with the authorities failed to bring improvements to the situation. Faced with the problem of getting the blocks entangled in their trawls, the local fishermen made an informal agreement with the quarries that the loading of the cargo would be inspected before leaving the harbour. The inspection was conducted by a rotating team of fishermen and advised the quarries on how to secure the blocks onboard. This minor example is an illustration of how fishermen, when facing local problems, can make a concerted effort to protect their fishery, even when the effort involves another sector. In this case, the source of the problem and the actors involved were easy to identify. In addition, the outcome was beneficial for both resource users, those in the business of cutting the blocks, who lost fewer blocks and the fishermen. It was a win-win situation.

Source: Interviews 1998-2001.

In general, approaches to dealing with conflicts of use in the coastal zone often fail to address such non-discrete and transitory users' groups. Indeed, these types of groups bring more complexity to the *cpr* situation and difficulties to its management. This is not to say that the group of users cannot be identified, approached and engaged in a problem solving exercise. A group of users that at sea can be considered as diffuse and consisting of unorganised individuals, such as the recreation boat owners, does not need to be diffuse and unorganised on land. In Sweden, for example, there are three major national organisations and more than 1000 local boat clubs disseminating information and facilitating training (Sveriges Turistråd 1987). Through these organisations, the boat owners' insurance companies and the physical concentration of boating activity in harbours and marinas, a large proportion of this users' group can be reached.

One informant who had worked with the management of local harbours in the area over the last thirty years suggested that a change of the behaviour of the sea-based leisure community in Sweden will require the following major elements:

> "An obligatory registration and visible identification, a boat driver's licence, a code of conduct, and penalties for noncompliance" {0.1#135}.

The interviews confirmed that fishermen operating in inshore waters have recognised their interdependence with this diffuse movement; they have yet to find ways to communicate with

the recreational community in searching for mutual gains. A few had already started by mixing fisheries and tourism. But in general, those interviewed did not see any alternative strategy that could produce a better outcome. Diversity of their business and individual fishing strategies (in terms of space, time and gear) rather than collective action seems to be their main means of coexisting with an expanding and transient group of coastal resource users such as the sea-based leisure movement. The economic significance of the leisure activities for the local communities along the coast is reflected in the seasonal expansion of all sorts of commercial activities. The number of people, and the social and economic interests involved, in this broad and expanding sector, are substantially greater than those involved in local coastal fisheries, and particularly the inshore fisheries based on static gear. On the other hand, tourism and recreation in coastal areas stimulate the demand for fresh marine products and can provide opportunities for the fishermen to earn additional income (Van Ginkel and Steins 2002).

The fishermen's strategies of adaptation to the changed situation during the high summer have varied. While some fishermen continue fishing as usual, at the cost of smaller catches and risk of losing their gear, others close their business for a period (seasonal retrenchment) or diversify their activities. The latter could take the form of changing business (diversification outside the fishing sector), fisheries (diversification within the fishing sector), or gear (technology diversification). One fisherman, for example, mentioned that during July he normally worked on the ferryboat, another that he usually rented out his house during this season and went on vacation. A third fisherman was planning to open a summer seafood bar, a fourth mentioned he hired out his boat for recreational fishing trips and a fifth was planning to invite business people to hold meetings and seafood lunches on board. It was clear that they saw linking fisheries to tourism as providing new opportunities to earn additional income.

Symes and Phillipson (2001) see a potential for pluriactivity within the European fishing households embracing new sectors such as tourism. Combining fishing with tourism and with cultural values can have a positive effect because fishery products can be presented as having a cultural and social value and may therefore attract higher prices paid by visitors; the local fishery thus becomes part of the tourism experience. Moreover, new opportunities may arise for exchange of knowledge between generations.

6.4.3 Pollution

The issue of coastal pollution seems to be one about which there is consensus among the fishermen of Northen Bohuslän. While the local fishermen from Koster-Väderö were mainly concerned about nutrient discharges, the SVC delegates were also worried about industrial sources of pollution, especially those living close to more industrialised areas of Southern Bohuslän.

Nutrient enrichment of the coastal zone from diffuse land-based sources (agriculture, forestry, and transport) has been a problem for many years in Sweden. The sources of the nutrients reaching the coast of Skagerrak are many and diverse (agriculture, domestic waste, transport, and forestry). The consequences of eutrophication cut across a range of resource users both on land and at sea (e.g. tax payers in general, fishermen and tourists).

The enrichment of nutrients in semi-enclosed bays, combined with the reduced water circulation (due to man-made infrastructures such as road embankments), has led to ecological changes particularly in shallow soft substrates which form the natural nurseries for fish, and are attractive fishing grounds for the eel fishermen. The situation also affects the people living close to shallow bays who experience the visual and olfactory impacts of recurring algae blooms and lack of oxygen, and a consequent decrease of property value. It also concerns the tourism sector, which requires good water quality for bathing. Many areas that in the 1970s were open water with sandy or muddy bottoms rich in seagrass, and known to be good

nursery and feeding grounds for young flatfish, are today covered with filamentous algae mats from May-September under low oxygen conditions. The structural and functional changes occurring in shallow coastal ecosystems, which affect not only the biodiversity but also the economic returns from both tourism and coastal fisheries, have been noted by Phil et al (1994) and Phil (2001). Phil (2001) has calculated that the recruitment of plaice could be reduced by 40 to 60% as a result of algae mats developing on the nursery grounds.

Concerns about nutrient discharge were more common among those using static gear than those using trawls. Among the latter, those trawling for deep-sea prawn were the most concerned. Interviews with eel fishermen in particular indicated deep concern about massive seasonal blooms of short-lived filamentous macro-algae in shallow bays. The implications of eutrophication for to the eel fishermen and their gear are illustrated in the following quotations.

> "These sticky algae grow in many of our former fishing grounds, where the eels used to be before. These days we have to go around with the boat and look for new places, use a larger number of fyke-nets and empty them more often" {1.0 #143}.
>
> "Look at this sticky green mass, it takes us very long time to clean it" {0.1 #145}.
>
> "I have found that I can compost this material, where I let worms work, to reduce considerably the time involved in cleaning. This means, however, I need to have a large number of fyke-nets" {0.0 # 139}.

Thus, locally, eutrophication is associated with development failure and lost habitat; it involves assignment problems, but is also associated with technological and appropriation externalities.

But the problem of eutrophication has more serious implications than those reported at the local level by the eel fishermen. Interviews with shellfish fishermen showed that the problem of eutrophication was a concern especially for prawn fishermen, who blamed the lack of fish in Northern Bohuslän partly on the eutrophication of the coastal waters. They referred to recurrent micro-algae blooms spread along the coastal zone, associating the blooms with run-off from farmland, the installation and poor efficiency of treatment plants along the coast and the polluted waters of the Glomma River in the North.[27]

> "Nobody knows where the fish has gone. There must be something wrong with the water" {0.0 #11}.
>
> "The water has changed colour. First came the water treatment plants, then came algae blooms and now they say we are getting radioactive spills from UK" {0.0 #10}.

The prawn fishermen were mainly concerned at the degradation of the ecosystem derived from the increased outflow of nutrients. Both biologists and fishermen regard the coastal waters of Skagerrak as the "nursery of the North Sea". This means that the ecological changes and the functionality of the local ecosystems also affect fishermen out in Skagerrak and the North Sea. Compared to other countries Sweden has made considerable progress with the reduction of pollution from point sources. Nevertheless, and despite the all 'end of the pipe' efforts to reduce leaching of nitrogen and phosphorus from point and diffuse land based sources, such as the transport and agriculture sectors, the problems still remain.

Lann and Oscarsson (1999), reported on the state of nutrient discharge in the study area. According to their findings, farming accounts for 40% or more of the total nitrogen and

[27] In this area poor water quality and occurrences of red tides during prolonged periods of summer heat, are associated with high inflow of nutrients and suspended matter from land. In the literature this is linked to two influential physical phenomena: a) the fresh water contributions from the Swedish Göta Älv and b) the Norwegian Glomma Elv and Skagerrak's counter-clockwise coastal water circulation drawing out inshore waters rich in nutrients coming from land (see references made to Svansson 1975; Svansson 1988; Rosenberg et al. 1991 in chapter 2).

phosphorous discharged in Northern Bohuslän. The authors argue that the intensive technical assistance provided to farmers in the area on how to reduce the use of fertilisers during the last ten years has not had much effect. They further explain that the monitoring program by the County Board Administration has shown that leakage of nutrients from agricultural land has been constant since the beginning of the 20th century. The authors conclude that what has in fact changed is the natural drainage capacity of the soil.

The new environmental management strategies aimed at fixing and recycling nutrients from sea to land are becoming increasingly important. The Swedish EU-Life algae project and the "Levande Skärgård" program have addressed eutrophication. To mitigate macro- algae blooms in local bays these programs propose the removal of infrastructures obstructing water circulation and the harvesting of large quantities of macro-algae. The strategies proposed to mitigate problems in the coastal zone are, apart from continued technical assistance to the farmers on how to economise in the use of fertilisers, the transformation of farming land into wetlands and the promotion of mussel cultivation (EU-Life 2001; Lann and Oscarsson 1999). If well planned, the restoration of wetlands could prove an attraction for wildlife tourism and become a join enterprise between the farming and tourism sectors. Similarly, groups of fishermen and farmers could be offered concessions and investment support to collectively run mussel farms.

The character of the pollution source, whether local or diffuse, influences the likelihood of involvement of the organisations and the fishermen. Minutes from SVC (1971) show that in the 1970s, the organization was engaged in debates in the water court (now the environmental court) dealing with the establishment of and techniques used in domestic water treatment plants. Yet, the involvement of the organization and/or the fishermen in cases related to more diffuse sources of pollution (in or out of court) has been minimal. Pollution of the marine environment is typically a transboundary problem, and as such is commonly addressed at the national, the regional seas level and internationally. As in the case of seals, fishermen expect the government to come up with solutions to problems of pollution. Several respondents considered the major difficulty lay in identifying who was responsible for the pollution in the firs place – a situation not dissimilar to that previously recounted for recreational boating.

The creation of communication channels between the parties involved, users as well as authorities, is a prerequisite for mutual understanding of their problems and potentials for collaboration in searching for a solution. There is, however, a major difference between the leisure interests and farmer, in that the latter is also a local person. Furthermore, in contrast to the leisure interests, farmers are like the fishermen, well organised groups. Farmers and fishermen and the institutional regimes governing their production systems are functionally interconnected through the affected ecosystem. It is more likely that a farmer, also a local, will take active part in the protection of coastal waters for the sake of a neighbouring coastal fisherman than that he will comply with national regulations on nutrient reduction. But the political institutional interplay between these local resource users and their organisations, if it exists at all, seems to be rather ineffective. In any case, fishermen and farmers in Sweden fail to collaborate in the search for collective action for mutual gain.

Therefore, in this case, the facilitation of "user platforms" as proposed by Steins (1999) may be a promising mechanism for looking at ways to satisfy each others interests and concerns, and explore the scope for mutual gains. Similar findings have been reported by Susskind and McCreary (1985:373) who conclude that "What appear to be win-lose situations often can be transformed into win-win outcomes if the parties in dispute can be brought together in a process of face-to-face negotiation". The authors suggest that when it comes to coastal multiple-use situations there is a clear need for independent or state offices for mediation.

The interviews showed that local fishermen did not know what to do to combat this problem. In general, the quality of coastal waters in Sweden is seen as the responsibility of the Municipal and/or County Board Administration. Apart from farmers, as receivers of technical assistance, and their potential effort to reduce the use of fertilisers, the involvement of other resource users is not mentioned in proposals prepared by the authorities. The government for its part is investing funds to compensate farmers for the unilateral actions taken. When targets are set and reductions of nutrient discharges monitored and enforced, farmers will be asked to pay if the targeted reductions are not achieved. Such a strategy can certainly mitigate the problem, but does not encourage collaboration between fishermen and farmers. On the contrary, it inhibits understanding of their interdependency. Eventually, it will probably imply that the current losers (the fishermen) and the winners (the farmers) of today both become losers, or will simply swap positions. Unfortunately, formal approaches (legislative, administrative, judicial and municipal planning) on which the fishermen and society rely for a resolution of these types of inter-sectoral problems often fail to produce win-win outcomes, but rely on outcomes of a win-lose type.

6.4.4 Problems within fisheries

In the questionnaire surveys, fishermen were asked for their opinions on problems arising from different fishing practices. In the interviews with fishermen from Northern Bohuslän, it was apparent that problems were more likely to be related to the decline in specific fish stocks that to conflicts between different forms of fishing. There was general agreement that, with the exception of lobster fisheries, appropriation and development problems occurring within professional fisheries were of greater consequence than the problems posed by recreational fisheries.

Recreational fisheries

Recreational fisheries have increased considerably in the last few decades and in some inshore waters areas now account for as much as 75% of the total catch (Svedäng et al 1998; Neuman and Píriz 2000). In the study area, however, Lagenfelt and Svedäng (1999) found catches of non-professional fishery to be low (26% of the total catches in 1997) when compared to other areas.

The expansion of non-professional fishing activity in Sweden will probably continue, and assessing the volume of the catch for its consideration in the TACs and the status of non-professional user groups in the management of fisheries has turned into a complicated issue.

While professional fishermen tend to associate non-professional fisheries with problems, recreational and subsistence fisheries have very different connotations for many people in Sweden. The expansion of these fisheries receives political support from various factions that see recreational fisheries as an alternative to professional fishing from a social, economic and conservation perspective. In the debate on how natural resources can best be used, it is often suggested that non-professional fisheries generate more value for the Swedish society than professional fisheries in social, national economic and conservation terms. Estimates of 2.3 million people engaged in recreational fishing at least once a year (Fiskeriverket 2000) are set against the relatively small number of professional fishermen and used to argue for the rights of non-professional fishermen. Finn (1997) has highlighted aspects of sports fishing that portray this activity as one presenting good opportunities for development within the context of tourism. In his report, Finn discusses organised sport-tourism fishing activities that can generate economic revenues for rural coastal areas.

Subsistence fishing is a contributing factor to the socio-economic situation of local communities in rural areas including the archipelagos. Sport, eco-tourism, recreational, and

subsistence fisheries are often interrelated and presented as a public right sometimes independently of the level of business organisation lying behind. Also in this case there is a potential to engage the local fishermen with his local knowledge.

Professional fisheries

Appropriation problems derived from the allocation of the most productive areas (so called assignment problems) among professional fishermen were in all cases associated with the arrival of fishermen from outside the area.

Technical externalities due to interference between fishermen operating with static gear increased considerably in the summer months, and were largely related to seasonal recreational and subsistence fisheries. In other words, these problems had to do with interference by non-local, non-professional fishermen. Those using static gear in inshore waters confirmed that they knew about and respected "each others sites". There was, in effect, a distinct sense of "local archipelago tenure."

> "Everybody here knows where not to go, and as there is not much space left, the area is rather crowded with gear" {1.0#145}.
>
> "Once an inland eel fisherman arrived and just started fishing here. I was watching him for some days and I asked "what did he think he was doing, fishing my sites? We had a conversation, I explained to him where my sites were and that was all" {0.0#139}.

In a sense, therefore, local fishermen fishing with static gear inshore can be seen as "proprietors" able informally to exclude other fishermen. Informal practices can in this way be important in securing de facto tenure rights.

The answers to the questionnaire had indicated a concern over trawling among local fishermen fishing for *Nephrops* with creels. In Sweden the problem of trawlers and purse seines accidentally damaging static gear had previously been resolved by the demarcation of a general trawling limit creating static gear reserves closed to shore. Initially, the reserved area coincided with the Swedish territorial waters (4 nm); it was not grounded on relevant ecological information. Over time the resources in the Swedish territorial waters also had to be shared with vessels that earlier operated farther from shore. The trawling line lost its functionality of exclusion and the trawling limits again became a source of conflict. To resolve new conflicts the fishermen's association (SVC) set up a trawling limits committee. As a result, the co-ordinates of the limits were revised and the regulations changed. The authorities reached an accord that permitted trawling in public waters and under certain conditions to be defined by the National Board of Fisheries under special regulations. This allowed for regional variations, yet in most cases the 4 nm limits was abandoned and the operation of the more mobile fishing fleet was permitted in waters that had once been reserved for local fishermen who based their fishing on static gear. Today many local fishermen make use of old or small trawls.

Technological externalities which result in conflicts between trawl and creel fishermen are noted in a recent official report (Fiskeriverket 2001). The report briefly discusses the possibility of extending the trawling limits to expand the area available for creel fishing, a more ecologically friendly technique than trawling. However, in the same report it is concluded that such a decision would also affect the local fishermen operating from small trawlers. The interviews confirmed that technological externalities due to unclear assignment of fishing grounds had occurred in the area. However, when discussing these problems the fishermen explained that most local fishermen knew from experience where the trawlers operate and therefore avoided setting creels in such areas. In some cases the problem occurred at night involving trawlers from outside the area or inexperienced creel fishermen who had yet to learn where they should and should not set their creels. Related to these observations are factors of locality and the fact that local small-scale fishermen trawling in the area are – except

in the summer months – normally back home before 8 pm. The use of time specific trawling limits, e.g. one for daylight hours close to land and the other for the hours of darkness set further from the shore, have not so far been formally considered.

These empirical findings appear to be in line with those reported in the literature. It is generally recognised that local fishermen do not normally trespass on the preferred fishing spots of other local fishermen (Schlager 1990; Baland and Platteau 1996). Empirical studies have shown that in general, fishermen take a positive attitude to formulating internal rules to address local assignment problems and physical interference with gear. These problems are often localised and clearly evident, and the rules easy to monitor and enforce (Ostrom et al 1994; Schlager et al 1994).

The expansion of the fyke-net fishery was an issue in the minds of the shellfish fishermen, particularly those combining *Nephrops* and fish. To get an idea of the magnitude of this increased fishing effort one can compare the recommendations made today by the County Board Administration and by the fishermen themselves in the seventies. While the former recommends a maximum of 800-1000 fyke-nets per fisherman, in 1972 a recommendation of maximum 100 fyke-nets per fisherman was adopted by the association of SVC (SVC 1972). Some of the fishermen interviewed in the present survey suggested closing the fyke-net fishery, arguing that it gave them all a bad reputation and would fail any test of eco-friendliness. Connections were also made with the issue of by-catches and seals.

> "The fishing of eel with fyke-nets should be prohibited; too many young cod get caught, a more selective type of gear is needed" {0.0 # 8}.
>
> "The eel fishermen are putting at risk the future of many other fishermen. Besides, it is too costly from a national perspective. We first pay taxes to import and release the seed, and we then pay again to compensate for damage done by the seals" {0.0 # 21}.

Fyke-nets are normally used in relatively shallow areas within the archipelago, which are also the nursery and feeding grounds for important species of fish including cod and plaice, and may lead to considerable bycatches of young finfish, especially cod (Svedäng 1999). The increased number of fyke-nets was, according to the eel fishermen, a response to ecological changes in the shallow sandy and muddy areas. Following the classification of problems by Ostrom et al (1994), in the fishermen's argumentation degradation problems have developed into, assignment problems, maintenance problems and appropriation externalities.

The issue of a lack of control over other fishing and the state of the resource, in the sense of appropriation externalities across spatial scales, worried the fishermen very much. Similarly, the issue of free riding across institutional boundaries was in various ways frequently pursued in the interviews (see box 6.2).

On the one hand, the local coastal fishermen portrayed other fishermen, particularly those from the South fishing for cod and shellfish, as the scapegoat. The fleet from "GöteborG" (GG) symbolically represents the latter, and was blamed for over-fishing and free riding on the local coastal fisheries. On the other hand, the cod and shellfish fishermen from the South were concerned about the behaviour of those fishermen involved in the semi-industrial fisheries for small pelagic species (herring, sprat and mackerel) in particular those who had left the association. They were also concerned at the appropriation of resources by fishermen from Denmark and the Baltic States.

Box 6.2 Blaming "brothers" for being free riders

"Nowadays, when there is no fish, everybody wants to fish shellfish. The fishermen from the South have expanded their shellfish fishery quickly and intensively here" {0.0#129}. "We know what happens when the quota in Kattegat is reached; they come over and start fishing here as much as they can" {1.0#88}. "Unless they are also involved and follow the rules, we cannot regulate our fisheries" {0.0#21}.

"Herring can suddenly disappear, we know that; it has happened before, and when that happens and the herring fishery collapses we may have all these advanced vessels with large storage capacity being used for cod fisheries. Such a development will automatically make the medium-sized fleet go over to the shellfish fishery. Nobody can apparently control these people; the fishermen's association and the authorities have failed to stop them. They will go where the money is" {0.0#131}.

"The Danish fishermen take undersized fish anywhere; they do not care about minimum sizes and market anything. Meanwhile we are asked to introduce more and more selective gear, square-mesh panels and other devices to avoid that" {1.0#81}.

"Today the Danes and the fishermen from the Baltic States are taking all the fish and in an unguarded moment the Spanish will also be here" {0.0#130}.

"We know fishermen from the Baltic States are fishing large quantities and their fisheries are poorly accounted for in the analysis because many fishermen do not report their catches. It is not fair to ask the Swedish fishermen to stop fishing cod in the Baltic when they can observe that other fishermen are grabbing everything" {1.1#58}.

"The Danes do not care, and there are more and more fishermen from the Baltic States everywhere. When it comes to the minimum size of cod, we have been trying to convince all other countries for years but without success. Their behaviour can easily become the norm" {0.1#28}.

Source: Interviews (1998-2001)

No matter who was being interviewed, the scapegoat – the causal factor for this pattern – was always to be found in other functional groups, across geographical scales, political frontiers, or in the bureaucratic system, i.e. across imagined institutional boundaries. In general, what was happening elsewhere clearly affected their fishing strategy and their willingness to co-operate.

What happened at one institutional level, geographical scale and type of fisheries was perceived as a disincentive to resource conservation at local levels. The answers given by the fishermen also illustrate the consequences of fish being a fugitive *common pool resource.* Fishermen are clearly aware of the high connectivity of the common pool resource system and the high interdependence and the problem of mismatches between ecological and institutional boundaries. These empirical findings seem to follow the pattern of problems identified by Schlager et al (1994) who have identified four ways by which fish migration can aggravate common pool problems: 1) users are more likely to attribute resource flow declines to the behaviour of users elsewhere in the system; 2) the users in one location cannot control the flow of resources even if they act collectively; 3) because no single group can control the flow of resources and capture the benefits of collective action, users in any one location are less likely to provide benefits for users elsewhere in the system by restraining their own

appropriation activities; and 4) co-ordinating activities with users in other locations raises transaction costs.

The problem of free riding was not new. The very first regulation approved by the West Coast Fishermen's Association (SVC) in 1930 confronted the problem of the invalidity of unilateral regulations beyond the political boundary. The regulation was unilateral in the sense that it prohibited SVC members landing small sized haddock in Sweden. As confirmed by Gerhard (1995), it did not take long for the regulation to be abolished, because a group of Swedish fishermen took advantage of marketing the small haddock in Denmark and Norway. The lack of common rules applied on a wider scale was already an issue. Even today the problem of free riding across institutional boundaries inhibits unilateral decision made in Sweden.[28]

Another recurrent strategy mentioned in the interviews was the race for fish.[29] This relates to the intensification of resource appropriation and the concentration of the resource in the hands of the more powerful vessel owners. Time at sea has traditionally been regulated by coastal fishermen in Sweden as a means of allocating resources as equitably as possible. Today, the use of time has become largely an individual choice. With some exceptions, the same is true for the use of space in the Swedish territorial waters. Both can be seen as a product of open access regimes.

The race for fish in Sweden has resulted in quotas being exceeded, fishing stops occurring early in the year, and conflicts arising among the fishermen. It has also resulted in a loss of trust in the management regime and in those to whom responsibility for the distribution of resources has been delegated, namely the Fishermen's Associations. In the autumn of 1999 a race for mackerel occurred. Shortly after the opening of the fishing season, 5 modern high-tech vessels from Göteborg fished intensively outside Norway with an early exhaustion of the Swedish national quota as a result. The fishermen involved were regarded as "separatists" from the fishermen's association. The mackerel race surprised the small-scale fishermen who had planned, but not yet started, to fish mackerel in the coastal waters of Skagerrak. These fishermen found that the opportunity to fish their share of the mackerel had suddenly disappeared, despite the fact that,

> "…there was plenty of mackerel in the water" {0.0#8}.

To resolve the problem of a "lack" of mackerel confronting the small-scale fishermen, the administration decided to authorise the use of next year's quota.

Although most fishermen would prefer to keep the principle of freedom of access, they are critical of the institutionalisation of strategies that, under the slogan "flexibility and freedom of access" mainly benefit single individuals.

> "That type of freedom....is only for a few and is not wanted here" {0.1#23}.

> "The "Olympic fishery" has to be stopped; we need to plan our fishery so it lasts on a year round basis and forever" {0.0#17}.

The most salient arguments against the race strategy were: i) fishermen who do not participate in the race for fish strategy are unable to continue fishing; ii) the year round strategy of local coastal fishermen and their combination of seasonally based fisheries is disrupted; iii) less

[28] The issue become highly relevant in 2002 when the Green Party of Sweden in the recent elections made their co-operation with the Social Democrats in the Swedish Government conditional upon a unilateral halt to the Swedish cod fisheries. No Swedish fisherman is prepared to stop fishing unless other European fishermen, particularly the Danes and those from the Baltic States, agree to act in the same way.

[29] The race-for-fish behaviour was also referred in the interviews as the "Marathon fishery" and "the Olympic fishery."

fresh fish is delivered to the market on a year round basis because large quantities of fish caught in the early part of the season have to go for processing; iv) prices during the period of excess supply are low, which affects those selling small quantities more than those selling large volumes; and finally v) an erosion of the social bonds, trust and sense of solidarity that are essential for collective action.

As can be seen in box 6.3 in the statements of fishermen working onboard modern vessels, wholesale traders and a few government officials, one can detect a tendency to look for rational, if sometimes highly selfish, explanations for the mackerel race.

Box 6.3 Why did the fishermen race for mackerel?

"The small pelagics come and go in cycles and we have to catch them when they are there" {1.0# 47}.

"There is nothing wrong with using your own skills to compete in fisheries that otherwise are based on equal opportunities and treatment" {0.1#26}.

"We have invested a lot of money and need to get our returns; we cannot afford to think about other fishermen and stop fishing when we are in the middle of a good shoal" {1.0#49}.

"The race for mackerel happened because the national quota was too small. The fishery for small pelagics requires larger quotas. This is something any bureaucrat should understand when negotiating quotas" {1.0#50}.

"One has to understand that it is only during this short period of the season that the level of fat in the mackerel suits the demands from the buyers. We can't do much about it. It is the consumer who wants to have a fat mackerel" {0.1#28}.

"The race happened because the fishermen knew there were opportunities to fish Morocco's waters" {0.2#35}.

Source: Interviews (1998-2001)

While some interviewees referred to a sense of individual freedom and justified their individual choice, others argued that the race for mackerel had more to do with the inability of the administration to negotiate better quotas. The governing role of the market and consumer preference was also offered as an explanation. Indeed, the race was often excused on the pretext of being synonymous with freedom and a response to the demands from the market. Finally, a few suggested that the race had to do with the open access in Europe and the potential of fisheries elsewhere.

It is worth mentioning here that the race strategy only makes sense when undertaken under certain conditions, often related to stock size, annual catch-quota regimes and large common pools. Apart from a market for the product, the race for fish or a "hit and run" strategy requires highly mobile and technologically flexible vessels with good storage capacity and a certain degree of spatial and temporal freedom of access. The ability to switch to new fishing grounds and new resources after the race is over is another necessary condition.

But the race for fish was not a new strategy, nor was it only related to non-members of the associations, and there are also cases where collective action aiming to avoid races has been an outright failure.

Events from the 1990s, fresh in the memories of the local coastal fishermen, revealed that once the decline in catches of cod and other groundfish became critical, patterns of conduct based on the "hit and run" strategy spread in a contagious manner. As a response to this situation, a debate started within the fishermen's associations about reviving operational rules that had previously been practised in Sweden, such as the use of market quotas or landing rations.[30] In the early nineties these demands were translated into more formal appeals made jointly by fishermen belonging to a few local branches of SVC.

In the Swedish co-management model, resource allocation among the professional fishermen has been the concern of the Associations. The demands from coastal fishermen in the early nineties triggered an introduction of internal collective rules in the cod fisheries.[31] In an attempt to slow down the increasing pressure on cod and to improve the allocation of available resources, rules commonly used by the deep-sea prawn fishermen were tested in the cod fisheries in the south of the Baltic. First, input rules based on time (three days fishing per week only) were tried. However, in other to get more fish out of the fishing time available some fishermen would trawl day and night. To resolve this problem a system of individual fishermen weekly quotas (FWQ) based on the size of the crew was tested. This time, in order to get more quota out of the system, some fishermen would enlarge the crew by bringing on board family members who were normally not active in fisheries. This led, in fact, to more protests from local fishermen who saw the allocation rules leading to a steady decline in their profits.

Local collective action had been instrumental in the allocation among the prawn fishermen in a way that was seen as equitable by them. But in the case of the cod fisheries, where users often fish far from their home waters and have diverse social backgrounds and economic positions, the conditions were not suitable for collective action to emerge and be strong enough to protect and share the resource in an equitable way. As a response to the claims from the local small-scale fisheries the system was adapted from fisherman weekly quotas (FWQ) to vessel weekly quotas (VWQ). In this case, in contrast to the prawn fisheries, the rations/quotas are allocated using the vessels' registered tonnage as a criterion. This institutional arrangement is one that has probably come to stay in the Swedish cod fisheries. This time, because of complaints from the larger boat owners, the size of the VWQ was adjusted to the size of the vessel. Thus, to secure compliance, the FAs opted to petition the National Board of Fisheries to intervene and formalise the fishermen's own internal, semi-enforceable rules. When formalised, these internal rules were transformed into enforceable ones, and compliance was controlled by the state administration through the coastguard.

The failure of the associations and fishermen to organise themselves around the problem of sharing the scarce cod resource cannot be attributed to a single reason. In chapter 3 a series of factors that have been empirically shown to increase the likelihood for collective action to work were introduced. Some were related to the resource and other to the users (see box 3.2 and 3.3). In the present case, the predictability of cod was low, the demand for cod in the market high, and the fishing community very heterogeneous (in terms of residence, fishing strategy, size of vessel and technology). All these characteristics imply that any institutional arrangement introduced to limit use would affect the various groups of users differently; some

[30] Landing rations or market quotas are a mechanism that the Swedish fishermen have historically used to constrain excess supplies to a saturated market, to distribute among themselves weekly rights to market's demands. In situations where resources become scarce and the market is not saturated the system takes on another meaning, standing for the allocation of resources. It functions as a quota which is adjusted to either the size of the vessel (VWQ) or the number of men onboard (FWQ), expires weekly or every two weeks and is not tradable.

[31] Here the term internal is used to mean sharing systems that have been designed and administrated by the fishermen themselves through their associations. These rules are semi-enforceable in the sense that they only apply to the members of the association.

would lose and others win, preventing the regulation from working. In fact, it led to an intensification of the race to fish, more protest and conflict, deliberate flouting of the regulations, and the erosion of the credibility and authority of the associations. Moreover, when resources are scarce, the incitement to race may also be found in specific "perverse" institutional arrangements, such as the possibility of using the unemployment benefit fund when regulated fishing stops due to the quota being exceeded.

During this period of turbulence some fishermen would leave the FAs and two other divergent processes would occur. One was that the government authority was formally asked to assume a central function of the FAs in the Swedish co-management system - namely the monitoring and control of internal allocation of resources among the fishermen. The other was that new organisational forms for coastal fishermen would emerge. As will be demonstrated in chapter 8, having observed the failure in the South, and in order to secure long-term access to the resources for the coastal fisheries, these new organisations of coastal fishermen would advocate a reallocation of the national resources.

6.4.5 Marine reserves and fishery regulations

Marine reserves and fishery regulations were also a factor identified by the fishermen as important, even if the respondents to the Väderö questionnaire mentioned them comparatively less often than the SVC delegates. In the interviews, rules and regulations were strongly highlighted by the fishermen.

The problems identified under the heading of competing fisheries can be discussed from an institutional perspective, in view of the fact that the purpose of such a management system should be to resolve appropriation and provision problems in the multiple use *cpr* by defining boundaries, rights and obligations, and allocating resources interalia. These institutional arrangements belong to a different analytical level or order than the analysis of uses in the *cpr*, and will be examined in greater detail in the following chapters. The level also has to do with the constellation of and interplay between the actors involved. How these arrangements and actors influence local coastal fishermen's capacities to access resources and take active part in the management of coastal fisheries will be examined in chapter 7.

The ideas of alternative management models and a marine reserve in the area were actually reaching a critical momentum in the late nineties, when the fieldwork serving this investigation was being undertaken. In chapter 8, these cases will be further discussed.

6.5 SUMMARY AND CONCLUSIONS

The purpose of this chapter was to examine what Northern Bohuslän's coastal fishermen perceived to be problematic in their *cpr* situation. No matter what type of common pool resource, users will experience a variety of problems. The depletion of fish stocks and the sharing of available resources have been shown to be central to present conflicts of interest in Northern Bohuslän and is in turn related to development failures and the issue of internal diversity in fisheries and the increasing pressure of multiple uses affecting the ecosystem and the resources. Collaborative management assumes resource users are aware of their own and other users' effect on the resource. Relatively few problems were given priority by the fishermen from Northern Bohuslän. Following Ostrom et al (1994) these can be categorised as follow:

- appropriation externalities due to rival predators within the ecosystem;
- provision problems due to the pollution;
- appropriation externalities and provision problems due to fisheries;

- assignation problems and technological externalities due to expansion of sea-based recreation, and
- problems in the management instruments.

The types of problems identified by fishermen are illustrative of the problems associated with the management of complex and highly mobile multiple-use common pool resources. Although they are manifested locally, the fishermen's *cpr* situation extended far beyond their local fishing grounds and involved more stakeholders than those found in the local fishing community.

Fishermen seem to be aware that joint use of the ecosystem requires that the governance of fisheries be distributed between fishermen practising different fishing strategies, across spatial scales, institutional levels and sectors, both upstream and downstream. Their awareness of the poor state of the resources and the ecosystem and that others also influence the outcome does not mean that they are in a position to devise rules for resource management that fit such complexity. But such awareness is at least a good foundation because it helps them to understand the need to search co-management partners. Yet co-management is about interrelations and requires communication, and the local fishermen did not seem to have much experience in discussing their problems with stakeholders other than those who have traditionally been involved in the sectoral management of fisheries. Moreover, they believe their ability, individually or collectively, to influence these issues is weak.

The analysis exposed the complexity found in the *cpr* and how competing claims on coastal ecosystems make the management of coastal fisheries delicate, with conflicts of interest inherent in this complexity. One may speculate that the larger the scale of management and the number of users and stakeholders involved in the governance of the multiple-use *cpr* situation, the poorer the individual users' knowledge of each others' effects and efforts to protect the ecosystem. Even when *cpr* conflicts involving subtraction can be attenuated, for example, by the segregation of users, e.g. a trawling limit, they cannot be entirely resolved. In multiple use *cpr* systems, where the state of the ecosystem and the resource (e.g. fish or shellfish) is the result of multiple users' actions at different scales of the ecosystem, their efforts to reduce the impacts are difficult to identify. Furthermore, the impact of multiple-uses on the ecosystem cannot be measured simply by the aggregation of single uses. Thus, it is difficult to list who is doing "right" and who is doing "wrong". As a result, the advocacy of unilateral actions is difficult unless there are clear incentives.

Uses having less easily identifiable subtraction effects were perceived as less problematic. The fishermen were in agreement in dismissing defence, aquaculture, harbour activities, and wind power as unproblematic factors; these activities are at present not very prominent in Swedish coastal waters. Many of the unproblematic activities can be described as situational activities in the sense that they have a clear position in time and space. Moreover, the source of the problem and the actors involved are easy to identify. Local negotiations among users and comprehensive municipal plans, which are commonly based on the zoning of uses, seem to be useful in the allocation of resources for these types of activity. Otherwise they do not appear to be problematic in the context of the study area and do not appear to warrant institutional change.

The assignment of space was definitely important for inshore static gear fishermen. Yet the interviews illustrated that problems relating to the assignment of space within fisheries, and to a lesser extent even technological externalities, appear in general to be internally (informally) solved by the fishermen. In this sense, the results support empirical findings of other authors such as Schlager (1994). But assignment problems were far from being the only ones identified by this group of fishermen least likely to be able to resolve appropriation and provision

problems in the *cpr*. Also the system of indirect representation within the fishermen's association may increase their marginalisation from the management process.

Where assignment problems are combined with circumstances of scarce resources, the degradation of the local ecosystem and dislocated fisheries the problems of competition between fishermen can become much more severe and the capability of the fishermen to influence decreases. The fishermen were aware that they must share the resources with other fishermen and ecosystems with other users. This problem was certainly highlighted in the interviews, which illustrated the problem of appropriation externalities across ecosystems and sectors, and the sharing of common pool resources with fishermen whose livelihoods was based on different harvesting strategies. The example indicates that the use of spatial boundaries for the purpose of exclusion - e.g. imaginary lines - is not sufficient to resolve problems derived from the sharing of common pools. Wherever the limits are drawn there will be transboundary subtraction problems.

The resolution of conflicts involving the sharing of fugitive stocks and resource flows is rather more complex than simply solving conflicts derived from spatial and technological interference. Such problems are related to the mobility and dynamics of the resource, involve substraction and cannot be solved via, for example, zoning. They are appropriation problems involving the allocation of the yields in an efficient and equitable manner. The Fishermen's Association (FA) has formulated rules to allocate resources among the community of professionals, but has not always been able to enforce them. This is particularly the case when high value migratory resources such as cod are involved, rendering the rules meaningless and the brake down of collective efforts to the point where they become counter productive. Appropriation problems and differences in the use of time and space create a serious point of contention between the more "modern, more mobile, non-local" fishermen from southern Bohuslän, and the more traditional local fishermen from northern Bohuslän. In those cases it is proposed that to meet ecological and social sustainability criteria the fishermen need management rights.

The fishermen seem capable of designing and enforcing informal institutional arrangements to address cross sectoral problems when the users involved can be clearly identified and the resources and problems in question have clear spatial and time co-ordinates. However, such conditions, where the users possess rich time and space based information, are not always present in coastal fisheries, and when the boundaries become imprecise – as in the case of the fuzzy community of recreational boat users – the fishermen find difficulties to address *cpr* problems. Neither the boat owners nor the fishermen can independently adopt institutional arrangements to address the problems. The proliferation of user groups with imprecise boundaries requires the involvement of external assistance to mobilise a range of diverse organisations and run well-integrated information campaigns. This also means that the authorities have to play multiple roles in the co-management of the *cpr*.

Provision problems can easily exacerbate the fishermen's problems of appropriation. As seen in chapter 3, provision problems relate to a lack of motivation and to insufficient investments in the maintenance and protection of the ecological qualities of the *cpr*. In theory, the issue of coastal pollution could prove enough to sap the energy of the fishermen and their willingness to provide for the resource and the marine environment. In Sweden eutrophication problems are seldom framed as conflicts of interest between land and sea based producers and production systems. Framing problems in this way may reveal opportunities for co-management and the use of user platforms at the local level. These could be rather specific in terms of space and issues. However, since these waters form an important nursery area on which some North Sea fisheries depend, the deterioration of their nursery function can be seen as a factor constraining the fishing rights of local and non-local fishermen from several

countries. This raises the issue of connectedness across scales and life cycle management, which also has implications for co-management.

The co-management of the seal problem, for example, requires that all interested parties sit around the table. Even when the functional interplay in the *cpr* situation occurs between marine wildlife and fishermen at the local level, the conflict of interest is between people attaching different meanings to natural resources and wildlife and the decision-making spheres have to deal with these different meanings held by different groups in society.

The results presented in this chapter indicate that the fishermen are aware that access to and control over fish and ecosystems flows and services, on which the abundance and distribution of fish depends, is *de facto* influenced by multiple actors and changes with the course of time. Attempts by fishermen to conserve their fisheries and protect the local ecosystem may be hampered by their uncertainty in relation to mobile resources, their perception of the behaviour of other fishermen at larger scales and users outside the fishery sector. Particularly when dealing with migratory species the user in one location cannot control the flow of resources. In these cases the fishermen need external assistance to provide them with information and negotiation arenas. What this implies for co-management is the building of poly-centric, nested decision making structures, as suggested by Ostrom (1999) and the idea of promoting inter-sectoral negotiations or users' platforms at the local level, as suggested by Steins (1999).

The study revealed that despite the extended socio-political network needed to formulate solutions to the problems identified by fishermen in the complex *cpr*, contacts and discussion outside the local arena of fisheries are highly unusual among the small scale fishermen. Vertically, the contact network of the fishermen is largely single-stranded and limited to the delegates to the fishermen's regional organisation, SVC. The latter were more inclined to manifest their dissatisfaction with current management instruments and were greatly concerned about the explosion of stakeholders now involved. Their inclination to blame management instruments and the actors involved in their formulation illuminates a problem of legitimacy for the present management model. The problematic of institutional arrangements and actors involved in their design has yet to be discussed. The rules play a crucial role in shaping the fisherman's actions and the *cpr* situation, but can be treated as belonging to a different analytical level than the factual uses affecting the fishermen's access to and appropriation of resources, as will be made clear in the following chapter.

CHAPTER 7

THE MARGINALISATION OF LOCAL FISHERMEN IN THE INSTITUTIONAL FRAMEWORK

As discussed in the previous chapters coastal fishermen share fish stocks, resource flows and ecosystems with various resource users, including other fishermen, making use of distinct strategies, and confront problems with scarce resources. The dynamics and complexity involved in the shared ecosystem, on the one hand, and various groups of resource users, on the other hand, have been shown to affect the coastal fishermen's ability to tackle the problem and exert control over the resources in question. But the coastal fishermen opportunities to influence their own and other fisheries are also limited by a series of institutional arrangements.

This chapter examines how the problems of the coastal fishermen relate to the institutional arrangements and to the relations between the fishermen and other actors in fisheries co-management. It enters into the issue of institutional interplay and discusses how aspects related to the choice of knowledge base and fishermen's capacities in the design of institutional arrangements, can challenge the local fishermen's ability to take collective action and preclude them from taking a more active part in co-management.

7.1 METHODOLOGICAL CONSIDERATIONS

This chapter focuses on institutional problems in the current management system, as defined in the interviews with fishermen and supplemented by information collected at meetings, informal consultations and documents. The results are presented in a thematic fashion where various perspectives are highlighted. Even though the focus is on identifying the local coastal fishermen's perspective and their perception of problems with the institutional regime, their views are contrasted with the opinions of other actors and non-local coastal fishermen. The non-fishermen referred to in this chapter are mainly civil servants working in fisheries and coastal management related issues within the state administration, including the national, the provincial and the municipal levels, but they also include fishery scientist and new actors.

Basic data from the interviews were presented in chapters 4 and 5. It is worth noting that the fishermen were affiliated to various organisations and that their level of involvement in the organisational work varied. They identified themselves as belonging to the associations (FAs), some local organisations and two producer organisations (POs). The majority of these fishermen had also chosen the national SFPO as their producer organisation, but a few had chosen the local PO, NBPO. Some were members of Bohusläns' coastal fishermen's association (BKF),[1] a local organisation bringing together fishermen independently of their affiliation to different FAs and POs. For the prawn fishermen from Northern Bohuslän working waters in and around the Norwegian trench, a less formal organisation, Koster - Väderöarna fjord group (KVF), was important.[2]

7.2 FLEET RESTRUCTURING

The fishermen associated the "lack of fish" with many issues, one of which was the expansion of the semi-industrial fleet. Bringing fleet capacity into line with available resources is a

[1] In Swedish: *Bohuslänsfiskarförening*

[2] In Swedish: *Kosterfjordgruppen*

declared goal of the European Union. Multi-annual Guidance Plans (MAGP) for fleet reduction schemes have been agreed within the framework of the Union's Common Fisheries Policy (CFP). In Sweden, since the mid 1990s, – notwithstanding disagreements about the dimensions of a viable fleet – capacity limits in terms of gross tonnage (GT) and engine power (KW) have been established for each segment of the national fleet.[3] Within the total allowable tonnage scheme new vessels entering the fleet could do so only at the expense of existing ones. The small-scale coastal fisheries working with stationary gear on vessels under 12 m size were exempted from the fleet reduction scheme. Simultaneously, structural aid or subsidies were available through the Financial Instrument of Fisheries Guidance (FIFG), for renewal and modernisation of the fleet.[4] The underlying argument for subsidies was the need to modernise the old fleet with its low economic efficiency and unsatisfactory safety standards. Only those member states which succeeded in reaching the targets set for capacity reduction within MAGP were to have full access to the modernisation grants.

With restrictions imposed on national fishing capacity and limited opportunities to increase the scale of the enterprise by commissioning new vessels, it became expedient to purchase additional capacity by buying up old vessels as they became available. Taken together with opportunities for modernisation grants through the structural funds, the system clearly benefited well established fishermen with access to capital.[5] Market tonnage prices have varied between 12,000 and 22,000 Sw. cr. per ton[6] and the scrapping premium has also proved attractive, particularly for the owners of small-scale boats (≤12m) who have no tonnage for sale. This premium and the tonnage market have also raised prices for vessels in the second-hand market. This not only makes it more difficult to recruit young people into the industry, but also offers an inducement to traditional fishermen to sell their old vessels and close their businesses or alternatively buy a smaller vessel and diversify the business. At present many fishermen in Northern Bohuslän are operating with rather old, inefficient second-hand vessels which now have a high replacement value and all these strategies were present in the plans of the fishermen interviewed.

The capitalisation process and the technological imperative associated with the fleet development plans was matter of concern for the local coastal fishermen who predicted that in a situation with shortage of resources and deteriorating ecosystem, their ability to fish and

[3] Under the fourth Multi-annual Guidance Programme 1997-2001, the Swedish fishing fleet had targets for the reduction in capacity measured in terms of gross tonnage and engine power, for each of the six segments according to which the fleet has been structured. The six segments are defined by a combination of vessel size, gear and target species. During the same period the prawn trawlers have a reduction target of 2.2%, the pelagic trawl and purse seine 0.5%, and the bottom trawl for cod and *Nephrops* 26.4%. The small-scale coastal fisheries segment, defined as all boats smaller than 12m with the exception of trawlers, was not subjected to reduction targets. At the time of this writing the member states of the European Union have the authority to redefine the segmentation and decide how the total national reduction targets should be reached.

[4] Modernisation grants were made available through FIFG. Modernisation and technological progress go hand in hand. Garcia and Newton (1997) quote a study by Fitzpatrick (1996) which estimated the relative value of technology progress in terms of increased catch for different fishing vessels. These types of studies indicate that in general there is a fleet over-capacity of at least 30 %. The target within the CFP is to reduce the European fleet by 30%. The issue of technological progress and what that means in terms of increased fishing power and fishing rights has been little discussed in Sweden.

[5] For a discussion of the problem of unequal distribution of structural funds in Sweden the reader is referred to evaluations and reports such as the ones prepared by Helle et al. (1997) and Neuman and Píriz (2000).

[6] By the end of the 1990s and the beginning of 2000s, the equivalent of 1000 Swedish crowns in US dollars was 100.

compete with other better endowed fishermen, would continue to decrease. In box 7.1 the fishermen's worries regarding the concentration of fleet capacity and resource appropriation is illustrated. A prominent feature of their concern is the fear that the increasing presence of non-local fishermen and their growing share of the resources and political influence would ultimately decide the future of the local coastal fishery.

The reduction of the size of the fleet is expected to reduce the cost unit of fish caught and, provided quotas remain stable, to enable an increase in the economic returns from fishing, that is, higher economic efficiency in terms of higher productivity. The extent to which this

Box 7.1 The market and concentration of tonnage in high-capitalised vessels

"A few are buying up all the tonnage, soon they will own everything and with the tonnage also the right to fish. What are we suppose to do, where are we suppose to go, then" {0.0#10}.

"We do not want these high-tech large vessels here; there are not enough resources to share" {0.0#20}.

"Some fishermen fish to earn more and more money, to buy more effective vessels with luxurious leather sofas. Have you been to their homes? These are rich people, you know. You should pay them a visit. We don't want that fishery here, I'd rather fish less and skip the leather sofa but see more of my kids. It is a matter of choice 10 of them or 1000 of us. You should go and ask the Swedish people what they prefer" {0.0#13}.

"The European policy is the end of us, our salvation is just to sell the vessel as scrap and retire. Nobody will take over, the professional local coastal fisheries will die" {0.0#15}.

"GG fishermen always want more and more, they search for new waters all the time. With their vessels they drive other people to ruin" {0.0#2}.

"Together with our vessels years of tradition and local knowledge will go to the scrap yard" {0.0#19}.

"The bureaucrats from NBF support the idea of a mobile and flexible fleet, because a flexible fleet can better adapt its fishing to changing conditions and collapses. The question is whether that will be one more incentive to ruin local coastal resources and then go and fish other places" {0.0#23}.

"We don't want to change to fishing with high tech vessels here, because, in the long term, one will no longer have fish to eat or sell. This is a matter of lifestyle and morality, and it is time for the Government to choose" {0.0#1}.

Source: Interviews (1998-2001)

may be possible in the coastal zone, where there is shortage of resources and other users affect the resource, can be questioned. Besides, the concentration of tonnage combined with other current institutional arrangements, e.g. shared quotas and TACs, can lead to the appropriation of resources and concentration of fishing rights by a few resource-strong commercial areas and fishermen, resulting in less social equity. Under the present conditions of total allowable catches and national quotas, this is a way of securing the appropriation of resources where, for a given size of national fleet, the accumulation of fishing capacity becomes a zero-sum game with win-lose outcomes. It results in competition for an ever-dwindling share of the resource and can easily turn into an incentive to race for vessel tonnage and fishing opportunities.

Thus, one of the implications of the CFP structural plans in Sweden – and elsewhere – is that they may well lead to a further concentration of resources in the more capital-intensive

segments of the fleet[7]. The Swedish case illustrates a situation where new licences are only issued in exceptional cases, and the dominant principle is free access under shared quotas and TACs; contraction of the fleet will only strengthen the more well-established fishermen. It is the fisherman from the larger urban ports like Göteborg, who has the financial means and business connections to enable the construction of new vessels as part of a continuing process of modernisation and accumulation of fishing capacity. It is the traditional fisherman, in the more peripheral rural communities, who is tempted to sell his vessel. When a local fisherman decides to sell his vessel, he is also denying himself, and future generations, their right to make a living off the local natural resources. In Sweden, the situation is further aggravated through the licensing system. According to the Fisheries Act (1993), to obtain a fishing licence in Sweden one has to have 3 consecutive years of economic dependency (main income) on fisheries (sometimes referred as historical track records). Even when the requirements for getting a fishing licence are not extreme in economic terms, licences have not been issued due mainly to the critical resource situation of cod. In any case, becoming a fisherman requires fishing experience and knowledge and access to fishing equipment, including a vessel. These skills and the fishing assets are normally transferred within the household, the extended family or the local community (Hasslöf 1949, Löfgren 1978, Hazlehurst 1994). The situation can be interpreted as one where the right of alienation, in the sense of Ostrom and Schlager (1997), applies and the reproduction of local knowledge is hampered. That the decision to sell the vessel is an individual choice is not considered problematic here. What is problematic, however, is that under the present institutional regime, the transfer of tonnage out of the local community also means the transfer of appropriation rights (and therefore fishing and management opportunities as well as jobs). This will limit the future contribution of local professional fisheries to keeping the archipelago in Northern Bohuslän alive. The regulations that have such effects should therefore be seen as a collective rather than an individual choice.

The interviews have illustrated how in Sweden "non-tradable" fishing rights are in practice traded with the vessel, and although MAGP targets address a collective need, namely an improvement in the state of the resources, their implementation is an individual choice, usually made without reference to the effects on and needs of the wider local community.

Reasoning along these lines one can argue that the vessel, which in Giddens (1997) terminology could be classified as an allocative resource, is becoming an authoritative resource that predetermines the definition of future rights. In this way, material assets or artefacts are also given authority to mediate rights in management. This illustrates what has previously been argued in chapter 3, namely that institutional changes – in this case the adoption of certain rules in fleet development plans – can result in the transformation of allocative and authoritative resources' functions. This can be interpreted as a way whereby the institutionalisation of individual transferable rights is slowly introduced and mediated by the investment in material assets or individual goods.

One issue where the interviewees disagreed was in relation to the overcapacity of the Swedish fishing fleet and the relevance of the EU's capacity reduction policy to the Swedish case. At the beginning of this investigation, the official discourse was that a capacity reduction was not necessary. However, during the period of time when the research was taking place, the debate turned in favour of restricting the expansion of the fleet, particularly the pelagic fishing units based in and around Göteborg. More recently, the concentration of fleet capacity has become a delicate matter for both the Swedish Government and the FAs, principally the SFR which is

[7] It should be remembered here that the Swedish fleet does not have what are called distant factory vessels, normally referred as the industrial fleet in for example the Spanish fishery. The concept of industrial fisheries is in a Swedish context normally used to refer to what in international terms could be referred to as high-tech middle size flexible fleet. In a negative way, the concept is also used to refer to fisheries that deliver fish for reduction.

expected to represent the interests of all fishermen and guarantee some sort of equitable internal distribution. The FAs have tried to maintain a fragile coalition consisting of various interested parties, but dominated by non-local fishermen (see chapter 2). In the early years of the present decade, the CFP's schemes were judged a failure. The mid-term review of the 4th MAGP concluded that this programme was having only marginal effects on the excess fishing capacity and consequently a process of reform of the CFP with new regulations has been agreed[8]. Thus, the need to reduce the capacity of the Swedish fleet was not longer questioned by the Swedish authorities. But the issue of how this was to be done was and still is a relevant question. The concentration process is inconsistent with the policies of regional and rural development and is politically controversial because it raises the question as to what type of fisheries do the Swedish people want. It also raises the question as to what is needed to counter such a trend. One option much debated within EU, is the reduction – or possibly the elimination of – subsidies to fisheries.

By 1998, to neutralise the expansion of the segment of the fleet fishing on small pelagics at the expense of other segments of the fleet, the Swedish authorities decided to limit the trade in vessel tonnage, to vessels within each specific segment.[9] According to the fishermen, this regulation was not effective. Its effectiveness was counteracted by another rule whose intention is to allow for flexibility in fisheries. In this latter rule, the definition of a segment is based on the main species of capture in the previous year. A vessel is considered part of a particular segment when at least 30% of the annual capture by weight is attributable to that species. Thus the rule allows for vessels to change segments; as one fisherman, cited below, explained one can easily convert a vessel from one segment to another before trading the tonnage.

> "Due to the differences in volume and weight between for example prawn and pelagic species, reaching the 30% level can be done in a few weeks. Thus, you can transform your old prawn vessel into a herring vessel quickly, and then sell it to Göteborg" {0.0#24}.

Many non-fishermen highlighted the fact that the state did not have the means to stop the concentration trend:

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[8] The new system, replacing the former system of MAGPs, will give more responsibility to the Member States to achieve a better balance between the fishing capacity of their fleets and the available resources. Reference levels will be set based on the MAGP levels set for 31 December 2002. For each gross registered tonne introduced in the fleet with public aid (which will only be available for the next two years, 2003 and 2004), Member States will have to decommission, without aid: a) an equivalent amount of capacity (1:1 entry/exit ratio) for vessels up to 100 GT (gross registered tonnes) or b) 1.35 tonnes (1: 1.35 entry/exit ratio) for vessels over 100 GT. Over the period 2003 - 2004, Member States that grant public aid for the renewal of the fleet, will have to reduce the overall capacity of their fleets by a minimum of 3% compared to their reference levels. It will be up to Member States to ensure that the total fishing capacity of new vessels entering the fleet does not exceed the capacity of those being permanently removed and that fishing capacity is adjusted to the available fish resources. Aid for the renewal of fishing vessels is being phased out and will only be available for two more years (up to the end of 2004) and only for vessels under 400 GT. It will be restricted to Member States, which have met their overall MAGP IV capacity targets, and its allocation will have to comply with the entry/exit ratios described above. Aid for modernization of fishing vessels will only be available for vessels that are at least 5 years old to improve safety, product quality or working conditions, switch to more selective fishing techniques or to equip vessels with the VMS (Vessel Monitoring Systems). EU aid will be restricted to Member States which have met their overall capacity targets set under MAGP IV. (for more information see: www.europa.eu.int/comm/fisheries/news_corner/press/inf02_61_en.htm)

[9] The decision was triggered by new large investments by a few wealthy fishing families from Gothenburg in the so-called pelagic segment of the fleet (herring and sprat, mackerel and tobis). According to the rules, and provided the investor removes the same capacity (in tonnage) that he brings into the fleet, the authorities cannot constrain investment and economic expansion. Trapped by the rules the authorities could do nothing against this type of investment and permits for the new vessels had to be issued. This, despite the fact that the fishermen's association (SFR) had recommended the authorities not to issue the permits.

> "The National Board of Fisheries does not have the tools, however, to limit investment, and those investing and not responding to the association are gaining economic power" {0.1#28}.

Thus, in spite of the rule adopted by the central authorities, the fishermen remain concerned about the transfer of vessel tonnage, a matter of particular importance to Northern Bohuslän, and what this means for the local access to resources.[10]

The local coastal fishermen also had ideas on how to counter such trend. A number of alternatives that could ensure that the vessel tonnage would remain in the local area were identified both in the interviews and in fishermen's meetings organised in Northern Bohuslän.

One idea was to restrict the outflow of vessels to other areas or districts and only allow trading of vessels between those living in the area. A similar idea proposed by the FAs was to restrict the outflow of vessels during a given period, e.g. the first 12 months, or up to 7 months after the vessel has been put up for sale. Yet another idea was to create pools of vessel tonnage to be administered locally e.g. by the Municipalities or the local branches of the FAs. A share of the tonnage would be available for sale to the local pool and the shares accumulated in the pool, could subsequently be offered to fishermen from the area and preferably to young people wishing to enter fisheries. In this way, the problem of youth recruitment in the area could also be mitigated. Other fishermen argued that any strategy to counter the outflow of tonnage from the region would yield the best results only when combined with subregional or local quotas. As one fisherman commented in a meeting,

> "We cannot eat the tonnage if there is no fish left; the vessels tonnage by itself won't help" {2.0#74}.

Common to these various proposals by the local coastal fishermen was the need for differentiation (disaggregation) of the national fleet and transfer of "tonnage rights" to remain within the local communities. The proposals from local fishermen thus reflected an interest in making the right of management, exclusion and alienation a collective choice and offering collective solutions to moderate market forces and individuals' behaviour. They wanted to maximise their benefits through wise economic decisions and at the same time protect the local community. However, the local fishermen were not influential enough for the ideas discussed by them in the meetings to have an impact on the institutional arrangements. The institutional framework could not handle the emergence of collective action for the adoption of such measures. That implied the merging of economic and social dimensions and rationalities. Based on the argument that "*we are living in a market economy",* those opposing local control argued that everybody should have the right to sell his vessel and his tonnage wherever he can get the best price. In contrast to the concern of the local coastal fishermen from Northern Bohuslän related to future access and withdrawal rights to local resources, interviews with fishermen from the South and with non-fishermen revealed a tendency to be less critical of the situation. In their view the renewal and modernisation of the vessel was linked to technological progress and the efficient allocation of resources. Here, the vessel and technology were seen as an external phenomena having a life of their own and developing outside the sphere of influence of fisheries management. This view is actually supportive of the need to use means other than the vessel to manage the resource. Access to the latest

[10] In the case of Sweden, the displacement of the traditional fleet by the pelagic fleet has another connotation: fishing down the trophic web is highly criticised by the ecologists and reducing a large portion of the catches from pelagic fisheries to produce fishmeal, animal fodder and oil production is questioned by the environmental movement, which brings into the picture aspects of global justice and trade and the alternative cost of this fishmeal and fodder when compared to the Soya been from Brazil. Polarised questions, such as *fishing for reduction or fishing for human consumption?* make decisions uncomfortable for the Swedish politicians.

technology was viewed as an individual right. As such, access to technology was disconnected from its possible impacts on the distributive aspects in a multiple-use common-pool resource system.

Box 7.2 collects together some comments from non-fishermen and non-local fishermen which illustrate this way of thinking. In this discourse, the fisherman from Northern Bohuslän was often used as a symbol of poor efficiency. Comments like those presented in box 7.3 below were not unusual in meetings and interviews with fishermen from South or the leaders of the FAs, who saw the coastal fishermen from Northern Bohuslän as inefficient and non-representative of the fishery of the future. Furthermore, the type of technology used in Northern Bohuslän was used to explain why the problems or solutions identified by local fishermen could not be considered as reasonable grounds for institutional change.

The excerpts from the interviews in box 7.3 illustrate this. In their view, a prototypical fisherman gains prestige mainly through his vessel and possibly through stereotyped gender roles. This phenomenon has been described by Hazlehurst (1994), who highlighted the role of

Box 7.2 The imperatives of technology

"One cannot prohibit fishermen from acquiring the latest technology and modern vessels; we live in a free country and a market economy. Technology has its own life; we can not limit technological development nor influence its market" {0.1#28}.

"Any strategy restraining technology development will bring Swedish fisheries to ruin because it will make the Swedish fishermen less competitive in the European market" {0.1#27}.

"A sustainable fishery, in economic terms, is one which allows a fisherman, without subsidy, to buy a new, more efficient vessel every 15 years" {1.1#58}.

"No one in this country tells a farmer which tractor to buy. Why shouldn't I be allowed to choose the vessel and the trawl I want?" {1.0#47}.

"We have invested much capital in the vessel and need efficient technology to get economic returns" {0.0# 142}.

Source: Interviews (1998-2001)

artifactual structures, particular the vessel, in mediating the identity of a prototypical fisherman from Southern Bohuslän. This focus on the vessel can be contrasted with the local fishermen's views on coastal fisheries discussed in chapter 5. The fishermen's images about their own fisheries presented in chapter 5, indicate that they did not only fish from vessels; they fished from households, local harbours, and communities (in the sense of Jentoft 2000). These are "non tradable" resources which also play a role in the fishermen's relationship and access to the local common pool resources. Fishermen making use of different livelihood assets have benefited unequally from the interventions. Yet the livelihood assets of the local fishermen seem to have been filtered out both when preparing the development plans for the fleet and also in the search for ways to neutralise their unintended effects. The marginalisation

of local fishermen and the filtering of their knowledge seem to occur at various levels in the institutional interplay.

7.3 ALLOCATION OF RESOURCES

Among non-fishermen, there was a tendency to focus discussion on TACs and the pros and cons of expanding the number of parameters involved in adopting an ecosystem approach. The discussion mainly concerned issues of uncertainty and accessibility, i.e. how reliable scientific assessment methods could be translated into a language that the fishermen could understand so as to convince them of the need for their implementation.

Scientists often reflected on how both fishermen and politicians undermined the reliability of the TACs. From their perspective the fishermen had done so by not reporting the "truth" in their catch log-books and landing returns[11], while the politicians had not held to the scientific recommendations rigorously enough. In their view, the interests and considerations of politicians and fishermen had prevailed over the resource situation.

> "If politicians and fishermen had from the very beginning followed the TACs then we would never have reached this level of stock depletion" {1.1#147}.

Fishermen for their part questioned the reliability of TACs and the fishery science as unable to assemble a sufficient breadth of knowledge required for advice on the allocation of resources, particularly in reference to the relationships between species and their presence in the catch.

> "Who can be so stupid as to give us a specific TAC-based quota for one species and prohibit the landing of another species that everybody knows has the same pattern of distribution and appears in the trawl with the first one? We cannot understand that way of thinking; there is a big gap between what the scientists recommend and the reality of our fishing" {0.0#15}.

In the interviews the fishermen emphasised problems in sharing the quotas and questioned the validity of the knowledge base used in determining boundary rules. The pattern of distribution of certain species such as hake, cod, haddock, pollack, saithe, and *Nephrops*, imply that their TACs cover larger geographical areas than just the Skagerrak Sea, i.e. the North Sea. Depending on the species, Skagerrak can be merged into Skagerrak-Kattegatt, Skagerrak-Kattegatt-Baltic Sea, or the North Sea[12], with the result that those fishing inshore in Skagerrak were crediting their catches to the same quota or allowable catch as those fishing off shore or in Kattegatt. This way of defining output boundaries, based on the "one stock- one TAC- one common Swedish quota" rule was considered highly problematic by coastal fishermen, who were often forced to share national quotas with the modern, mobile fleet on an "equal basis". The problems with sharing of quotas, as perceived by fishermen, have also been reported in chapter 6 under the issue of free riding across scales (see box 6.2).

[11] The opinions of the Swedish fishermen about issue of misreporting and cheating in fisheries have been collected within the framework of SUCOZOMA via a nation-wide survey prepared by Ellegård and Eggert (2002).

[12] At the time of this writing there were only a few quotas (e.g. mackerel) embracing large areas such as Skagerrak-Kattegatt-Baltic Sea, or the North Sea.

Box 7.3 Critical views about fishermen from Northern Bohuslän

"Has a vessel only fit for the scrap yard" {2.0#73}.

"Believes he fishes, but in reality what he does is to take a daily tram-tour" {0.0#131}.

Is entirely dominated by his wife who forces him to be at home more than at sea" {0.1#26}.

"One cannot stop technological development and progress in fisheries simply because a group of fishermen have mismanaged their business and have no capital to reinvest. They are the ones lagging behind; they are the ones that have to adapt, not the rest" {1.1#58}.

Source: Interviews (1998-2001)

The boundaries of the geographical areas to which quotas apply and the lack of boundaries to fishing communities with rights to extract resource units from the TACs and the quotas in these areas (under an open access principle) were matters of concern and criticism among local coastal fishermen.

> "Sharing quotas with the fishermen operating in Kattegatt is not good for us" {0.0#127}.
>
> "The fishermen from the South are more specialised than we are, and fish the quotas very fast" {1.0#145}.
>
> "Rather than organising our fisheries to get a portion of the quotas as soon as possible, we would like to plan our fisheries on a seasonal basis following the rhythm of nature" {0.0#25}.

In the case of the prawn fishermen, the problem of sharing the quota was aggravated by the size of the allocation to Sweden, considered by Swedish fishermen to be too small, especially in comparison to the Danish allocation with a smaller prawn fleet[13]. The prawn fishermen frequently commented on the negative impact that the principle of relative stability had on them as a group. The principle of relative stability is a key component of the European Union conservation policy counterbalancing the principle of non-discrimination or equal access. In an attempt to guarantee continuity of fishing opportunities for individual member states, and their fisheries dependent regions, this principle can have unintended consequences in the form of undesirable fishing patterns. The principle of relative stability is based on the rule that each member state of the EU is allotted a fixed percentage share of the TAC for all quota controlled species, in a given ICES area, based on historical catch records[14]. The allocation thus favours those who previously had maximised their catches, and in some cases this occurs at the expense of those who have attempted to conserve the resource.

> "The European rules have been very problematic for us prawn fishermen. First, because when the TAC for prawns was distributed among the countries we were punished because we had fished too little for prawns just the years used to calculate our share. Then because the Government is not longer protectionist, the liberalisation of the market has led to lower and lower prices, and we cannot survive any longer"{0.0#7}.

[13] This situation has for example been alleviated through quotas exchange with Denmark.
[14] Problems with the principle of relative stability have been discussed by for example Fraga Estévez (1999).

> "In this stupid world, the more resources you have caught in the past the more you are allowed to catch today and tomorrow. Contrary to what normally happens in the movies, the one who wins in fisheries is the bad boy" {0.0#9}.
>
> "If the Danes do not efficiently use the quota that has been allocated to them, then that quota should go to someone else" {0.0#129}.

The principle did not favour the Swedish prawn fishermen who historically had regulated their fishery and considered that others were free riding on their historical collective efforts (see chapter 8). The prawn fishermen regarded the principle as a disincentive to conserve the resource. This case illustrates that time dependent models of allocation need some type of dynamic in order to adapt to local changes in terms of the resource base, the fishing strategy (e.g. use of time and space), and conservation effort, or the introduction of eco-labelling. To serve the interests of resource conservation such principles should be continuously reviewed so that they do not become a barrier to the resource conservation opportunities to be found in combining dynamic non-market driven (e.g. collective rules) and market driven mechanisms.

The effect on other fishermen's views of the prawn fishermen's strategies deserves to be highlighted here. They argue that the prawn fishermen have put themselves in that situation through unilateral or voluntary over-regulation of their own fisheries.

> "The prawn fishermen have over-regulated their own fisheries; they can only blame themselves" {0.1#26}.
> "All these local rules have only affected the prawn fishermen negatively; they've got less to share and can no longer compete" {1.1#58}.

Such arguments indicate that the application of this principle is a disincentive to fishermen's participation in co-management for resource conservation. Looking at the trade of tonnage and the concomitant concentration of resources is particularly interesting in Sweden, where with the exception of the semi-industrial fleet for pelagic species, the FAs and the majority of the fishermen reject the formal introduction of individual transferable quotas (ITQs) (Ellegård and Eggert 2002). Within the present study a majority of fishermen preferred a quota system that would allow them to be more involved in the monitoring and control of quota uptake or the regulation of fishing effort in terms of time at sea. Their experiences with the selling of tonnage had made the local coastal fishermen very sceptical of the idea of introducing ITQs.

In box 7.4 the fishermen's worries regarding the introduction of ITQs are illustrated. The procedures and criteria for the initial individual quota allocation were highlighted. The importance of finding a balance between individual and collective rights and between the rights of local and non-locals was a topic frequently raised in local fishermen's meetings and by those interviewed. The fishermen referred to their own attempts to resolve problems of distribution related to geographical and social scales applied to the quota system. They pointed to the formation of the local organisation BKF, in the early 1990s, and their demands for a special quota for the coastal fishermen of Northern Bohuslän. According to members of BKF, the main purpose of the new organisation was to find means of ensuring a stable flow of resources for local coastal communities. The survival of local fish auction was also seen as a pre-requisite for their fishing activities. The latter is a specific problem for local fishermen, which those landing their catch in urban centres like Göteborg or in a major landing centres in Denmark do not have to confront.
To secure long term access to the resources for the coastal fisheries, BKF advocated a differentiated allocation of the national resource including the creation of community quotas (CQ). In other words, the BKF fishermen tried to redefine the boundaries of quota management by reducing the geographical and social scale i.e. scaling down the unit of management. This was done by adding a new variable – place of residence or homeport. By

scaling down and making use of a territorial construction based on the local fishing fleet, BKF was abandoning the principle of free access to the resource and resolving the issue of non-SVC members free riding on the associations semi-enforceable rules, without surrendering their collective responsibility to the central government administration (for further discussion see chapter 8).

Box 7.4 Northern Bohusläns local fishermen's worries about ITQs

"How to divide? If the first individual allocation is calculated on the basis of a fixed share of a quota, then those who have diversified their fishing will lose in the distribution. If it is calculated on the basis of the investment made, the rural fisherman with his second hand vessel will be the loser. If it is calculated on the basis of tonnage or the power of the engine then the small-scale fisherman will be the loser. Whatever we choose will have a negative effect on the local fisheries" {0.0#17}.

"Developing ITQs for *Nephrops* may be easy but what about all the other species you get in the trawl? What would happen to those of us who switch from prawn to finfish depending on the demands of the market and the weather conditions" {0.0#7}.

"The thing that worries me the most with regard to the idea of ITQs is the issue of inheritance. You see, my son is fishing with me (he is today only 16). But soon he would more or less automatically get a fishing licence. If we protect the prawns and he is well skilled he will manage, but I worry about the ITQs. Do you know what would happen if I get an ITQ and then die, would he inherit it? Suppose he gets a good price for it and sells it and then wastes the money….I do not like that…some fish will at least always be there"{0.0#11}.

"Like the transfer of tonnage, the transfer of quotas will also bring our local communities to ruin. We need to join together here, not become more individualistic. The ITQs are made by the people from the major cities who only think about making money; we have to think about how this community is to survive" {2.0#84}.

Source: Interviews (1998-2001)

7.4 FRAMING OF REGULATIONS

The proposals made by BKF were based on previous experiences. The historical review of the Swedish fisheries (chapter 2) pointed to a situation where in the past the rules governing coastal fisheries were designed at the local level. The engagement of local fishermen in the management of coastal fisheries predates that of the engagement of the state in the regulation of offshore fisheries and the establishment of the fishermen's associations (see chapters 2 and 5). The establishment of SVC in the 1930s, brought a new order where the organisation of collective action and fishermen's management functions became partly centralised. The state, initially represented by the County administration at the provincial level and subsequently by the National Board at the central level, had the authority to issue formal regulations for coastal fisheries and stocks[15] (Fiskeristyrelsen 1988).

[15] "Formal" means here that the rules are legally enforceable. These are by no means the only rules governing the Swedish fisheries.

A formal takeover and concentration of regulating authority at the provincial level was first supported by the FAs (SVC), who saw this as an alternative to the privatisation of fishing rights in the inshore and the archipelagos of the West Coast (see chapter 2).

In the interviews the local fishermen revealed that their participation in management has decreased considerably over the last four decades. Several fishermen remembered the time when decisions regarding operational and even collective rules were taken locally.

Box 7.5 The local rules system in Northern Bohuslän

"When my uncle here was active no fisherman left harbour before 05:00 and everyone lifted the trawl and returned home before 20:00. Besides, fishing on weekends within the 15 nautical mile zone was prohibited" {0.0#15}.

"We were organised in "fiskelag". There were many "fiskelag" here and we met to discuss common problems and to organise community work. In those days there were no races and the fishermen who transgressed the rules were confronted by the social pressure of the group" {0.0#18}.

"When my father was an active fisherman, fishing around that island was not allowed because the lobsters reproduce there, and when I started fishing nobody caught lobster during the time they were carrying eggs. In those days, we had the right to protect the lobster in our own way; we do not have that right today. People come from anywhere to catch lobster here" {0.0#8}.

"The idea of putting limits on the size of the trawls in home waters was first taken up at the community level in 1950". But it was not until 1963, when the catch of prawn was very low, that consensus in the area was reached to present a proposal and fight for it within SVC" {0.0#10}.

"When I started in 1935, there were no local regulations for prawn besides a fishing stop on Saturdays and Sundays, of course. Already in 1959 we allocated the prawns through a fixed allotment of max 480 kg per 4 men onboard, but we called it a ration. In this area we had developed individual quotas long before the scientists and bureaucrats started thinking about quotas and TACs; a good fisheries management requires a just sharing system"{0.0#19}

"We fishermen from Northern Bohuslän had the power to influence the prawn fisheries because there were no prawns in Southern waters. In the forties and the fifties we had much more influence than we have today" {0.0#11}.

"Before the sixties my fisheries were more diverse, it was more adapted to the natural seasonal variation of the species on the coast. It was less monotonous and harmful for the environment but I do not know to what extent that type of seasonal fishing is possible today when there is almost no fish and the coastal waters are so polluted" {0.0#25}.

"When I started fishing, time at sea was limited and so was the number of days at sea. Everybody knew the rules, and nobody from the surroundings here would dare to break them, because if he did the rumours would knock him down, and people from the village wouldn't talk to him anymore" {0.0#127}.

Source: Interviews (1998-2001)

The local rules were often based on the control of inputs in the use of time, space and technology (see box 7.5) known in the literature as parametric management (Acheson and Wilson 1996).

This information, when combined with the historical analysis and the interviews with local fishermen, indicate that the rules designed by fishermen relied heavily upon parameters of time and space and easily observable phenomena that facilitated their own monitoring of enforcement. How the fishing was done, where and when, were central aspects in the design of the rules, which were related to small areas. Prohibiting fishing during nights and weekends; seasonal closures directing the fisheries to other times and zones; limiting certain technology and gear sizes; catch size limits; fishing stops during breeding and spawning seasons and the sharing of market rights are examples of these local rules.

Even though some of the rules can also be found in the present government driven management system, the present system is primarily based on output limits for single stocks (TACs). As discussed by Schlager (1990; 1994) and Acheson and Wilson (1996) one aspect that marks a difference between fishermen based rules and scientific based rules, is the scale and the use of TACs and quotas.

In the case of Sweden, fishermen have de facto controlled output by devising their own quota system. But what the fishermen shared through the quotas was not the right to a maximum fixed amount of fish, but the capacity of the market to absorb the fish at a reasonable price. What is important here is that the rules were designed and agreed by the fishermen collectively and were related to processes on a scale that was possible for them to observe.

The local coastal fishermen perceived the entry of the offshore fleet into the coastal areas to be a turning point with regard to their ability to participate in the design and implementation of local rules. In the interviews, the local fishermen were eager to recount the events of the 1970s (see box 7.6). A recurrent theme was how, in the 1970s, vessels from the South ruined the local fishing grounds and what was left of the local management system in Northern Bohuslän. Memories from the 1970s seem to play a particular role in fuelling the clash of interests between local and non-local fishermen in the area of study but also between local leaders. It was the establishment of the national exclusive economic zones, the expansion of the industrial fisheries and the acknowledgement by science of ecological dependencies across scales and the idea that the unit of management must be large enough to cover the various live cycles of the species, which in the late seventies led to the scaling up of management.

7.5 THE FILTERING OF NON-SCIENTIFIC KNOWLEDGE

Conventional management models, where the central government authorities play a central role, tend to rely on expert scientific advice. The social and ecological knowledge of fishermen is often bounded by place, time and context, and developed on the basis of long series of observations. The capacity of the authorities to acquire this type of knowledge is rather limited. Those supportive of co-management seek to incorporate fishermen's social and ecological knowledge into the formulation of problems and the design of solutions. Among others Finlayson (1994), Jentoft (1998) and Rörling and Jiggins (1998) have highlighted the cognitive aspects of co-management and the need to broaden the basis of information.

Cooperation between fishermen and fishery scientists was considered critical to the functioning of the current management system by most of those interviewed. In spite of this, the fishermen regarded their interplay with scientists as poor and one-sided. With only a few exceptions, where the relationship had evolved into personal and mutually beneficial in general the fishermen considered the relation with the scientists as unidirectional in the sense that they did not get much benefit out of it. Part of this problem is related to the differences

Box 7.6 Memories from the 1970s of Northern Bohuslän's local coastal fishermen

"In the seventies, they came and fished finfish day and night, nothing was left - they ruined our best fishing grounds. Now they are here again and are ruining the shellfish also" {0.0#2}.

"They came and fished constantly, day and night, Saturday and Sunday". "They did not let the seabed and the fish rest as we commonly did here" {0.0#3}.

"The southern fleet has already once before ruined our fishing grounds without any consideration, we just don't trust them" {2.0#79}.

"They have imposed their own non-rule system - the law of the jungle, once before and they will do so again, we just know it" {0.0#4}.

"We have already learned once that the fisherman from the South is of a particular type: they could not care less about nature and locals' rights, they believe they own all fishing grounds. They got the support from SVC which since then has represented their interests. These people land in SVC's auction or deliver to SVC's processing plant, so they depend on each other. We no longer have any influence in the associations. Our local divisions are too weak in economic and numerical terms" {0.0#14}.

"We had our own rules here, but the whole local system was overruled and the Government did not care" {0.0#5}.

"They came, they argued that the rules that apply ought to be the rules of the homeport. The regional as well as the national associations supported them. They said everybody should have the right to make use of their own fishing skills everywhere in Sweden" {0.0#128}.

"The only place where local rules are still at work is in the Koster-fjord. The prawn fishermen are the only ones who have been able to continue governing their fishery" {0.0#23}.

Source: Interviews (1998-2001)

in conceptualisations of fisheries management and what should be the focus of the research that supports decision-making. For example, one of the questions put to non-fishermen was how they conceptualised fisheries management. Non-fishermen had a tendency to relate this to the Swedish term *fiskevård,* which refers to resource conservation rather than the wider concept of fisheries management (*fiskeriförvaltning*). What at the beginning was seen as a question of semantics, has been shown to have more significance.

Fiskevård was described as a combination of functions and activities to protect and improve the state of fish stocks and the habitats of importance to them. Under this concept measures are to be taken on biological grounds. Thus the functions and activities of resource conservation are defined and undertaken by professionals working for the state authorities and within the framework provided by the European Common Fisheries Policy. The conservation of resources should be implemented on the basis of data produced by fishery biologists and through legal instruments and statutory enforcement. Fishery scientists saw their role in regard to resource conservation as the development of models for fish stock assessment and their application for the purpose of conservation. But this concept does not include the allocation

of fishable resources, funds to the fishing fleet influencing technology, rules designed by the fishermen or the way management is organised. In the Swedish fisheries management system resource conservation (*fiskevård*), resource allocation and fleet development aspects have been treated in a separated and compartmentalised way.

The controversy over the Sunday and weekend stop was one of the issues raised frequently in the fishermen's meetings and was followed up in interviews. The example of the "Sunday stop" discussed below provides an illustration of the problem with a limited knowledge base used in fisheries management when this has been conceptualised simply as *fiskevård*. It illustrates how a scientism in resource conservation has contributed to the compartmentalisation of different but interrelated type of knowledge and thus hindered the adoption of the fishermen's knowledge in the co-management of fisheries resources.

The fishermen from Bohuslän have historically practised a Sunday stop (Gerhard 1995) and for some periods, weekends stop. When SVC was created, the association adopted the Sunday stop rule. Through this process, the Sunday stop was transformed into a general rule applicable to all members of the association (semi-enforceable) and it became a source of many conflicts. Over time, the wider application of the rule lost support and today it is only valid inshore. The issue of a Sunday stop has, since the introduction of more industrial modes of production, been a matter of conflict between local fishermen and those who fish on weekly basis.

Among local fishermen the issue of a Sunday stop was not controversial, since these fishermen normally fished from Monday to Friday.[16] The regulation of time at sea is part of their fishing strategy. Furthermore, fishermen from northern Bohuslän, considered a general Sunday stop to be a good way of giving the sea bed and the fish some respite from trawling activity and giving the fishermen a break, without others free riding in their absence.

In the mid 1990s, the Northern Bohuslän Producer Organisation (NBPO) submitted a request to the national authorities for the legal formalisation of the Sunday stop in Skagerrak. The petition from NBPO was forwarded to the Institute of Marine Research of the National Board of Fisheries (IMR), which regularly delivers scientific advice for fisheries management. IMR responded negatively, but mainly on the grounds of a lack of scientific evidence in respect to the prohibition's assumed positive effect on the resources. The note prepared by IMR in answer to the petition from NBPO stated the following:

> "From the point of view of stock conservation it is highly uncertain whether a fishing prohibition on Sundays will reduce fishing pressure, since an intensification of fishing on other days could compensate for such a prohibition…. Whether, however, the Sunday stop ought to be introduced for market or social reasons, we at IMR cannot judge…From the point of view of stock conservation, Sunday stops cannot be recommended" (Fiskeriverkets Havsfiskelaboratoriet 1995). [17]

The note invites reflection on the type of rationality underlying the argument that effort might be intensified during the permitted fishing time. This assumes that there is scope for and a will to intensify effort on other days. But, if that is the case, it is also possible that intensification could occur without the measure being introduced. Indeed, the logic can be seen as a further illustration of a way of thinking strongly influenced by the rationality of "economic man".

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[16] An exception might occur when fishermen were forced to go out on a Sunday to remove their gear in bad weather. This was not controversial. In general the controversy of Sunday stop had more to do with the semi-industrial fisheries.

[17] The Swedish text states: "*Ur beståndsbevarande synpunkt är det mycket osäkert om söndagsfiskeförbud skulle minska fisketrycket, eftersom ett sådant förbud skulle kunna kompenseras med ett ökat fiske de övriga fiskedagarna. Om det däremot av marknads - eller sociala skäl bör införas kan vi på havsfiskelaboratoriet inte bedöma. ...ur beståndsbevarande synpunkt inte går att rekommendera söndagsfiskeförbud...*"(Fiskeriverkets Havsfiskelaboratoriet 1995).

When IMR states that they cannot judge the social value associated with the Sunday stop they are actually revealing a set of problems. First, that they lack competence to assess the value associated with an instrument that is not directly related to the fish stocks. Second, that to undertake this kind of assessment is not the task of natural science. Third, that the scientific advice provided to fisheries management is highly specific.

Some of the fishery biologists interviewed argued that:

> "The Sunday stop has nothing to do with the fish stocks" {1.1#66}.
>
> "The Sunday stop is a political goal not to be dealt with by fishery science" {1.1#63}.
>
> "That is not science; it should be resolved by the fishermen. We scientists deal with the state of the resource" {1.1#57}.

It is interesting to realise that some scientists felt that the questions I posed to them were "not themes for scientific investigation but for the politicians to debate".

These positions found support among the fishermen's associations:

> "The issue of the Sunday stop has to do with how the resources are distributed, something fishery biologist should not deal with and should be left to the politicians or the fishermen themselves" {1.1#52}.

Indeed, such expressions depict the use of scientific advice for fisheries management as limited to what is biological defensible, when in fact fisheries management may also involve aspects that are socially defensible.

In Swedish fisheries management, collective decisions involving distributive aspects have normally been taken by the fishermen's associations and/or the politicians, but without specific scientific advice. In this way social aspects have been divorced from resource conservation aspects, when in reality the outcome in a *cpr* system is dependent on both these dimensions. Both are interrelated and equally important in the management of common pool resources.

The case of the Sunday stop can be contrasted with another case where non-scientific knowledge criticised by the local fishermen has been validated by the fishery scientist. This is the case of the minimum size for *Nephrops*. Large by-catches and discards of small *Nephrops* is a general problem in trawl fisheries for *Nephrops*. The problem is more pronounced in areas where a high minimum landing size (MLS) applies. The fishermen were critical of the fact that the MSL that applied to Swedish fishermen was considerably higher than that used in Denmark and the rest of the European Union. The MLS for *Nephrops* in Sweden is (13 cm).[18] The issue is particularly controversial among the fishermen because the *Nephrops* in Kattegatt and in Skagerrak are considered as belonging to the same stock and the Danish and the Swedish fishermen draw from the same TAC (see chapter 2; table 2.3).

Studies made in Sweden report that the proportion of undersized *Nephrops* in the catch can be on average of 78% (Ulmestrand et al. 1998). The introduction of a square mesh panel in the cod-end of the trawl has been proved to be a more size selective gear for *Nephrops* fishing in Northern Bohuslän. Nevertheless, discards of about 25% of the *Nephrops* catch were common, and of the *Nephrops* discarded about 75% died. Yet the majority of the fishermen have been unwilling to invest in the more size selective gear.

[18] More specifically the minimum landing size is defined as 40 mm carapace length (CL). This is the distance measured from the rear eye socket to the distal edge of the carapace. The size at which females reach sexual maturity varies within the size range 25-30 mm CL.

Many local shellfish fishermen claimed that considering the high mortality of discarded individuals the minimum marketable size should be reduced if accompanied by an obligation to invest in the more selective gear. To do so would be an incentive for other fishermen to adopt the more selective gear, since there is a market for *Nephrops* of 11 cm size. In this case, the fishermen were looking for a harmonisation of the regulation in favour of relaxing the norms applied in Sweden. According to them, the discarded *Nephrops* – most of which will die after being returned to the sea – would have a value of millions of kronor on the market and improve their income considerably.

> "If I was allowed to market all the *Nephrops* from 10-11 cm up, instead of being forced to discard them and let them die, I promise you that I would consider the idea of reducing time at sea. The quotas could be also reduced based on that strategy. That would be much better for *Nephrops* I have yet to catch" {0.0#17}.

When putting forward their case for a revised Swedish MLS for *Nephrops,* the fishermen argued that the present norms had little to do with the biology of the species. The MLS for *Nephrops* had been defined mainly because of the demands from workers in the processing factories, who had found shelling *Nephrops* smaller than 15 cm difficult. Consequently, the MLS, agreed upon by the processing industry and the FAs (SVC), was 15 cm; in the late sixties it was reduced to 13 cm. Today, the bulk of *Nephrops* is sold fresh, and shelling is now very uncommon in Sweden. Nevertheless, the higher minimum landing size remains in use.

The purpose here is not to question the conservation value of adopting a higher MLS, but rather to illustrate that fishermen and scientists can interpret rules in different ways. The examples of Sunday stop and MLS for *Nephrops* further illustrate that when non-scientific knowledge is to be adopted in fisheries management it passes through a scientific validation filter designed only for biological facts. In the case of the minimum size for *Nephrops,* the scientific criterion used to test the proposal rule coming from the industry is conservation. The high minimum landing size can be validated on the basis of biological knowledge, because the higher the MLS the greater the opportunity for *Nephrops* to reproduce. The rejection of the Sunday stop was related to the scientists' inability to explain how the Sunday stop would work in biological terms; here the result was almost certainly less conservation.

In a system where science is dominant, as with fisheries, traditional rules for which there is some scientific support are more likely to be adopted. Both examples illustrate that when critical distributive issues are brought to the table by groups of fishermen, biological facts are often used to moderate the demands. Surprisingly only a few scientists, with whom conversations were held, problematised the distributive (political) effects that various scientific results may have. In the Swedish system there is an image of scientists and officials as making the "scientifically objective and neutral judgements" and the fishermen and politicians as making the decisions affecting distributive aspects.

7.6 LACK OF TRUST IN THE MANAGEMENT SYSTEM

Many authors acknowledge trust as a prerequisite for co-management arrangements to work, but trust is difficult to measure. Local coastal fishermen indicated distrust of the main protagonists in the Swedish co-management system (see box 7.7).

Local coastal fishermen expected both the FAs and the Government authorities to understand their reality and act in their interest, to defend their own and their local community's rights to continue fishing for their livelihood. Local fishermen argued that the FAs did not share these views. They also argued there was not an official vision about local coastal fisheries and that they lacked support.

Local coastal fishermen recognised that as a group they exerted a weak influence within the FAs. This was related to problems of representation within the FAs both at the regional level and the national level. The central co-management system *per se* guaranteed neither trust nor local participation. Trust and participation, depend on how co-management is designed and on the building of institutions and mechanisms that involve and support fishermen at the local level. In general the communication with the main actors involved in decision making was considered to be poor. The fishermen found it difficult to trust decisions taken far from the local level, particularly when those decisions did not fit the problems they could observe in their *home waters*.

Box 7.7 The lack of trust in the Swedish central corporatist co-management

"It is nice to be interviewed; this is the first time someone from Göteborg wants to hear my opinion" {0.0#10}.

"Bureaucrats take decisions at their desks without consulting us, how can they know what is right and wrong?" {0.0#24}.

"There are good people at the NBF [x, y mentioned] but decisions are taken by a handful of powerful persons who do not care about us. The marriage between SFR and the staff at the National Board of Fisheries has brought us to ruin" {1.0#14}.

"We have to be careful when passing information to officers of NBF because the information is then used against us. Within NBF there are individual officers that are friends of the fishermen and there are those that are enemies of the fishermen" {2.1#148}

"Locals we are able to manage, but when the central authorities get involved we are lost; therefore we need the support of a strong national association. However the one we have does not defend our interests" {1.0#84}.

"There are scientists and there are scientists (x, y mentioned), I do not trust scientists that have a passion for sea worms and forget the people (x, y mentioned)" {0.0#6}.

"Our capacity to be influential in the FAs is very low and when we vote for these types of ideas, we lose…SVC should be reorganised…we have suggested that already" {0.0#24}.

"We should be more strategic here up north, change our address and build up many branches of exactly 21 members" {0.0#13}.

"The association has abandoned us and we can wait no longer. We have to do something ourselves to change the situation, can you help us" {0.0#21}.

"The time of despotism is over (referring to SFR); it is time for us to negotiate directly with the authorities" {0.0#22}.

"Somehow, I believe, we need a strong and politically informed leadership which can negotiate at the ministerial and the European level and that we have at SFR. But we also need local strong organisations that are more influential; as things stand today everybody opines but nobody listens to us" {0.0#5}.

"I am not a member of SVC- being part of the main association is not of much help for me, only the economically powerful fishermen benefit there" {0.0#16}.

Source: Interviews (1998-2001)

The leadership factor appears to be a key element of building trust at the various levels, the local, the regional and the national. The sense of "we" in the interviews and in the meetings

was remarkable and the feeling of trust as well as mistrust was often personified. This was particularly the case when referring to the behaviour of other fishermen. In meetings, specific individuals were often identified without mentioning their names but by just commenting: "we all know, who we mean". At the local level informal interpersonal relations are often strong and trust develops in the practice of doing what has been collectively agreed and helping each other to get things done on the ground. Local presence and personal relations seem to be of importance in co-management. For example, only a small number of the fishermen interviewed trusted scientists. For the most part those fishermen had participated in research projects, developing personal relations with research staff from the government agency. The centralisation of authority within the state and the intermediary role of the FAs seem to have created a co-management form that makes the development of communication with the local level difficult.

7.7 OBSTACLES TO MORE PLURALISTIC CO-MANAGEMENT

Co-management is largely about agreeing upon rules of interaction, as well as the authority, roles, and distribution of responsibilities to each stakeholder. Who is involved and how, will certainly affect the fishermen's capability to be influential. In the central corporatist co-management system the authorities and the FAs have primarily discussed quotas, operational rules and financial support for the vessels, rather than who should or should not have a say in the decision making on what, and at which level. How co-management is to be organised and who to co-manage are not stipulated in the Swedish fishery regulations. This was considered problematic by the staff.

> "The Swedish Fishery Law does not provide any guidelines or instructions on which stakeholders should be consulted, when and how; how co-management should be organised is not legally defined. The Government has given instructions on the constitution of boards and committees but the modality of consultation with the fishermen has just evolved as praxis" {0.1#55}.

Table 7.1 presents a synopsis of views from the stakeholders and how these have accomplished their role. Three stakeholders were identified by all respondents as prominent in the management of fisheries: the National Board of Fisheries (NBF), the National Fishermen's Association (SFR) and the European Commission.

In the late nineties Hasselberg (1997) identified the first two organisations and the Department of Fisheries in the Ministry of Agriculture, as the most influential actors in the Swedish fisheries. The ministerial department was hardly mentioned by the fishermen interviewed in this study, in spite of the fact that they saw the need for having strong leaders that could be influential at this level. In general, from the perspective of fishermen interviewed, the national governmental authority was the NBF, whose influence is now limited by decision making at the European level.

A pattern emerging from the interviews was that those who had been involved in the earlier system of co-management (FAs and NBF with its research institutes) were criticized for passivity by the local fishermen and their organisations, NGOs, government staff at the various levels and the wider scientific community.

In one way or another, almost all the interviewees criticized the performance of the NBF[19] and the SFR.[20] The responses from local fishermen indicated that they perceived a lack of support

[19] The National Board of Fisheries works under the political instructions of the Department of Fisheries of the Ministry of Agriculture and should not be understood as a unified structure with one common position. It is an organisation consisting of differentiated structures, and a number of separate units, where the staff (~270)

from these organisations. The criticism of these organisations by fishermen refers essentially to their mode of working and the rules of the system, not to their existence.

All interviewees agreed on the need for a more proactive role to be played by the NBF. The staff of the NBF, on the other hand, expected the ministerial level to give more clear instructions. In her analysis of relations of power in the Swedish fisheries, Hasselberg (1997) refers to this phenomenon as a vacuum of decision-making power, with poorly implemented policies as a consequence.

That the supra-national body, the European Commission, is widely recognised as the new central actor and largely responsible for the loss of national and local influence in the development of management solutions was made clear in most interviews. Membership in the European Union brought many radical changes to Sweden, not least in the real of marine fisheries. Not only was a new supranational level of government created, but many of the original rules applied to Swedish waters were replaced by universal rules designed in Brussels.

Following EU membership, the decision making process changed and became disengaged from the Swedish context and particularly from the reality in which local fisherman live and work. Many local fishermen were of the opinion that the distance between themselves and the organisations traditionally involved in co-management had increased. However, although the EU reinforced the role of the central administration and weakened the role of the FAs, it also made possible the establishment of independent Producer Organisations. The national system of price regulation was replaced by a European system which functions through such POs. In Sweden this led to a re-articulation of the vertical interplay within the industry and the revival of the local level, which in the case of Northern Bohuslän led to the reconfirmation of the local importance of coastal fisheries, but with a focus on shellfish. However, POs were not seen by the dominant actors as organisations that could take on wider management responsibilities (see table 7.1).

The late 1990s and the early years of the 21th century, characterised by interaction with Brussels and a situation of depleted coastal resources and witnessed a weakening of the authority of the associations and the Ministry and a reinforcement of the authority of the National Board of Fisheries.

Recognition of interdependencies and the limits to governing complex *cpr* through central management – where only the economic sector is invited to the negotiation table – has given rise to a global debate. In the management of natural resources, the development of new modes of interaction and co-operation between government and society (e.g. scientists, NGOs and resource users) can be observed. These new modes expand the scope of participation to new stakeholders.

In Sweden, certain changes broadening the scope of representation on the executive of the National Board of Fisheries had already taken place in 1991 (see chapter 2). New partners both from the government and civil society were getting involved and demanding a say in how fisheries resources are managed. The wider community of stakeholders put pressure on the authorities and the debate triggered new approaches to the issue of resource depletion and allocation and working styles. The representatives of these new partners had a tendency to enlarge the agenda of issues to be managed and demand more transparent decision making. In such a pluralistic constellation, the FAs have great difficulty fulfilling their intermediation role in co-management. This development was considered problematic by the fishermen, who felt they had enough problems within their own organisations and sectoral partners.

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performs different functions and operates under different imperatives and pressures, even with contradictory goals. The contradictory nature of the main national goals for fisheries has been previously discussed by (Hasselberg 1997).

[20] The dominance of this association has also been discussed by Hasselberg (1997).

Table 7.1 Views on the roles of various stakeholders in the management system (Interviews 1998-2001)					
Category of interviewed	*Who plays a prominent role?*	*Who should play a more prominent role?*	*Who should not play a prominent role?*	*What role is adjudicated to/expected from the player?*	*What is the player criticised for?*
Ministry	Eur Com			Defines the frame	Dictates many rules that do not fit the Swedish context.
	NBF	NBF		Has been delegated management responsibilities by the Swedish Parliament. Reports to us.	Being passive. Lack of initiative, acting in a reactive way and with delay. Lacking links to the fishermen.
	FA (SFR)			Is often consulted. Good source of information. Can play strategic role.	Having a despotic appearance and making use of political power. Conservative approach, unwilling to accept change. Poor relations with its base.
		Environmental movement		Get more involved. Inject new ideas.	Being passive, not being sufficiently influential.
		Market mechanism?		Up to NBF to assess.	May lead to increase resource concentration.
		The fisherman		Take more active part in management.	Individual strategies, conservatism.
NBF	Eur Com	Eur Com		Defines the frame and set the rules.	Defining too much and doing too little. Should give more clear instructions.
	NBF	NBF		To assess the state of the resources and adapt the rules accordingly.	Resource aspects and fleet structure aspects are treated separately.
	FA (SFR)			Is often consulted and informed. Keeps members informed and collaborates in securing rule compliance.	Having too much political power and working methods based on pressure. Having lost control over non-members.
		Other countries sharing resources with Sweden		Co-operates for the management of resources across scales.	Taking unilateral decisions that counteract collective action at the international level.
		Ministry		Provides clear political instructions.	Is not indicating direction.
		Fishery scientists		Reports to us. Delivers more useful and comprehensible information fundamental to management.	Being confused and inefficient. Focusing on wrong issues. Too much involved in nature conservation.
			Market mechanism.	Linking conservation to the economics of the firm.	Bad experiences with ITQs elsewhere. Can lead to resource concentration to a few.
			NGOs	Lobbing.	Are getting more and more involved but lack knowledge of fisheries.
			POs	Market aspects.	Taking steps beyond their mandate, confusing.

Table 7.1 (cont)	Views on the roles of various stakeholders in the management system (Interviews 1998-2001)				
Category of interviewed	*Who plays a prominent role?*	*Who should play a more prominent role?*	*Who should not play a prominent role?*	*What role is adjudicated to/expected from the player?*	*What is the player criticised for?*
Fishery scientists	Europ Com	Europ Com		Guarantee all member states follow the same agreements.	Making political compromises out of scientific results.
	NBF	NBF		Take precautionary measures.	Lack of leadership. Not being able to take decisions.
	Fishery scientists	Fishery scientists		Assess the state of the resource and give the numbers.	
		Market mechanisms		Linking conservation to the economics of the firm.	
	FAs		FAs	Order and implementation.	Concentrating decision-making power.
			Ministery	Guidance on how policies are to be implemented.	Making politics out of the fish.
County Administration	Europ Com			Sets the frame.	
	NBF			Management responsibility.	Being too sectorial and old fashion.
	FAs			Coordinate the fishermen.	Ignoring our role in marine nature
		Municipalities		Direct local development.	Poorly interested in coastal fisheries.
		Local fishermen		Have many ideas but little to say.	Individualist.
			SNV	Policy making to protect the environment.	Getting involved at the wrong level.
FAs	Europ Com		Europ Com	Sets the frame.	Setting a frame that does not suit our situation, ties up our hands. Decision-making is too rapid, no time for reaction and consultation at the ground.
		FAs		Participate in negotiations and decision-making. Define what to do research on.	
	Other countries	Sweden		Co-operate for the management of resources across scales.	Not giving a damn, not being willing to join our proposals on increased mesh size.
	Fishery scientists		Fishery scientists	To deliver what they are asked to in a comprehensible manner.	Had got too much power and their production is incomprehensible. TACs have lost credibility. Scientists are biased and poorly informed.
	NBF	NBF		Has the national management responsibility.	Has centralised decision making further. Does not know what to do. Does not listen to us. Cannot interpret scientific reports.
			Provincial /Municipal	The allocation of structural funds to land-based infrastructure and in natural protection.	Looking for any opportunity to gain authority in fisheries management.
			Market mechanisms	Stopping races.	A few will buy the available quotas.
			NGOs	Lobbying	Being influential with poor knowledge of the situation.
			Local POs	Market aspects only.	Create confusion and gain political space. Interfering with the role of NBF and the FA.

Table 7.1 (cont) Views on the roles of various stakeholders in the management system (Interviews 1998-2001)					
Group of interviewed	*Who plays a prominent role?*	*Who should play a more prominent role?*	*Who should not play a prominent role?*	*What role is adjudicated to/ expected from the player?*	*What is the player criticised for?*
Local fishermen (in general)	EU			Taking most decisions concerning fisheries.	Are blind to what is going on here.
	Nat. politicians		Nat. politicians	Consult what we people want.	Decide about our lives over the tops of our heads.
	NGOs		NGOs		Lacking knowledge about the reality of fisheries.
	Fishery scientists			Advising decision makers.	See only bits and pieces. Are always late.
	The Danes		The Danes	Introducing more selective gear.	Not giving a damn about the resources.
	NBF	NBF		Responsibility of management	Staff only interested in making personal career. Defend the interests of Göteborg.
	FAs	FAs local branches		Order and social equity among the fishermen.	Passivity regarding the interests of the local fishermen. Defending the interests of Göteborg.
			Provincial Government	Environment protection	Serving the interests of urban people. Impressing their bosses and show results internationally.
			Market mechanisms	Repartition of available quotas to individuals.	Repartition may not benefit the small fishermen.

Table 7.1 (cont) Views on the roles of various stakeholders in the management system (Interviews 1998-2001)					
Group of interviewed	*Who plays a prominent role?*	*Who should play a more prominent role?*	*Who should not play a prominent role?*	*What role is adjudicated to/expected from the player?*	*What is the player criticised for?*
The prawn fishermen	"We do"	We should		Devise fishing rules and secure a sustainable fishery.	Being ineffective as fishermen.
		FAs		Support us in our efforts to manage the resource.	Thinking differently. "We do not recognise ourselves in their words". Serving the purposes of Göteborg members only.
		Fishery scientists		Do research on prawns and develop good technology.	Listening more to the fishermen. Helping the devise of less harmful technology.
		Local politicians		Defend their communities.	Poorly involved in fisheries.
			Green biologists	Learn more from the fishermen.	Putting nature first.
			SNV	Nature Conservation only.	Getting involved in fisheries.
			NGOs	Nature Conservation only.	Dead hand over coastal communities
NBPO (Local PO)	Eur Com			Sets the frame	
	NBF			Implements and regulates within the 12 miles.	Supporting the idea of flexible and mobile vessels operating on the basis of open access.
	SFR/SVC	SFR/SVC		Defines the principles for distribution.	Supporting free access regime. Is losing power and members. Cannot rule any longer.
		NGOs		Direct fisheries towards eco-labelling.	Being delayed.
		Local politicians		Defend their communities.	Being too passive.
		Scientists		Develop new models and techniques.	Being too silent. Providing poor advice to politicians.
		"We should"		Build up common property systems.	Poor communication with its members.
NGOs	Eur Com			Resource conservation and allocation between members.	Failing policies, but improving.
	NBF	NBF		Resource conservation.	Too passive, too old fashionable.
	FAs		SFR/SVC		Driving specific economic interests.
		NGOs		Guarantees transparency and nature's rights.	
		Local fishermen		Local knowledge.	Being left out.
		Scientific community		Laying the foundation for ecosystem based management.	Being left out.

Kooiman (1993) explains that in many spheres we can empirically observe how governance is shifting from unilateral to interactive models. This tendency has recently also been discussed in an official report assessing various sectors of the Swedish society, which in general terms proposes more locally driven, interactive and pluralistic modalities of management (SOU, 2000:1). According to this study, in post-industrial Swedish society there are new stakeholders who wish to exert their influence. This process poses difficulties for conventional management systems and their use of conflict resolution methods where only a few selected partners having direct economic interests are invited to the negotiation table. A similar process taking place in Norway has recently been described by Mikalsen and Jentoft (2003).

The profusion of new stakeholders and different answers to the question: *who do we co-manage with*, has put some tension into the relations between the traditional co-management actors who could no longer find solutions within closed circles. It also resulted in the establishment of new dissident organisations. As Mikalsen and Jenftoft (2003) argue in the case of Norway, so in Sweden a key question is how to make institutions more inclusive and representative of the various voices within the industry itself. This is an issue deserving attention from the authorities, the FAs and the new stakeholders.

The new stakeholders (NGOs, BKF, POs, Prov Gov, EPA, scientific community in a wider sense, media, etc) are sometimes criticized by the fishermen, the FAs and the staff of the NBF for becoming too involved in the new emerging co-management model, at all levels of the hierarchy (see table 7.1 and box 7.8). In this situation the majority of those being interviewed expected "others" to take the lead or have the means to resolve the problems, though there was considerable disagreement as to who the influential "others" might be (see table 7.1). The scapegoats were many and usually identified with organisations and arenas beyond the circle of influence of the interviewed, meaning that the issue provision problems, derived from the complex characteristic of the common pool resource system, extend beyond the community of resource users. While some blamed inaction on the organisations which had the power or the mandate to undertake changes, others believed that only inputs from new actors, such as the conservation NGOs, or fishermen's organisations at the local level, could contribute effectively to resolving the problems. At the administrative level some thought it was best to wait either for the ministerial level or the European Commission to give clear instructions as to the way forward. Others expected the problems to be resolved in time by market forces.

Even when there was disagreement among the interviewees over the effect of expanding the membership of the policy community to involve other stakeholders, the expansion was making room for new coalitions. While approximately two thirds of non-fishermen saw this as an opportunity to secure the inclusion of conservation in fisheries management at different levels and to promote more pluralistic and democratic procedures in decision making, one third saw the increased number of actors, many of whom had little real knowledge and experience of the fishing industry, as problematic. This view was endorsed by the majority of the fishermen interviewed but also by staff of the fishery administration.

The profusion of new stakeholders with different views of the problems and their solutions is understood here as a factor that has contributed to the temporary paralysis of decision-making noted by Hasselberg (1997) and confirmed by the interviewees. Inability to decide and act in a situation of increasingly diverse demands from different actors has been described by Kooiman (1993) as the traditional state administration's governing failure, in acting as a catalyst for changing the modes of governance in different sectors of society.

Box 7.8 The problem of inaction among traditional actors and the proliferation of stakeholders

"We no longer have time to travel to the fishing harbours; now we travel to Brussels" {0.1#44}.

"Those delegated with the responsibility are not acting; the local fishermen from hereabouts should re-organise and get a management role" {0.1#40}.

"Today the discussion and the decisions about our future take place far from here" {0.0#23}.

"We know the small ones are uninformed and marginalised from the political process, but we cannot do much about it, we do as much we can. Today, decision-making is too rapid and distant (Brussels). There is no time for reaction and consultation on the ground. We have lost power, when Sweden joined the EU the administration became much more centralised and the scientists and the administration got most of the power" {0.1#28}.

"The politics of fisheries appear to be defined by a few. This implies that the association is losing its role and will collapse. The entire co-management system will collapse and we will get the ITQs" {1.1#97}.

"There is not much I can do about the situation. A few bureaucrats in concert with the industry take important decisions in the Swedish fisheries. The decision making power is concentrated on a few with an iron curtain around them" {1.1#53}.

"We know about the problems but we cannot proceed with any management reform unless we get instructions from the ministerial level" {1.1#133}.

"The Swedish parliament has delegated management authority to the National Board of Fisheries. If the Board is waiting for instructions to act, then they have misunderstood their management responsibility" {0.1#45}.

"The State requires some form of representative organisation as a discussion partner, we cannot deal with individuals or a group of organisations. The optimal case from the administration's viewpoint is to have one organisation to negotiate with. The involvement of new actors makes things more complicated for us" {1.1#53}.

"Building coalitions with the conservation movement does not solve the problem. Those building coalitions with the conservation movement and Brussels are burying themselves" {1.1#99}.

"The conservation movement should get more involved and support a process of more local co-management; I do not understand why they are so passive in fisheries. In other sectors they are more aggressive" {0.1#43}.

"Fish and all the biodiversity that is caught in the trawlers are part of the ecosystem and cannot be left in the hands of associations defending private interests" {1.1#69}.

"Producers Organisations should not have a management role. This is possible within the EU but we have said no to that possibility" {0.1#33}.

"Too many people are becoming involved and this confuses us a lot" {0.0#11}.

"I think the problems the coastal fisheries meet today will be resolved by the consumer through the market, with the introduction of eco-labelling of fish" {1.1#58}.

Source: Interviews (1998-2001)

7.8 SUMMARY AND CONCLUSIONS

At the local level, the problems of depleted resources and the concentration of resources in a relatively few hands were associated with a lack of institutional capacity in responding to the resource crisis and its unequal effects. Not only is a sense of inequitable distribution of available resources felt by the fishermen but also an inability to influence decision making through participation and the deployment of practical knowledge. The fishermen found the structure of the current management system and the dominance of certain actors to be barriers to their involvement in management. The findings show that the Swedish central corporatist co-management model was unable to guarantee social equity or local participation. On the contrary, the interests and knowledge of local fishermen were filtered out at various levels and local fishermen were prevented from using their capacity to take collective action.

The discussion on development plans illustrated how fisheries as *cpr* have special characteristics where access rights and control over the resource can be mediated by a variety of assets and strategies. This suggests that rights in fisheries do not derive from what is written in the law alone. From the analysis it is not difficult to predict that should the outflow of vessel tonnage continue, the institutionalisation of a free "take away" service of fish and ecosystem services from the archipelago will emerge. The protagonists will not be the local coastal fishermen, but rather fishermen who have the means to invest capital in a modern efficient and all purpose-vessel.

The adoption of technology and the different livelihood strategies and uses of time and space in fishing create a serious point of contention between the more "modern" fishermen from southern Bohuslän and the more traditional local fishermen from Northern Bohuslän. The diversity and dynamics of the coastal marine ecosystem and the common pool nature of the fisheries resources make differentiation in terms of the fishermen's livelihood strategies possible. This has implications for the extent to which the fishermen can make use of and draw benefits from different management models and interventions by the authorities. Certainly, one of the problems seems to be that the centralised system attempts to use a "one size fits all" policy approach both in terms of management scales and tools. Yet many of those interviewed fall all too easily into the trap of thinking that in a common pool resource system such as coastal fisheries, the introduction of differential rights and policies is unfair and could easily lead to greater inequity and loss of individual freedom. They tend to confuse equal rights with social equity. This way of thinking has delayed institutional change involving a process that recognises the issue of internal differentiation among fishermen. Heterogeneity and inequality among fishermen is intrinsic to the condition of fisheries as a genuine *cpr*. Such a situation calls for special attention in decision-making and particularly in allocating funding for technical capital investment at the individual level. This suggests there is a need for the state administration to provide new types of services to fishermen, services which relate to organisational matters, internal negotiations, conflict resolution, and interplay in co-management – with re-organisation and re-staffing as probable consequences.

For a long time, the state has deliberately chosen to focus on regulating fishing activities at the operational level, and has limited its involvement in collective-choice allocation issues. Co-management links between the state authorities and the local level seem to be missing. The state has focused on stock conservation and the administration of aid to individuals for the acquisition of technical assets used in fishing activities. This focus on fish stocks and fishing activity has unfortunately diverted attention from other social assets and capacities that fishermen can normally bring to bear on management. In this context the problems identified by local coastal fishermen are also associated with the conceptualisation of management and

the management system and with the tendency of scientific advice to filter out local knowledge which is thereby discarded in the decision making process.

The FAs were used as intermediaries in communicating with fishermen who were virtually regarded as a homogenous group. Through this process, the fishermen became increasingly dependent on the central bodies, and the associations became increasingly detached from their members. Local knowledge was neither gathered nor integrated. Scientific advice to the FAs, on which the distributive aspects of fisheries management have relied, has not been considered. As a result, local fishermen have lost confidence in the efficacy of the current management model and practices as well as in their leaders.

During the period of research, fisheries management in Sweden was clearly going through a transitional period when no one apparently felt responsible for the overall performance of the system and during which the number of stakeholders claiming the right to be a part of the decision making process was increasing. With so many stakeholders and scapegoats in a *cpr,* it is clear that the administration must learn to operate through "networks" of interdependent actors. But the question that needs to be asked now is what then should be the roles and functions of the various stakeholders in co-management? How can new management institutions be more pluralistic without losing efficiency?

With the sudden increase in stakeholders the fishermen find themselves in limbo. A failure to involve the fishermen in these emerging, more pluralistic management constellations can easily undermine their participation and their confidence in the management system. As Jentoft et al. (1998) noted, the more the fishermen are involved in the decision-making process, the more legitimacy the resulting regulatory process will be perceived to have. Legitimacy and trust are critical for the successful operation of any *cpr* management system and are central to the notion of co-management. The question that arises here is how a more pluralistic decision making system, in the sense of more stakeholders being involved in the co-management of coastal fisheries, can be designed and function so that the fishermen do not lose engagement and influence.

The previous chapters have shown that the use of common pool resources makes institutional interaction functionally inevitable. The present chapter has shed new light on the problem of how institutional arrangements and the institutional setting can become a barrier to the fishermen's involvement in co-management. The institutional factors emphasised by the fishermen related to the design of development plans, the rules for allocation of available resources, the scientific advice, the issue of representation in co-management, and the growth in the number of stakeholders demanding a say in fisheries. All these factors, in except for the proliferation of stakeholders, have constituted a barrier to the use of their practical local knowledge in the present system and contributed to the marginalisation of local coastal fishermen. But they also form the roots of emerging institutions.

The extent to which the shift from users' groups in co-management to stakeholders may or may not become a barrier for participation of local coastal fishermen in co-management remains to be seen. The fundamental question then is how the Swedish central corporatist co-management can in practice be re-designed in order to better serve the needs of the local coastal fishermen. Are there practices and ideas at the local level that can offer some insights as to possible alternatives? To answer these questions, case studies, which emerged during the research process and which serve the purpose of discussing other forms of co-management, will be examined in the following chapter.

CHAPTER 8

CO-MANAGEMENT ALTERNATIVES FROM NORTHERN BOHUSLÄN

The preceding chapters support the argument that the centralised corporatist "co-management" model has proven ineffective, not only in maintaining the long-term sustainability of the fisheries but also in dealing with social interdependencies derived from the use of the resource and the ecosystem and in making collective action work. In the present chapter, alternative forms of co-management are discussed. This is done by examining two examples from Northern Bohuslän where the local fishermen have taken initiatives to become more involved in co-management.

The first case study concerns the local co-management of prawn fisheries in the Koster-Väderö archipelago[1] and its submerged fjord (the Norwegian Trench), an area which has been chosen for the establishment of a marine reserve. This co-management system has been operating for several decades nested within the dominant regime and has recently come to the attention of the administration because it has been instrumental in the implementation of the EU's-Habitats Directive. The second case study concerns a proposal for the establishment of a local coastal fishery management regime in Northern Bohuslän submitted by the Northern Bohuslän Producers' Organisation (NBPO).

The sections in the chapter are arranged so as to provide answers to a number of questions and in this way discuss conditions for the emergence of more participative forms of co-management. The questions are:

What are the driving forces behind the fishermen's collective action?

What are central elements in their alternative models?

How are the alternative models contested?

Are the alternative models feasible in the light of theoretical criteria?

8.1 SOME METHODOLOGICAL CONSIDERATIONS

The first case is, in effect, an old existing model; the second is a proposal for change that has not yet been tried. Both cases lend themselves to analysis of emerging institutional change and how new forms of co-management are contested. But to examine an existing local regime and a proposal requires some methodological scrutiny. The literature reviewed in chapter 3 indicated that for common pool resource co-management systems to emerge and endure, certain basic conditions have to be in place. The emergence of co-management initiatives will depend on certain basic conditions, for example, the resource (R) and the community of users (U) (see box 3.2).

Cpr studies also indicate that the long-term sustainability of co-management systems is related to their scale and organisation, in the sense of who is invited to make decisions on what and how. Here the co-management arrangements made by the prawn fishermen and the tenability of NBPO's co-management proposal are assessed in the light of the criteria outlined in chapter 3 and developed by Ostrom and her co-workers. Ostrom's (1990) criteria for robust institutions of management for common pool resources (box 3.2), have also guided the

[1] The area addressed by the Väderö questionnaire discussed in Chapter 6 is situated in the southern part of this area (see figure 6.1).

analysis and presentation of NBPO's proposal, in order to give the analysis at least some elements of a common structure.

The information sources for the two case studies have been interviews, participation in meetings and various types of documents with an emphasis on correspondence and notices from the fishermen's organisations. In the first case, which relates to the local management of prawn fisheries and the proposal to establish a marine reserve in the area of Koster-Väderö (involving the closure of prawn trawling), the data was collected through open-ended in-depth interviews, participation in discussion meetings and negotiations. Out of 29 fishermen interviewed (see chapter 4), 7 were prawn fishermen active in the Koster-Väderö Fjord group.

The meetings on the issue of the marine reserve in Koster -Väderö were varied and included: one meeting between staff from the Tjärnö Marine Laboratories and local fishermen; two internal meetings of the Koster-Väderö fishermen group; a workshop organised by the County Board Administration and the local municipalities, involving local fishermen and researchers; a second workshop organised by the municipality and the fishermen's association to discuss the future of fisheries in the area; two further workshops organised by the Swedish Environmental Protection Agency (SNV) where the issue of marine reserves was discussed with government experts and invited stakeholders' representatives, including the fishermen's associations; and, finally, three negotiation meetings involving the County Board Administration, the National Board of Fisheries, local fishermen and their associations.

In the second case study, nine members of NBPO belonging to five different coastal communities, including the local leaders, were interviewed and a number of meetings were attended. Information about the NBPO proposal was collected by examining the correspondence from NBPO during the period 1996-1998, as well as all correspondence from NBPO filed in the National Board of Fisheries. The selected material consisted of 45 documents (formal letters).

8.2 CASE STUDY 1 LOCALLY DRIVEN CO-MANAGEMENT BY PRAWN FISHERMEN IN THE KOSTER-VÄDERÖ ARCHIPELAGO

8.2.1 The features of the resource and the users

In Northern Bohuslän, not far from the shore, there is a deep-sea fjord, known as the Norwegian Trench and also referred to as the Koster-Trench and the Koster-Väderö Fjord (see chapters 2 and 6). The Trench stretches, within the base line, from the most western group of Swedish islands - the Väderö archipelago - in the south, to the border with Norway in the waters north of the Koster islands.

The Trench is a 70 km long submarine corridor of irregular depth and width, and with short lateral branches. The inventory of the marine biotopes in the area of Koster-Väderö was started in the 1970s following the establishment of the Tjärnö Marine Biology Laboratory (TMBL), situated close to the city of Strömstad. Until recently, the study of deep sea beds and marine life was poorly developed. The area is considered an important habitat for shellfish, and recent studies indicate this area is most probably the one which has the highest diversity of marine species in Sweden (Nilsson 1997). The presence of reef building cold water corals has been reported in depths of the Trench (Lundälv and Jonsson 2000).

The prawns (*Pandalus borealis)* enter the area with the currents in their early larvae phases and remain thereafter confined to the area during their adult phase when they migrate with the depths and in patches. The stock of deep sea prawn is characterised as falling within the safe biological limits (Sjöstrand 1999). Swedish landings from the area (about 200 tons per year) and from Skagerrak (2000-2700 tons per year), indicate stable catches for the last twenty years.

The catches also include *Nephrops*, cod and other species. The 2002 total value of landing of prawns was 216,000 €, which is approximately 10% of the value the total national landings (Concerted action 2003). Research on prawn and prawn fisheries has not been a top priority in Sweden. The fact that the quotas and volumes of landings are small when compared to the landings of other species, and that the fisheries and the state of the resource have apparently been stable for decades, and thus considered unproblematic by fishery biologists, probably explains the lack of attention given to this fishery.

The number of fishermen trawling for prawns in Skagerrak at the time of the present research was around 90 of whom no more than 20-30 operated within the base-line in the Koster-Väderö Fjord. These fishermen who commonly work the Koster-Väderö Fjord waters are all residents of the area and members of SVC, the regional branch of the national fishermen association SFR. The fact that the Trench is close to land, confined and fairly exposed to strong winds, makes it a fishing ground where deep-sea trawling can continue even when operations in the rest of Skagerrak are difficult.

The fishermen working the Trench belong to two generations and the average age among those who hold a licence is rather high (see table 2.1). The crew members are commonly relatives and the level of investment in the fisheries is rather uniform. Vessel's size working in the Trench varies between 10-19 m (gross tonnage between 1.5 - 60 ton) and the larger boats are relatively old (average 39 years).

8.2.2 Problems in the common pool resource situation and driving forces behind the fishermen's collective action

Trawling for prawn in the area began over a century ago in 1902, as a result of Norwegian influence. Hasslöf (1949) reports that the number of wooden sailing boats trawling for prawns in the archipelago expanded rapidly from four in 1902 to around 80 in 1914, under special authorisation of the Crown. Trawling between the islands of the archipelago and along such submarine corridor must have required specific local knowledge. It must also have required some exclusivity of access and the fishermen's involvement in the design and implementation of voluntary rules, if conflicts due to physical interference between the sailing trawlers were to be avoided.

Sharing the market with the Norwegians has not been easy for the prawn fishermen. Until the end of the 1930s, when the auction at Strömstad, was opened, the bulk of the prawns caught by Swedish fishermen in this area was landed and sold in Norway[2]. When the local auction was opened, a major concern was to find the means of securing a regular flow of local landings. A regular supply of prawns to the buyers was a pre-condition for the local fishermen to keep their fishery, the local auction, and its related activities. Even if the local auction made life easier for the local fishermen, in that they no longer needed to deliver the prawns to Norway, this did not stop the supply of prawns from Norway to Sweden. On the contrary, the more industrialized Norwegian prawn fishery continued to take market shares in Sweden.

The Second World War, the temporary exclusion of Swedish fishermen from Norwegian territorial waters in the 1950s, the collapse of the Atlanto-Scandian herring in the 1960s and, finally, the establishment of EEZ-regime in the late 1970s were all events external to the coastal fisheries but used by local fishermen to explain the introduction of more industrial modes of production and offshore fisheries into coastal areas where fish was abundant. The

[2] Having an auction and landing in Strömstad was not worthwhile before the rail links to the main cities Stockholm and Göteborg acquired refrigerated wagons {0.0 #14}. The fishermen commented that until World War II the market in Sweden and the refrigerated transport facilities from this area to the major cities were poorly developed.

prawn fishermen confirmed that during this period there was a progressive regression of trawling limits and erosion of local rules (see chapter 7). The accounts of prawn fishermen record that throughout the 1950s, ´60s and ´70s the number of vessels fishing the Norwegian Trench increased considerably.

> "In the fifties and the sixties you could see 40-60 vessels operating here. This area cannot bear that quantity of vessels at once. Already in the fifties we started to discuss the banning of big trawls in this area" {0.0#18}.

To conclude, the prawn fishermen acknowledged that they encountered assignment and appropriation problems in the use of this common pool resource. Assignment problems had to do with the small size of the area and crowding, while appropriation problems were associated with the intensity of harvesting. But the factor that gave rise to the design of appropriation rules, with their distributive effects, was the problem with the market.

Problems in the marketing of the product are often referred to as contextual factors in the *cpr* literature (see chapter 3). Contextual factors affect the local *cpr* situation, but decisions about them are usually taken outside the local arena. When dealing with fisheries resources and marine ecosystems, contextual factors are recurrent factors triggering change and increasing ecological and social interdependence across scales. The number and effect of these contextual factors on institutional cross-scale dynamics is increasing with the globalization (Berkes et al 2003). Indeed, when looking at fisheries from the perspective of *cpr*, where the crux is social and ecological interdependence, the development of institutions in which local users can influence decisions will be essential to the formulation of adaptive responses to externally induced change.

8.2.3 The fishermen's response and the development of locally congruent rules

SVC's protocols and circular letters from the 1950s regarding prawn fisheries provide information on the adoption of closed areas, fishing stops, fishing hours, size and price regulations, and output and input regulations (see for example SVC, 1951; SVC, 1951a; SVC 1952; SVC 1952a; SVC 1954; SVC 1955; SVC 1959).

In the 1960s the prawn fishermen proposed limiting the size of the trawls in the area, specifying both their physical dimensions and number of meshes.[3] According to the fishermen interviewed the introduction of this smaller trawl was related to the limited resources available locally and to the increasing number of larger trawlers operating in the area which drastically affected the catch of other fishermen trawling in their wake. With time this regulation became codified in law and these trawls were referred to as "Paragraph" trawls. Further technical requirements developed by the local prawn fishermen have also been adopted in law and applied in the Koster-Väderö area within the trawling limit where trawling is allowed subject to the observance of local regulations. The prawn fishermen were of the opinion that the recognition by the authorities of their local technical rules had been important for making them work.

These technical limitations have a clear exclusion and distributive effect because, together with rules limiting number of fishing days and the night trawling prohibition, they render the cost-benefit relation for potential non-local users negative.

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[3] Another voluntary complementary regulation in the prawn fisheries is the Minimum Landing Size (MLS). Although the intention of this rule was partly market related, it had little to do with the protection of the stock because any discarded prawns do not survive, independent of their size. Several fishermen considered this rule an incentive not to fish for smaller sizes, something which local fishermen - knowledgeable of behavior of the prawns - can avoid simply by avoiding specific sites and depths at particular times of the year.

With regard to problems of marketing, letters written by the prawn fishermen in the 1930s show that, for a long time, they tried different strategies to tackle the market competition with the Norwegians. One strategy was to persuade Swedish buyers to rely in the first instance on prawns landed in Sweden (supply preference). On several occasions, agreements with the principal traders and merchants have been struck, in which stable supplies were promised in return for preferential treatment.[4] However, there were always a few buyers willing to act outside the rules thus distorting the agreement.

In the search for solutions to this market related problem, the fishermen devised internal output rules known in Sweden as "rations" or market quotas aimed at securing a uniform flow of fresh prawn to the market all year round. "Rations" are a mechanism that Swedish fishermen have historically used to constrain excess supplies to a saturated market, and are based on the allocation of weekly landing rights to match market demand. The rations function like an individual quota and have given long term planning. The ration system, which is an output regulation, can apply to a specific area and be used in combination with input regulations limiting manpower on board, the number of fishing days at sea and the time for trawling.

The Swedish fishermen's ration system has previously been referred as fisherman weekly quota (FWQ) and vessel weekly quota (VWQ). But the quota used by the prawn fishermen in Koster-Väderö, applies to a specific area and days per week and can be referred to as Individual Quota and Effort Share in Space and Time (IQESST). It constraints output and input and consists of individual weekly non-transferable quotas for a maximum of 4 fishermen on board, and three days per week. Night and Sunday trawling is not been permitted. The size of the quota is adapted through the year and varies with the size of the TAC agreed.

Before Sweden became a member of the EU the rations were sanctioned by the FAs; at present they are sanctioned by the national producer organisation SFPO. By means of these semi-enforceable arrangements, the fishermen guarantee stable landings throughout the year and an equal share of the annual quota of prawns allocated to Sweden. Furthermore, the IQESST guides the input in terms of labour, because only quotas for a maximum of four men on board are allowed and the size of the individual quota decreases from the second to the third and fourth man onboard. A fifth man onboard is thus an additional cost because he has no ration to bring to the crew and his presence on board diminishes the value of the ration entitlements held by other crew member. When the resources became scarce and the market was not saturated, the ration system took on another meaning; it became a mechanism for the equitable allocation of the available resources among the prawn fishermen.

More recently, in the 1990s, a group of prawn fishermen from Strömstad bought out the local auction, previously owned by the Municipality. In this way, they were at least able to intercept the supply of prawns from Norway via land transport to the local auction. The Strömstad fishermen also invited Norwegian vessels fishing the surrounding areas to land their prawns on the Swedish side, in Strömstad.

The rules devised by the prawn fishermen have certainly played an exclusion role, reduced the number of fishermen and shaped the prawn fisheries in the Trench.

[4] Similar agreements between these fishermen and the Swedish traders aimed at boycotting the market of Norwegian prawns in Sweden were temporarily launched in the 1950s when Norway decided to expand its territorial waters to 12 nautical miles. This decision, which was later revoked by an international agreement between Denmark, Sweden and Norway, implied the exclusion of prawn fishermen from waters that had long been considered subject to international open access (SVC 1950).

8.2.4 Monitoring compliance with the rules and sanctions

Despite the informal and semi-enforceable character of most of the local rules, compliance has been high in the area[5]. The entry of non-locals into the prawn fishery would normally be expected to reduce the level of trust and reciprocity and increase transactions costs substantially (Ostrom 1999). According to local fishermen, however, the prawn fishery does not suffer from a race to fish nor from quota busting; the "greed" of the fisherman has been restrained and single *cpr* problems collectively resolved. As one fisherman explained:

> "Morality and trust are important factors and most conflicts are resolved locally; difficulties arise when we have to deal with outsiders" {0.0#24}.

In the particular case of the fishermen trawling for prawns in Koster-Väderöarna, compliance is strongly influenced by ecological and social factors. Ecologically, the area has clear submerged geo-physical boundaries, which help to define the geographic unit of management and to delimit the user group. The fishermen operating here share a common history, are homogenous in terms of cultural background and social relations on land. Moreover, the number of fishermen trawling for prawns is relatively small (under 30) which facilitates communication and monitoring, and their level of investment in the fisheries is rather uniform. All these factors reduce transaction costs in the management of fisheries (Ostrom 1990; Baland and Patteau 1996; Schlager 1999).

The majority of the rules are sanctioned by organisations at higher hierarchical levels; rules involving the introduction or constraint of technical aspects related to the fishing equipment (e.g. selective gear) have been sanctioned by the National Board of Fisheries, and rules dealing with the use of time and outputs rules are sanctioned by the FAs. This division in the sanctioning system is consistent with the division of roles between the government and the FAs in the Swedish co-management system (see chapter 2 and 7).

Instances of non-compliance by "non-locals" have been consistently reported to the FAs by local fishermen, but only in a few cases have they resulted in an internal investigation and fines.

One somewhat bizarre strategy to secure enforcement and at the same time minimise interpersonal conflicts within the group of local fishermen, was to repeat the fault that another fishermen was alleged to have committed and then denounce oneself to the local group of fishermen and/or to the FA.

> "If someone here violates a rule, I will go and do the same as he did and then report myself as a rule-breaker first to the board of the local branch of the association and then to the regional branch; in this way, one can make the problem more visible and trigger a discussion" {00# 24}.

The prawn fishermen explained that to maintain flexibility, they would generally avoid transforming their locally agreed rules into formal (statutory) regulations. In this way, the rules can more easily be changed and adapted to new situations. The adoption of the local rules by the FAs, even when this implies only semi-enforceability was considered sufficient. The need to codify the rules as part of the formal regulatory system appears to be linked to agreements involving the constraint or acquisition of technology. In combination with the government regulations the management system in the prawn fisheries is a mixture of informal and formal rules of interaction at the local scale and the regional scale.

[5] The views and attitudes of Swedish fishermen with regard to compliance and control have been recently reported by Ellegård and Eggert (2002) within the framework of SUCOZOMA.

To conclude, the management of prawn fisheries thus has elements of the basic design principles for long enduring collective action referred to by Ostrom (1990) (see table 8.1 and box 3.2).

Table 8.1 A comparison between Ostrom's (1990) design principles for enduring *cpr* institutions and the Swedish prawn fishermen's local co-management system.

Ostrom's design principles	Prawn fishermen
1. Clearly defined boundaries.	1. Boundaries of fishing community are defined by means of technology and other space and time based restrictions. Particular rules apply to a specific resource in a defined area.
2. Congruence between appropriation and provision rules and local conditions.	2. Output and input rules both restrict and give an exclusivity which is beneficial.
3. Collective-choice arrangements.	3. Local fishermen have designed and adapted their own rules. Some of these rules have been adopted by SVC and applied to all Swedish prawn fishermen.
4. Monitoring.	4. Research on prawns has not been prioritised. The Trench has permitted local monitoring of individual behaviour. Local fishermen have exerted peer pressure on each other.
5. Graduated sanctions.	5. The sanction system is weak. The fishermen do not have 100% control over compliance and rely on external actors such as SVC and the Coast guard.
6. Conflict-resolution mechanisms.	6. The fishermen meet regularly both formally and informally and are engaged in other social activities in their local communities. When needed, their technical rules have been codified.
7. Minimal recognition of rights to organise.	7. Despite some opposition, the fishermen have been able to organise and devise their own rules within the framework of a central co-management model.
8. Nested institutions For *cpr* that are parts of larger complex systems	8. The local co-management arrangements, only operative for the prawn fisheries in the area, interact with the dominant arrangements at a larger scale. Output rules for example have been adopted by the FAs and apply to all prawn fishermen. A few European rules appear to threaten the system.
Source: Ostrom (1990: 90)	Source: Interviews (1998-2001)

The prawn fisheries displayed conditions that, in the context of the international literature, should be favourable to the emergence and endurance of local management institutions. The number of fishermen is relatively small, the boundaries of the ecosystem and the fishery are clearly identifiable in geographical and social terms, and there is congruence between the fishing communities at sea and on land.

The characteristics of the Trench, with its ecological boundaries, suggest that the opportunities for decision making, monitoring and control over the use and social distribution of the local resources have, in effect, provided the fishermen with a bundle of rights. Furthermore, they have been able to influence decisions on prawn fisheries within the FAs. By being active in management, the prawn fishermen have been able to secure their long-term right of access to the resources in their local area. This position as holders of a bundle of rights (rights of access, appropriation, management and exclusion) can be argued to have enhanced their capacity to maintain prawn fisheries over the last 100 years. The prawn fishermen have not invested greatly in new vessels but in the development of "social capital".

The institutional arrangements that have emerged seem to have clear implications for the use and the state of the resource at the local level. To what extent these conditions would enhance conservation of the same resource at other spatial scales would depend on the extent to which congruent regulations exist at larger scales. Thus, as long as non-local fishermen, external interventions or policies do not challenge the voluntary arrangements, the fishermen will prefer a locally driven, informal and flexible system of management.

8.2.5 Threats to the fishermen's co-management strategies

The interviews with officials of the National Board of Fisheries and representatives of the FAs indicated that there were doubts about the prawn fishermen's local management system. The system was considered by many as contrary to the principles of a free market, technological progress, and equal access to fishing waters.

> "The prawn fishermen's rules are market rules and have nothing to do with resource conservation; these rules distort free competition in a market economy" {1.1 # 58}.

> "These local rules have retarded technological progress and hindered development" {1.1 # 59}.

> "The local regime is still in operation only because the area is small and not interesting for the modern vessels; modern vessels need to work larger areas" {1.1 # 51}.

In the views of FA representatives, the local management of prawn fisheries in the Trench has endured not because local management is welcomed by the industry as a whole, but rather because in the specific local area the prawn fishery is economically insignificant compared to a more modern fishery.

Underlying this way of thinking, therefore, is an argument that the emergence and endurance of the prawn fishermen's local regime results more from the incapacity of outsiders to make a profit out of the limited area and its resource, than from the capacity of insiders to secure their fishing rights and keep the regime working within the given boundaries. Implicit in this argument is that management regimes in Sweden should address the needs of modern fisheries, rather than the needs of local coastal fisheries. It also implies a lack of reflection on the opportunities to be found in the attributes of these fisheries which may facilitate self-organisation and collective action. Even though non-fishermen recognized the existence of the prawn fishermen's local rules, their opinions about these rules mean that they can quite easily be challenged unless legally adopted.

Within the EU, problems of market competition are resolved somewhat different and do not involve time, labour and catch limitation (input and output limitations) as agreed by the prawn fishermen and described above. Within the Common Fisheries Policy (CFP), Producers' Organizations (PO) are empowered to withdraw fish from the market if the price falls below a certain level. The Norwegians, whose prawn fishery is more industrialized than that in Sweden, are able to sell prawns at price levels where Swedish fishermen are paid the withdrawal price for fish not sold through the market.

> "At any moment, cheap frozen Norwegian prawns may cross the frontier on wheels; 50 % of the prawns now sold in Sweden arrive from Norway by land, undercutting the price of our fresh prawn" {0.0#7}.

> "According to the rules we cannot sell prawns below 30 Swedish crowns per kilo, so it has happened that we have had to throw away the prawns. Imagine how people in

> Stockholm would react if they knew that we have on several occasions been forced to paint beautiful red prawns green and dump them. We should at least be more intelligent in this country and use prawns to feed children at school or the elderly in hospital. The whole system is criminal" {0.0#14}.

Market withdrawal, even when financial compensation is forthcoming, is a regulation that the prawn fishermen dislike and try to avoid. To re-establish a competitive market after a period of discards may take several weeks, sometimes months, with reduced incomes and wasted resources. Furthermore, the strategy threatens the image of coastal fishermen as quality oriented and environmentally friendly producers. Last but not least, the fishermen are concerned that repeated occurrences of withdrawal from the market could be interpreted by the authorities as a sign of fleet over-capacity.

Even though the Trench is situated within the base-line (defined as the archipelago's outer belt of skerries) – which marks the limit for the European or Community waters and turns the prawn fishermen's local management into a national matter – the decisions taken outside the area are still relevant. Overall, the fishermen considered their ability to compete with the Norwegians, based on collective restrictive action, had been partially undermined by overarching rules at national and European levels, including the so-called relative stability principle (see chapter 7).

The fact that PO's could take some independent decisions with regard to market aspects was problematic to the prawn fishermen who for a long time have been able to define their rules through the FAs. The establishment of POs meant the emergence of a new mechanism with which they had to interact. In recounting their experiences, fishermen brought to light the problem of contradictory policies and instruments.

Worldwide, the process of selecting sites for protecting marine biological diversity was accelerated in the early 1990s, following UNCED in Rio de Janeiro in 1992 and the ratification of the Convention on Biological Diversity in 1993. As a part of this process the Council of European Communities adopted a special Directive on the conservation of natural habitats and wild fauna and flora (Council of the European Communities 1992) and the Swedish Environmental Protection Agency (SNV) selected sites for the establishment of marine reserves (Grönqvist 1997). The archipelago of Koster-Väderö and the Trench is one of the prioritised sites (Nilsson 1997).

For several years, the planning process for the establishment of marine reserves involved a limited number of experts from SNV, nature conservation NGOs and researchers (marine biologists). The discovery of reef-building corals such as *Lophelia pertusa* in the cold waters of the Koster-Väderö Fjord has attracted the attention of many marine biologists and nature conservation NGOs. The initial debates were very much influenced by biologically based arguments. Despite the fact that the most immediate threat to the biological diveristy was considered to be to the prawn fishing, and that the solution to the problem was to prohibit trawling in the area, it was several years before the fishermen were invited to the negotiation table.

That the prawn fishermen perceived this idea to be a major threat was revealed in the questionnaires discussed in chapter 6. Recent empirical experiences with the prawn fishermen (see below) seem to indicate that the capacities of local fishermen and their management regime can be instrumental in resolving conflicts of multiple-use involving nature conservation. Their capacities can also be instrumental to integrated coastal management (ICM), the process of taking decisions on the sustainable use, development and protection of coastal resources by taking due account of ecological and social interdependencies.

8.2.6 The value of the prawn fishermen's capacities in solving the marine reserve conflict

In August 1995, and following the government decision to establish marine reserves, a group of local prawn fishermen was invited by scientists from TMBL and the Swedish Society for Nature Conservation to discuss the need to protect the corals and proposals for establishing a marine reserve in the Trench. The fishermen saw this proposal as the end of 100 years of prawn fisheries and local management efforts. Following this meeting 15 local fishermen created the Koster Fjord Group, an informal group to discuss how fishermen should collectively proceed with the marine reserve issue. But the debate over the Koster-Väderö marine reserve first reached critical momentum in early 1997, when several reports were made public.

Reports published by the Swedish Environmental Protection Agency (SNV) identified the archipelago of Koster-Väderö and the Trench as one of the prioritised sites selected for the establishment of marine reserves (Grönqvist 1997) and described the area in biological terms as well as indicating the threats to biological diversity (Nilsson 1997; 1997a). In these reports prawn trawling was identified as a direct threat to the biological diversity of the Trench. The other two critical threats mentioned in these reports were the suspended matter and nutrients washed down from the Glomma Älv watershed in Norway and the risk of incidents involving significant oil spills due to the increasing maritime transport passing through the area.

During the same period, the World Wildlife Fund (WWF) decided to support a scientific project which was to be implemented by scientists associated with TMBL. The project aimed at documenting the presence and extent of living and dead hard substrates, particular corals, in deep waters by using a remotely operated vehicle (ROV)[6].

Another important report made public that year was an assessment of the sustainable development of the archipelagos of Sweden commissioned by the Swedish parliament (SOU 1996:153). The Commission which had carried out the assessment for the Swedish parliament had been receptive to ideas from different stakeholders, and the report addressed both the problems of resource distribution and the need for protecting the biological diversity in the area. The report included a short discussion of coastal fishery problems in Bohuslän, the issue of coastal pollution, the allocation of resources, and the introduction of environmental protection measures in the form of a marine reserve in the area of the Koster-Väderö Fjord. The Commission did not, however, recommend the establishment of a conventional marine reserve in the sense of "fencing off" the sea and closing the fisheries in the area. On the contrary, it called for cooperation between scientists, staff administration (officials), and fishermen, and highlighted the need for taking advantage of the creation of a marine reserve to further involve and develop the local small-scale fisheries in the area (SOU 1996:153: 115).

Even though the report stated that the County Board Administration should intensify its work for the establishment of the marine reserve in Koster-Väderö, it also stated that protection should be seen in the broader perspective of maintaining fisheries resources and the small-scale local fisheries over indefinite period of time. What the Commission actually suggested, though not explicitly, was a change of approach from the conventional marine reserves to "marine reserves without fences"; commonly referred in the literature as marine protected areas (MPA). The difference between marine reserves and MPAs is the that in the latter a plan for protecting the ecosystem is made together with the users which are neither excluded from the area nor from the process of management (IUCN 1996; Borrini-Feyerabend 1997). The involvement of stakeholders in the planning, implementation and monitoring of MPAs is considered today an important factor to making this tool effective and sustainable in the long term (Kelleher and Kenchington 1992; Gubbay 1995; Pimbert and Pretty 1995; IUCN 1996;

[6] For more information about this project - Deep-water corals in the Skagerrak- and the ROV technique the reader is referred to http://www.tmbl.gu.se/wwf/abstract/html

Dutton and Saenger 1997). The challenge of involving non-local, fugitive or fuzzy "communities" in co-management has partly been discussed in chapter 6. To involve local fishermen, on the other hand, should be easier.

Notwithstanding the participatory intentions found in the report delivered to the Swedish parliament, a preliminary report produced by the WWF-TMBL project indicated the presence of problems derived from the physical effects of trawling the sea base and the corals.

During this period several open meetings were organised by the scientists, the County Board Administration and the Municipalities, most of them at TMBL, where various stakeholders expressed their concerns about the need to protect the corals and the reserve. In the meetings and seminars, the authorities and the scientists were inclined, on the one hand, to refer to Sweden's commitments to European international agreements and the Convention on Biological Diversity as the main issue. In their presentations, the scientists and officials were rather selective and did not se the need to mention or discuss article 8(j) of the Convention, which refers to traditional knowledge and the governments' commitment to establish mechanisms to ensure the effective participation of local communities in decision-making and policy planning. Referring to such aspects requires that scientists and officials addressing social science questions.

Over time the number of actors involved in the debate increased and the fishermen found themselves in the situation of not knowing who their actual negotiation partners were. As a result these meetings were unsuccessful in improving communication between the authorities involved and the local fishermen. The situation overwhelmed the fishermen who felt misinformed and unable to communicate and negotiate a resolution.

The fishermen perceived themselves as losers and the tension with the conservation interests increased. Threatening phrases such as the followings were not unusual:

> "Who has given them the right to decide over our lives? We should ration the entrance of tourists to this area; if they want to see corals let them pay us local fishermen a fee, only then can I stop fishing" {2.0 #20}.
>
> "Who does that person think he is to propose the establishment of a reserve in our place? Has he been here before? Is this about personal interests and professional careers? Bring him to me and I will tie a chain around his neck and cast him to the bottom of the sea" {2.0 #13}.
>
> "What the fishermen do not understand is that we could close the entire prawn fisheries in the area tomorrow and no one in Stockholm [meaning the ruling politicians] would notice it anyhow; nobody in the capital would care about their future. They will get prawns from Norway anyhow" {2.1#40}.

Those statements from meetings illustrate the fishermen's general concerns; they refer to the differences between local and non-locals inhabitants regarding views of nature and its usage rights. They also show that 100 years of local management experience were being seriously threatened. In the meetings differences of approach between state authorities concerned with environmental issues at the central, the regional and municipal levels had become quite clear.

In Sweden, the external relations in co-management have been retained at the central level within the FAs. The prawn fishermen expected the leaders of the FAs to negotiate with the decision makers in Stockholm, as that was the usual way to deal with conflicts in the corporatist centralised co-management system. Even so, many prawn fishermen considered the formal commitment of the FAs at the central level in this issue to be both poor and ineffective. According to members of the group assistance from the FAs had not previously yielded any positive results and would not do so in this occasion either. Interviews with prawn

fishermen revealed how they had asked the board of the FAs for support but without much positive response.

Faced with a threat of closure for the Koster-Väderö fishery, they decided on their own course of action. The concerns of the prawn fishermen were considerable and the members of the Koster Fjord Group decided to become formally organised and recognised. Thus the group turned out to consist of members of 6 local branches of SVC[7] and the local Producer Organisation, NBPO. In this way the group and its members were given a more formal role within the community of professional fishermen; they were given the authority to plan actions and represent the interests of the local prawn fishermen.[8] This position also allowed them to be reimbursed by the local branches for specific expenses, reducing in this way their individual costs of involvement. The group has key leaders both among the older and the younger generation. They have pursued a clear participative style, read the scientific reports and debate.

In their meetings, prawn fishermen discussed issues pertinent to the organisation of co-management as an element of integrated coastal management. Table 8.2 lists issues discussed by the fishermen in their internal meetings. The issues raised by the fishermen help us to appreciate aspects and factors that need to be considered when fishermen are to be involved in new forms of co-management; particularly when this new form involves the resolution of new conflicts.

Several fishermen in the group felt that achieving a win-win solution was important to them, but not to the rest of the fishermen or the FAs. Thus to ask the FAs to take a leading role in the negotiations was a rather controversial matter. As discussed earlier, the prawn fishermen had over the decades developed a capacity for internal self-organisation and rule making, but the density of the "external social network" and their ability to act and communicate externally was poor. Thus part of their strategy was to communicate with people. The group engaged local politicians who highlighted the economic significance of prawn fisheries for the area, wrote articles in the local newspapers, collected signatures for a petition to send to the government, and organised demonstrations on the quays. The fishermen believed that media attention, a public campaign and the presence of local politicians were key ingredients for institutionalising co-management. Nevertheless, in Stockholm officials of the Environmental Protection Agency continued discussing the establishment of a marine reserve in the area.

In meetings with multiple stakeholders, the fishermen were asked to provide detailed information about how and where they trawled in relation to the corals, and which areas could be closed. The fishermen felt accused, and instead of providing the information required they argued that the very existence of the long lived corals was sufficient proof that they had been protected through use. Instead they tried to use the meetings to inform others about the rules that they had already undertaken voluntarily.

During this period the fishermen adopted further rules to improve the selectivity of their gear and to constrain trawlers known to cause physical damage to the bottom of the Trench. After a series of meetings and by a majority vote, the fishermen from the area agreed to limit the total length of the trawl wing and the weight of the trawl board, to adopt the use of sorting grids and to ban the use of double and triple trawls in the area.[9] This time, however, before making the final decision, they discussed the available alternatives with the marine research

[7] The members of the group are from the following SVC branches Kungshamn (23), Smögen (31), Hamburgsund (26), Fjällbacka (34), Grebbestad (37) and Strömstad (32).

[8] The group was not formally registered as an organisation and did not have written statutes and working rules.

[9] A sorting grid (*sorterande ristgaller*) is a device introduced from Norway that facilitates the escape of small sized fish. In the inshore waters, some fishermen explained, where there are large fish, the sorting grid fills the function of sorting the small fish, particularly the seasonally abundant and non marketable Norway pout (*Trisopterus esmarki*) locally called "*plugg*" i.e. plug or stopper. When the *plugg* appears in large quantities it gets stuck in the net which has to be the properly cleaned. Fishermen fishing prawn offshore in Skagerrak, where there are no *plugg,* were against the introduction of this type of sorting grid because, according to them, in offshore waters it means losing fish of commercial size.

laboratories of the National Board of Fisheries. This process of consultation with experts working for the central administration helped to validate the proposals in the eyes of both those fishermen who were sceptical of further restrictions on fishing technology and those supportive of banning trawling in the Trench. In this sense, external scientific validation of the local knowledge played a role of interest mediation. It would also prove to be of help when these rules were then transformed into statutory regulations in the year 2000.

Table 8.2 Challenges to be overcome by local fishermen in integrated coastal co-management

Issues discussed by the Koster Fjord Group	Aspects pertinent to the co-management process
Are the "sea worms" valued today more than the local people? Do the plants and animals go before fishermen?	World views; diversity and changes.
Who should have the right to decide on the use of local ecosystems, scientists and bureaucrats from urban areas or the local residents?	Participation of affected resource users' in the definition of the problem.
Lack of concern for the socio-economic significance of the prawn fisheries for the region and the city of Strömstad.	Socio-economic linkages to the wider community.
The need to engage the Municipal Governments and local politicians in the negotiation process.	National politics and local : non-local cleavages.
Lack of clarity concerning the mandate of the people involved in the discussions.	Mapping stakeholders and negotiating partners.
The significance, in terms of resource conservation, of their own voluntary rules.	Recognising that allocative rules can have conservation effects.
The potential to further develop the rules limiting the weight and size of the trawls in the area.	Building on already existing rules.
How to convince other fishermen to adopt the use of sorting grids when trawling.	Supporting the exchange of information between fishermen.
The need to make their voluntary rules public.	Recognition and publicising of informal arrangements.
The pros and cons of a legal formalization of the local voluntary rules.	Degree of formality, allowing for rule flexibility and adaptation.
How the Norwegian fishermen might react? Would the marine reserve affect the Norwegians and what would happen if Norway closed their waters to Swedish fishermen?	Analysis of impacts across scales and institutional hierarchies.
The controversy between the idea of developing further and formalising their own local management system and the tradition of open access.	Clarifying differences between property rights and management rights.
The issue of their local management system being associated with NBPO's controversial proposal for the establishment of a local management system on the entire coast of Skagerrak.	New demands emerging in other areas. Management boundaries and scale.
Whether it was problematic to involve some controversial leaders.	Leadership issue. Discussing problems and not groups or individuals.
The question of the mandate to take decisions and negotiate without the involvement of the FAs at the central level.	Roles and locus of authority in large organisations.
The lack of capacity to negotiate and the need to engage the FAs at the central level, where they had so far not received any specific support.	Skills at the local level.
The availability of time and money for meetings and activities.	Transaction costs and financial sustainability.
How to cope with new Environmental Protection Agency (SNV), the NGOs, the scientists, the press and provincial authorities.	Facilitating communication.
The need to have one spokesperson towards the media.	Communication skills.

Source: Participatory observations 1998-2001

By 1999 the situation had changed drastically, both institutionally and in terms of knowledge available about the biological diversity in the deep waters of the Trench. Institutionally, with the coming into effect of the Swedish Environmental Code in 1999, a County Administrative Board (Provincial Government) or a Municipality has the authority to designate valuable natural environments as habitats deserving special protection and establishing nature reserves (Ds 2000:61). In order to facilitate the establishment of reserves, the Code also entitled these two bodies to constrain economic activities such as fishing. This new delegation of responsibilities challenged the concentration of fishery management authority at the sectoral and central level and was questioned within the fishery sector, especially by the dominant actors in the central co-management model the National Board of Fisheries and the FAs.

In terms of available knowledge, the experts working with the ROV technique – who from 1998 and onwards had received additional support from SNV and the provincial government of Bohuslän – had succeeded in producing detailed maps of deep coral reefs, together with multi-beam echosounder images of the seafloor at depths of up to 300 m. The administration, scientists, fishermen, NGOs and general public could now see on video the contours of the Trench and the coral reefs, and also evidence of the physical effects of trawling the sea bed and the coral reefs (Lundälv and Jonsson 2000). Based on this information and now holding the necessary authority, the County Board Administration took the leading role with regard to the establishment of the marine reserve, but opted for another approach than that originally suggested by the Environmental Protection Agency (SNV). Under the framework of the Habitats Directive, it elaborated the idea of establishing a Special Area of Conservation (SAC) under the Natura 2000 initiative. Following this process a proposal for the area identified 10 hotspots where trawling should be banned (figure 8.1).

In comparison with the policies that had been pursued by the Environmental Protection Agency (SNV), which argued for a more conventional and stricter form of marine reserve and the Swedish Environmental Code that promotes stakeholders consultation in a more conventional style, in the management of a SAC the Habitats Directive encourages the active involvement of people who live in and depend upon the designated areas (Article 6). Following article 8(j) of the Convention of Biological Diversity, the directive not only promotes user participation, it also recommends a variety of protective measures (statutory, administrative, contractual, management and sectoral plans) to be considered by the Member State (Council of the European Communities 1992).

Compared to the Swedish Environmental Code, the Habitat Directive turned out to be a more flexible tool that permitted protection to be tailored to the ecological and the social context. Using this directive and Natura 2000 as a framework also permitted the application of the Fisheries Law as an instrument to protect particular hot spots from trawling. To proceed in this way was deemed less controversial by the fishermen, the FAs, and the National Board of Fisheries on whom the sectoral management relies. Using the Environmental Code, would probably have put fisheries and the authority of the central co-management system at a disadvantage relative to other interests.

The County Board Administration presented its proposal of ten sites (see figure 8.1) to a more fishery specific working group. The group consisted of representatives of the Koster Fjord Group, the FAs (SFR and SVC) and NBPO and experts from the National Board of Fisheries. The local governments concerned (Strömstad and Tanum) were also represented. The fishermen were now shown three- dimensional images of their fishing grounds (see figure 8.2) and were provided with detailed information about the location of the various species (site, bottom type and depth) acquired through the mapping. This visualization proved instrumental in persuading the fishermen to discuss the different sites and their relevance for the fisheries. Once the co-ordinates were given the fishermen had something concrete to relate to.

Three (sites 4, 6 and 8 in figure 8.1) out of the ten sites identified by the scientists and presented by the provincial government were considered unproblematic by the fishermen,

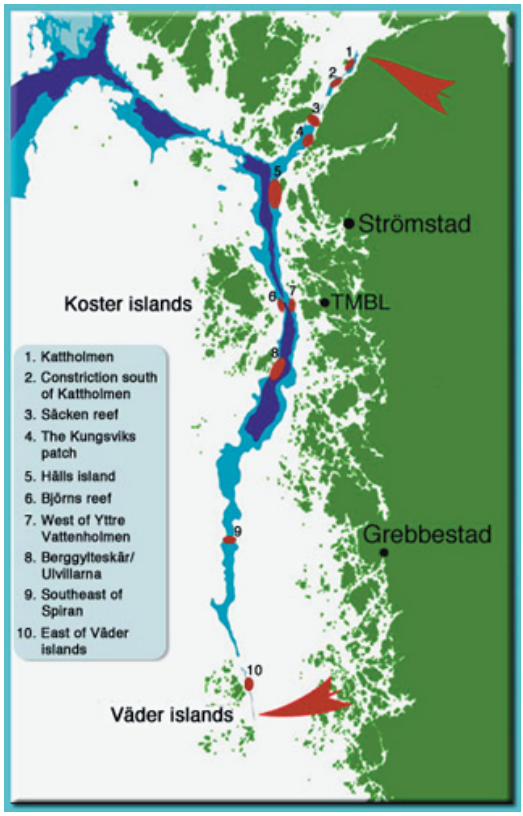

Figure 8.1 **Map of Koster-Väderö Fjord with 10 proposed sites for special protection from trawling.**
Source: courtesy of Tomas Lundälv.
http://www.tmbl.gu.se:16080/resdev/project/CUD.

who agreed that on these sites trawling could be banned. The sites were characterised by steep walls, which the local fishermen with their locally adapted gear did not trawl, or fringe zones with depths under 50-60 m. In discussing with the fishermen about how fishing was practised in these three locations, the conclusion was that banning trawling was unnecessary. The decision by the authorities to allow trawling at these three sites amounted to trusting the fishermen and validating the positive effect of the fishermen's voluntary local rules which constrained the use of certain type of gear. Trusting the fishermen and minimizing external intervention in these sites was part of the conflict management strategy.

Other sites proved more controversial: notably sites 3, 5, and 9 on figure 8.1. The fishermen argued that in site 3, which was narrow and coincided with the area where they normally turned around and therefore trawled on the walls of the Trench, the protection of corals in Swedish waters also involved Norwegian fishermen. Any measure to be taken in this area therefore required consultation with their Norwegian counterparts and the corresponding authorities. This process resulted in the protection of the Swedish side and also a protective decree on the Norwegian side.

Site 5, a popular trawling area, led to some disagreements among the local fishermen (see below). Closing trawling at site 9, an important area of passage for those trawling in a south-north direction, would require lifting the trawl and thus involve additional work and expense for those from the south. Here the partners agreed to limit the passage route to a narrow and specially defined corridor.

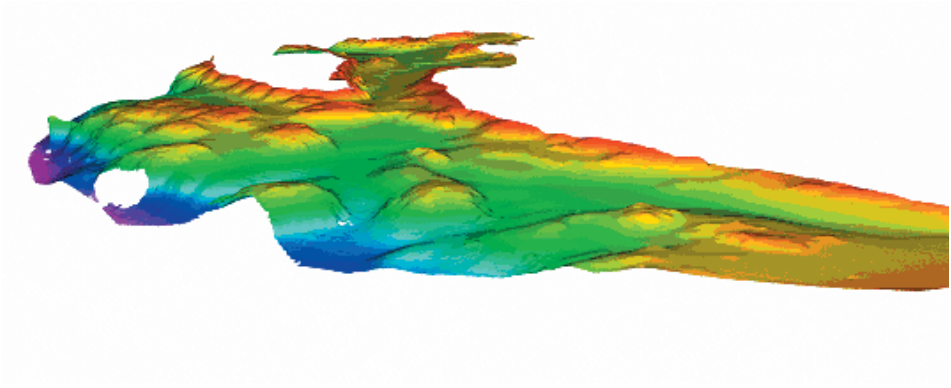

Figure 8.2 ROV technique based image of site nr 5 "Hälls island" in Koster-Väderö Fjord
Source: Courtesy of Tomas Lundälv. Produced by Marin Mätteknik AB, Tjärnö Marin Biological Laboratory, and County Board Administration of Västra Götaland.

A few individual fishermen with a vested interest in the outcome of the negotiation regarding specific sites were asked by the Koster Fjord Group to attend the meetings and explain their fisheries in relation to the site, and the impact that closure would have. The use of visual material was shown to be instrumental in motivating the fishermen to discuss details and reveal their local knowledge and to explain where, when and how of they trawled in relation to the hotspots and the corals.

When the fishermen exchanged views about their fishing in the area identified by the authorities, access to various fishing sites was referred in terms of "Tom, Dick and the grandson of old Harry". The language used by fishermen illustrated the use of place and time as two main descriptors of the ecosystem, their interaction with them, and also the existence of local patterns of traditional sea tenure based on family history. During negotiations, their experiences in both fishing and management of the fisheries in the Trench mediated or potentialised both collective and individual rights and participation in the decision making.

Christy (1982) uses the acronym TURF to refer to this type of territorial use rights in fisheries, explaining that such systems take a long time to evolve and are often embedded in cultural tradition.

Rights acquired by the fishermen and the internal capacity for organization, were shown to be fundamental for participation in negotiations involving a diversity of external actors and interests. Also important was the willingness of the officials from the County Board Administration to listen to all parties.

The negotiations were successful in defining a number of hotspots where trawling is now forbidden and in gaining legal support for exclusion of harmful technology and larger trawlers from the areas. The latter was achieved through the legal endorsement of the locally designed informal rules involving the use of sorting grids, and size and weight reductions on trawls used in the area. Furthermore, the depth limit for trawling in the area was extended from 50 to 60 m. Finally the parties have agreed to continue working for the development of better gear, the improvement and dissemination of knowledge about the area's significance in terms of marine biological diversity, and the extension of this mode of work to include the management of other inter-sectoral problems.

The negotiation was rather controversial within the large collective of professional fishermen and disappointed many fishermen. These fishermen were of the opinion that the Koster-Väderö group had given up the fight. But, for the local prawn fishermen who were directly dependent on access to the Trench, the negotiations were a good compromise. What in chapter 6 was perceived by them as a general threat coming from the central level and narrow scientific advice – a marine reserve closing all trawling in the area – was reduced to specific sites and dissected case by case together with the local resource users. Had the marine nature reserve been formed as originally envisaged by the Environmental Protection Agency, and had the decision followed the normal top-down mode of delivery, it is more likely that the local voluntary agreements would have been irrevocably breached and the system of local governance seriously undermined. Failures of this latter type have been for example reported by Ostrom (1990) and Wide (1986).

The Koster-Väderö case is now being presented to the public as a good local co-management example, where resource users, scientists and governmental administrators have agreed on a common platform for action. The representatives from the Koster-Väderö Group have been awarded an environmental prize and the inventory of corals continues and has now been expanded to new areas, including Norwegian waters and the officers of the County Board Administration predict new hotspots may need special protection from trawling.

At the time of this writing the scientists from TMBL and the leaders of the Koster-Väderö group had noted a few cases of non-compliance. Three local fishermen had on occasion not fully followed the agreed instructions about the closed sites, particularly at site nr 5 in figure 8.2. To resolve the problem the leaders of the Koster-Väderö group opted first to approach the fishermen who did not fully comply with the rules and warn them. As a result they requested the local coastguards to keep an eye on this particular site. According to the leaders of the Koster-Väderö group the coastguards lack sufficient resources to control fishing in the area.[10] The third option chosen by the fishermen was to discuss the issue with the local scientists at TMBL (who were actually aware of the infractions because they had found tracks of trawlers on the closed site). It was first then, that they came up with the idea of requesting obligatory special training for all fishermen trawling in Koster-Väderö. Their idea is that access rights or special fishing permits should be conditional on training in the ecological specificities of the area. However, as in previous cases, the Swedish fisheries law was not equipped to make distinctions of this kind. Unless the legal framework is reformed the fishermen's idea on training has to rely on voluntary agreements sanctioned by the FAs.

This case study indicates that fishermen can contribute directly to the management of local resources provided they feel they are part of the governing regime and see they will get long term benefits out of it. It indicates further that fishermen prefer local handling of conflicts and local solutions to more formal procedures. However, in the headquarters of the environmental protection agency (SNV), TMBL, and the conservation NGOs the idea of a general ban on trawling in the Trench remains latent and the debate about marine reserves continues. Finally it indicates that the negotiations with the prawn fishermen from Koster-Väderö have only just started and their capability to contribute to management has not yet been fully used.

In the case of the prawn fisheries in Koster-Väderö this is an issue which together with the import of frozen prawns from Norway, threatens 100 years of experience of self organisation and local management. The problems exposed by prawn fishermen suggest there is a need for a strategic reorientation by giving considerably more attention to mechanisms which value the importance of fishermen's knowledge and their engagement in fisheries and coastal management.

[10] The area coincides with political limits between EU/Sweden and Norway and sea based transport and recreation is rather intensive.

8.3 CASE STUDY 2 THE EMERGENCE OF AN ALTERNATIVE CO-MANAGEMENT PROPOSAL FROM NORTHERN BOHUSLÄN

8.3.1 NBPO in context

The origins of Northern Bohuslän Producers Organisation (NBPO) can be traced to the early 1990s, when the "gadoid outburst" (Svelle et al 1997) came to an end, resulting in declining catches and the contagious spread of patterns of behaviour maximising individual returns such as the "race to fish" (see chapter 6). This behaviour was sometimes associated with misreporting – stating, for example, that catches taken in Skagerrak had been taken elsewhere in the Baltic Sea. Such a situation was certain to inflame the existing discontent among local coastal fishermen and to create further tensions between those from the northern and southern parts of Bohuslän, as was apparent from articles in the *Yrkesfiskaren*.

As a response, local coastal fishermen started to demand more control over the resources. Several of the fishermen interviewed described how they had tried again and again to persuade the FAs of the need to pay more attention to distributional aspects and internal sanctioning systems. The interviewees reported that initially their demands were directed internally to the regional branch of the FA (SVC) and focused mainly on reviving operational rules that had historically been practiced in Sweden, such as sanction systems, Sunday and/or weekend stops and the rationing of cod and other related gadoid species. In 1992, joint written appeals were made by local branches from Northern Bohuslän to the FAs, advocating differential allocations of the available national fishery resources "to secure long term access to the resources for the coastal fisheries". Local branches from Northern Bohuslän started a debate on the regional distribution of the national quotas, which found further support in the various regions. In response to the growing turbulence, by the end of 1994 the FAs had agreed to introduce landing quotas for vessels involved in the cod fisheries in the Baltic Sea, where the race for cod had became critical for local fishermen mainly using stationary gears (net).

Through this process an independent organisation for professional coastal fishermen of Bohuslän named *Bohuslän's Kustfiskarförening* (BKF) came into being in 1993. Initially, the original members of BKF regarded themselves as dissidents from the main associations (FAs) and were treated as such, even though most retained their membership in the FA. With time, BKF would gain sympathisers and acceptance throughout the West Coast and the regional FA (SVC) would be compelled to recognise and refer to it as if it was its own suborganisation.

BKF's central concern was to find a means of ensuring that resources were available all year round, as this was regarded as a pre-condition for the survival of the local fisheries. Thus BKF proposed that a share of the quotas allocated to Skagerak be reserved for fishermen belonging to Northern Bohuslän's local districts (LL and SD),[11] introducing a new criterion – place of residence – into the process of resource allocation. As with previous petitions made by local branches of SVC, the BKF proposal to take into account place of residence when allocating management rights was rejected. Considered contrary to the principle of free access to state owned resources. Events of this kind could easily pass unobserved by fishery researchers and managers in Sweden for whom the question of who should have a say in how the quotas should be allocated was an internal question to be resolved by the FAs.

In previous chapters it has been demonstrated that coastal fishermen from Northern Bohuslän have historically been able to co-operate and take voluntary measures to regulate fisheries, particularly in the case of less mobile species and on local fishing grounds (e.g. the case of prawn fishermen). This was the dominant local order before the 1960s-70s when more

[11] Fishing vessels in Sweden are registered according to districts made of groups of municipalities and in Bohuslän three districts remain, from north to south, Strömstad (SD), Lysekil (LL) and Göteborg (GG).

mobile fisheries expanded their operations along the Swedish coast. Before that time the problem for local coastal fishermen was getting good market prices for their fish rather than the ability to catch the fish in the first place.

The establishment of independent producer organisations (POs) (see chapter 2) was highly controversial and a source of conflict. Opinions about the role that POs were to play in Sweden varied considerably among the fishermen interviewed. With the exception of those working at the Municipal level or within the conservation movement, the majority of non-fishermen interviewed were convinced that both the number and role of the POs should be limited. A re-organisation of the community of professional fishermen around autonomous, local or regional Pos, was seen by the FAs and the fisheries administration as a disuniting and retrogressive step and a threat to the existing model of management. The emergence of many small POs was thought likely to lead to a potpourri of marketing rules and standards and to challenging the political and mediation role of the FAs in representing as a coherent and unified whole. Thus the FAs and the central administration supported the idea of a single national producers' organisation (SFPO).

Notwithstanding this oposition, in 1994 five POs were established in Sweden, one covering the entire country, SFPO, and four smaller POs, including the Northern Bohuslän Producers' Organisation (NBPO); a set up which recognised regional differences in the resource base as well as the need for a national PO for aquaculture.

NBPO, which had a difficult birth and a rapid death, was created by a small group of fishermen who had been active in the establishment of BFK. With its headquarters in the fishery dependent municipality of Sotenäs, NBPO amassed about 70 local finfish and shellfish fishermen from Northern Bohuslän, led by a core group of well-informed and articulate fishermen.

To constitute a PO, producers must demonstrate sufficient economic activity, defined in Council Regulation (EC) No 2939/94 as a situation in which either the members represent at least 20% of the total number of vessels established in its economic area or account for at least 15% of the total volume of production of a species in the area (or at least 30% of the total production in a major port or market within the area). NBPO was created on the basis of the 30% rule, with its members responsible for at least 30% of *Nephrops* landings at the Smögen fish auction in Sotenäs, Northern Bohulän.

The creation of a local PO not only denoted the arrival of the CFP and its influence in the area but also made Northern Bohuslän's dependence on shellfish much more widely known. As members of a PO, the shellfish fishermen of Northern Bohuslän had in theory gained a toehold in the policy process with power relations nominally shifting from the centre to the local level.

8.3.2 NBPO's proposal for institutional change

The inquiry into the future development of the archipelagos, commissioned by the Parliament in 1996 (see Case 1 above) had proved receptive to ideas from local fishermen. The consultation process had given the prawn fishermen, BKF and NBPO the opportunity to put forward a number of critical remarks on the established management system. In its report (SOU 1996:153) the Commission supported the introduction of an MPA in the area of the Koster-Väderö Fjord and the reallocation of national quotas between those fishing the coastal waters and those fishing off shore –in line with the local coastal fishermen's views – it also discussed the introduction of local quotas and local transferable fishing licences. The Commission gave positive encouragement to developing *Nephrops* creel fishery and was critical

of the impacts of trawling on the seabed. Overall, the report was anxious that any new measures should not disadvantage the small-scale, local fishermen.

Faced with the challenges posed by shrinking fish stocks, market competition, concentration of fisheries resources, the establishment of a marine reserve and the risk that part of the local trawling being closed in the area, the NBPO fishermen offered an alternative management strategy.

The first formal proposal for the establishment of a local co-management regime in the coastal waters of Skagerrak was submitted by NBPO to the central government in 1997. This was done in connection with the process of consultation on the report on sustainable development in the archipelagos of Sweden (SOU 1996:153). As a PO, and through the procedure of referral consultation (see 2.4), they could now formally elaborate their position and put forward recommendations in relation to the issues and proposals discussed in the report.

NBPO's proposal was based on the allegation that the present locus of co-management – as well as the scale and boundaries on which the present institutional framework is based – had serious shortcomings when it came to resolving local problems in an acceptable way. NBPO sought to redefine the ecological and social management boundaries, reallocate rights to the local fisheries resources, and alter the terms of representation and locus of co-management in the direction of increasing local participation in decision making. NBPO argued vigorously in the presence of the media and stakeholders who traditionally had been left outside the corporate central co-management model (namely sports fishermen, the nature conservation movement, academics, local politicians, and the county board administration). Moreover NBPO fishermen began to participate in research projects and the testing of selective gear. It invested time and resources in the development of external relations, beyond the conventional arena of fisheries management. For the NBPO fishermen their *cpr* situation was sufficiently problematic to warrant taking collective action for institutional change. In other words, the proponents believed there was another more effective way to organise the management of fisheries in the region.

In box 8.3, NBPO's proposal is summarised. The concepts used by NBPO to describe the rationale behind their proposal have varied over the time. NBPO has used the Swedish terms for area management (*områdesförvaltning),* local management (*lokal förvaltning*), coastal zone management (*kustzonsförvaltning*), and regional management (*regional förvaltning*). However many of the non-fishermen interviewed considered the language of NBPO incomprehensible and their proposal unclear. Vague and unclear formulation of the proposal and rumours of a hidden agenda lying behind the proposal, aroused suspicion among other fishermen and structured the debate in terms of a personal defensive dialogue between charismatic leaders.

The weak interest shown by the authorities in NBPO's proposal finds its explanation in the dominant co-management regime where according to the Fisheries Law (1993) the National Board of Fisheries has the mandate to regulate fishing but only on biological grounds. The regulatory instrument available to the authorities did not provide guidelines on how to deal with distribution issues among professional fishermen. Internal distribution problems derived from the sharing of resources are expected to be solved on a voluntary basis within the FAs. The officials interviewed were of the opinion that to consider proposals like that put forward by NBPO (and the Sunday stop proposal discussed in chapter 7), the Swedish Parliament had to rewrite the Fisheries Law. As with Sunday stop, this case also points to a common pool resource management system that attempts to separate what is ecological from what is social and economic; in this way the interaction between the social and the ecological systems is ignored.

Box 8.3 A brief account of NBPO's proposal on local area management

Purpose: The redrawing of management boundaries, clarifying the community of users and redefining the terms of representation in co-management.

Problem statement: The degradation of the coastal biotopes and fish resources which are the mainstays of the local coastal fishermen's livelihood.

Policy statement: NBPO emphasizes the need to protect these waters due to their importance as nursery ground for finfish and shellfish. The proposal appeals for a more ecologically sustainable fishery that better suits the characteristics of the local coastal biotopes and the realities of the local communities depending on them. To collectively manage the area so that a balance between "coercion and legitimization" is reached and political controversies are avoided.

Boundaries: The area identified by NBPO extends from Paternoster's lighthouse (the southern point of Tjörn Island) in the South to the Norwegian border in the north. To define the seaward boundary NBPO first suggested the12 nautical mile and then due to opposition, the 6 nautical mile limit. The socio-economic boundaries are based on the cultural particularities of coastal fisheries where the degree of variation is indeed conditioned by the characteristics of the exploited biotope. 3 sub areas are identified as deserving special treatment: the Gullmar Fjord, the Koster Trench and Per's Ground. In this sense the authorized fishing community is predicted to be fishermen operating different types of fisheries, but in compliance with the rules agreed for the area and its peculiar biotopes.

Management Committee: A management committee working under the supervision of the National Board of Fisheries and consisting of local representatives from the different producer organizations, the FAs, fishery scientists, municipal and the provincial government shall devise the rules. The rules are finally approved and codified by the NBF (In the more recent documentation conservation organizations are also to be invited).

Right of Entry: The management committee should approve fishing licences for the area. The coastal fishermen are considered as the main target group and the need to benefit the local communities was also raised. Priority should be given to residents and those who have traditionally fished in the area. Vessels of certain sizes (e.g. >20 -24 m) are to be excluded.

The rules: - A fixed share of the national quotas in Skagerrak to be reallocated to the management area. Depending on the state of the resources, licences to newcomers could be temporarily authorized and fishing stops implemented

- Weekend stop
- Adoption of rules designed by local prawn fishermen for Koster-Väderö Fjord should apply to the entire area
- Highly selective techniques, as recommended by scientific studies, should apply
- Prohibiting light fishing within the 50-m isobaths
- Reduced gear input in the eel fisheries
- Square mesh and increased mesh size in the N. lobster trawl
- Reduced gear input in the recreational fisheries after lobster

Special features: It is suggested that the area should be used for research and monitoring and that the fishermen should actively participate in these activities. The committee should work on the development of green labeling and electronic auctions. A strategy for the use of EU structural funds should be developed. Norway and Scotland are seen as practical examples where local management is working. Denmark and Norway should be encouraged to do the same and the fishing rules in Skagerrak's waters be harmonized.

Sources: Prepared on the basis of Norra Bohuslän's P. O. 1997; Norra Bohusläns's P.O. 1998; Norra Bohusläns's P. O. 1999.

Unlike the case of the prawn fishermen (see 8.3) – a sort of success self management story in the sense of Ostrom (1990) – where the threat of local co-management being nullified by decisions made at higher levels was more or less satisfactory overcome, NBPO's proposal has not been fully tested. Since 1997 the proposal has been further elaborated and articulated in a series of letters and documents addressing various stakeholders both within and outside the governmental sphere.[12] The proposal can therefore be seen as an ongoing process by which alternative ideas to the dominant corporatist central co-management system are discussed, tested and promoted among various actors, contested and re-elaborated.

NBPO's proposal was at odds with the main principles sustaining the dominant management regime and generated a debate. The differences of opinion between the local coastal fishermen from NBPO and the FAs was made evident in an open meeting jointly organised by World Wildlife Fund (WWF), NBPO, a small group of local coastal fishermen from the southeast and the sports fishermen's association in 2000. The topic of the meeting was coastal fisheries, and the potential for the establishment of local-co-management regimes in Sweden was the central item on the agenda. This meeting gave a new focus to the debate where the main question became how to reform the Swedish management system. Since then, the debate on the potential of local resource management has grown and become more pluralistic in Sweden.

8.3.3 The tenability of NBPO's proposal in the light of Ostorm's design principles

The analysis of literature on common pool resource management presented in chapter 3 has indicated that the likelihood of success in the implementation of co-management institutions will depend in large measure on certain basic conditions being met, referred to by Ostrom as design principles for endurable *cpr* institutions (Ostrom 1990:90). Below, these principles have been applied to NBPO's proposal and the socio ecological context from which it has emerged.

Clearly defined boundaries

The area discussed in the proposal includes from north to south the municipalities of Strömstad (80-90 licenced fishermen), Tanum (135-145), Sotenäs (100-110), Lysekil (40-45), Uddevalla (8-10), Orust (20-25) and Tjörn (100-110). To mark the southern boundary NBPO chose the Pater Noster lighthouse, outside the southernmost point of Tjörn Island. This location coincides with the zone regarded as the border between Skagerrak and Kattegat in oceanographic terms (see chapter 2).

The southern boundary as proposed by NBPO appears uncontroversial from a biophysical viewpoint. Paternoster lighthouse also has a cultural meaning; once an important toll post, it is still used to express distance from the home harbour. Expressions like "*fishing within*" or "*outside the toll-station*" were not unusual among older fishermen who saw it as an historical boundary marker between north and south, between "*us and them*". As discussed in the case of the prawn fishermen, cultural ties to a fishing site or area can be an important factor because they can help to validate a management situation and the identification of management units.

[12] Besides officials involved in fisheries among the remittances one can find high officials involved in environ mental policymaking at the national and regional level, commissioners and officials of the European Commission, and, European and Scottish fishermen's associations and producers organizations.

In this case the cultural aspects associated with Paternoster may increase its acceptance as an "ecological" boundary even among those who do not necessarily see a link to the oceanographic phenomena characterising the zone.

To the north, the area proposed by NBPO coincides with the national border between Sweden and Norway. As with many administrative boundaries, it has little correlation with natural biophysical characteristics. On the contrary, it divides the submerged fjord running parallel to the coastline of Norway and Sweden in two. Employing different management options within the Trench on either side of its political boundary can scarcely be justified from an ecological point of view, and is difficult to understand, particularly for prawn fishermen living in the area who fish both sides. However, the boundary is important from a political perspective, particularly since Sweden joined the EU, for it now separates European Community waters from Norwegian waters. In the NBPO documents, no arguments were advanced for ignoring the political boundaries.

As core members of NBPO explained:

> "There is not much one can do about this boundary" {0.0#22}.

> "Obviously, co-ordination across political frontiers is needed; we expect Norway as well as Denmark to develop local coastal management systems, too" {0.0#23}.

To define the seaward boundary of the management area, NBPO first suggested a 12 nautical mile limit. NBPO's proposal emphasized the need to include an area sufficiently extensive to cover *"the variation of biotopes that are essential for the nursery and juvenile phases of most commercially important species in the area"*. From the perspective of NBPO, the 12 nautical mile limit was sufficient to cover the most vulnerable biotopes in the area and was also appropriate from a CFP perspective.

According to the leaders of NBPO, the most appropriate limit would actually be the 160–180 m isobaths (expressed in terms of "*80-100 famn*"), a depth which coincides with the migration patterns of young ground fish, especially cod. The use of cod's migration cycle as a point of reference in the definition of the boundaries was also explained in ecological terms. The following extract from an interview explains the arguments underlying the use of cod as an indicator of ecosystem health in the area.

> "You see, cod and other cod-like species mature comparatively later than other species and therefore stay a longer time in the area…up to three years. They and the shellfish are often found together and keep to distinct areas. This you can easily check by looking at the mix of species caught by bottom trawls; researchers should focus more on these things. Besides, young fish of the cod family feed on shellfish so their distribution does temporarily overlap. If we are able to protect the cod, so that it manages to spawn at least once, we are at the same time protecting all the other related species. Finally, as the demand and price paid for cod is higher than for other species and the number of permitted landings of bycatch is limited, for each cod landed probably 10 other fish are discarded, while for each young cod saved, 10 other fish are gained" {0.0#23}.

NBPO leaders referred to local stocks of cod and discussed the incongruence between the biology of cod and other species and the scales of management. However, the use of depth as a boundary for management purposes was considered impractical, and the 12 nautical mile limit was considered to be somehow appropriate to the dynamics of the coastal zone and the ecosystem of the young cod and the shellfish.

However, using the 12 nautical miles would also mean the inclusion of Norwegian and Danish fishermen who, in Skagerrak, have been granted traditional rights up to the 4 nautical mile limits. Influenced by the opposition to the idea of making use of the 12 nautical mile limit as a management boundary, the NBPO-fishermen proposed 6 nautical miles as well as 4 nautical miles as possible alternative limits.

Yet NBPO's leaders argued the 12 nautical miles choice was appropriate from the point of view of the CFP, which allows coastal states to take management measures within this zone (see chapter 2),[13] though until quite recently (December 2002) it was anticipated that this limit would be only temporary and might be revised. Thus, by proposing the 12 nautical miles the fishermen hoped to retain preferential rights in the area beyond 2002. From a Swedish legal perspective, this coincides with the definition of territorial sea and the responsibilities of the Municipalities in terms of physical planning (Boverket 1995). Linking the role of the management committee to the boundary of the municipal waters and the municipal planning process would give greater validity to the use of the 12 nautical mile limits. This argument was not mentioned by the fishermen in the interviews.

The proposal identifies neither individuals nor households that will have the right to extract resource units from the area. In general, there was a consensus among the fishermen interviewed that the area should be open to all fishermen prepared to follow the rules independent of place of residence. NBPO suggested the transformation of the authorized fishing community into the group of those willing to comply with the management system defined for the area. In this sense, NBPO does not directly advocate a conceptualisation of the management community as one which is territorially fixed, small, and homogeneous. The definition of collective choice and operational rules is devolved to a Management Committee working under the supervision of NBF.

Several fishermen argued that it was clear that by making use of specific variables when designing the rules, the Committee would indirectly define the authorized users. Among the NBPO fishermen interviewed, there was consensus that bottom trawlers of 100 ton GT capacity or more (equivalent length circa 20-24 m) and pelagic trawlers or purse-seiners of 150 ton GT capacity or more (equivalent length circa 22-25 m) should be excluded. In spite of this detailed recommendation, the exclusion principles were not made clear enough in the proposals.

Yet, for the majority of NBPO fishermen it was clear that local fishermen, followed by those having historical track records in the area,[14] should be given preference. The lack of clarity in relation to the issue of exclusion made non-NBPO fishermen anxious and was used as an argument against the proposal on the grounds that it was looking to exclude non-local fishermen from the area. Exclusion and the introduction of ITQs were seen from the outside as NBPO's hidden agenda.

[13] Within the European Union it is possible to discern four limits for exclusion. The base-line delimiting the EU-common fisheries waters, the coastal line which can be based on the 12 or the 6 nautical miles, an inner line defining access to fishermen from other countries but based on traditional rights and the lines of specific boxes (Shetland's box) to which access is restricted.

[14] The fishermen meant standard procedures could be used to issue local fishing licences. The logbooks could be checked and those that had reported for example 30-50% of their catch coming from this area would be authorized to continue fishing there. The fishermen interviewed said that they knew who has traditionally fished there and who has not.

When considering what impacts the exclusion of vessels from the area might have on other coastal areas, the fishermen from NBPO argued that similar arrangements could be set up along the entire Swedish coast, thus encouraging coalition between NBPO and local coastal fishermen from the South East.

Congruence between appropriation and provision rules and local conditions

NBPO proposed restricting fishing time, gear, and certain technologies. NBPO fishermen highlighted the need to be able to plan their fisheries year round and take decisions on fishing stops. Adopting the Swedish market quota model applied by the prawn fishermen (see section 8.3) which had gained the support of fishermen, was seen as one possibility by both NBPO and other local fishermen. Limits to the appropriation of resources were to be defined by the authorities and instrumentalised in regional or local collective quotas.

Individual transferable quotas (ITQs) were not mentioned in the documentation. That ITQs are not popular among the Swedish small-scale fishermen has been confirmed more recently by Ellegård and Eggerts (2002). But NBPO members did not reject the possibility of entitling individuals to a proportional share of the collective quota by e.g. introducing individual, non-transferable, quotas. However, due to the species mix and the diversity of fisheries, the allocation of individual quotas was seen as too complicated an issue for which there was no clear procedure. The criterion on which the initial quota distribution was to be based was a further matter of concern among the fishermen (see box 7.4).

The NBPO documents suggest that the area should be regarded as a pilot area for testing experimental fishing and other research. It was proposed that scientists and fishermen should work together under the supervision of the NBF, with EU's structural funding the project and the implement its results.

These allocation and provision rules were considered better and expected to result in net economic benefits rather than costs. In the interviews the leaders explained that such an approach could help to qualify local fishermen for some form of eco-labelling for their products (for which they expected WWF support)on the one hand, and further enhance the local tourism sector in which a number of fishermen had an active interest, on the other hand. In other words, any costs incurred through restrictions were expected to be balanced by improved income earning potential.

Collective-choice arrangements

An essential part of the NBPO proposal was the delegation of rule making authority to a management committee. The committee would act under the supervision of the central fishery administration (NBF) and consist of local fishermen from different organisations and fishery scientists, together with representatives of the municipalities and the county board administration. Individuals affected by the operational rules would be allowed to participate in the formulation of operational rules through their local representatives on the Management Committee. In this way institutional arrangements were adapted to suit a smaller geographical area, with decisions taken as close as possible to the local level and hence involve more user influence than is the case today. The committee would be given authority to grant local fishing licences, sanction operational rules, and adapt fishing pressure to the state of the resource on the basis of scientific advice. In this sense, it would be given a significant range of management and exclusion rights. The issue of granting licences was seen as particularly critical by the non-NBPO fishermen.

It is worth mentioning that the range of possible stakeholders representatives increased over time as the proposal was modified. In a more recent version, for example, nature conservation organisations are to be invited (Norra Bohusläns P. O. 1999). This mirrored the increasing number of stakeholders involved in fisheries (see chapter 7).

Among local fishermen, there were strong differences of opinion about who should and should not be represented on the committee, particularly if the committee were to be responsible for issuing fishing licences. A majority, however, were concerned that the size of the committee should be limited. Some considered the committee should involve primarily professional harvesters, fishery biologists and the authorities presently involved in fisheries management. Beyond this core membership there was little agreement. The involvement of the processing industry was, for example, not mentioned by any of the fishermen interviewed. Broadening the committee to include new stakeholders with little knowledge or experience of fisheries and who traditionally had not been involved in fisheries management was considered problematic. Ideas of involving representatives of environmental NGO's and/or other fishing interests such as sport and subsistence fisheries proved relatively unpopular. Some were also critical of the idea of appointing local politicians to the committee, partly on the grounds of a potentially high turnover of political representatives. In general, there was support for a more local sectoral management committee, but scepticism of the role that a more broadly constituted committee might play.

Monitoring and graduated sanctions

No specific reference is made in the proposal to monitoring compliance with the regulations. In general the fishermen preferred that the coast guard should continue to exercise the function of enforcement. The issue of sanctions is not mentioned in the proposals. But all the fishermen interviewed considered a strict gradual sanction system to be necessary. Several prawn fishermen considered the present control system to be incomplete because it included only the control of formal or legally adopted rules and ignored informal rules agreed among the fishermen. The system was also considered ineffective because sanctions were hardly ever imposed. A "three strikes you're out" system culminating in the withdrawal of the licence was deemed appropriate by the majority of the local fishermen interviewed. The suggestion was that the coastguards should report all infringements to the management committee, which would be responsible for warning offending fisherman on no more than two occasions before the licence to fish in the area was finally suspended.

Conflict-resolution mechanisms

NBPO's proposal is interpreted here as a response to the existence of conflicts within the ranks of the fishermen and their associations and the inability of the dominant management system to become a platform for conflict resolution. Fundamental to NBPO's proposal was that it shifted the locus of co-management from the central to the local level and extended the invitation to participate in co-management agreements to a wider range of partners than those involved today. As such it would invest the management committee with a unique opportunity to become involved and have a say in both intra- and inter-sectoral issues and conflicts. The involvement of external actors and stakeholders in the co-management of fisheries was seen by NBPO leaders as a mechanism facilitating the introduction of new perspectives. In the interviews, non-NBPO fishermen indicated that fishery related conflicts should preferably be

resolved within the FAs at the regional and central level and not in a local arena. Similarly they were sceptical towards the involvement of people outside the professional harvesting sector.

Minimal recognition of rights to organize

Considering that the right to organise is a fundamental right in Sweden, to examine NBPO's proposal in the light of this principle can be seen as irrelevant. Nevertheless, in their accounts NBPO members reported that to establish the organisation they had to first petition the Prime Minister claiming the right of free choice of association. NBPO had a difficult birth and a weak ability to involve fishermen other than its own members. As previously mentioned, NBPO was created on the basis of the criterion that the membership of the PO represented at least 30% of the total catch of *Nephrops* in the area. This situation did not last for ever and the same principle led to the downfall of NBPO and its proposal.

Nested enterprises

One problem which inevitably confronts the idea of local co-management – particularly in relation to highly dynamic ecosystems and fugitive resources – is how to deal with problems and interventions having their sources outside the local area. This requires achieving a sound working relation with neighbouring organisations and continuing adaptation to institutional dynamics across the various scales of the overall management structure.

This important aspect was not considered in the NBPO's proposal, though from interviews with NBPO leaders it was clear that similar organisational structures were envisaged for other parts of coastal Sweden and that harmonisation with regulations in the wider Skagerrak would be an important issue. Indeed, interviews with the PO leaders indicated that some form of hierarchical structure would be needed to tackle the issue of cross institutional cooperation. Figure 8.4, similar in design to that prepared by Symes and Pope (2000) for England and Wales, presents an institutional structure for Skagerrak and the neighbouring seas as imagined by one of the interviewed NBPO-leaders.

By the time this thesis was written regional seas governance structures of the CFP were emerging. In the search for a more transparent, participatory, ecosystem-based approach to the CFP, the European Council has decided on the establishment of regional advisory councils (RACs) involving the fishery industry and other stakeholders (Council Regulation 2371/2002 article 31). In this way better links to the supranational level were expected to be opened for the fishery sector and the fishermen.

The decision on RACs by the European Council of Ministers appears to coincide with the ideas of the leaders of NBPO. This is not surprising considering that the NBPO leaders had close contacts with the fishermen from West Scotland and the Scottish Fishermen Federation, which in its turn have lobbied for the granting powers to local and regional management. In the case of Sweden, the debate on the European fisheries policy reform appears to have strengthened the Swedish debate on possible management innovations, triggering a process of revision and "pluralisation" of the Swedish central, corporatist fishery co-management system.

When compared to the dominant central corporatist co-management model, the proposal put forward by NBPO members introduces at least eight innovative elements: 1) it redefines the co-management scale; 2) it proposes a devolution of decision making to the local (regional) level; 3) it suggests a more pluralistic decision-making forum in fisheries co-management; 4) it

introduces the notion of area-based collective quota allocations; 5) it redefines a few operational rules emphasising the use of effort (time) and catch quotas and technical conservation measures within given spatial areas with specific ecological characteristics; 6) it reformulates the authorized fishing community on the basis of compliance with the predefined rules; 7) it suggests that the area be regarded as a pilot or demonstration project, supported from EEC and/or national funds; and finally 8) it envisages a nested institutional structure.

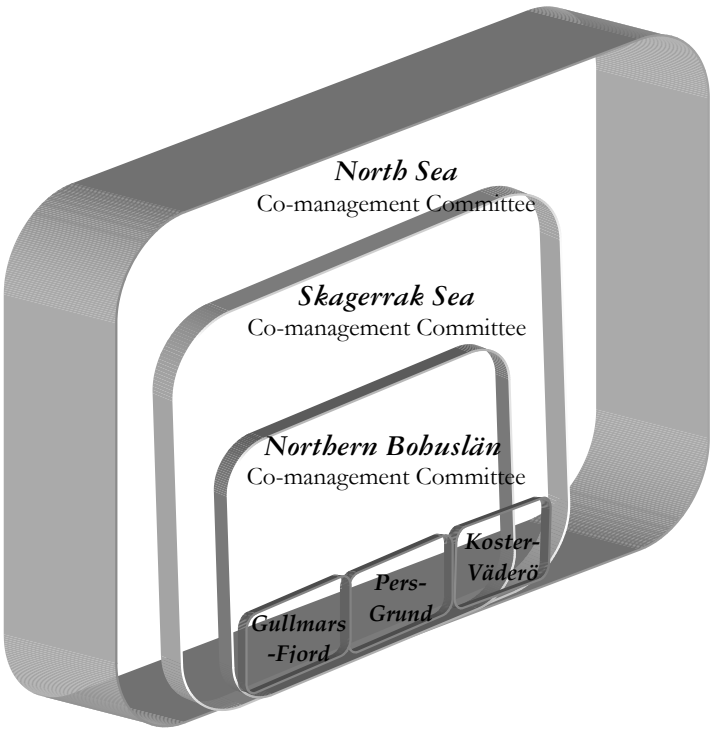

Figure 8.4 Co-management nested structure as envisaged by NBPO

Source: Interviews 1998-2001

In the language of Ostrom (1990), one can posit that these main elements introduce changes to local coastal fisheries management in Sweden at the constitutional, collective and operational levels. NBPO's proposal could be interpreted as one that would extend the resource users' positions from being authorised users, holding access and withdrawal rights, to becoming co-managers with additional management and exclusion rights (see Ostrom and Schlager's (1996) typology of rights, reviewed in chapter 3). The NBPO proposal to redefine the boundaries of management did not evolve in a political vacuum but developed from a situation in which the PO members perceived a resource crisis and an imbalanced distribution of benefits, between the modern highly capitalised and mobile, dislocated fisheries, and the local, more small-scale coastal fisheries.

One question still to be answered is how far this kind of institutional change can be expected to find social acceptance in a heterogeneous group which has formerly been fishing under the principles of free access and equal treatment. An interrelated critical question is that of the extent to which the essential elements outlined above are understood to be feasible among those involved in fisheries management.

8.3.4 Recontextualising the NBPO proposal

A critical question for the NBPO proposal is the extent to which the socio-ecological setting is likely to facilitate the emergence of collective action. Ostrom (1999a) has discussed attributes of the resources (R) and of the users (U) that may affect the users' willingness and capacities to self organise and collectively pursue institutional change for the management of common pool resources (see chapter 3). The attributes highlighted by Ostrom are:

For the resource: R.1 feasible improvement; R.2 indicators; R.3 predictability; R.4 spatial extent and

For the users: U.1 salience; U.2 common understanding; U.3 discount rate; U.4 distribution of interests; U.5 trust; U.6 autonomy; U.7 prior organisational experience.

In the following subsections, facts and perceptions about the resources and the users are reviewed in relation to the actual setting of the NBPO proposal. The arrows in parenthesis give an indication of to what extent these facts and perceptions about the attributes of the resources and the users may enhance ↑ or reduce ↓ the likelihood of the fishermen self organising around NBPO's proposal.

According to scientific assessment the shellfish is not at a point of critical deterioration and there may well be opportunities to improve both the fishery and its natural resource (feasible improvement: R.1↑). Even though the biological study of *Nephrops* is rather recent, local fishermen can easily get access to local scientists from the three major Swedish marine laboratories and view their monitoring reports for free (indicators: R2↑). Moreover, *Nephrops* are rather sedentary in behaviour which facilitates the follow up (indicators: R2↑) and prediction of the state of the stocks by both fishermen and scientists (predictability: R3↑). Thus, with regard to the attributes of *Nephrops* the conditions for the emergence of collective action seem to be favourable.

But NBPO's proposal addresses not only the management of shellfish but also the management of fish whose availability is more difficult to predict (predictability: R3↓). The probability of the local fishermen getting organised around the management of fish stocks that have reached a critical biomass, such as it is in the case of cod, can be expected to be low (feasible improvement: R.1↓). The fact that cod is a bycatch of the eel and the *Nephrops* fisheries complicates probably further the emergence of a collective action form that would involve the whole fishing community.

The non-fishermen interviewed perceived the area selected by NBPO to be "too open", "too large", "too diverse", or "too complex" to be managed as a unit and by a committee, from the local level (spatial extent: R 4↓).

The relevant fishing community consist of both locals (salience: U.1↑) and non-locals (salience: U.1↓) making use of different livelihood strategies (distribution of interests: U.4↓). As might be expected, the dislocated fishermen found the proposal of NBPO highly controversial (common understanding: U.2↓). The members of NBPO share their perceptions about problems with the resources with many other local fishermen from the area (common understanding: U.2↑) but not with the more mobile modern fishermen coming from outside the area (common understanding: U.2↓). Exploiting local resources and then moving on to other grounds, a characteristic of the non-local fishermen, is not part of the strategies adopted by local fishermen and implicit in the NBPO plans (discount rate: U3↑). Thus, problems with the current patterns of use and the regulations at work affect the local and the non-local fishermen, differently (distribution of interests: U.4↓).

The opposition from the mobile southern fishermen was predictable. The dislocated fishery requires larger areas and relies on the absence of boundaries, uniform policies, the established co-management order and generic rules. In their opposition to NBPO's proposal, the issues of a loss of legitimacy for the existing system and the threat of exclusion together with distrust of the NBPO's leadership were most frequently mentioned. Typical expressions in this group were:

> "Are we going to allow a group of fishermen that are condemned to extinction to change a system that has worked well for decades? Shall I close my fishery in Skagerrak because of the Smögen fishermen? Since when has a group of fishermen the right to limit other fishermen's rights? We are all equals" {1.0#101}.
>
> "NBPO leaders have now discovered that they can travel to Brussels and in this way earn more money than they normally do by fishing. We don't give a shit for the NBPO proposal; we prefer that things continue the way they are" {2.0#73}.

Local fishermen were in general positive to adopting changes in their trawling technology and pursuing other regulations to reduce fishing effort (common understanding: U.2↑). Thus the organisation of local fishermen around the management of *Nephrops* can be understood as theoretically feasible. By contrast, more modern mobile fishermen are far less likely to make the same concessions and are therefore unlikely to react in the same way as local fishermen (common understanding: U.2↓). Moreover, the ability of the non-local fishermen to benefit from any spillover effects from *Nephrops* management into other stocks will be considerably lower (feasible improvement: R.1↓). Therefore to predict their behaviour with regard to the natural resources outside the area would also be difficult (predictability R3↓).

Local non-NBPO fishermen who in general were critical of several aspects of the dominant regime were positive about the introduction of many of the operational rules discussed by NBPO-fishermen particularly the idea of allocating separate quotas to the coastal and offshore sectors (common understanding: U.2↑). But they felt committed to the established co-management order involving the FAs and did not believe that NBPO was the right forum in which to discuss changes in the management regime (common understanding: U.2↓). Many feared the implications that implementation of the proposal might have for their own business flexibility. In spite of sharing common views about the problems they did not share common images about the feasibility of the proposal (common understanding: U.2↓).

Less predictable, however, was the reservations of local prawn fishermen operating in the Koster-Väderö Fjord. One might have expected relations between the NBPO's proposed

regime and the existing Koster-Väderö Fjord regime (section 8.3) to be positive. The prawn fishermen might reasonably have expected to gain from being nested within a supportive regime covering a larger area. But four arguments against NBPO and its proposal can be identified among the prawn fishermen.

The first relates to the lack of trust in NBPO's leaders and has to do with previous experience. Previously NBPO had authorized its members temporarily to land more prawns per week than the fishermen's weekly market quota or ration (FWQ) agreed by the national SFPO. This had been opposed not only by the prawn fishing community but also from within NBPO's own ranks resulting in a few prawn fishermen leaving the organization. NBPO was seen to have challenged the central tenet of prawn fisheries management in Sweden. In this case the autonomy given to NBPO was problematic (autonomy: U6↓). Though the decision was soon revoked by NBPO, trust had been lost (trust: U.5↓). Cleary, NBPO also had difficulty gaining credibility among other local fishermen.

The second line of opposition was related to the fear of losing fishing rights in Norwegian waters. The prawn fishermen were afraid of the potential consequences that the establishment of a local management area in Swedish coastal waters might have in terms of their access to fishing rights in Norwegian waters. NBPO's proposal had not been clear when it came to the issue of traditional rights in neighbouring waters.

The third argument was related to the fear of losing co-management rights. Several prawn fishermen were convinced that a coalition with NBPO and concomitant drive for the extension of local management rights to a larger area would generate turbulence in the FA and put at risk their own management rights in the Koster-Väderö area. Efforts to nest small scale arrangements within larger ones are usually motivated by a desire to promote the effectiveness of the smaller system by integrating it into a larger system. But unless NBPO's alternative regime was welcome by the FA and clearly nested within and coordinated with a larger system, the prawn fishermen would not be willing to take the risk (feasible improvement: R.1↓).

Finally, NBPO leaders had also been willing to discuss and establish alliances with sports fishermen and the nature conservation organisations. These were the same conservation organisations that had promoted a ban on prawn trawling and the establishment of a marine reserve in Koster-Väderö, and were perceived by the prawn fishermen as a threat. NBPO had difficult gaining credibility among the prawn fishermen (trust: U.5↓).

The condition of having prior experience of organisation does not to seem problematic at the local level (prior organisational experience: U.7↑) but it has been problematic at larger scales. Local fishermen are already organised around the maintenance of the local ports, the collective purchase of gear and other fishing assets, the marketing of their catch, through local branches of the FAs, and are members of other organisations such as BKF, NBPO and also the Koster-Fjord group. Most fishermen were also active in non-fisheries related organisations in their communities.

To conclude, NBPO's proposal involves a considerable number of users and four subgroups of fishermen: 1) NBPO members who look for solutions to the problems found in the *cpr* situation in the reorganisation of a centralistic co-management model; 2) other local combi-fishermen who despite the fact that they are only endowed with access and fishing rights and lack management rights do not see NBPO as the appropriate forum for solving the problem of sharing resources finding; 3) prawn fishermen who are endowed with separate management rights; 4) mobile non-local fishermen with medium size vessels whose historical records in the area differ considerably.

The proposal excludes the more industrialised fisheries that are empowered through vessel capacity, mobility, efficient technology and influence within the FAs. The fishermen belonging

to the first three sub-groups share basic characteristics. They are highly dependent on local resources, share a common understanding of the problems found in the *cpr* situation and the dominant regime, have similar discount rates and seek to develop their own rules and have interests in common with NBPO fishermen. When applied to the theoretical findings presented in chapter 3 their similarities could favour the emergence of a common management regime but this would require a process involving communication about the alternative solutions to the problems. The more mobile fishermen, on the other hand, share none of these basic characteristics. They are not affected in the same way as local fishermen by the current patterns of use and management system. To find a common solution involving this group is particularly challenging.

In summary, when one looks at the attributes of the users in the specific setting of the NBPO proposal, they appear to reduce the feasibility of any form of organised self-management to endure, particularly if such management system is to involve locals as well as non-locals and cover the whole 12 nautical miles fringe.

As with previous proposals for institutional change made in the early 1990s, the NBPO proposal also failed. However, in contrast to previous attempts in the early and mid nineties debated almost exclusively in fisheries specific circles, NBPO abandoned the traditional circle of national fisheries co-management. In favour of engaging new actors, it handed over the proposal to the environmental movement and the research community. Thus, when the debate initiated by local fishermen from Northern Bohuslän converged with a discussion on the issue of depleted resources led by the scientific community and the reformulation of the CFP, new opportunities for local co-management were opened up.

8.4 SUMMARY AND CONCLUSIONS

The chapter has discussed two local co-management proposals driven by local fishermen; an old and an untested one. In their solutions, fishermen have introduced institutional innovations that involve constitutional changes, collective arrangements with spatial separation of user groups, the assignment of collective quotas, input (time) based regulations, and limiting the adoption of certain aspects of technology. In this way new boundaries are drawn and a different, often local, concept of entitlement to specific rights with regard to coastal waters and resources emerges. Such solutions have a redistributive potential and are perceived as posing a threat to the dominant principles of free access and equal treatment.

In the prawn fishermen's case the driving forces behind the fishermen's collective action were market problems, problems of equity emerging from the sharing of resources, or conflicts derived from spatial interference. The *raison d'être* for these experiences was not primarily resource conservation.

The management practice here identified is embedded in a system of voluntary operational rules constraining catch, time and technology which secure spatial or territorial use rights at the scale of the Trench. The fishermen's own rules governing prawn fisheries in the area have adapted over time to cope with *cpr* situations that became critical for the users. With a relatively high degree of autonomy, the fishermen have developed their own system of rules and this is adapted to meet the challenges of local conflicts and market problems.

The attributes of the ecosystem in terms of its submerged physiographic boundaries, combined with the patchy distribution and rather sedentary characteristic of prawns, together with strong social bonds among local fishermen, are conditions that have probably allowed the system to work. The local regime poses no real threat to other fishermen and is therefore accepted; moreover its redistributive potential is weak. To other non-local fishermen, the Trench with its local management system transmits the notion of the right of exclusion and is seen as an economic disincentive.

The property regime governing the prawn fisheries remains a "common property" regime. The prawn fishermen operating in Koster-Väderö Fjord have made clear their ability to manage the local resource without incurring Hardin's "tragedy of the commons". The formal state of ownership (in this case state owned waters and fisheries resources under free access) is not seen as dysfunctional for sustainable resource use and management in this line of argumentation.

This case study also demonstrated that the fisheries in these waters were far from being governed solely by formal institutional arrangements and based on conventional scientific knowledge. Following Ostrom et al (1994:15), with regard to the prawn fishermen's case, it could be said that given the present ecological, social and institutional context, there is no alternative set of institutionally feasible strategies other than the one designed by the local prawn fishermen, that could produce a better outcome for the appropriators either individually or collectively. Thus these fishermen are not confronting a dilemma. The case of prawn fishermen could have been listed among Ostrom's (1990) success stories but the management system was in a fragile condition because, despite its existence, had neither been documented nor formally recognised as legitimate or effective by the national authorities and the FA.

The local voluntary rules are nested in a system made up of informal (unenforceable) and formal or codified (enforceable) rules. In this way it appears that the prawn fisheries management system is nested in a harmonious working relation with institutions at a higher hierarchical level in the overall management structure. In contrast to normal practice in the dominant regime, the rules have been initially devised to serve local governance needs and then adapted and scaled up. However, the analysis in section 8.3.4 showed that wider policies and arrangements at a higher hierarchical level were threatening the local management system. Whether scaling up or scaling down (i.e. from inshore towards offshore or from offshore towards inshore) in the nesting process has any significance for the outcome, is a question that certainly deserves further research.

The prawn fishermen's local co-management regime has proven to be instrumental as a platform for negotiations in the resolution of conflicts of multiple-use. Solutions to problems identified outside the local arenas could easily threaten the existence of the local management system and the fisheries in the area. The debates over the marine reserves have exposed this weakness and forced the prawn fishermen to develop new communication channels and a greater capacity for articulation, participation, and representation in arenas of negotiation with a diversity of actors.

At the outset of the marine reserve debate, the prawn fishermen's social networks were limited to the local level and were insufficient to exert an active role in co-management and negotiate with the increasing number of stakeholders claiming rights to natural resources and involved in the establishment of marine reserves. The local arena for collective action was shown to be weak and isolated in relation to external actors and the central level. The group finally had to rely partially on mediation by the FAs which reinforced the local capacities to cope with external relationships in co-management. Probably, any negotiation conducted solely on the basis of their own resources would not have been legitimated by other fishermen nor considered sufficient by the central authorities. The fishermen's reaction directed negotiations to the local level where local knowledge combined with scientific evidence was instrumental in the mitigation of a conflict.

Natura 2000 negotiation process also influenced the roles and improved relations in the Swedish fisheries co-management system where the common tradition was to take decisions in closed circles at the central level. Until the negotiations with the prawn fishermen were "concluded", their local management model was seen as controversial and a device likely to cause stagnation. Through the negotiation process, a local co-management system was recognized by the administration and the FAs and their relationship with local fishermen

improved. The local users' previous experiences and their management rights, clarifying who were the negotiating partners, the engagement of the local municipal government, and the use of visual materials to describe the Trench, were all factors which facilitated the negotiation of measures to protect marine biological diversity from the effects of trawling. Nevertheless, the negotiation process would probably not have been successful if the fishermen involved had not held a complex bundle of rights including *management* and *exclusion* rights in the sense of Ostrom and Schlager (1996), and taken up the position of *proprietors*, within clearly defined boundaries.

NBPO-fishermen were articulate and quickly developed external relationships with local, national and international strategic actors and stakeholders outside the traditional circle of the national fisheries co-management system. The driving forces behind the initiative were the shortage of resources and the failures of the dominant co-management system to allocate resources equitably, as perceived by a group of local shellfish fishermen who found themselves in a *cpr* dilemma.

In the case study, the redrawing of boundaries and the shift of locus in co-management were two central elements in the local fishermen's strategy to generate better outcomes. NBPO fishermen claimed the same bundle of rights that the prawn fishermen already possessed: management and exclusion rights. NBPO's proposal sought to redefine the conditions under which fishing was to be sanctioned in the coastal zone. To achieve those objectives they suggested a redefinition of the unit of management in ecological and social terms. By doing so, they questioned the established order in the Swedish central co-management system. NBPO's proposal had a redistributive potential and threatened the economic interests of non-local and more industrial coastal fisheries; it also threatened the economic interests holding power within the FAs, and SVC in particular.

When tested against the theoretical ideals for common pool resources management institutions, the latter proposal can be seen to be incomplete, and the specific social and ecological conditions far more complex than those found in the literature on successful cases. NBPO's proposal comes from a rather homogenous group of local fishermen but involves a rather diverse group of fishermen in terms of fishing strategies, endowments and rights, and is concerned with the management of a variety of resources, some of them much more fugitive than prawns. The feasibility of implementing the proposal was related to the issue of internal diversity and weakened by NBPO's inability to communicate and organise the local fishermen in the area. The debate was often hampered by misinformation and personal disputes, and lack of trust made the emergence of collective action unlikely. The failure of the NBPO members to develop a proposal attractive to all those fishing in the area, is not surprising. Given this heterogeneity any rules designed to limit use would tend to benefit one subgroup over another, rather than benefit all in a similar manner (Ostrom 1990).

The case of NBPO's proposal illustrates the collision between two coastal fisheries management regimes and diverse property rights and exposes the fragile coalition that the FAs rely upon. It could be argued that NBPO's proposal was well timed in relation to the criticism and reformulation of European policies and the debate on regionalisation and localisation of fisheries management, but failed to galvanise in the short term a sufficiently wide base of support within the ranks of the Swedish fishermen and the actors involved in the corporatist central co-management regime. At times when fishery managers are keen to promote privatisation (ITQ) or to reinforce costly output controls as the only way out of problems derived from the allocation of depleted resources, ideas such as these should have some resonance. In fact in Sweden, the debate about these two cases has served the purpose of introducing perspectives other than that of Hardin's "tragedy of the commons" regarding local co-management opportunities. It has generated a momentum that has contributed to the recognition and better understanding of the potentials for nesting co-management regimes within the dominant national large scale system.

CHAPTER 9

HAULING HOME CO-MANAGEMENT: INSTITUTIONAL BARRIERS AND PRECONDITIONS

9.1 INTRODUCTION

At the time of writing, the scientists' concerns over the critical status of most commercial fish stocks in the North Sea and the coastal waters of Skagerrak have resulted in the International Council for the Exploration of the Sea, offering its most trenchant recommendations to the European Commission and the member countries to take immediate action to drastically reduce fishing pressure. To ask the question *what constitute barriers to fishermen's involvement in the management of coastal fisheries* appears crucial today.

In Sweden as well as in the rest of Europe, the current fisheries management system is criticised for its inadequacy in coping with the increasing problems of degraded coastal ecosystems and fish stocks and the development trends within the fishing industry. The criticism has converged around the diagnosis of management shortcomings relating to:

1. resource conservation and maintenance of biological diversity [the ecological dimension];
2. social equity and conflict mitigation [the social dimension];
3. the economic viability of local coastal fisheries [economic dimension].

The Swedish management system, characterised in this thesis as a centralised co-management model with corporative influences, has been slow to respond to these deficiencies. Faced with a situation with depleted resources and demands from a wide spectrum of stakeholders, both within and outwith the fisheries sector, and in recognition of the many international and European commitments, the Government of Sweden recently made clear the need for institutional reform. In the search for alternative management approaches, the government emphasises the importance of: giving local coastal fishermen a better chance in a regional development context; developing new arenas for consultation affording greater influence for the stakeholders; and testing collaborative management initiatives at the sub-national – local and regional – level (SOU 2003/04:51). In time, this is expected to lead to a more effective form of fisheries management, with less top down coercion and increased responsibility on the part of those exploiting fisheries resources and their ecosystems.

In this thesis, various institutional aspects of the issues relating to shared fisheries resources and ecosystems in the coastal waters of the Skagerrak have been analysed. This has involved applying a resource user oriented approach and a common pool resource theoretical perspective to determine how the community of users, and the system of rules through which they operate, have affected the participation of coastal fishermen in co-management. In this way, the analysis has attempted to get to grips with the problems posed by institutional barriers to the effective involvement of local fishermen in co-management.

During the course of the research, the context of an institutional change has been uncovered. The change consists mainly of the nesting of local and regional more pluralistic co-management in an otherwise more centralised co-management regime with corporatist influences.

In this final chapter, the findings in relation to institutional barriers to the fishermen's involvement in coastal fisheries management are summarised and discussed. Although the study focuses on the management of coastal fisheries in western Sweden – and the investigation is based mainly on issues defined by the fishermen themselves – with all the limitations this may have for generalising the findings, the results can be related to previous *cpr* research and to the ongoing Swedish policy debate. The latter is important in the context of the need for institutional change being acknowledged by the Swedish government.

9.2 REVIEWING THE EMPIRICAL FINDINGS

In the management of Swedish professional fisheries, formal decisions have been taken at the central level, either at the European level, by the government, by the government in agreement with the fishermen's associations or by the fishermen's associations themselves. The system has no institutional arrangements for structuring co-management relations at the local level; it can therefore be described as "incomplete".

This centralised form of management, to which the concept of "co-management" seems difficult to apply, has neglected the specificities of the local coastal ecosystems and become a barrier for the involvement of local fishermen in co-management. This thesis has identified six major and interrelated domains in the management system from which barriers to the involvement of local fishermen in co-management can be derived:

1. the modernisation processes and the loss of local management rights;
2. the way in which the management system is organised and the division of roles in co-management;
3. the balance of power in the fishermen's associations;
4. the use of generic rules and incentives;
5. the conceptualisation of fisheries management and the over reliance on biological facts;
6. the dissociation of coastal management and the proliferation of users' groups with imprecise boundaries.

9.2.1 The modernisation processes and the loss of local management rights

The historical description in chapter 2 indicated that at the beginning of the 20th century, access to the coastal zone and the fisheries resources was free and open to all, but the management regime resembled what is described in the literature as communal governance or community based management. The locus of management authority regarding fisheries in coastal waters, as well as the principal arena for resolution of conflicts of use was the local level. In other words, decisions were taken close to the level where the socio-ecological interaction occurs. This system worked well as long as resource users at the local level devised the local rules and the resource base was abundant.

The case of prawn fisheries management (chapter 8) support previous *cpr* studies in maintaining that local resource users can make credible commitments, agree upon rules and engage in collective action and in this way transform the open access regimes. What was important to the use of the resource was the question of how and by whom the rules governing fishing were designed and implemented with regard to the local social and ecological systems. In such cases it was the system of local management rules that guaranteed the allocation of resources and attenuated future claims to the use of local ecosystems. Thus

the findings of this study confirm that in fisheries the form of ownership is not a decisive factor for having a management system or sustainable outcomes.

In the second half of the 20th century, changes in fisheries management were characterised by modernisation and a decreased role and authority for the local level. Among the important tendencies of modernisation that influenced this management shifts from local to central levels were:

i) the intrusion of industrial modes of production into the coastal waters;

ii) the institutional modernisation of resource users' organisation, with the transfer of responsibility from the local community to professional associations;

iii) the institutional modernisation of the state with the centralisation of management authority at the national and supranational level;

iv) the scaling up of the management unit;

v) the idea of scientific knowledge as the only valid kind;

vi) the professional specialisation of coastal fishermen;

vii) the globalisation of the market;

viii) the proliferation of new users of the coastal ecosystems.

It was found that since the 1950s, the coastal communities of Northern Bohuslän have witnessed various processes all tending to scale up the management of fisheries and expand the user community. These tendencies are neither new nor specific to Sweden and many have been identified in the introduction (chapter 1) as tendencies that progressively led to the dysfunction of traditional management institutions (the fishing community) and the marginalisation of the local coastal fishermen in Europe; with increased pressure on coastal natural resources and weakened local institutions and collective action. The findings in chapters 2, 6, and 7 indicated that the local management systems displayed an inability to function under the impacts of modernisation and the national government failed to develop an adequate alternative. This indicates that the authority of local institutions and the local rules can be undermined and faded out, which is supportive of findings reported by other *cpr* studies (Ostrom 1990; Baland and Platteau 1996; Ostrom and Schlager 1996).

In Sweden, the loss of local management rights and institutional arrangements (with local rules often based on space and time) and the origins of the current fisheries management regime can also be traced to a number of "external factors". The food security issue during the world wars, the collapse of fish stocks in distant waters (notably the Atlanto-Scandian herring) and the adoption of a new international access regime to the seas (EEZ) are examples of external factors determining the situation of local fishermen in Northern Bohuslän. Such factors triggered institutional changes that were disarticulated from the views of reality held by local fishermen, who, as a consequence, have no contingency plans and need time to perceive the impacts of the new situation, organise and react.

The issue of external factors is also related to the unit of management. To account for the mobility of fish stocks and allow for flexibility of fishing, the Swedish system has preferred to make use of relatively large units of management and a semi-open access system under generic rules. External factors will, however, affect fisheries operating in different physical and socio-cultural environments differently and their specific adaptation strategies will certainly affect their relationships in the common pool situation with both winners and loser. Alongside with

these processes, local fishermen in Northern Bohuslän witnessed local resource dependency shifts, from small pelagics to gadoids and from gadoids to crustaceans.

Together with the increasing incursion of the offshore sector in the coastal waters, the processes of modernisation, globalisation of the markets and social changes in the coastal areas, have made the borderline, which once marked the differences between traditional inshore fisheries and modern offshore fisheries more and more blurred. Nevertheless, this study showed that despite this tendency of convergence, turning difficult the identification of discrete fishing communities, local coastal fisheries have specific characteristics.

The coastal fisherman of Northern Bohuslän was shown to be a local resident, who fishes near his home (no farther than 6-12 nautical miles from the base-line), fishes various species depending on the season, uses various gear, lands his catch in the local port, spends more nights per week at home than on the boat, allowing the ecosystem to rest at night and at weekends. He possesses situational knowledge about the local ecosystem and the social system, trusts his fellow locals, distrusts non-locals and does not wish to invest in his vessel more than he can actually earn. This leads to the question of the potential use for these specific characteristics in management.

9.2.2 The organisation and the division of roles in co-management

The tendencies of modernisation outlined above strengthened the central components of the management system, turning the national fishermen's associations (SFR) and the government administration (NBF) into the main protagonists in the co-management of the Swedish fisheries.

In the Swedish management model management responsibilities were divided between: 1) stock assessment, monitoring, biologically grounded regulations, enforcement and financial development assistance in the hands of the National Board of Fisheries and 2) social order and distributive aspects in the hands of the fishermen's associations.

This differentiation of roles can be seen as a clear and reasonable separation of management functions in a co-management system. However, the model assumes that in the management of complex and transient common pool resources, it is possible to separate allocation from conservation and development; when in practice this is only possible as an analytical exercise because they act together and the outcome is the result of their interaction. Indeed, one of the important implications of looking at fisheries through a common pool resource perspective, is that the dynamics of interrelations between the social and the ecological systems in fisheries are exposed. When this occurs, the separation of management into functions and tools addressing resource conservation (ecological dimension), allocation (social equity dimension), and productivity (economic efficiency) seems artificial. In complex common pools these aspects act together and their particular effects out there cannot be separated out and dealt with in isolation. They need to be treated in an integrated way.

The simple division of tasks at the central level between the fisheries authority and the FAs has inhibited the involvement of the fishermen in resource conservation and the involvement of the state in allocation, when these should be seen as closely interrelated and treated together in co-management. It also appeared to hinder the systems ability to respond to feedbacks in one or domain.

The model was found to hinder the flow of different types of knowledge and led to situations where the partners involved did not value each others' contributions.

9.2.3 The balance of power within the fishermen's associations

The fishermen's associations had clear tasks to play in fisheries management: to represent and defend the professional fishermen's economic interests; to negotiate with the governmental authorities and other relevant actors in the public and private sector; and to resolve internal conflicts among professional fishermen through for example resource allocation. The study has shown that local coastal fishermen expected that the associations would articulate their interests and promote institutional changes more beneficial to them. Relegated to the role of branches of the associations at best, local fisheries communities could no longer define their own rules, without their endorsement by the regional or the national associations, comprising members relying on different modes of production and with different interests.

The fishermen's associations had a polyvalent model of organisation, with local branches and a series of fishing committees, with opportunities to discuss local issues and interests and a space to discuss on cross scale issues related to the use of a particular resource (e.g. herring or prawn) or fishing gear (trawl). However, the analysis has shown how this organisational form, with the tendencies of modernisation above discussed, the social changes in the coastal zone, and the strong economic interests of SVC in the processing sector, became less and less sensitive to the diversity that characterises local coastal fisheries. The balance of power tilted towards those fishermen who did not reside within the ecosystems they exploited, that is, the modern mobile fisheries from the Göteborg area. This had the concomitant effect of neglecting local coastal fishermen in the managerial representation of interests and discriminating against their fisheries as outdated, non-modern and inefficient.

The study highlighted tensions within the fishermen's associations and the difficult internal relations in such heterogeneous organisations. When the situation became critical, the FAs were shown to be unable to coordinate grass-roots responses and make the changes necessary to fulfil their allocative function. A loss of trust was the inevitable result. Local coastal fishermen were highly critical of the appropriation of resources by the dislocated fisheries and their operational strategies based on a "hit and run" approach in which annual quotas were rapidly exhausted. A common feature of the results from this study was the existence of a clear "local/dislocated" division between the fishermen. There were clear contradictions between their worldviews.

The Swedish co-management model assumed that the articulation of local fishermen's interests could be achieved in a system where participation in decision-making process was organised through indirect representation at the central level. The present study has shown, however, that the system of representation within the associations constituted a barrier to the articulation of these interests blocking attempts by local fishermen to be influential in management. The fishermen did not believe it possible for sufficiently robust collective action to emerge from within the associations which would help in resolving problems of resource appropriation and free riding and also assist in securing a more equitable allocation of the available resources. Demands for changes in the rules, discussed in chapter 7 and the cases discussed in chapter 8, indicated that local branches had lost their power of influence proceedings internally and they had therefore to redirect their demands to the authorities and look for new coalitions outside the fisheries sector.

The way in which the fishermen are organised in a co-management system and the organisations' capacities to respond to changing circumstances, can affect the fishermen's *cpr* situation and can become crucial to their ability to get involved in management. This supports previous studies by Jentoft (1989) who, basing his findings on similar experiences with fishermen's associations in Norway, suggests that in general fishermen will tend to identify

themselves with smaller rather than larger organisations. The size of the organisation also relates to the building of trust, essential for collective action. The building of trust requires of time and effort and learning from shared experiences.

This is not to say that fishermen's associations do not have a role to play in co-management but rather that they have to develop a modus operandi that allows for the recognition of local specificities. Only on the basis of full recognition of these local specificities can coastal fisheries become sustainable.

9.2.4 The use of generic rules

In this study the issue of resource concentration and marginalisation of local coastal fishermen and their knowledge in the co-management process were also found to be related to the use of generic rules based on principles of equal treatment of a unified collective. The policies and management instruments systematically treated coastal fishermen as a unified group. In chapters 5, 7 and 8 the differences between institutional reality and the local coastal fishermen's perception of their reality became apparent. Examination of rules illustrated, for example, how the use of limits in terms of fleet capacity when combined with overall catch limits (TACs and national quotas) in a semi-open access regime, has led to the appropriation of resources by a relatively small group of fishermen. Even though such measures are thought to operate independently, in a complex common pool resource system they will operate in an interactive way. Tied to the national quota system and the semi-open access regime, the purchase of tonnage is a way of securing the appropriation of resources by those exploiting large-scale ecosystems with win-lose outcomes. It results in unfair competition for an ever-dwindling share of the resource and can easily become an incentive for the race to acquire vessel tonnage and fishing opportunities. In this case, the market-based approach tends to favour resource strong areas and individuals. Under the present management system the transfer of vessel tonnage, from the rural communities in the North to the urban communities in the South, will diminish the contribution of local fishermen to the management of coastal fisheries, the reproduction of local knowledge and the reality of a living archipelago. This tendency has been reinforced by development plans which for many years have focused on the vessel and, in this way, assisted more mobile fishermen to secure their appropriation rights through deployment of material assets.

Chapters 5 and 7 highlighted problems with development plans that adopt a standardized approach to the improvement of technical capital – the vessel – which is falsely assumed to be equality relevant to all categories of fishermen. This "one instrument fits all" approach is clearly inappropriate in addressing needs and capacities of local coastal fishermen, whose strategies to secure rights to fish may be based on other criteria than material assets.

The investigation has shown how the concentration of resources and property rights in the hands of a few can occur within a specific public policy framework and a discriminatory institutional context, despite the existence of principles of equal treatment and policies of access to resources on equal terms. It is argued here that in the management of *common pool resources* there is certain to be a bounded discriminatory effect and is made explicit in the analysis of the support given to resource users. In relation to this specific empirical finding, the study illustrated how different fishing strategies under the framework of generic institutional arrangements, can de facto generate entitlements to common pool resources.

These findings indicate that the argument by Ostrom (1999) that central governments tend to use a small set of variables and generic rules is also pertinent to a country like Sweden.

Certainly the contents of these standard packages meet the needs of the administration to exercise authority, administrate and expend funds, reach targets and monitor their use. The dominant mode of participation in co-management through representation at the central level has further strengthened the tendency of the central authorities to view fishermen as a uniform collective of members having the same interests, needs, capacities and opportunities. But the local fishermen's livelihood strategies were shown to have implications for the extent to which they could make use of and draw benefits from external interventions and assistance offered by the administration. Chapters 5, 6, 7 and 8 showed that the means commonly used by local fishermen – namely allocation of time, situational knowledge, gear and catch diversity, seasonality and pluri-activity – are not yet fully integrated into development plans or Swedish fisheries management. This is not meant to imply that all development assistance addressed to users of common pool resources should be cut off. Rather, development assistance can be redirected to facilitate their organisation of collective actions. However, this means choosing forms of development assistance that focus less on material assets and more on human resources, their organisational capacities and management rights needed to co-manage the use of coastal ecosystems.

9.2.5 The conceptualisation of fisheries management and the over reliance on biological facts

The analysis in chapter 7 showed that the predominant conceptualisation of fisheries management among scientists and officials was found to be problematic, first, because it was frequently reduced to the work undertaken by the authorities and by the fishery biologists, and, second, because it focused on operational regulations that could be rationalised only on biological grounds.

The scientific approach has been to predict the short-term changes for given fish stocks and to adapt fishing plans to such predictions. It is postulated here that the division of roles has largely prevented the use of other scientific knowledge, such as social science, as a basis for management as a whole (conservation, allocation and development). In this study, this was clearly visible in the tendency to give scientific biological knowledge the leading role in management and to concentrate the scientific advice to only the authorities, when also the fishermen's associations did have a role to play in management.

In general terms, the management of fisheries has been based on the conventional idea that fisheries are successfully managed if the total allowable catches (TAC) are not overdrawn. Following this assumption biological and technical knowledge has then been translated into operational regulations designed to adjust the level of catches. Factors related to the issue of the social interactions that occur when fishing and when the regulations are implemented have been excluded from the assessment exercise.

It is argued here that the lack of attention to internal diversity in management is closely related to the narrow conceptualisation of fisheries management which has been strengthened by the way fisheries management has been organised. This conceptualisation seems to have permeated the work of both researches and administrators where:

1. fishermen's rules and knowledge are systematically excluded from the analysis of the management system at work;
2. making distinctions among fishermen are related to the internal allocation of the available resources, disconnected from opportunities for conservation, and left in the hands of the fishermen's associations;

3. development plans direct support to the individual fisherman in relation to his capital assets(the vessel), disregarding the potential to support the development of conditions for collective action.

Chapters 5, 6, 7 and 8 revealed that the fishermen had extensive local knowledge and understanding of interrelations in the social and ecological systems and that learning from their previous experience and adaptations to external factors affecting the ecological and/or social environments may generate new insights for the management of complex common pool resources. But each of these circumstances above works against the development of local coastal fisheries as a sub-community with locally specific (differentiated) interests in the large "community" of professional fishermen. In fact, part of the lack of specific policy attention and research is related to the lack and difficulty to find common definitions. In the absence of an institutional framework recognising differences and facilitating effective differentiation across scales, the centralised fisheries co-management system that has evolved in Sweden has been unable to come to terms with local socio-ecological variations. This calls for the strengthening of local structures.

9.2.6 The dissociation of coastal management and the proliferation of users groups with imprecise boundaries

The coastal waters of Skagerrak supported a "fishing community" of professional fishermen with different endowments who fished according to different strategies. But the pool of resources on which the local fishermen depended extended well beyond local fishing grounds, and the resource users well beyond local and non-local fishermen. In spite of that, the management of fisheries was much a sectoral concern and the involvement of fishermen dissociated from the involvement of other resource users depending on and/or affecting the local coastal ecosystems.

The findings in chapters 5, 6 and 8 indicated that, in general, fishermen were more likely to grapple with *cpr* problems having clear place-time co-ordinates. The analysis of the fishermen's perceptions with regard to problems in a multiple-use situation showed that the allocation of space was mainly an issue for those using static gear in inshore waters. The findings support other *cpr* studies by Ostrom et al (1994) and Schlager (1994), suggesting that local coastal fishermen normally posses ample time and place based information and that this facilitates their situational co-operation and their involvement in the management of local fisheries.

But the analysis of the multiple use *cpr* situation in chapter 6 also illustrated that in the case of fisheries, time and place based information is not always available and the boundaries of the community of users are imprecise (fuzzy). As a result, the information about the subtraction of resources can be difficult to specify.

Pollution, seals and to a lesser extent sea-based recreation activities were problematic issues from a boundary point of view. Local fishermen can with difficulty handle problems having imprecise boundaries and different points of origin, such as pollution and sea-based recreation. In these cases, there is a compelling case for external mediation and assistance.

In this context it is important to discuss how the various users could get involved in and contribute to coastal management. While it is important that the fishery sector bears as much of the costs of its environmental impact as possible, care is needed to ensure that other sectors, both land- and sea-based, also bear the costs of their impacts on the ecosystems and the fisheries resources. This is important if local coastal fishermen are not to assume the costs of other users who impact on the ecosystems; it is also of central concern for the involvement of fishermen in the co-management of local coastal ecosystems.

In some cases, pollution sources maybe related to local point-sources which could facilitate the use of stakeholders' concerted action or "users' platforms" as proposed by Steins (1999). This is a method that has been tested in watershed management and could be a promising mechanism for exploring the scope for mutual gains in the coastal communities. The Natura 2000/Koster-Väderö negotiation process, where fishermen are involved in the management of biological diversity together with other local stakeholders and government agencies at local, regional and national levels, seems to be a fruitful living experience.

The lack of time and place based information also applies to the fuzzy boundaries of the expanding sea based recreation "community". Responses to this type of problems will probably be left to the adaptive strategies of individual fisherman and capacities to mobilise local authorities, planners, and the wider local community. The fact that fishermen found subtraction and user's groups with imprecise boundaries problematic, but problems related to spatial access with clear coordinates less problematic, partly explains their lack of involvement in physical planning process at the municipal level and the limited use of these plans at sea. The plans, based on spatial segregation, are certainly useful for resolving problems of assigning space but less appropriate for coping with problems of subtraction across different temporal and spatial scales and dealing with ill-defined communities of users. This makes it difficult for the integration of problems identified by local fishermen in what are, in effect, static coastal management tools.

At the time the fieldwork was being undertaken, the problems associated with seals affected mainly coastal fishermen using static gear, though many other fishermen perceived the seals as "the tip of the iceberg". Seals and cormorants may function as "competing users" and, through damaging gear and reducing possible catches, affect the fisherman's ability to benefit from the *cpr*. But neither cormorants nor seals can claim rights. Their rights are defined by society as part of its prevailing values. The inclusion of new values suggests that there is support for more inclusive pluralistic management arrangements leading to the question of how are those "new voices" in society to be represented in co-management institutions.

Local coastal fishermen are aware that joint use of the coastal ecosystem implies that governance of fisheries is distributed across scales and sectors, both upstream and downstream, and that their capacity to extend their influence across scales and sectors will be weak. Indeed, management crises in fisheries are critical not only because they involve a complex and connective ecosystem and various administrative levels, but also because they involve many diverse users operating and affecting each other's potentials. This study indicated that attempts by fishermen to conserve their fisheries and protect the local ecosystem may be blocked by their perceptions about the agency of other actors within and outside the fishery sector and on a larger scale. Such perceptions make the advocacy of unilateral decisions and actions to conserve the ecosystem difficult.

This leads to the probably obvious conclusion that the larger the space occupied by the resource in all its life cycle phases, the scale of management and the number of users involved in the multiple-use *cpr* situation, the less certain it will be that local fishermen can deploy their situational knowledge to the conservation of the local resources and ecosystems. On the other hand, it leads to the conclusion that the involvement of local fishermen in multiple uses and the management of multiple-use activities within the coastal zone may contribute to improve the situation with the coastal resources. It also strengthens the argument that the management of complex *cpr* requires of the development of wider networks and institutions that address spatial and temporal cross scale and sectoral linkages.

9.3 THE LESSONS FROM LOCAL CO-MANAGEMENT INITIATIVES IN NORTHERN BOHUSLÄN

In chapter 5 it was found that the coastal fishermen of Northern Bohuslän made a fundamental distinction between the actual fishing community sharing coastal waters and resources, and fishermen fishing in *home waters*. Time was a reference to space in the sense of the close to home ecosystem was a central variable in their self-conceptualisation.

The coastal fishermen's description of their fishing strategy (chapter 5), the type of problems they identified (chapters 6 and 7) and were able to resolve (chapters 6 and 8) – as well as their historical accounts of local rules (chapters 2, and 7) – all confirmed that in the search for solutions to common pool resource problems, the management of coastal fisheries should gradually increase the use of specific time and place information possessed by local resource users. Fishermen's knowledge better fits the use of qualitative input measures (often referred to as parametric management) than output quantitative measures. It also supports the idea that an increased use of the knowledge about the dynamics of patterns of concentration of ecological resources in the coastal zone, could improve fisheries management.

In the fishermen's accounts, coastal fisheries in home waters exhibit properties resulting from the complexity and dynamics of both the biophysical and the local social context. Closely associated with these, was the issue of compliance with rules and trust. The local coastal fishermen's perspective supports an institutional reform where the analysis rests on the standpoint of socially embedded rationality. In the local fishermen's accounts, the viability of the coastal ecosystem and the local community are highly interrelated and paramount. This interdependency does not, however, seem to be properly addressed in the dominant management regime. The disregard of distinctions in coastal fisheries has made among other things difficult the evaluation of the present and potential contribution by local coastal fishermen. It is in this context that the descriptive variables of coastal fisheries, as articulated by the coastal fishermen, give some insights into the opportunities for making management distinctions within the fisheries. These findings can therefore be helpful to the definition of ecological and social boundaries suggested as a precondition for endurable management institutions in a large number of previous *cpr* studies.

The management of the prawn fisheries (chapter 8) is in some ways an exception in Swedish fisheries management, where self-regulation has developed with very little external intervention. It is a locally driven management system nested in an otherwise state driven centralised co-management system. The local institutions that govern the prawn fisheries have been stable for 100 years and are known and understood by the fishermen. The prawn fishermen's local organisational capacities and their voluntary rules have for a long time been used to adapt to changes in the social and ecological system. The fishermen have developed operative rules which clarify aspects of the fishing gear and collective rules which clarify the distributive terms. The latter have been accomplished by defining individual rights with respect to fishing time, space and weekly output share. Local rules have emerged partly to resolve conflicts derived from spatial interference and the appropriation of limited resources in a confined area and partly as an adaptation to the market. However, by resolving these collectively, the appropriation of prawns has been balanced and dominant individual strategies constrained.

The prawn fishermen hold management rights or a "claimant" position. They have developed a sense of "local ownership" and taken for granted their right of exclusion, even though this right has never been formally granted. This is in line with the findings of other authors (Hanna et al 1996; McCay 1996) who postulate that the form of ownership is not a decisive factor in

the management of fisheries. What is decisive in this case is how the rules governing the fisheries were designed, practiced, monitored, controlled and continuously revised with regard to the local social and ecological systems. The case of the prawn fishermen in Northern Bohuslän confirmed Ostrom and Schlager's (1996) conclusions that for local level governance structures to work well, they must first take into account the nuances of the physical and socio-cultural environment in which they operate. In the management of the prawn fisheries, attributes pertaining to the domain of boundaries of the resource and the ecosystem (prawns in the Trench), the appropriators (a relatively small number of local fishermen) and external threats have enhanced the emergence of collective initiatives to overcome new, more complex *cpr* problems.

The characteristics of the seabed and the behaviour of the resource, prawns, showed to be conditions that facilitated the development of time and space-based rules.

The prawn fishermen have been able to articulate their interests and retain their management influence both locally (via the local branches and local communities) and across scales (via the specific prawn fisheries committee of the fishermen's association). On a larger scale, in Skagerrak the rules governing the Swedish prawn fisheries have been less restrictive, though still congruent with the local rules. There are good reasons to believe that part of the success in the management of prawn fisheries is related to such nested arrangements. The physical presence of the "Trench" (though a submarine feature) has certainly enabled the legitimisation of a local regime among the collective of fishermen at large. However, with the disruption of the social order in the FAs and plans for a marine reserve the whole system was placed in danger.

What was perceived as a general threat, in the form of a marine reserve closing all trawling in the area, was solved through a negotiation process where the local resource users in discussion with other stakeholders, was reduced to site specific adaptations. This process would probably not have been successful had the fishermen not held a complex bundle of rights including *management* and *exclusion* rights and taken up the position of *proprietors*, within clearly defined boundaries. The organisation and experience of local fishermen regarding the management of prawns proved instrumental as a platform from which to negotiate collective rules addressing the impacts of fishing operations on other marine species. The case demonstrated that sectoral management experience among local users can be instrumental for integrated coastal co-management initiatives taken by the authorities and other stakeholders. The process required, however, the introduction of changes at the constitutional level with the involvement of multiple, local, provincial and national levels of the state administration and the fishermen's organisations.

The formal recognition of the co-management authority of the prawn fishermen by other stakeholders is an important factor for the successful outcome of the negotiations. Had the decision concerning the marine reserve followed central, top-down mode of delivery, it is more likely that local voluntary agreements would have been breached and the system of local governance seriously undermined. Local rules in this and other areas of Sweden's coasts have been undermined in the sixties and seventies under the influence of industrial modes of production and large scale management; the same could also have happened in Koster-Väderö under the influence of nature conservation goals and large scale management. In this case, however, the informal local rules were recognised by the authorities and some were codified.

Through this process of codification the prawn fishermen's management rights were made public. Actors within and outwith the fishery sector have carefully observed the legitimisation of the prawn fishermen's management rights.

This strengthens the proposition that the delegation of management authority to the local level must be legally formalised and enforced. However, the issue of formalising informal rules is still rather delicate in Sweden because of the administration's restricted mandate with respect to distributive aspects and non biologically-grounded rules. This restricted mandate, and the consequent shortcomings of the management system and knowledge supporting it, partly explains the lack of resonance that the local fishermen's proposals have had in the National Board of Fisheries.

The second case, consisting of the proposal for local co-management presented by a newly established producer's organisation, NBPO, threw further light on the preconditions for increased involvement of fishermen in management. NBPO's proposal could be interpreted as one that would extend the resource users' position from being authorised users, holding access and withdrawal rights, to becoming co-managers where the co-management system as such was to be granted exclusion rights.

However, NBPO's proposal was unwelcome and faced a bleak outlook. The management unit identified by NBPO had diffuse social and ecological boundaries. The "fishing community" working the area consisted of local and non-local groups of fishermen dissimilar with regard to their fishing strategies, withdrawal rate and exposure to the supply of fish. Moreover in this area there were different forms of property rights and management modes. Within this heterogeneous group problems concerning the availability of resources and their possible solutions were perceived differently. At the local level, the fishermen's opposition to NBPO's proposal was influenced by their scepticism with regard to exclusive and transferable rights, whether based on area or quota; it rekindled old disputes and personal distrust and provoked fear of recrimination from the fishermen's associations. Here, all preconditions for an increased conflict rather than common solutions were present.

As depicted in chapter 8, local leaders and new actors can play a significant role in establishing new arenas for debate and in this way shape organisational change within the fishermen's associations. Actors and instruments other than those at the central level, are shown to play an important role in that they have, on the one hand, developed new channels for communication between the local fishermen and their organisations, the central authorities and the world outside fisheries and, on the other, they have experimented with a new modus operandi. Among the new instruments able to exert an influence on the debate and the modus operandi were the POs and the Habitat directive. Actors with a significant role in triggering debate are the Commission for Sustainable Development of the Archipelagos of Sweden and the NGOs. The NGOs, for example, sustained the debate started by NBPO. In the case of the prawn fishermen and the search for solutions to the protection of deep sea corals, the County Board Administration with the assistance of local scientists adapted the modus operandi.

The development of wider networks seems to be needed when dealing with resources whose governance is highly distributed as in the case of coastal marine ecosystems and fisheries resources. The social network developed by local leaders of NBPO and the prawn fishermen from Northern Bohuslän allowed them to test and elaborate their proposals for institutional change with various actors at different levels. It facilitated the development of new mechanisms and the introduction of new perspectives. Through these processes the local fishermen were able to innovate on the basis of previous experience.

At the time of this writing most local coastal fishermen in Northern Bohuslän were positive to try the local co-management of coastal fisheries. They also now perceived fisheries were in crisis and this made them willing to make local collective action work and improve the situation with the resources and the ecosystem on which their livelihoods depend. This

development indicates that when confronted with critical situations fishermen belonging to the same group of users or "fishing community", in the sense of Schlager et al (1994), can overcome old disputes and agree on collective action. Moreover that even local fishermen belonging to a same community need time to come to terms about institutional change.

The likelihood of emergence of institutional change in Northern Bohuslän may be influenced, among other things, by the following factors:

i) the excludability implicit in the ecosystem and the local permanence of the resource;
ii) the type and size of the user-community ;
iii) the social and ecological management boundaries used, and the scale of the management unit;
iv) the degree of delegated management authority and its formalisation;
v) the information and coordination across institutional scales;
vi) the presence of stakeholders and their worldviews;
vii) the approaches to local knowledge adopted by scientists and managers;
viii) the opportunity to combine conservation, distributive and market rules;
ix) the development of multifaceted social and economic relations within the local community;
x) the transaction costs involved;
xi) the availability of communication and mediation skills;
xii) type of external assistance.

A question that emerges at this point is how to make outsiders more fully aware of and committed to local socio-ecological conditions and management systems. Ostrom (1999a) argues that one way is to alter the composition of those who use a common-pool resource so as to increase the proportion of participants with a long-term interest in sustaining the resource and who are therefore likely to look for reciprocal arrangements and generate greater mutual trust. But another way is to make "visiting fishermen" formally accountable to the local management system. For this to happen, the local management systems must be recognised by the authorities and the fishermen's associations. It also implies the integration of management functions across the different scales.

Nevertheless, local co-management faces a delicate situation in which the emerging management system has to take into consideration other local management systems working side by side and a mixture of existing overarching levels and structures of management, all with their own particularities. Clearly, the issue of sharing access to resources is one of the most difficult to resolve in Swedish fisheries management.

9.4 THEORETICAL IMPLICATIONS

According to these empirical findings, it is clear that the future of fisheries in coastal waters and their relation to the coastal communities, will depend on how we deal with fish stocks and ecosystem as a common pool resource system and in particular with interactions between users. The marine coastal ecosystem is open and dynamic, with high resource diversity, and lends itself to multiple uses and many different users. The high degree of connectivity and unclear ecological boundaries − together with low storage capacity, high mobility and fluctuation of living marine resources spending different stages of their live cycles in

interlinked adjacent or distant ecosystems − implies that resource users become interdependent – ecologically and socially – across different scales of space and time. Not only can the outcomes, in ecological as well as social terms, change in unforeseen ways but the conditions for use and management can also vary.

The concept of common pool resources has been used to draw attention to features inherent in the nature of certain resources such as fisheries that are critical to their governance and sustainable use. First, the exclusion of specific beneficiaries from access to and use of the common pool is both difficult and costly to achieve; in other words, the system infers low excludability. Second, under conditions of sustained pressure of use, users will progressively reduce their own and other users' potential harvest; in other words, the system suffers from high subtractibility. Therefore in fisheries the actions and benefits of a fisherman cannot be separated from what other users do in relation to the same ecosystem or interconnected ecosystems. This makes collective action of resource users essential to fisheries management.

The frameworks for analysis of the common pool resource situations and factors influencing the emergence of institutional change developed by *cpr* scholars have been shown to be fruitful. When applied to the management of fisheries they exposed more variables than those accounted for in the conventional fisheries management models. They also indicated that to think of "fish" as discrete stocks, of "fishermen" as non-cooperating individuals, and of "vessels" as discrete units of production, is a reductionistic approach. The position of the analyst studying and making decisions in fisheries needs to be broadened, a more interdisciplinary oriented debate is necessary, and the users' perception of the institutional (social) system mediating their interaction with the resources and with other users must be a primary concern. In this sense, the application of an actor-oriented approach has shown to be fruitful in making visible the differences of meanings and various views of the actors involved in the use and management of coastal fisheries resources. It was also useful to contrast the knowledge of local users with the institutional domain.

Looking at fisheries resources through the common pool resource concept has proved a fertile approach, creating an increased understanding of the social and ecological interdependency, implicit in the joint use of such resources. It provided, however, little guidance as to the preconditions needed to cope with problems derived from the sharing of fisheries resources with other predators in the ecosystem. This suggests that most *cpr* studies have defined the issue from an anthropocentric perspective where problems are seen as arising from situations in which the appropriators and the claimants are the same. This is a shortcoming, especially with an ecosystem-based approach to management still under elaboration.

The review of *cpr* studies indicated that, under certain conditions, resource users do take collective action and avoid the overuse of the resource. Earlier *cpr* studies have been criticised for their methodological approach, which tended to oversimplify the situation so that it no longer mirrored the complex reality found in most coastal areas. The *cpr* situation confronted by the coastal fishermen of Northern Bohuslän was certainly complex, implying a need to reorient the enquiry to capture those more complex *cpr* conditions. Despite the methodological shortcomings it is argued here that the conceptual apparatus, principles and ideas developed by the *cpr* school of thought is able to generate new insights into coastal fisheries management.

The *cpr* perspective helped, in particular, to demonstrate the impact that uniform policies and generic rules can have when applied to the use of this type of resources. This type of uniform treatment is ineffective, and probably a major source of inequity in terms of resource allocation. When the main elements represented in the framework (see figure 3.1) were broken down into its many constituents, they represented a source of heterogeneity that clearly affected the pattern of interactions in the common pool situation both within the social

system (or groups of users) and between this and the ecological system. In the use and management of complex common pool resources, material assets, rights, rules and management systems work together and potentialise each other, so that the properties of one become a platform for construction or enabling further development of others. Uniform incentives and institutional arrangements may thus empower or inhibit the resource users' use of particular allocative and authoritative resources, through which access to and control over natural resources is gained and further institutionalised. A more satisfactory account of the interwoven relationships between rules addressing material assets and the transformation of property rights is lacking in fisheries. Understanding how institutional change enables such dynamics of transformation is in urgent need of additional research.

The *cpr* school of thought proposes that for local level governance structures to work well, they must first take into account the nuances of the physical and socio-cultural environment in which they operate; that is, each setting will require different and particular rules, specially designed to take advantage of specific attributes or confront specific problems. While the study of relationships and internal agreements among resource users at the local level is important, the complexity characteristic of coastal fisheries implies it is not sufficient.

The characteristics of living marine resources suggest the use of large marine ecosystems as the unit of assessment and management of the fishable stocks. But the unanswered – and possibly unanswerable – question is how large? Small areas are inappropriate due to the migration of finfish species but large areas are difficult to handle in practice and can easily lead to a disregard of the underlying social and ecological complexity. Even if the ecological boundaries are defined, the problems derived from the shared use of resources and ecosystems will remain. The likelihood that a local coastal fisherman will be able to capture the benefits that may derive from his efforts to contribute to maintaining the production capacity of a specific coastal ecosystem – or at least avoiding its degradation – is lower than is the case for users who husband, for example, a forest.

This is related to the debate on "the privatisation" of the commons. In theory the ownership of natural resources – or the exclusive right to appropriate them – is alleged to allow the owner to plan resource use and harvest in a sustainable way. But at sea, there is no such clear direct link between ownership of the resource and the right holders' de facto opportunity to appropriate resources and draw benefits from resource conservation. In the use of complex and transient common pool resources, such as fisheries, the rights granted to resource users and their opportunities to draw benefit from them are two different things, and this difference is a difficult matter to deal with. Therefore, in the absence of an adequate system of management, which guarantees future claims to the use of local ecosystems, the sense of "ownership" in fisheries is only realised when the fish has been caught. In fisheries, the failure to elaborate clear property or use rights has hindered the development of effective management. How far this is possible, in theory and in practice, remains an ongoing subject of debate.

The issues of heterogeneity, mobility and interdependency across different scales that characterise the nature of fisheries and living marine ecosystems call for complementary arrangements in management. In general, the globalisation of the market affecting the supply and demand side of fisheries, the separation from "the geography of place" and the recognition of interdependency at the ecological, economic, and socio-political levels calls for more thorough analysis of the external factors. External factors play a role in shaping not only the system of rules at the various institutional levels but also the fishermen's internal relations and collective actions (Edwards and Steins 1998).

To match the complexity of fisheries in management calls for more thorough analysis of external relations between multiple users and other actors with management responsibilities

(e.g. government and the scientific community) across spatial and temporal scales. Ostrom has identified the need for nested enterprises and proposed the matching of this complexity through polycentric multi-layered systems of governance (Ostrom 1999;1999a).

The empirical testing of these ideas needs further research. Indeed, it can be argued that the absence of such work may have delayed the application of results from early *cpr* studies to the management of fisheries. It is in this context that co-management studies which refer to the external relations between users and authorities can be a useful if not vital complement. One way to develop *cpr* management studies, so that they better serve the management of fisheries, is to encourage interdisciplinary debates on collective action, property rights and co-management to converge and pay much more attention to spatial and temporal scales and cross scale linkages.

9.5 POLICY IMPLICATIONS

As mentioned in the introduction, the Government of Sweden recently made clear the need for institutional reform. The Swedish case illustrates the need to develop the external relations between the government authorities and the local industry, as well as to strengthen the development of local fisheries co-management institutions (LFCM) where the interests of the local communities can be articulated and become an integrated part of fisheries management. In this thesis, some of the processes and factors that have contributed to the destabilisation of the Swedish fisheries management system have been analysed and are visualised in figure 9.1.

The slow reaction time of the system is not surprising considering that any reform will require the accommodation of new stakeholders in the co-management structure and involve a redistribution of power from the central to the local level. Today, the ideas of the fishermen of Northern Bohuslän have gained considerable support both within Swedish government and among other local coastal fishermen, who in the mid nineties were opposed to local co-management. Today they are supportive of reforming the co-management system so that

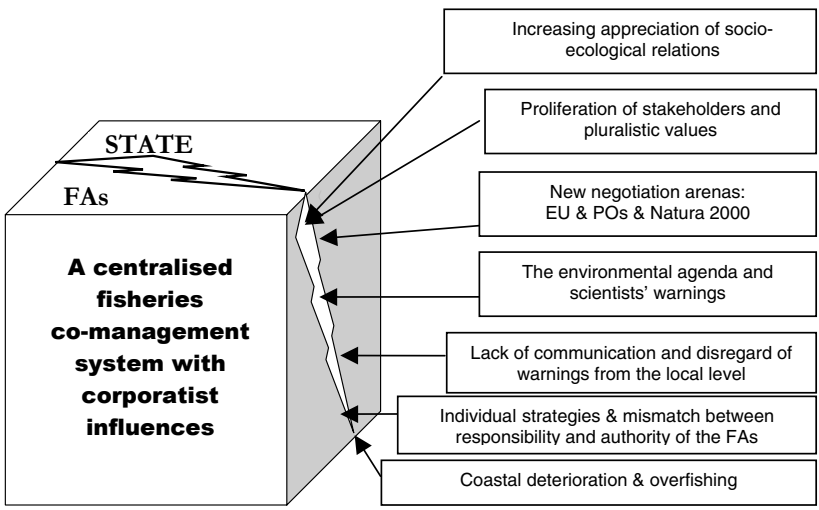

Figure 9.1 The destabilisation of the Swedish centralised co-management model

collective and operative-choice rules can be agreed and tested in relation to the social and ecological specificities of the Skagerrak coast. With depleted fisheries resources and degraded coastal ecosystems, the challenge implicit in a local co-management approach to high priced resources cannot be underestimated.

However, before developing local institutions the premise of local co-management must be formulated in practical terms and with regard to the specific terrain. The cases discussed in chapter 8 provided some insights into the processes and conditions that may be needed for the success of such a process.

In contrast to other authors, there is no suggestion here of a total transfer of management responsibilities and authority to local fishermen, but rather the institutionalisation of co-management at the local level. Nor is it proposed to transfer the entire political and administrative power to the regional or local governments. Local autonomy could put at risk the important institutional coherence across scales and create instead a social space that would facilitate the marriage of the economic and political interests of the local elite and so lead to new processes of fragmentation and marginalisation in the sharing of the local commons. Actually a basic assumption that supports the twining of the state and the users' community in management is that the latter has limitations in managing common pool resources due to interdependency and transboundary aspects, particularly in the light of external factors, multiple interests and the emergence of new claimants.

The challenge for fisheries management is not only to build participatory institutions at various levels, but also to develop spatial and hierarchical links that guarantee resource conservation and equitable distribution of resources. From this perspective an exclusive focus on the local would not be appropriate. To propose local co-management approaches is in this case not the same as suggesting a retrenchment of government responsibilities for common pool resources management. On the contrary, the basic idea is to reform the institutional set up so that it will allow users to participate. This analysis does not argue for a return to the "good old days" privileging those who once had customary rights but rather for the further development of the existing institutional framework so that it embraces and gives recognition to the local level.

The findings of the thesis strengthen the argument that, in order to increase the involvement of fishermen in the management of coastal fisheries, co-management institutions should be considered as a hierarchical set of nested systems efficiently linked across different scales. It also suggests that in Sweden there may be scope for using different resource allocation models, where both individual and collective rights are combined.

It proposes further that the fishermen's associations and the state have an important role to play in articulating the interests of local resource users and recognition of their local management rights. The role of other actors is seen as a platform from where innovation and debate can be continuously triggered. Communication, negotiation, coordination and harmonisation across hierarchical levels are crucial processes in fisheries management; someone has to act out the role that guarantees users participation in these processes and ensures that at least some of the fruits of self-regulation are enjoyed by those directly involved. Today in Sweden, only the state, under the scrutiny of the various stakeholders and the scientific community, can fulfil this role.

However, based on the analysis in this thesis, it can be argued that further involvement of fishermen in management will require the reformulation of national policies and legislation

addressing coastal fisheries as well as a the revision of the roles and functions of the traditional co-management actors. An institutional reform in Sweden would have to at least involve:

i) the recognition of local management rights;
ii) a multi-layer co-management structure which fosters user participation at all levels;
iii) new legislation enabling the consideration of the ecological, economic and social dimensions of fisheries management and their local specificity;
iv) the integration of knowledge provided by a wider group of disciplines and by the local fishermen;
v) the integration of social, economic and ecological criteria in the development incentives;
vi) new working strategies within the administration and the FAs.

Implicit in this is the reconstruction of the nexus relations between the resource users, the government authorities and the fishermen's associations and to change the roles of the partners involved. For the incorporation of local levels of co-management in Sweden to be successful, considerable time must be devoted to rebuilding trust within the associations and between the fishermen and the government authorities as well as the research community. To work effectively with local resource users, new skills may be needed within both the administration and the FAs. To encourage the organisational and institutional development needed for their collective action to succeed suggests a need for new working strategies in providing different services to the fishermen. In table 9.1 some necessary changes are highlighted.

A key issue when reforming the Swedish co-management system then becomes deciding what management functions are most appropriate for the local level. There is no given formula to the answer. Nor can the transfer of management functions be made immediately. On the contrary, it suggests a phased or stepwise procedure in which monitoring and evaluation play an important role in "learning process" at all levels. The institutional change and the development of local co-management institutions should be approached as a continuously evolving process, which is ecosystem specific and adjustable over time. Folke et al (2002) refer to a type of management where institutional arrangements and ecological knowledge are tested and revised in a dynamic, ongoing, self-organised process of learning by doing as adaptive co-management.

The de-localisation and sectoralisation of fisheries management as well as the disregard for local knowledge are of some consequence to the resilience of both the ecological and social systems essential to the living archipelago policy. On the one hand, the management system becomes less able to flexibly take into account and assimilate local knowledge about changes in the local ecosystem and resource base; this risks weakening the ecological resilience of coastal fisheries, through the tendency to overuse resources. On the other hand, the system becomes less able to flexibly utilise knowledge about the local social system/community and patterns of livelihood; and this risks weakening the social resilience of fishing communities. Local communities become increasingly dependent from external income generating activities and resources (e.g. tourism and subsidies). It can be argued that from the perspective of a living archipelago, the integrity of the ecosystem and the viability of the local communities are simply "two sides of the same coin" and that for each of them to survive their relation of interdependence should be safeguarded.

Table 9.1 Essential changes for Swedish fisheries management		
Dimension	**From**	**To**
Type of management	Command and control Reactive and addressing artefacts and individuals	Co-management Proactive and addressing collectives
Locus of management authority	Central and International	Local, Regional, Central, International
Stakeholder involvement	Corporatist	Pluralistic
Participation style	Informative and consultative	Interactive
Knowledge used	Scientific, disciplinary Quantitative	Interdisciplinary, Local Quantitative and Qualitative
Property rights	Less specified Access and withdrawal oriented Universal	More specified Management oriented Differentiated collective and Individual
Unit of management	ICES-Divisions, Single stocks, vessels	Socio-ecological systems Single stocks, fishermen
Central variables in management	Spawning stock biomass Volume of landings Categories of vessels Species selectivity of gear	Spawning stock biomass Ecosystems functions Time and space Categories of fishermen Size selectivity of gear
Development Support	Sectoral and focused on the vessel	Multi-purpose and focused on social assets

To summarise, the foregoing analysis has indicated that what is commonly referred to as a "natural resource crisis" can be seen to be a crisis in management or in governance, deriving from (or leading to) a situation of institutional turbulence. Even when this thesis does not discard the use of individual quotas in some specific fisheries, it argues that the solutions are not to be found in just privatisation or more command and control based regimes. In addressing resource use and distribution problems, no single type of property or management system can be prescribed as a remedy. Policy must not only focus on the development of property rights regimes, but must also take careful consideration of the socio-ecological context in which these are to be exercised, the management system and the knowledge base on which the rules and decisions are based.

This study sustains that there is a form of fishery by local people that can be considered as socially and ecologically adapted and not fully exposed to the dominant, individualistic, economic rationality. It postulates that there are institutional barriers in the current management systems which tend to block, or at least delay, the use of local fishermen's management capacities and the emergence of local institutions. These barriers, which stem from the treatment of fishermen as a homogenous collective of individuals who can only act according to an economic rationality, have contributed to turn depletion into a self-fulfilling prophecy.

When looking at fisheries in the light of the *cpr* perspective, the condition of inequality among fishermen becomes an intrinsic one. The complexity, dynamics and diversity of the ecological and the social system makes inequality in terms of individual appropriation of resources inevitable. Processes of differentiation with regard to power, influence, knowledge, experience,

skills, interests, values and attitudes are constantly going on as a consequence of changes in within these subsystems and their interaction. This condition is however, aggravated by external interventions believed to be equally relevant to all categories of fishermen and offering a "one size fits all" approach. The effect of undifferentiated policies and management instruments has been growing inequality in terms of resource appropriation and economic and social instability.

The study has revealed that conventional models and instruments in fisheries management are part of the problem leading to the managerial shortcomings mentioned above. Because, these models and instruments do not yet relate to fisheries as the complex common pool resource system it is, where the outcome – in ecological and social terms – is the result of the concurrence of the attributes of the ecosystem, the community of users, their assets, the system of rules and external factors. Processes of change in all these domains will trigger changes in the social and ecological interaction and the linked systems.

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APPENDIX 1
NAMES OF COMMON COMMERCIAL SPECIES IN THE COASTS OF SKAGERRAK

English	Latin	Swedish
Norway lobster / *Nephrops*	*Nephrops norvegicus*	Havskräfta
Deep-sea prawn or Northern pink shrimp	*Pandalus borealis*	Nordhavsräka
Lobster	*Homarus gammarus*	Hummer
Crab	*Cancer pagurus*	Krabbtaska
Blue mussel	*Mytilus edulis*	Blåmusslor
Plaice	*Pleuronectes platessa*	Rödspotta
Sole	*Solea vulgaris*	Äkta tunga
Whiting	*Merlangius merlangus*	Vitling
Cod	*Gadus morhua*	Torsk
Turbot	*Psetta maxima*	Piggvar
Common dab	*Limanda limanda*	Sandskädda
Flounder	*Platichthys flesus*	Skrubbskädda/Flundra
Long rough dab	*Hippoglossoides platessoides*	Lerskädda
Mackerel	*Scomber scombrus*	Makrill
Haddock	*Melanogrammus aeglefinus*	Kolja
Saithe	*Pollachius virens*	Gråsej/Sej
Hake	*Merluccius merluccius*	Kummel
Dogfish	*Squalus acanthias*	Pigghaj
Herring	*Clupea harengus*	Sill/Strömming
Sprat	*Sprattus sprattus*	Skarpsill/Vassbuk
Eel	*Anguilla anguilla*	Ål
Ling	*Molva molva*	Långa

APPENDIX 2
THE RESEARCH TASK, THE TOOLS, THE INFORMANTS AND THE TYPE OF DATA

Research task	Research tool	Key Informants	Type of data
Find out theoretical perspectives and concepts.	Review of literature.	International scientific community with focus on social scientists.	Empirical results and theoretical analysis.
Understand the ruling definitions of coastal fisheries.	Review of official documents. Participation in meetings.	Policy makers. Policy makers and staff administration. Interviews	Statements, decisions, definitions, views. Opinions and views.
Describe the scene and the roots of the dominant fisheries management regime.	Review of literature. Review of documents. Examination of logbook-based database. Secondary numerical data.	Swedish fisheries scientists and bureaucrats. Fishermen's associations. Fish auctions.	Historical accounts, ethnographic studies, resource assessments, social statistics, and fishermen's reports or logbooks.
Explore problems in the multiple use commons as regarded by the coastal fishermen.	Questionnaires Study of Municipal plans. Grey documents. Open-ended semi-structured interviews.	Professional fishermen operating in the Väderö area outside Fjällbacka. Delegates to the regional fishermen association. Coastal fishermen Complementary actors.	Written answers to multiple choice questions and open questions. Reports on the state of the environment. Perceptions.
Explore fishermen's perception of coastal fisheries.	Open-ended semi-structured interviews.	Coastal and non coastal fishermen. Fishermen's associations. Informants connected to fisheries.	Statements. Perceptions.
Explore problems in the current management system.	Study of documents, legal instruments and regulations. Semi-structured interviews. Informal consultations. Participation in fishermen's and administration's meetings.	All categories of informants from the fishery and nature conservation sector	Complaints. Statements. Perceptions.
Explore management alternatives as regarded by the local fishermen and compare to the findings in the literature	Study of correspondence Semi-structured interviews. Participation in meetings and negotiations. Comparison with literature.	Local fishermen (NBPO) and government administration. All categories of informants from the fishery sector. Informants from Nature conservation.	Proposals and ideas. Accounts of history. Views. Perceptions.

APPENDIX 3
GUIDING QUESTIONS FOR THE SEMI-STRUCTURED INTERVIEWS

With the fishermen

1. When did you start fishing?
2. What is your main fishery?
3. Where have you fished most of the time?
4. How did your fisheries look like last year (1997 or 1998)?
5. Would you mind drawing your fishing pattern on this time-line for me?
6. Why do you follow that pattern?
7. Have you always followed the same pattern?
8. Which natural factors influence your fisheries most?
9. If I was your son and you wished to teach me an important aspect of your fisheries what would that be?
10. Which other species do you associate with your fisheries?
11. Are you a coastal fisherman? Why do you refer to yourself as a coastal fisherman?
12. When does a fisherman stop being a coastal fisherman?
13. Is fishing a good business?
14. What could you do to improve your income from fisheries?
15. What problems do you meet?
16. What would you like to change in fisheries?
17. Is any other factor specially threatening your own ability to continue fishing?
18. Can you do anything about it?
19. Who can do anything about it?
20. Are you able to influence the decisions about that factor?
21. Are there other aspects you find to be problematic?
22. What would you do to improve the situation?
23. Do you have any special proposal?
24. If you had the opportunity to make decisions what would you change about your and other fishermen's fishing?
25. Would you change any of the factors here below?
26. The fishing ground; The target species; The kind of fishermen; The vessel; The fishing gear; The fishing time; The quotas; The number of fishermen.
27. Tell me why.
28. Any other special factor?
29. Who can influence these factors?
30. Can you influence the decisions that are taken in fisheries?
31. Have you considered the idea of making radical changes in management?
32. Have you heard about a proposal to create a sort of local committee or board for the management of fisheries here around?
33. What is your opinion about it?
34. Are there any special issues that you think a local board should not deal with?
35. What aspects do you think such a local board could decide on?
36. Who do you think should have a sit and who shout not on such a board?
37. Are there other rules which apply here than the ones decided by NBF?
38. Do you fishermen have your own rules?
39. Did you have your own rules before...Do you remember what these rules were about?
40. Do you know why that rule is no longer working?
41. What do you think about enforcement and punishment in fisheries?
42. Have you heard about the idea of a marine reserve in this area? What do you think about that?

With the non-fishermen

1. How would you define coastal fisheries?
2. What do you think are the main problems of the Swedish coastal fisheries today?
3. What do you think are the underlying reasons of these problems?
4. Do you have any ideas on how to overcome these problems?
5. What is fisheries management from your point of view?
6. Is there anything special in the present management system that you would like to change?
7. Do you and your colleagues (in the Ministry, research centre, NGO, FAs, etc) discuss alternative ways?
8. Which alternatives are the one you discuss most?
9. Are you aware of proposals for change in the management system coming from the fishermen?
10. How do you interpret these proposals?

APPENDIX 4
ACRONYMS

ACFM	Advisory Committee on Fishery Management.
BKF	Bohuslän's Coastal Fishermen Association.
CBD	Convention on Biological Diversity.
CFP	Common Fisheries Policy.
CITES	Convention on International Trade of Endangered Species.
CL	Carapace Length.
cpr	Common Pool Resources.
CPR	Common Property Resources.
CQ	Community Quotas.
DDT	Diclordifenyltricloretan.
EBFM	Ecosystem-based Fisheries Management.
EEC	European Economic Comission.
EEZ	Exclusive Economic Zones.
EIA	Environmental Impact Assessment.
EQO	Environmental Quality Objectives.
EU	European Union.
FA	Fishermen's Association.
FAO	Food and Agriculture Organization of the United Nations.
FCA	Fisheries Cooperative Association.
FDA	Fishing Dependent Areas.
FIFG	Financial Instrument of Fisheries Guidance.
FIFS	Fiskeriverkets Författningssamling.
FWQ	Fisherman Weekly Quota.
GEF	Global Environmental Facilities.
GT	Gross Tonnage.
HELCOM	Helsinki Commission:The Baltic Marine Environment Protection Commission.
IAD	Institutional Analysis Development Framework.
ICES	International Council for the Exploration of the Sea.
ICES-WG-ECO	ICES-Working Group on the Ecosystem Effects of Fishing.
ICM	Integrated Coastal Management .
ICZM	Integrated Coastal Zone Management.
IMR	Institute of Marine Research of the National Board of Fisheries.
IQ	Individual Quotas.
IQESST	Individual Quota and Effort Share in Space and Time.
ITQ	Individual Transferable Quotas.
IUCN	The World Conservation Union.
IUU	Illegal, Unregulated and Unreported Fishing.
KFG	Koster Fjord Group.
kW	Kilowatt.
LFCM	Local Fisheries Co-management Institutions.
LME	Large Marine Ecosystems.
MAGP	Multi-annual Guidance Plans.
MBAL	Minimum Biologically Acceptable Limit.
MFU	Maritime Fishermen's Union.
MISTRA	The Swedish Foundation for Strategic Environmental Research.
MLS	Minimum Landing Sizes.
MPA	Marine Protected Areas.

MSVPA	Multi-species Virtual Population Analysis.
MSY	Maximum Sustainable Yield.
NBF	National Board of Fisheries.
NBPO	Northern Bohuslän Producers' Organisation.
NEAFC	North East Atlantic Fisheries Commission.
NGO	Non-governmental Organisation.
nm	Nautical Miles.
OECD	Organisation for Economic Co-operation and Development.
PCB	Polycloratedbiphenyls.
RAC	Regional Advisory Council.
ROV	Remotely Operated Vehicle.
SBC	Statistiska Centralbyrån.
SBL	Safe Biological Limits.
SFA	Shetland Fishermen's Association.
SFC	Sea Fisheries Committees.
SFPO	Shetland Fish Producer Organisation.
SFPO	Sveriges Fiskares Producers Organisations.
SFR	Sveriges Fiskares Riksförbund.
SFS	Svensk Författningssamling.
SNV	Swedish Environmental Protection Agency.
SOU	Statens Offentliga Utredningar.
SSB	Spawning Stock Biomass.
SUCOZOMA	Sustainable Coastal Zone Management program.
Sw. cr.	Swedish Cronor.
SVC	Svenska Västkustfiskarnas Centralförbund.
TAC	Total Allowable Catch Limits.
TMBL	Tjärnö Marine Biology Laboratory .
TPFR	Territorial Private Fishing Rights.
TURF	Territorial Use Rights in Fisheries.
UNCED	United Nation Conference on Environment and Development.
UNCLOS	United Nations Convention on the Law of the Sea.
WWF	World Wildlife Fund.
VWQ	Vessel Weekly Quota.