Rural resource use and environmentalisation: governance challenges in Finnish coastal fisheries

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Abstract. Fisheries provide an example of a rural resource using sector which has been confronted by the rise of environmental concerns and practices. Contradictions that have emerged in this environmentalisation process form the basis for governance analysis in this paper, resting on the conceptual framework of interactive governance. The main research question is: how are the complex fisheries-environmental conflicts governed? More specific questions are 1) what kinds of governance instruments are designed and used and 2) how do the governance structures affect the design and use of governance instruments and their capability of managing conflicts. These questions will be studied in the context of two debates concerning Finnish fishing livelihood and animal protection, namely the cases of grey seals and cormorants. The governance instruments are divided in 1) policy instruments and 2) conflict mitigation instruments. Policy instruments offer co-governance forums for interest group collaboration and propose practical instruments for conflict mitigation.

The story of environmentalisation in rural sectors over the past decades reflects an emphasis on ecological values, together with growing bureaucratisation and professionalisation (Marsden 2004: 142). Thus environmental themes have emerged not only in the public discourse but also in governance institutions and practices in rural natural resource utilisation. Current demands for sustainable development and the protection of biodiversity are changing rural life and governance in various ways.

Fisheries provide an example of a rural sector which has been confronted by the rise of environmental concerns and management practices in various contexts. The discussion about integrating environmental concerns into fisheries has often been limited to the resource perspective, i.e. the protection of fish stocks. Several ecosystem effects of fishing have been detected, but the interaction occurs also in the other direction: environmental changes that affect fish stocks or protected species cause economic losses to fisheries (Varjopuro et al. 2008). The capability of governance institutions to cope with fisheries-environmental conflicts is crucial, and requires paying attention to crossing sector boundaries and ensuring the legitimacy of the decision-making system. This challenge is not alleviated by the high diversity, complexity and dynamic nature of fisheries, which take various forms

according to, for example, targeted fish species, fishing techniques and cultural traditions. The use and management of fish resources involve various rural-urban relationships, stakeholder groups and penetrating debates about sustainability – whether defined by social, economic or ecological arguments.

The basic idea behind the concept of sustainable development, adopted about 35 years ago, is not so new: the long-term supply of natural resources has always been a precondition for rural people and their resource-based livelihoods. Also in fisheries, people have long been worried about the sufficiency and reproduction of fish stocks, but nowadays the concept of preserving biodiversity has gained popularity (Tonder–Salmi 2004). Current debates concerning the sustainability of fisheries and coastal issues are often about who may legitimately access, use and manage natural resources, though they also deal with wider questions of governance. The transfer of authority for fisheries policy making from national governments to European institutions has meant that social objectives have tended to be neglected in a complex multi-level governance framework, as well as in the allocation of sectoral and regional development responsibilities (Symes–Phillipson 2009). Appreciation of the social and political aspects of fisheries management is growing, although policy makers are often unwilling to incorporate explicit social objectives into the design of fisheries policy.

As Svein Jentoft (2006) argues, the social and economic issues regarding fisheries should be examined as thoroughly and systematically as those of natural systems. 'Management' is increasingly being replaced by the broader concept of 'governance', which lacks a clear-cut, generally accepted definition. Often governance is used to refer to a new process of governing or a new method by which society is governed (Rhodes 1996). Sociopolitical fisheries analyses increasingly apply the theory of interactive governance by Jan Kooiman (2003), which widens the formerly popular idea of co-management to a new level (Symes 2006). Kooiman's broad theoretical framework has been welcomed internationally by fisheries social scientists since it is well-fitted to the diversity, complexity, and dynamics of fisheries systems. The interactive governance theory makes a distinction between the analytical and the normative perspective. The normative perspective typically aims at reinforcing inclusivity, partnerships and interactive learning as key elements of new governance structures. This article applies selected concepts from Kooiman's theoretical framework in order to analyse governance interactions in environmentalised fisheries systems.

Governance of fisheries-environmental conflicts in focus

The process of environmentalisation forms the setting for governance analysis in this article. The main research question is: how are the complex fisheries-environmental conflicts governed? More specific questions are 1) what kinds of governance instruments are designed and used and 2) how do the governance structures affect the design and use of governance instruments and their capability of managing conflicts. These questions will be studied in the context of two debates concerning Finnish fishing livelihood and animal protection, namely the cases of grey seals and cormorants. These cases hold both similarities and differences for the purposes of comparison and analysis. Governance systems regarding seals and cormorants are characterised by divergent administrative structures, which is relevant for studying differences in governance instruments.

The seal and cormorant conflicts reflect the multiplicity of tensions between demands for rural social and economic sustainability and animal conservation. The bases for the conflicts are in the damage induced by the seals and cormorants to the fishing livelihood. Grey seals are commonly regarded as the main threat in Finnish coastal fisheries and there is increasing discussion about the effects of the cormorant populations. The images of the problems to be governed and the governance instruments and actions often differ depending on whether the emphasis is on rural livelihoods or ecological modernisation. The

perspectives concerning Finnish seal politics are steeply divided between the fisheries and hunting groups on one hand and nature protectors and environmental administrators on the other (see also Storm et al. 2007). Not surprisingly, the former groups want to restrict the seal population and the latter groups would like to restrict hunting and increase the conservation areas. Similar tensions are present also in the cormorant conflict, where the environmental perspectives hold more power, largely because the cormorant belongs to the list of species which fall within the responsibility of environmental administration.

This article utilizes both published and unpublished material for a description of changes in fisheries and for the two case studies. The published material consists of research reports and articles, newspaper articles and policy documents. The Internet has been used as a source concerning, for instance, the practical information that authorities have aimed at commercial fishers. Other material has been collected during field work by the author of this article during the last ten years in connection with various research and networking projects, such as the INTERCAFE (Interdisciplinary initiative to reduce pan-European cormorant-fisheries conflicts) project. This qualitative material consists of observations, interviews and discussions. The scope of the case study descriptions is to reveal the variety of governance instruments and structures that have been proposed during the debates. Before this, the conceptual framework for the analysis will be specified and reflected upon in the fisheries context.

Environmentalisation process and interactive governance

Environmentalisation can be defined as the process by which a formerly non-environmental issue comes to be defined substantially as an environmental issue (Buttel 1992). In the environmentalisation process the paradigm of ecological modernisation has become important. While recognising the variety of meanings and analytically different levels of the concept, Pertti Rannikko (1999: 396) holds that ecological modernisation has begun to dominate the conceptualisation of environmental problems and the goals of environmental politics in Western industrialised countries during the 1980s.

> Ecological modernisation is a new paradigm of the late modern age, and even as a concept it contains the idea of continuing the modern project. It states that environmental problems can be solved within existing institutional structures, such as capitalism or industrialism. (Rannikko 1999: 396.)

According to Terry Marsden, the story of environmentalisation reflects an emphasis on ecological values in society and tends to disempower the primary producers and other rural people. In the context of the agricultural and food sector in Europe (post BSE), the state has set up highly professionalised and bureaucratised forms of environmental safeguards and instruments (Marsden 2004: 142). Also in fisheries, an increasing trend of science-based regulation and bureaucratisation has been visible in Europe and in the European Common Fisheries Policy (CFP). Protecting the marine fish stocks and reducing the fishing fleet have been the main values and aims of this management system.

By defining social-political governance in terms of interactions, Kooiman (2003: 4) seeks to make social-political processes analysable and interpretable. Jan Kooiman and Maarten Bavinck (2005:16–17) use the following definition of governance:

> Governance is the whole of public as well as private interactions taken to solve societal problems and create societal opportunities. It includes the formulation and application of principles guiding those interactions and care for institutions that enable them … . The state of contemporary governance reflects in particular the growth of social, economic and political interdependencies, and trends such as differentiation, integration, globalisation and localisation. These processes result in length-

ening chains of interaction, stretching across different scale levels and sectors.

In Kooiman's (2003) theory of interactive governance, an interaction is a mutually influencing relation between two or more actors, possessing an intentional and a structural dimension. The intentional elements, i.e. images, instruments and action, interact with the structural modes of governance. Regarding the intentional elements, the main focus here is on governance instruments, which is an intermediary element link images to action. Instruments are not a neutral medium; their design, choice and application frequently elicit strife (Kooiman–Bavinck 2005:20). One's position in society determines the range of instruments available. The instruments may be 'soft' in nature, such as information, bribes, and peer pressure. They may also have roots in the legal or financial realms, and involve e.g. permits and taxes. There are also 'hard' instruments of physical force (Kooiman–Bavinck 2005:21).

The Finnish seal-fisheries and cormorant-fisheries disputes reveal the importance of public discussion especially in the newspapers, where stakeholders attempt to influence not only the decision makers but also the opinion of the general public. In these conflicts the governing instruments include technical measures, financial support, compensation payments, protective hunting, culling of animals, laws, permits, management plans and the Government Programme. In line with Swedish seal-fisheries conflicts (Bruckmeier–Höj Larsen 2008), protective hunting, financial support and compensation payments have been at the core of the debates, but fishing gear development has also been important in the Finnish grey seal controversy. For the purpose of analysis, the governance instruments are divided in two categories: 1) policy instruments and 2) conflict mitigation instruments. The former reflect social-political will, but also define the more practical instruments for managing the conflicts. Putting the instruments into effect – taking action – is also a source of conflict.

Governance theory distinguishes three ideal types of structural modes: hierarchical governance, co-governance, and self-governance (Kooiman–Bavinck 2005:21). Hierarchical governance is the most classical of the governance modes, characteristic of the interactions between a state and its citizens. This top-down style of intervention expresses itself in policies and in law. Control and steering are key concepts in hierarchical governance. The essential element of co-management is that societal parties join hands with a common purpose in mind, and stake their identity and autonomy in this process (Kooiman–Bavinck 2005:22). Governance theory contains numerous manifestations of co-modes, such as communicative governance, public-private partnerships, networks, regimes, and co-management. Co-governance is at the core of governance theory, as the necessity of broad participation is, for instance in the context of fisheries, seen as essential from a normative and from a practical standpoint (Kooiman–Bavinck 2005:19). Self-governance, where actors take care of themselves outside the purview of government, is rare in the governance of modern fisheries.

In Finnish coastal fisheries the role of the state and its fisheries administration has changed during recent decades and new powerful players, especially the environmental sector and the EU, have increased in influence. Power and responsibility have become fragmented in various levels and sectors of the official governance system and civic society institutions. As Jentoft (2006) notes, crossing departmental boundaries is especially challenging when the management problems derive from outside the fishing industry, which is the case in the animal-related conflicts. Moreover, the integration of environmental concerns into fisheries management will require action and communication on the international, national and local scale (Degnbol et al. 2003).

Coastal fisheries in Finland

Like other primary production sectors, employment in Finnish coastal fisheries declined drastically during the 20th century. In 1901

the number of commercial fishers was at least 20,000 (Eklund 1991) whereas in 2006 the register of professional fishers comprised 2,122 persons, 1,808 of whom can be regarded as coastal fishers (FGFRI 2007). Several factors have contributed to the decline, one being fish marketing opportunities connected to historical changes. For instance, Baltic fishing developed in symbiosis with Russia for centuries, but the loss of those markets after 1917 led to a significant fall in fisheries employment (Eklund 1991).

Later, especially the relative reduction of fish prices and tightened competition, e.g. from the products of modernised farming, have decreased profitability and fisher numbers. In the 1950s coastal fisheries faced a crisis, which was deepened by the fact that the Finnish state did not provide noteworthy support to the livelihood (Eklund 1993: 158). The agricultural producers have formed a powerful political force in Finland, which has affected the rural emphasis of the Finnish welfare state rationality – the field-working peasant became the symbol of the national ability for reconstruction and was economically supported by the state (Eklund 1993, Granberg 1999). In contrast, the level of coastal fishers' organisation and political influence has been low. Finnish coastal commercial fishing is mostly small-scale entrepreneurship and often embedded in local rural communities. There are hardly any fisheries-dependent communities left, but in many locations fishery supplements people's livelihoods and is a pillar of the coastal life mode (Salmi 2005).

Most of the Finnish coastal and inland waters have traditionally been under private ownership in conjunction with the possession of land. The decision maker is commonly a collective, a shareholders association, which jointly controls the interests of individual owners in fishery matters (Salmi–Muje 2001). The current governance system is a combination of local decision-making and a top–down management system implemented by the state and the Ministry of Agriculture and Forestry. Technical developments in fishing have increased efficiency and given rise to the debate on over-harvesting. International agreements and the adoption of the CFP by the EU have increased fisheries restrictions and control. The governance in accordance with the CFP also includes the funding of commercial fishing and development projects. Whereas in former days the framework for fishing was set by the local community, the major decisions imposed on local fishers today are made far away from the area (Storå 2003). The CFP emphasises big professional fishing units, which compete in the market with the small-scale coastal fishers.

During the last 10–15 years Finnish coastal fisheries have become increasingly involved in environmental politics. The fields of interest groups and administrative institutions, such as the Ministry of the Environment, have widened and thus the rather hermetic branch of fisheries has been forced to become more open. The environmental lobby groups and the CFP have turned their focus on the ecological sustainability of commercial fishing, whether regarding the size of the fish stocks or the effects on other animals and the ecosystem. At the same time, Baltic coastal fisheries have suffered from environmental changes, especially the eutrophication of water and accumulation of heavy metals in fish.

The following sections describe the new animal-related challenges faced by coastal fishers. The increasing numbers of fish-eating animals is a relatively new and growing arena of concern along the Finnish coastline. The management of the grey seal and great cormorant populations has become a hot issue in many coastal and archipelago areas and, moreover, the need for control measures have been included in the Government Programme for 2007–2010 (Finnish Government 2007). The cormorant, seal and salmon are the only animals specifically mentioned in the Government Programme.

Dispute 1: The grey seal

Seals have been captured and hunted since the Stone Age and in the Middle Ages seals provided a livelihood of crucial importance to coastal people (Ylimaunu 2000). In the 18th and 19th centuries people also began to consider seals as

harmful species, especially to fishing. Up till the early 1970s fishers were allowed to shoot seals almost whenever they encountered them. After a period of low reproduction due to environmental toxins, the Baltic Sea grey seal population started to recover in the early 1990s. Thereafter the number of grey seals has sharply increased and the seals have started to visit fishing grounds in inner archipelago areas and near the coastline, which is a new pattern of behavior for seals (Ylimaunu 2000). In the past, damage was limited in terms of intensity and locality. For many fishers, solving or mitigating the problem seems at present to be crucial regarding the continuance of their occupation. The seals eat fish completely or partly from fishing gear, and this hampers gill net and trap net fishing. The seals break the equipment and fishers claim that they also scare fish away from the fishing grounds.

In 2001 seven protection areas for seals were founded in Finnish sea areas. Fishing was restricted in those areas, but most of the commercial fishers had moved to other fishing grounds due to the seal problems already before the establishment of the protection areas. In a telephone survey conducted in 2006 the Finnish commercial fishers named changing their fishing areas or fishing methods as the main methods of mitigating the seal problem (Salmi–Salmi 2006). Concerning future actions, they preferred hunting, in order to reduce the seal population, and scaring the seals from the fishing gear.

The grey seal is categorised as a game animal in Finland. After a period of strict preservation, the authorities allowed limited hunting of seals in 1997. The hunting quota was 1,135 seals in 2008–2009 (FGFRI 2009), but since 1997 only a part of the annual quota has actually been hunted. Hunting has not halted the growth of the Baltic grey seal population. The fishers, however, consider hunting as an important method for managing the conflict due to the benefits of killing the most problematic seal individuals, which have learned to use fishing equipment as a supply for easy food. Attempts have been made to revitalise the hunting traditions and develop new ways of using the hunted seals as a resource, a source of livelihood. These actions have been taken by regional collaborative projects in the Northern Baltic Sea (Varjopuro 2008). The *Grey seal in Kvarken* -project started with a protest mentality against national level decision making, because in the region concerned the actors felt strongly that the seal problem was not taken seriously enough at higher levels. Later, the actors gained legitimacy also among the national level authorities (Varjopuro 2008).

Fishers have been compensated for a part of the economic losses induced by the seal concerning the years 2000 and 2001. Recently, a 'tolerance compensation' system has been established for compensating seal-induced losses for coastal fisheries (MAF 2009). This system is valid in the period 2008–2015 and it includes also subsidies for investments for preventing damage caused by seals. When applying for tolerance compensation, fishers are obliged to announce their fishing incomes, which are used to calculate the compensation sums.

Today fishers' encounters with grey seals have consequences not only on the economy of the livelihood but also on the general acceptability of their occupation: if a lot of seals drown in their nets this will clash with nature conservation policy and could even cause public protests. Presently the number of seals drowning in fishing equipment is unknown. Fishers are reluctant to reveal these numbers, because they feel that the authorities would use the information against the livelihood (Mattsson 2006). The conditions for continuing coastal fishing are dependent on a complex web of interdependences and fishers have a critical need to stabilise this complexity (Varjopuro–Salmi 2006).

In addition to hunting and economic compensation, technical methods for conflict mitigation have been developed by deterring the seals from approaching the nets or by preventing the seals' access to fish caught in the fishing gear. The idea of developing 'seal-proof' fishing gear has become popular among authorities, researchers and many fishers (Varjopuro–Salmi 2006, Varjopuro 2008). Compared to hunting, developing the gear seems to be politically less

controversial and an easier path towards balancing the profitability and acceptability of coastal fishing. Gear development projects as well as investments in seal-proof trap nets have been subsidised by the fisheries authorities. EU funding has been linked with developing options for selective salmon fisheries. Pontoon traps, known as the 'push-up' type, turned out to be the most efficient and easiest to use, but they are more expensive than the more traditional types. This gear was initially developed in Sweden and has become popular also in Finland. The idea of the pontoon trap is to make the fish bag strong enough to keep the seals outside and away from the catch. The pontoons in the gear make the heavy construction easier to handle in the sea.

A case study analyzing a co-operative project for developing seal-proof trap nets suggests that misinterpretations and differing views existed even concerning the basic goals of the development work (Salmi 2006). One complicating factor was the entanglement of aims regarding the selectivity of salmon fishing with the development of seal-proof trap nets. An obvious reason for this was connected with the availability of external funds for development and investments, due to the fish-stock-conservation-oriented EU fisheries policy and the lack of national funds allocated for seal-induced damage compensation, gear development and investments. Thus the trap net experiments aimed in two directions at the same time, while the commercial fishers would have stressed the prompt development and introduction of a seal-proof trap net type with a high catch rate. The power position of fishers was weak as the scientific/technical experts were considered key actors. Since the studied project, the commercial fishers' organisations have strengthened their role in development projects (Varjopuro 2008). As Finnish coastal fishing struggles with low profitability only a few fishers are able to invest in the new seal-proof gear innovations without external funding. Subsidies for investing in seal-proof fishing gear were introduced in 2004 and most of the funded pound nets were of the Swedish type. However, the seal-proof trap net technology provides only a partial solution to the seal-fisheries conflict, since gill nets are the most important gear in coastal fisheries.

Management plan and the Government Programme

A national management plan for the Baltic seals has been published by the Ministry of Agriculture and Forestry (MAF 2007). The plan is based on eleven gatherings with local people along the coast and questionnaire surveys of a variety of stakeholder groups. The general aims of the national management plan concerning the grey seal are:

1) to enable the coexistence of people and the seal in a way that the seal is seen as a natural resource which can be used in a diverse and sustainable way and
2) to take the regional fishing and fish farming livelihoods into account by intensifying cooperation and communication between stakeholder groups in order to prevent and provide compensation for damage caused by seals.

The coastal sea areas are divided into three population management areas with specific targets in the management plan. The plan also suggests actions concerning seal hunting, utilisation of seals (including seal tourism), preventing seal-induced damage, monitoring and research, education, and information and collaboration between stakeholder groups. The last action may include the forming of regional negotiation forums in which different interest groups are invited to participate. The regional administration may become more influential, but the management plan stresses that national game administration will have at least a coordinator role for the present.

In the Government Programme for 2007–2010 (Finnish Government 2007) the seal issue is first mentioned under the heading 'rural development': "The Government will seek to introduce a measure of flexibility to the policy concerning large carnivores to prevent carnivores and seals from posing disproportionate problems or insecurity to living and economic activities in

the rural areas. The Government will implement the approved management plans for large carnivores and seals."

The fisheries section in the Government Programme raises the seal problem twice. First it states that steps will be taken to prevent damage caused by seals and to develop the related compensation system. A substantial weight is given to the management of salmon fisheries, in regard to which the Programme mentions that "…the impact of growing seal populations on the fish stocks will be examined".

Dispute 2: The cormorants

The debate about cormorants and their effect on coastal fisheries is a recent phenomenon when compared with the grey seal problem. The number of the nesting cormorant pairs in Finland has increased from 10 in 1996 to 12,600 in 2008 (Finnish Environment Institute 2008). Until 2004 they nested in the Gulf of Finland, but recently the most rapid growth has occurred in other coastal areas. The birds are very flexible regarding nesting sites and efficient in finding fish for food.

The harm caused by cormorants is connected to fisheries and to the landscape. The fisheries-related problems stem from the bird's fish predation, which is considered as a threat to fishing and fish farming. The landscape-related problems include the destruction of the nesting trees and 'whitewashing' the islets with their faeces. These rapid changes in the coastal landscape caused by flocks of these big black birds are visible to the local people as well as to summer cottage residents. At this stage the landscape-related problems seem to provide stronger arguments for restricting the cormorant population than the fisheries-related arguments (Ronkainen 2006).

Cormorants have not caused such widespread damage to the Finnish coastal fishing livelihood as the grey seals have. However, those who want actions to be taken think the problem will soon escalate because of the rapid growth of the bird colonies along the coast; this is also apparent when drawing from the experiences from other parts of Europe. Many bird protectors, on the other hand, welcome the cormorant as a valuable addition to Finnish waterfowl. They want to see how far the population will grow and find no proper reason for restrictive actions. Thus the main difference of perception is related to the time scale and proof for action: whether action should be taken to prevent possible damage in the future or whether one should wait for scientific proof of damage before any action is needed. Illegal action, however, has been taken. Cormorant nests have been destroyed in all major Finnish sea areas in the 2000s. More than half of the colonies have been disturbed at least once (Finnish Environment Institute 2008).

One debate has touched on the credibility of scientific knowledge and generalisations about cormorants' diet and effects on fish stocks. The fishers' representatives have challenged the results presented by environmental researchers that suggest that cormorants eat mostly less valuable fish species (Mattsson 2005, Saarinen 2009). Fishers have also seen cormorants eating valuable fish species and injuring fish individuals. Cormorants are accused also of disturbing spawning fish and eating stocked fish. The total fish consumption of the cormorant has been calculated to be at the same level as or even to exceed the landings of commercial fishing (Kiuru 2006, Mattsson 2008). Mika Kiuru's (2006) calculations end up with the conclusion that the seals consume the largest proportion of fish stocks in the Gulf of Finland, followed by recreational fisheries.

According to the EU Bird Directive, cormorants are categorised as a protected species: the population can be hunted or otherwise reduced only under special circumstances. The Ministry of the Environment is responsible for cormorant management in Finland. The ministry has decided that if there is significant damage to fisheries the authorities can grant permission to disturb the bird colonies or cull the birds. No permits have yet been granted. The Managing Director of the Finnish Association of Professional Fishermen urges fishers to make applications for permits in order to get a better picture of the damage (SAKL 2006). On the other hand, he criticises

the instructions from the Ministry of the Environment, which allow a maximum of 70 birds allowed to be killed in Finland annually – "in Sweden they remove thousands of cormorants within one county annually".

The cormorant case is particularly international and this is not only due to the EU directive: the birds migrate long distances between the breeding and wintering areas across Europe and beyond (Cormorant Research Group 2008). During the last two decades cormorant-fisheries conflicts have attracted attention in several parts of Europe. An EU-funded project REDCAFE (Reducing the conflict between cormorants and fisheries on a pan-European scale) has studied these conflicts and this work is being continued by the INTERCAFE network. Conflict cases from 23 countries collected in the REDCAFE project occurred in rivers, lakes, aquaculture ponds and fishing and aquaculture along the coast line (Carss 2005). The main stakeholders were identified as recreational fishers, commercial fishers, aquaculturists and nature conservationists. The conflict settings, and the related interests and values, vary highly from historical carp pond districts, for instance, to anglers in rivers and commercial fishers on the coasts.

David Carss and Mariella Marzano (2005) state that "Given these conflicts, where the species causes 'serious damage' to specified interests such as fisheries and where other satisfactory solutions are lacking, several European Member States have derogated from their protective provisions with regard to the cormorant under Article 9 of the EU Bird Directive". In the European countries that were studied about 41,000–43,000 cormorants were killed annually as a control measure, nearly one half of these in France (Carss 2005). Also other methods for reducing the cormorant population, as well as non-lethal techniques for scaring the birds away, have been applied in many parts of Europe. In Denmark, cormorant nests have been exposed to one or more forms of management, especially egg oiling. These interventions have prevented further growth in the breeding population in specific areas and therefore are likely to have contributed to the decline in the total breeding population in Denmark in recent years (Bregnballe–Eskildsen 2009).

The European Parliament made a resolution on 4th December 2008 on the adoption of a European Cormorant Management Plan to minimise the increasing impact of cormorants on fish stocks, fishing and aquaculture (European Parliament 2008). This resolution calls on the Commission to submit a cormorant population management plan in several stages, coordinated at the European level. Among other duties, the Commission is also called on to carry out a comparative study of the contradictory conclusions concerning a cormorant management plan reached by REDCAFE, on the one hand, and FRAP (Framework for biodiversity reconciliation action plans) project and INTERCAFE, on the other.

Management plan and Government Programme

The Finnish management plan for the cormorant population was launched by the Ministry of the Environment in 2005 (Ministry of the Environment 2005). The plan was compiled by a working group, which involved representatives from the environmental administration, the commercial fishers' organisation, agriculture and forestry producers' organisations and the Finnish game and fisheries research institute. The plan summarises the knowledge about cormorants, cormorant-related problems and the institutional framework. It gives various general recommendations, but no detailed plan or schedule. A press release by the Finnish Environment Institute (2007) comments: "The plan recognises that the research done to verify potential conflicts is of poor quality, and urges for better information on the basis of which better decisions can be made".

The working group suggested the following actions for mitigating local problems: creating criteria in order to show the injurious effects, constructing a compensation system, preventing the damage by means of technical development and creating opportunities for restricting the cormorant population 'by force' (Ministry of the

Environment 2005). In a minority report for the cormorant management plan, the representatives of the fishers' organisation and the agriculture and forestry producers hold that the measures for solving the local cormorant problems should be taken without any delay. They also require actions to be taken by the EU to include the cormorant in a new annex of the bird directive, which would allow hunting.

In the Government Programme for 2007–2010 (Finnish Government 2007) the cormorant issue is raised under the heading 'biodiversity': "The control of populations of great cormorants will be permitted in areas beset by specific problems". A civil servant of the Ministry of the Environment, has stated that these areas are situated in the archipelagos where it is feared that cormorants eat the fish and destroy the trees (Turun Sanomat 2007). A scientist who monitors bird populations in the Finnish Environment Institute would have liked to follow the 'natural entrenchment' of the cormorant population. The views about the practical options for control of the cormorant population also differ. According to the civil servant, who has been involved in the preparation of the Government Programme, the measures are easy and inexpensive – such as breaking the cormorants' eggs (Turun Sanomat 2007). Drawing on international experiences, the scientist in the Finnish Environment Institute states that population control is laborious and ties up resources for years.

Governance challenges

The case studies of fisheries-environmental disputes illuminate the increased complexity of governance challenges in environmentalised fisheries. Fisheries governance has traditionally been a multifaceted task due to its complex interactions between the social, economic, technical, and natural spheres, but the animal-related conflicts add a new diversity of interests, values, and knowledge. The main focus of this article is on governance interactions, both intentional and structural. The case studies reveal many of the lively disputes which reflect and mould the images of the grey seal and the cormorant and their effects on fisheries. These images affect the selection and development of governance instruments, which link images to action. Especially in the cormorant-fisheries conflict the fishers are frustrated by the non-action – the scant implementation of conflict mitigation instruments. Fishers demand permits for concrete action, like shooting cormorants near the fishing gear. Action is not necessarily taken by the official system even when the conflict mitigation instruments are, in principle, agreed on; action or non-action is a question of different visions and perceptions, together with power. The illegal disturbance of cormorant nests manifests frustration and a need for local action. The structural dimensions interact with image formation, the design of governance instruments and action-taking in intricate processes. One dividing line in these processes often seems to run between the fisheries and environmental spheres and another between the rural resource user communities and the hierarchical science-based management.

Management plans are important policy instruments in the two studied disputes. Making management plans for animal species or animal groups is a relatively new phenomenon, which reflects the increase of environmental protection and attempts to manage animal-related tensions at different spatial levels. In the case of cormorant-fisheries interactions, even a European level management plan is considered important. The processes and outcomes of the national management plan for the Baltic seals and the Finnish management plan for cormorant population differed considerably. In the making of the former plan participation of interest groups was wider and the suggested instruments also included elements of co-management. Another type of policy instrument was the national Government Programme, which exerts political pressure for addressing the seal-fisheries and cormorant-fisheries conflicts. EU directives, legislation, agreements and permit systems have been used as formal instruments for species protection; the establishment of seal protection areas is one example. However, informal groups for discussion

and conflict mitigation have also been formed in the seal case. Many of the policy instruments provide forums for communication and collaboration between the interest groups, which include rural resource users, nature protectors, authorities and researchers. Similarly, the forums are used for developing practical instruments for conflict mitigation. Face-to-face communication and practical development work have been important tools for constituting legitimacy for governance action in the seal case, but not adopted for balancing the cormorant-fisheries conflict.

In line with the ideas of ecological modernisation, fishing technology development has become a core instrument for seal conflict mitigation. Gear development has aimed at enabling commercial fishing to continue without severely challenging seal conservation. The local co-operation between fishers, researchers and technical experts provides an important opportunity for collaboratively creating practical and context-dependent innovations for problem solving and building trust between the groups. These targets have not been fully reached, at least in the studied projects. In the Finnish cormorant-fisheries problem, the development of fishing gear technology is often considered less useful and devices for scaring the birds away from the fishing gear have not been widely tested. Shooting cormorants for scaring purposes or reducing the overall population divides the interest groups sharply: the methods are preferred by the fishers and many coastal inhabitants and are typically objected to by the environmental sector. In the seal case, hunting of seals is allowed, but the fishers demand more extensive hunting opportunities instead of strict regulations. Economic compensations for income losses and subsidies for investments in seal-proof fishing gear form less controversial but temporary types of conflict mitigation instruments.

Not long ago, the utilisation and regulation of animal species was in the hands of the people in the coastal communities. This former self-governance has turned into a hierarchical governance system, the actions of which are typically locally resisted in environmental disputes. In the seal-fisheries and cormorant-fisheries disputes, the governance system has increased in complexity due to the institutionalised sector barriers between two ministries supported by their sector research institutes. Both administrative sectors are involved in the governance of the grey seal and the cormorant, although the main responsibility lies with one ministry. Consequently, the main challenge lies in the increased complexity of governance interactions, connected with the environmentalisation process in fisheries. The examples of co-governance arrangements in the seal-fisheries dispute could be further developed for handling and discussing the multifaceted and diverse interactions and for reaching agreements on governing instruments and action in fisheries-environmental governance.

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