BOREAL ENVIRONMENT RESEARCH 3: 151–159
Helsinki 6 November 1998
ISSN 1239-6095

Towards sustainable vendace fisheries? Fishermen's conceptions about fisheries management

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Salmi, P. 1998. Towards sustainable vendace fisheries? Fishermen's conceptions about fisheries management. *Boreal Env. Res.* 3: 151–159. ISSN 1239-6095

The management and sustainability of commercial vendace fisheries in Finnish lakes were studied from the point of view of the fishermen. Their attitudes, problems and proposals for better arrangements were examined and the implications for the development of the fishery system were discussed. From the perspective of the fishermen, the main management problem is the lack of fishing opportunities due to the restrictive policy of the fishery associations. The fishermen feel they have been neglected by the local level of management and would rather rely on the state level and its district authorities. The attitudes towards ecological sustainability of vendace stocks varied widely. In many cases regulations were considered important in order to protect the fish resources. However, the fishermen also needed regulations to enhance socioeconomic sustainability. The commercial fishermen should be integrated more closely into the decision-making regime in order to reduce the likelihood of conflict.

Introduction

Background

Sustainable use of fisheries resources is commonly considered to be the overriding objective of management (articulated e.g. in the code of conduct for responsible fisheries, FAO 1995). Sustainable development is often broadly defined to include not only ecological sustainability but also economic, social and cultural dimensions (e.g. Willberg 1993, Rannikko 1997). According to Charles (1997), the long-term well-being of the fishery requires the simultaneous achievement of multiple sustainability criteria, ie. ecological, socioeconomic, community and institutional sustainability. The focus has been on sustainable outputs but there is a need for a new emphasis on the sustainability of the fishery system as a whole (Charles 1997). Crean and Symes (1996) emphasized that fisheries management is in crisis, and that there is a need to define and elaborate a set of social goals for fisheries policy to set alongside those of resource sustainability and economic efficiency.

According to Pettersen (1996) one condition for sustainable development is that it should increase people's control over their own lives. This is connected with the concept of 'subsidiarity' (*see* e.g. McCay and Jentoft 1996) adopted by the EU in accordance with the Maastricht treaty. A co-management arrangement has been presented where responsibility for resource management is shared between the government and user groups through their co-operative organizations (e.g. Jentoft 1989, Dubbink and van Vliet 1996, OECD 1997). Pinkerton (1994) argued that the procedures of co-management would encourage the different interest groups to work towards mutual targets. A co-management arrangement can form one type of 'knowledge interface' (*see* Arce and Long 1994) which provides the basis upon which bridges can be built between actors with opposing interests and different lifeworlds.

This article focuses on the management and sustainability of commercial lake fisheries in Finland from the point of view of the fishermen. The group of commercial fishermen includes both full and part time fishermen. Their attitudes, problems and proposals for better arrangements will be examined based on material obtained from qualitative interviews. Also the implications for the development of the fishery system will be discussed from the perspective of different forms of knowledge and options for building the bridges between interest groups. However, some background information about vendace fisheries and local conflicts will first be outlined.

Vendace fisheries and local disagreements

Vendace (*Coregonus albula* L.) has traditionally been of highest importance in commercial lake fisheries due to the high appreciation it enjoys among Finnish consumers. The commercial vendace catch in 1995, about 2 million kg, was mostly harvested with trawls (40%) and winter seines (34%) (Finnish Game and Fisheries Research Institute 1996). These effective fishing methods have been substantially developed for the last 15 years by professional fishermen. The rest of the commercial catch is caught by gill nets, summer seines and trap nets.

Unlike in continental Europe, passive gear is also commonly used in recreational fisheries in Finland. Vendace is actively harvested by recreational and subsistence fishermen with gill nets partly in the same lake areas as professionals. In the 1990s, the annual vendace catch harvested by recreational fishermen exceeded that of commercial fishery (Turunen *et al.* 1998). Recreational fishermen form the most significant group using the inland fishery resources, amounting to 1.4 million fishermen (Finnish Game and Fisheries Research Institute 1995). There are 1 100 commercial fishermen in 730 fishing enterprises in Finnish inland fishery (Salmi *et al.* 1997).

The management of vendace fisheries proved to be problematic and even caused open conflicts concerning the use of effective commercial fishing gear, especially trawls and winter seines. Strong fluctuations are typical for vendace populations and catches (Turunen *et al.* 1998). A relatively long period of scarce vendace stocks increased demands to limit the fishing pressure in the early 1990s. The disputes reflect the problems of sustainability: it is argued that commercial fishery threatens the sustainable and equitable allocation of fish stocks (Salmi and Auvinen 1998). The local disagreements over vendace fishing include elements of several types of conflict. In addition to the horizontal disagreements between user groups, the disputes also reflect vertical management disagreements which focus on power and knowledge (Salmi and Auvinen 1998).

Most of the inland water areas are owned by private land owners and managed collectively by statutory fishery associations. In a few of the largest lakes, there are also public water areas. The most prominent groups in the conflicts are the local 'owner-fishers' (Salmi and Auvinen 1998), and the professional trawl and winter-seine fishermen. Owner-fishers, who use passive fishing gear mostly for recreation or subsistence, form an important group of decision makers in the fishery associations. Although some of the professionals are shareholders of the fishery associations, they have little influence in the decision making. Other recreational fishermen, administrative authorities and researchers constitute the other significant parties involved in the disagreements.

The management of fisheries in Finland is organized in three levels. The local level includes the fishery associations (over 10 000). The fishery associations and also commercial and recrea-

tional fishermen are represented in the supervisory board at the next level of the management regime, the Fishery Regions (222). The Fishery Regions are relatively new organizations which aim to promote planning and decision making in larger water areas than the fishery associations. The central authorities in the regime are represented by the Ministry of Agriculture and Forestry and the Fisheries Sections of Rural Business Districts (11) at the regional level. The local decision makers rely on owner rights, yet the state has the power to enhance the use rights of more recently formed user groups and foster 'rational' fisheries through the legislation and fishery authorities (Salmi and Auvinen 1998).

Material and methods

The material was collected by interviewing 60 lake fishermen in all parts of Finland, in connection with an extensive research project (*see* Salmi and Salmi 1998). Both structured and unstructured methods (*see* e.g. Fielding 1993) were used in the interviews. This study deals with the parts of the quantitative and qualitative material concerning fisheries management, especially regulations, in the freshwater fisheries.

Prior to interviews, the inland fishermen were divided into three groups according to their main fishing method: (1) trawl fishermen, (2) winter seine fishermen, and (3) fishermen using other gear. Vendace was the most important fish species for the majority of the fishermen interviewed, especially in groups 1 and 2. In the first two categories, 20 percent of the interviewees were selected randomly. Five percent of the fishermen were randomly selected from the third, largest group. However, every third of the originally-sampled fishermen were replaced due to, for example, their retirement from the profession. Both structured and unstructured interviews were made consecutively with the same interviewees. The structured interviews were completed with 60 fishermen and the unstructured with only 52, because eight respondents refused to give a qualitative interview (Table 1).

The material on inland fishery was collected by face-to-face interviews during 1995. The structured questionnaires included 43 questions which can be divided into three main categories: (1) basic information about the fishermen, (2) their motives, problems and decision making; and (3) flexibility and attitudes towards the future. Questions concerning economic resources and profitability were also important.

An interview guide including nine main topics was constructed for use in the unstructured interviews. The conversation was to proceed freely within the framework of the topics. These qualitative interviews were taped and transcripted. The transcripted interviews were coded in order to make the analysis of the substantial qualitative material possible. The fragments of the texts could be categorized according to their substance into five main categories: (1) occupation, (2) nature and the environment, (3) other fishermen, (4) society, and (5) clients and market.

The qualitative material used in this article was gathered from the transcripted interviews of the 52 fishermen, namely the parts which dealt with the following sub-groups of the category 'society': (1) fisheries management (38 text pages), (2) water ownership, fishing permits and control (62 text pages), and (3) co-operation with authorities (53 text pages). This material was further categorized according to the contents of the arguments used, with special attention being focused on the statements regarding fisheries management. The relationships between categories and subcategories were also studied in the analysis (Strauss and Corbin 1990). The goal was to draw a picture of the way fishermen outline the problems in fisheries management and of their attitudes towards it.

Results

Fishermen and their motives

Commercial fishermen form a heterogenous group when considering their fishing strategies and eco-

Table 1. The number of structured and unstructured interviews.

Category	Structured	Unstructured
Trawl fishermen	19	17
Winter seine fishermen	24	20
Other gear	17	15
Total	60	52

nomic circumstances as well as their motives and attitudes. Most of the interviewed fishermen used a combination of more than one fishing method during the year. The trawl and winter seining categories each consist of 100 enterprises. The fishermen using other methods, i.e. summer seining, gill nets and trap nets, constitues the largest group. Two out of five inland fishermen earned more than one half of their total income from fishing. Trawlers and winter seiners, who have a more professional orientation towards the occupation, and made higher investments, were more dependent on fishing income than those using other less effective methods.

The freshwater fishermen's average age was 45 years, ranging from 27 to 66. Most of them lived in rural areas, though 32 percent lived in or near a city. More than one half of the fishermen had only elementary school as their formal education. Professional training in fishery was acquired by 12 percent. The fishing enterprises commonly harvest lake areas owned by statutory fishery associations in which the fishermen are shareholders or else they harvest rented water areas. However, 36 percent of the trawlers use mainly public water areas.

The fishermen usually have a long-term commitment to their profession. The most important reason for becoming a commercial fisherman was the continuance of the profession within the family. The fishery is still family-based, and family members commonly take part in fishing activities. For trawlers also the low level of alternative earnings, eg. from agriculture, was an important reason for starting to fish. Good earnings were rarely the most important motive for becoming a fisherman. Most of the fishermen aimed to secure a reasonable income for their family. Only 10 percent of the respondents stated that their main target was to catch as much fish as possible or to maximize their income.

Table 2. The disadvantages of the profession in %.

	Trawlers	Winter seiners	Other gear
Variability of fish stocks	68	57	58
Fishing regulations	21	14	6
Economic risks	11	14	12
Too dependent on nature	–	10	24
The growth of competition	–	5	–
Total	100	100	100

The fishermen regarded their independence as the best quality of their profession. More than half of the trawl and winter seine fishermen mentioned this. The greatest problem in the profession was the variability of the fish stocks (Table 2), and in particular the long-lasting period of scarce vendace stocks which has made commercial fishery difficult in many areas. Many of the trawl and winter seine fishermen found fishing regulations problematic. Their dependence on nature was considered the most negative aspect of the profession especially by the fishermen using other fishing methods.

Attitudes towards fishery management

Fishing gear regulations and catch quotas were often regarded as the least desired management tools among the inland fishermen according to the structured survey (Fig. 1). A substantial part of the winter seiners and trawlers did not approve of regional restrictions. Limiting the access of new enterprises to the fishery was most often considered as the best course of action for vendace fisheries management among trawlers and winter seiners, whereas regional and seasonal regulation were preferred among fishermen using other gear.

The selected material of the qualitative interviews can be classified into the following four main categories of arguments: 'fishermen want freedom', 'regulations are necessary', 'limited access to waters hinders fisheries' and 'more cooperation'.

Fishermen want freedom

The group of arguments which stress the need for freedom in decision making for the entreprises engaged in vendace fishery can be divided into the main argument on the one hand and the grounds for it on the other. One of the reasons presented especially by the trawl and winter seine fishermen is that overfishing of the vendace stocks is not technically possible, at least in the present circumstances. The restrictions are considered unnecessary because present fishing pressure — e.g. operating only on a part of a lake — cannot

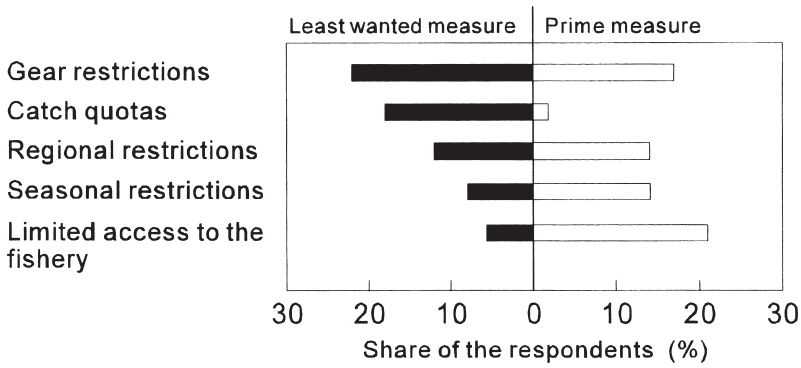

Fig. 1. The opinions of the interviewed fishermen concerning the best and the least preferred method of regulating the lake fisheries.

endanger the recruitment of the stocks. The fisheries are commonly seen as a self-regulative system where profitability restricts the fishing pressure before the vendace stocks decrease to a critical level. From the perspective of these fishermen, commercial fishermen should also be allowed to move without restrictions to new fishing areas according to resource availability.

Another reason for the free professional harvesting of the vendace stocks is presented in the argument which stresses the need for effective utilization of the fish stocks. This view is supported by the Finnish Fishery Act. Fishermen stress that only efficient commercial fishing is able to harvest vendace stocks to a sufficient extent, and without this fish resources would be wasted.

Regulations are necessary

Many of the fishermen emphasized the need for outside regulations in vendace fisheries. The interviewees presenting this view based their arguments on two different grounds dealing with either economics or the fish stocks. The former arguments point out that the number of fishermen should be restricted in order to secure sufficient profitability for the fishing enterprises. Some fishermen stressed the importance of the regulation of non-professional fishery.

Those who based their argument on the sustainable use of the resource considered that overexploitation of vendace stocks is possible. Trawls, seine-nets, gill-nets and trap-nets were characterized as effective gear and hence should be regulated in order to protect the stocks. Many of these general arguments were followed by statements that one's own fishing method was less harmful to the vendace stocks than those used by others. For example, winter seiners wanted to restrict trawling or summer seining and fishermen using other gear would limit the intensity of winter seining. However, a few fishermen were also ready to restrict the extent of their own fishing method, for example by limiting the number of fishing days permitted in a week.

Limited access to waters hinders fisheries

A common argument presented by the trawl and winter seine fishermen was that limited access to fishing areas weakens the operating conditions of the fisheries and increases uncertainty. Fishermen stress that the fishing rights of commercial fisheries are protected in law. Difficulties arise especially when fishermen are not shareholders in the statutory fishery association where they apply for permits. Fishermen seldom have problems with their own association, but the professionals, especially trawlers, usually need larger areas than are covered by a single association. Hence, from the fishermen's perspective, the access to water areas for professionals should not depend on ownership. They complain that the permits are too expensive and granted for too short a period. These difficulties have increased fishing pressure in the public water areas where permits for trawl fishing have been granted more liberally by the authorities.

The difficulties in obtaining fishing permits were attributed to (1) the age and envious disposition of the decision makers in the statutory fishery associations, and also (2) lack of knowledge: the decisions are based on unfounded assumptions. The fishermen argued for a change in attitudes

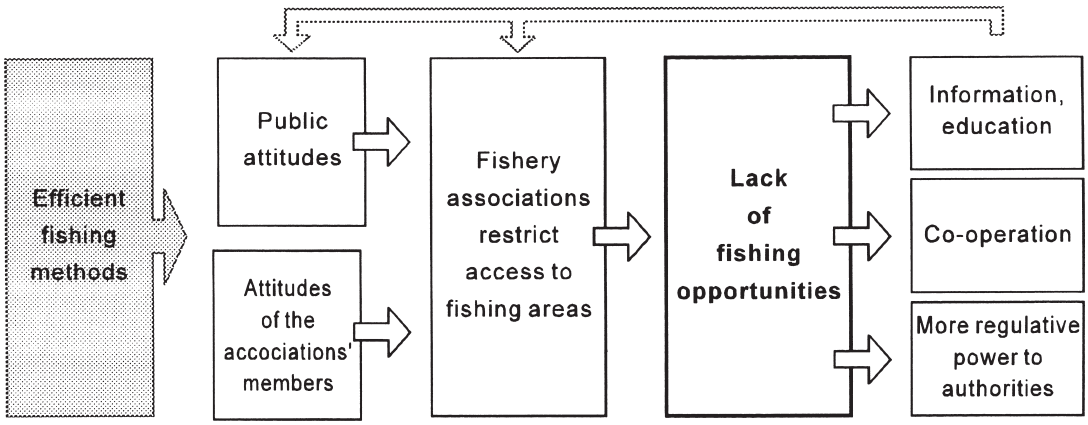

Fig. 2. The relationships between categories based on the qualitative analysis: the main problem (i.e., lack of fishing opportunities), its conditions and development strategies presented by the commercial fishermen.

through education. In this way, they claim, attitudes towards commercial fishery could be improved at least for the younger generation. They also call for more factual information to be made available to the public. The interviewed professionals stress that they have a better knowledge of fishery and its influences than the public in general due to their long experience. Yet, according to the commercial fishermen, public opinion has a strong effect on the restrictive policy of the fishery associations.

More co-operation

In general, the fishermen frequently had an ambivalent attitude towards the managers and other authorities, including researchers and consultative officers. However, in the context of fisheries regulations and fishing permits the attitude was usually positive. The state authorities have often supported the interests of commercial fishermen in conflicts and consequently many fishermen would prefer that the public authorities, with their less restrictive management policy, grant fishing permits rather than the fishery associations.

Many of the interviewed fishermen feel that regulations concerning commercial fishery should be implemented only after consultation with the professionals. They also argue that fishermen should co-operate more actively with each other. More co-operation is needed, for example, in the negotiations about permit fees. Though many fishermen argued for greater co-operation, they seldom commented on the function or structure of the whole decision-making regime. They rarely discussed the actual and potential role of the Fishery Regions, in which commercial fishermen have representatives, e.g. in the negotiations about fishing permits.

The central problem: lack of fishing opportunities

The first two main categories illustrate the variation in fishermen's attitudes towards problems and the need for regulations. The respondents' arguments vary widely from calls for more freedom and a so-called laissez-faire mentality to the demand for strict top-down regulations in order to protect the fish stocks. This reflects the heterogeneity of inland fishery. Yet the arguments, whether stressing freedom or regulations, are based on economic efficiency and resource sustainability.

At the centre of the fishermen's views concerning the management and regulations of vendace fishery was the problem of insufficient access to water areas. They suggested that the restrictive policy of the statutory fishery associations has resulted in a lack of fishing opportunities for commercial fishermen, especially in the context of the most efficient methods (trawl and winter seine) (Fig. 2). This was seen as a result of negative public attitudes and the attitude of the members of the fishery associations, both of which emphasize the supposed disadvantages of intensive fishing.

Fishermen suggest that negative public attitudes and the characteristics (lack of knowledge, age) of the members of the fishery association lie behind the restrictive policy. According to the interviewed fishermen, the lack of fishing opportunities is due to this tendency of the associations. The strategies for better vendace fishery management are proposed, from the perspective of the professionals, in order to develop the structure of the management regime and to remove the conditions of the present undesirable situation.

Discussion

During the last few decades the constraints of the profession shifted from nature towards society (Salmi and Salmi 1995a). Advanced techniques have reduced dependence on, for example, weather and fish migrations. Also the results of this study stress that the fishermen find management decisions problematic. When asked about the negative aspects of the profession none of the trawlers named dependence on nature but stressed the problems caused by regulations. Yet the variations in the fish stocks was a paramount problem because of the low densities in vendace stocks. Contrary to the opinions of the local decision makers, most of the commercial fishermen argued that the actual decline of vendace stocks was caused primarily by factors other than fishing. The fishermen found support for this view from the authorities and fisheries research (Salmi and Auvinen 1998).

The fishermen feel that the increased social pressure threatens to reduce their independence. This is seen in their attitudes towards different regulation measures: gear restrictions, regional restrictions and catch quotas restrict the fishermen's alternatives while the preferred method, limitations in the recruitment of new enterprises, reduces competition and gives more freedom to active fishermen.

In the literature dealing with fishing communities, the management actions of central government were commonly seen as being one-sided and in conflict with the opinions and practical knowledge of the local commercial fishermen and their community (Salmi and Salmi 1995b). Yet in the case of Finnish inland vendace fisheries, particularly among trawlers and winter seiners, the situation is quite different: the fishermen do not commonly consider local communities — the managers in this case — as an answer to sustainable fisheries. The fishermen feel that they have been passed by at the local level of management and would rather rely on the state level and its district authorities. While the fishermen value the independence of their work, they apparently feel that more freedom would be gained by relying on central bureaucracy. The 'rationalistic' arguments of the professional fishermen appear more in keeping with the views and management strategy of the fisheries authorities. Although it is reasonable to argue that the same fishermen would attack any actor trying to restrict their independence and fishing activities, one can conclude from the experiences of the vendace fisheries that localized management or private ownership of the resource do not necessarily provide better or more sustainable fisheries management.

In addition to the management level, Sen and Raakjaer Nielsen (1996) also emphasized the importance of the scale of and participation in a management system. In the context of the Finnish commercial vendace fisheries, the decentralized management structure does not offer clear benefits of user participation or co-management. Problems have also arisen because the scale of the management tasks concerning modern commercial fishing is larger than that of the typical local decision maker, the fishery association.

How can the fishery disputes described in this article be reduced and hence moved towards a more sustainable situation? The main hope lies in the fishermen's willingness for co-operation with the decision makers and among themselves. The commercial fishermen should be integrated more closely into the decision-making regime in order to reduce its susceptibility to conflict. If the fishermen could take part in the decision-making process, their dependence on the fishery associations' 'one-sided restrictions' caused by 'unsound knowledge' could develop instead into co-operation or at least bring about a reduction in suspicion between the groups. Hence the differing types of knowledge and interpretations of sustainable use of fish resources could be accumulated and combined in an effort to reach mutually acceptable goals.

The heterogeneity of the fishermen covers their fishing strategies, commitment to the profession as well as their consciousness of the decision-making regime. Finnish commercial fishermen have generally been poorly organized, partly due to this heterogeneity (Salmi and Salmi 1998). Yet representation in the decision-making process also requires more co-operation among the fishermen themselves.

The critical question is how to provide an institutional framework which offers a 'knowledge interface' for the involved groups of users and decision makers in which the different aspects of sustainable development could be balanced. A bridge between those with opposing interests and different lifeworlds could be built using the Fishery Regions, which are located between the local level and the national authorities. This would offer a potential institutional arrangement for co-management at least in connection with large-scale issues, for instance the management of modern commercial or mobile recreational fisheries. However, while the Fishery Regions have improved the availability of licences for recreational fishing over large areas (Sipponen 1995), they have not achieved a recognized status when managing the commercial fisheries.

Acknowledgements: Jukka Oksa from the Karelian Institute at the University of Joensuu, and Kari Ruohonen and Martti Rask from the Finnish Game and Fisheries Research Institute are thanked for their valuable comments on the manuscript. The author is also grateful to Juhani Salmi and Pentti Moilanen for their support in supplying material and fruitful cooperation during the research project.

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Received 23 October 1997, accepted 4 August 1998