Sharing the Baltic salmon

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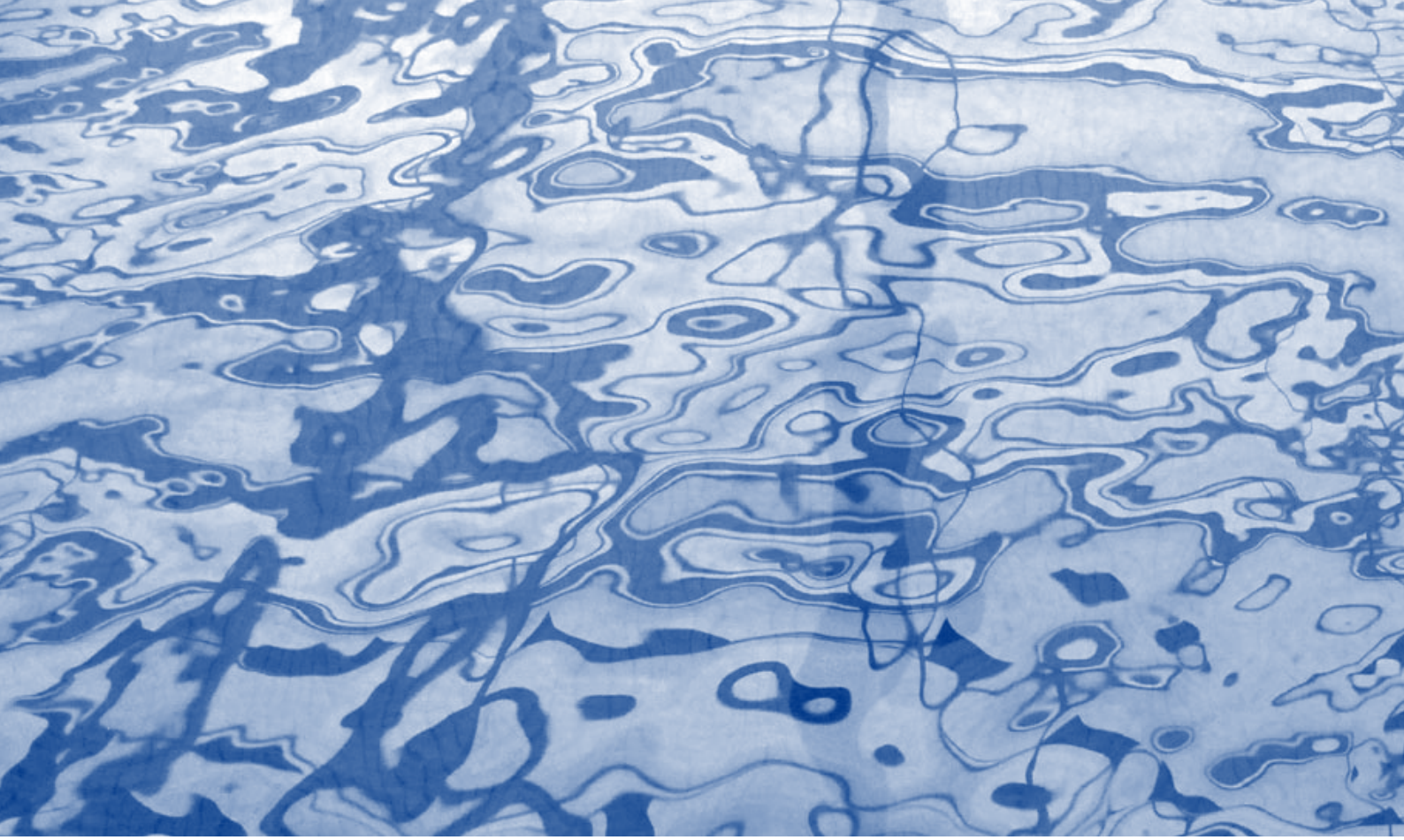

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Abstract

I study ways for increasing the impact of economically sound advice in the contexts of European Union's Common Fisheries Policy and Finnish national fisheries policy. At the international level, I propose two solutions. In the short term, particpation in the work of Regional Advisory Councils (RACs) provides a direct channel for economists to highlight the ways towards policies that enable both the profit-making fishing sector and healthy fish stocks. In the long-run, a reform of institutions that provide the scientific advice towards bioeconomic stock assesment, enables the research resources to be allocated in a more productive way. At the national level, I argue that individual transferable quotas (ITQs) would provide the best solution for the sharing issues related to Baltic salmon

Introduction

At the beginning of 21st century, the European Union (EU)'s fisheries management was in crisis. Overcapacity of fishing fleets and declining of the most important commercial fish stocks have led to situation where both the profits and employment of fishing industry decreased. To these ends, the EU's Common Fisheries Policy (CFP) was reformed in 2002. The objectives of the CFP that are: (1) responsible and sustainable fisheries and aquaculture, (2) an economically viable and competitive fisheries and aquaculture industry which will benefit the consumer and (3) a fair standard of living for those who depend on fishing activities, did not change substantially (Commission of the European Communities, 2002). On the contrary, the reform was the interpretation of the objectives and the ways to achieve these objects (Symes 2005).

Disjuncture between the key divisions of CFP – resource conservation, structural and economic development – precluded working out the policy objectives. Therefore, the reformed CFP emphasizes the integration of conservation and structural policies through multi-annual stock assessment complemented by fleet management system. This integration aims to prevent situations where fishing effort increases while conservation objects call for reduction in fishing effort (Symes 2005). Furthermore, in order to achieve the conservation goals, the quality and transparency of scientific advice underlying the policy decision has to be improved (Commission of the European Communities, 2002). However, several shortcomings of the CFP practices have to be overcome so that the potential improvements of scientific advice will be implemented in final decisions. The improvement of science impact on policy calls for co-operation between policy makers, scientists, fishers and other interest groups and integration of social and fisheries sciences (Daw and Gray 2005).

As I pointed out, current literature emphasises the relation between fisheries science and policy and integration of policy divisions. Even though the European Commission aim is a viable and competitive fishing sector,

economic research has had remote effect on fisheries policy. I suggest that this is due to the decision makers' ignorance of the general results of fisheries economics i.e. economically sound fisheries policy enables both the profit-making fishing sector and healthy fish stocks. Furthermore, one may think that economic methods and reasoning are hard to understand for decision makers, whose background or experience is in natural sciences. Deacon *et al.* (1998) argues that the minor impact of economic research on fisheries management results from stylized biological models used in economic analyses. However, natural resource economists have started to bring the economic models up to date with the complexity and realism of biological modelling of fish stock dynamics (see e.g. Bjørndal *et al.* 2004: Kulmala *et al.* 2006).

Recently in Finland, Michielsens *et al.* (2005a; 2005b) and Kulmala *et al.* (2007) have taken the first steps towards interdisciplinary research that considers biological, economic and social aspects of fisheries management while taking into account the subsequent use of the results in decision making processes. The demand for integration of socio-economic aspects to biological advice had been brought up from several directions (see e.g. European Commission 2001; Daw and Gray 2005). The objective of the present study is twofold. By using Baltic salmon as our case study at first, I consider the current bodies and decision-making processes of CFP. The aim is to find a way, how to increase the impact of economic advice in fisheries management. Secondly, by reviewing Finnish fishing regulations I propose a solution to the national sharing issues related to salmon.

Science, CFP and Baltic Salmon

The reform of the CFP in 2002 and the axing of the International Baltic Sea Fisheries Commission (IBSFC) in 2005 are the two driving forces of change in European fisheries management processes. First, after Estonia, Latvia, Lithuania and Poland joined to the EU, the Russian Federation became the only non-EU-member coastal state of the Baltic Sea (Figure 1). Previously, within the IBSFC six contracting parties: the European Community (representing Denmark, Germany, Finland and Sweden), Estonia, Latvia, Lithuania, Poland, and the Russian Federation negotiated the fishing rules. These negotiations were based on fisheries research carried out by International Council for the Exploration of the Seas (ICES). After the enlargement of the EU, IBSFC became unnecessary and was closed down in 2005.

Second, CFP has largely failed to achieve its object – sustainable fisheries management. Daw and Gray (2005) explain the failure by examining the supply and demand of fisheries science within the CFP. They found that policy makers' short-term interests in their electorates and scientists' disinterests towards fishers' knowledge and socio-economic aspects inhibit the efficient incorporation of scientific advice into practical policy.

The first place for science to contribute to the CFP decisions is within the working groups of ICES (Figure 2). For instance, the Baltic Salmon and Trout Working Group assesses the status of salmon stocks and provides stock projections. The Advisory Committee on Fishery Management (ACFM) then formulates the scientific guidelines concerning total Allowable Catches (TACs). Before entering to European Commission's Directorate-General of Fisheries and Maritime Affairs, the economic repercussions of the guidance will be assessed by STECF (Scientific, Technical and Economic Committee for Fisheries). Contrary to the ICES species-specific approach, by using the bioeconomic EIAA (Economic Interpretation of ACFM Advice) model, STECF provides estimates of recommended TACs' effects on the economic feasibility of different fishing fleets that may harvest multiple species. However, the impact of economic aspects on biologically based advice

Figure 1. States of the Baltic Sea. Arrows illustrates the migration routes of the salmon in the Baltic Sea. Salmon are harvested in the Baltic Main Basin, in the Gulf on Bothnia, and in rivers during the feeding and spawning migrations.

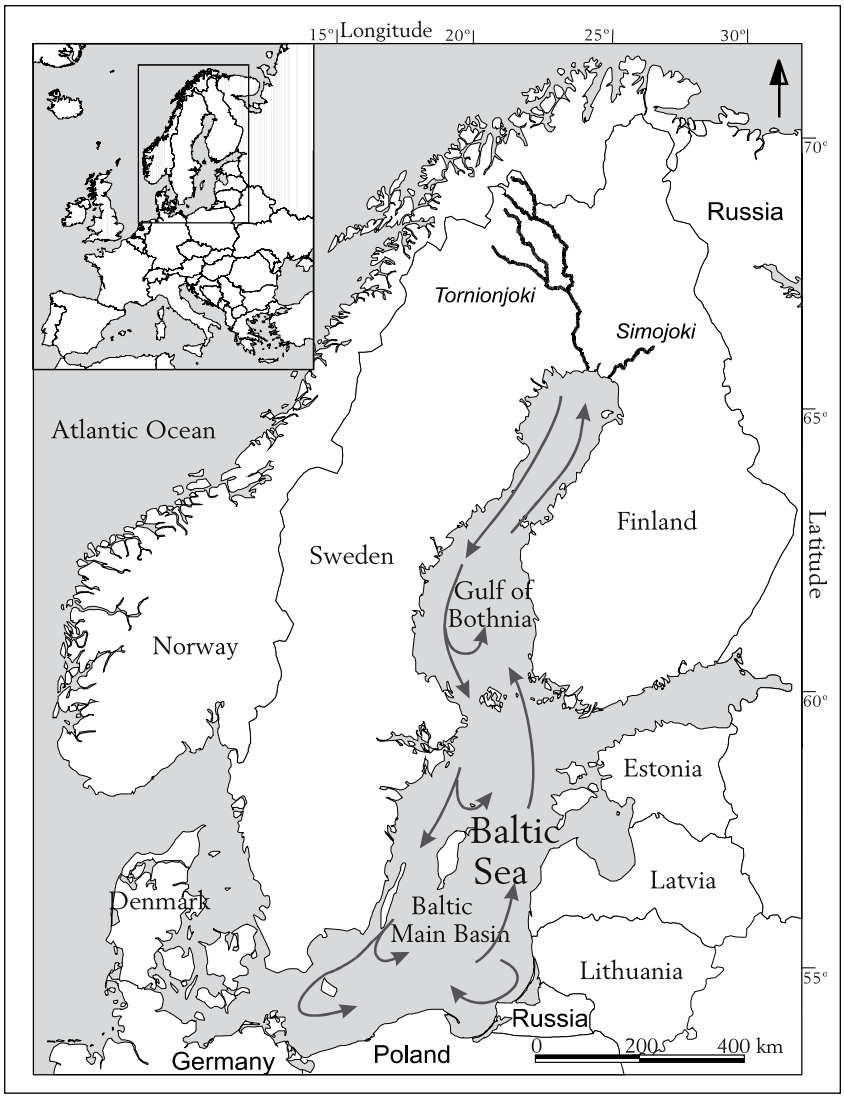
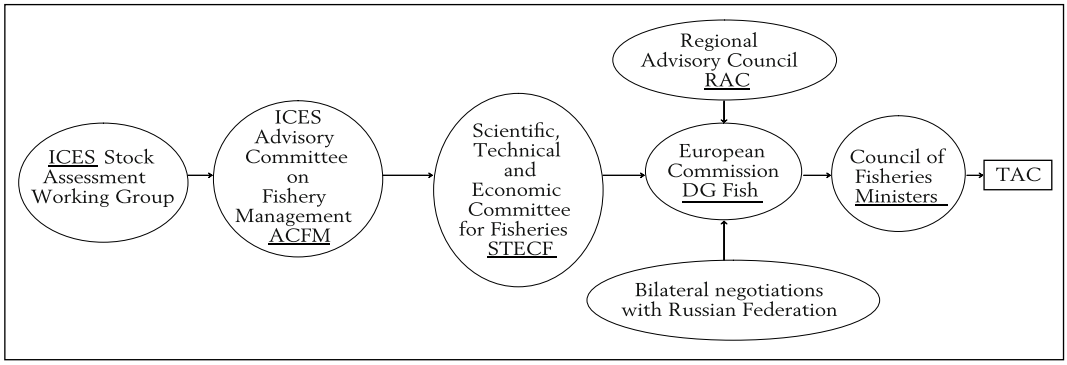


Figure 2. Schematic presentation of the main bodies within CFP decision process of fishing regulations.



is insignificant, since in most cases, STECF just agrees with ICES advice (Commission of the European Communities, 2005a). The tendency of concur with biological advice may originate from the time limits set to STECF's work and the deficiencies in economic data sets. For instance, price and costs data used in estimations of the economic consequences of TACs proposed for 2006 relates to 2004 (Commission of the European Communities 2005b).

Regardless of the substantial research input of ICES and STECF, the effect of their recommendations on the final management guidelines have been inconsequential. Political reasons and the principle of relative stability have combined to water down the scientific guidance. While negotiating on TACs the members of Council of Ministers by knowing beforehand the TAC level that preserves or increases the national quota, try to maximise their popularity with their electorates (Boude *et al.* 2001; Daw and Gray 2005). The TAC for Baltic salmon was first introduced in 1991, since then to 1999 the landings of salmon were greater than TAC i.e. unrestrictive 'paper-quotas' have been set to Baltic salmon. Since 2000 landings have been smaller than the agreed TAC, but both the agreed quota and landings have been over the scientific recommendations. (ICES 2004).

One of the reformed CFP's governance principles calls for greater and broader stakeholder participation in designing and implementation of policy (Commission of the European Communities 2002). Increasing the involvement of local and regional actors whose interests CFP affects, Regional Advisory Councils (RACs) will be created. Representatives of fishermen, scientists, aquaculture sector, non-governmental organisations related to the environment or comsumer interestes and administrators will be allowed to contribute to the CFP by informing the comission of the potentia problems of the CFP or by submitting their own suggestion to overcome the shortcomings of policy implementation. On the other hand, the commission could consult RACs on proposed management measures (Europa 2003).

The Baltic Sea Regional Advisory Council (BS RAC) will be formally established in 2006; the 1st General Assembly will be held on 15th of March 2006, in Copenhagen (http://www.cbss.st/calendar/). BS RAC will prepare and provide recommendations on the Baltic Sea fisheries management on behalf of the fisheries sector and other interests groups in order to achieve successful CFP. The bodies of BS RAC include members that attend a general assembly, an executive committee and secretariat. All organisations within the Baltic Sea region which the CFP affects will be given opportunity to participate, however the proposed allocation of seats in the general assembly and executive committee allots two-thirds to representatives of the fisheries sector and one-third to representatives of the other interest groups. According to provisional lists of BC RAC members, the fishing sectors from Denmark and Poland, will have the broadest representations and the representation of other interests will be dominated by Swedish and international members. In

order to achieve transparency, the reports of all activities will be available at a website and the general assembly and the meetings of the executive committee will be open to the public
(http://www.fishsec.org/news_bracestablishment.htm).

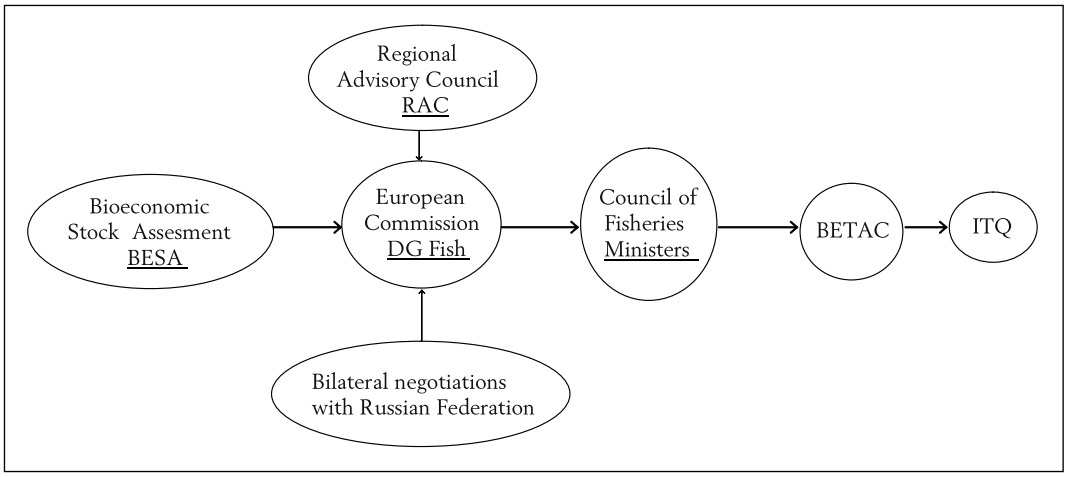
Proposal for a reform of scientific advice

Figure 3 presents a proposal for a reform of the bodies and decision process of CFP. By considering the chain of CFP decision bodies that scientific advice needs to pass down before it may affect final decisions one may think that RACs would be the place through which economic advice may have shortest way to contribute. I argue that the chances of economic reasoning to be supported by RACs increases if the awareness of the general fisheries economic results expands. This is due to the fact that economically sound fisheries management increases the economic feasibility of the fishing sector while maintaining healthy fish stocks. Of course, in practice, optimum economic advice is hard, if not impossible to achieve, but generally the economic guidelines are more conservative than biological advice.

Participation on RAC work is possible right away, but the long-term object should be to simplify the current decision making system of the CFP. The European Commission has already launched a process of legislative and administrative simplification of the CFP (Commission of the European Communities 2005c). I argue that a simplification of the stock assessment and the whole procedure of giving scientific advice would respond to the requirements of sustainable development and more effective, efficient and transparent fisheries policy. The work carried out by ICES stock assessment groups and STECF could be done by one organisation running a single bioeconomic stock assessment. The model would project the status of the stock and assess the economic consequences of policy options (Figure 3).

The reform proposed here presumes transition from population dynamic models of one fish species to a multi-species modelling and close co-operation between fisheries scientist and economists. However, the first steps towards interdisciplinary fisheries science, without institutional changes, could be taken by constructing a bioeconomic stock assessment model, for instance for Baltic salmon by developing the existing models (see e.g. Michielsens *et al*. 2006; Kulmala *et al*. 2006). Finally, I argue that the objectives of CFP can be achieved only after implementation of EU-wide individual transferable quotas (ITQs) that should be based on biologically and economically sound TACs i.e. BETACs (Figure 3). It is important to note that EU already exploits the basic principles underlying ITQs within the Emission's Trading Scheme to combat climate change.

Figure 3. Proposition for reformed CFP bodies and decision processes.



Sharing the baltic salmon in the national framework

In the Baltic Sea region, salmon stocks have been and still are the most controversial resources. In addition to international management measures set down firstly by IBSFC and later by CFP, the states of the Baltic Sea have their own national salmon fishing regulations. Within this section I discuss the possibilities of using individual transferable quotas (ITQs) to manage the Finnish salmon fishery. Within CFP, each member country has the power to decide how to share their national fish quotas. For instance, Denmark, Estonia and the Netherlands to some extent use ITQs. Salmon is a migratory species and therefore an EU-wide international ITQ-system could be the context of the present study. However, I argue that a possible implementation of salmon ITQs within a one member country will be a first step towards EU-wide ITQs for salmon.

Before the 1940s, 80-120 rivers in the Baltic Sea region contained wild salmon stocks (IBSFC and HELCOM 1999). Today, only some 40 stocks remain. Damming, habitat destruction, pollution and intensive fishing have all been identified as causes of the decline (Karlsson and Karlström 1994). IBSFC responded to the salmon conservation calls of scientist, fishermen, administrators and environmentalists by establishing the "Salmon Action Plan (SAP) 1997-2010". SAP aims to prevent the extinction of wild salmon populations, increase the natural production of wild Baltic salmon, re-establish salmon wild populations in potential salmon rivers, and maximize the yields of the salmon fishery. In order to safeguard the salmon stocks and maintain the fishing possibilities an intensive stocking of hatchery-reared juvenile salmon has been carried out; during 1987-2004 the annual number of stocked hatchery-reared salmon was near 5.3 million (ICES 2005). Consequently, wild and reared origin salmon coexist by forming the Baltic salmon stocks.

A characteristic for the salmon fishery is that fisheries differing in terms of fishing time, place and gears harvest salmon sequentially. Offshore driftnet and longline fisheries harvest feeding salmon in winter in the Baltic Main

Basin and coastal fisheries operating with trap, drift and gillnets harvest spawning migrating salmon in the Gulf of Bothnia in summer and finally, in autumn, when spawners reach their home rivers they are harvested by anglers. In the Gulf of Bothnia, spawners migrate mostly along the Finnish coast (Figure 1). Offshore and coastal fisheries are mainly commercial while the river fishery is recreational; in addition subsistence fishing exists.

At the beginning of the 20th century, Baltic salmon reproduced naturally in 18 Finnish rivers. Today only two stocks remain. The stocks of rivers Tornionjoki and Simojoki have been managed mainly through stockings and fishing time restrictions. In order to protect wild spawners, especially old females, Finland enforced early-season closures for coastal fisheries in 1986. That is due to the fact that wild salmon have a tendency to start their spawning migration earlier than reared salmon. Time restrictions were slight until 1996, when the Gulf of Bothnia divided into four fishing zones. In 1996-1997, salmon fishing in the southernmost zone was restricted from 1 March to 20 June, from which the opening of fishing within each subsequent zone was delayed by five days; therefore the fishing within the fourth zone was allowed to start on the sixth of July. From 1998 onwards, the opening of each fishing zone was relaxed by five days, and the closed season was postponed by two months in zones one and two and by one month in the northern zones (Romakkaniemi *et al.* 2003; Jutila *et al.* 2003).

In 2005-2007, the Finnish government decided to gradually extend the fishing season of salmon on their spawning migration. This has been regarded as a concession to professional fishermen, since fishermen making more than 35 % of their income by fishing will be allowed to advance their fishing by 7,10 and 14 days in each fishing zone in 2005, 2006 and 2007 respectively. This is the so called selective salmon fishery period since fishermen have to release salmon more than 85 cm long. (ICES, 2005) However, the advancement of coastal fishing is suspected to endanger the promising development of salmon stocks and fishing tourism in the Tornionjoki and Simojoki Rivers. Therefore, The Regional Council of Lapland, by following the lead of the North Atlantic Salmon Fund (NASF) established a Salmon Fund, which aims to use private donations to compensate the loss of professional fishermen if they restrain themselves from fishing during the last week of June.

Dissatisfaction with national fishing regulations and decrease in both salmon prices and in the numbers of professional fishermen set the scene for the establishment of the Salmon Fund. I argue that the ITQ-based management system for Baltic salmon would provide the institutional settings and more permanent solutions for the principles of the Salmon Fund. Furthermore, the ITQ-system would facilitate the expected structural changes of the Finnish salmon fishery; from fishermen to fishing tourism entrepreneurs. On the other hand, ITQs would provide a solution for ongoing public debate considering "where and how catching salmon is the most valuable"? This debate is based

mostly on too generalised a view of the economic research that allocates salmon catches more towards recreational fishing. The ITQ-system would reveal the real preferences of salmon fishermen and other interest groups. Due to the deficiencies in data sets, economic research cannot consider facts like the existence value of salmon stock or professional fishermen's valuation of their occupation, since these kinds of facts are not priced in the markets. If the right to by salmon quotas will be given to each Finnish citizen the distribution of buyers and sellers will reveal, for whom the salmon is the most valuable. This is also an opportunity for conservationist to practically contribute to salmon protection, since every quota that is bought but is not used, will increase the salmon possibilities for survival to spawn.

Actually, in the early 1990's, the Finnish fisheries management authority, the Ministry of Agriculture and Forestry, proposed a revision of salmon fishing regulation towards ITQs. The shortcomings of the ministry's proposal, and absence of a detailed proposition of ITQ-system's characteristic, was overcome by Mickwitz (1992). Even though he concluded that ITQs would be the best solution for salmon conflicts, business continued as usual. From these ends I raise the question, is Finnish society ripe for change in fisheries policy?

Conclusions and discussion

Several factors may inhibit scientific recommendations to change fishing regulations. Even though the CFP emphasises socio-economic aspects, economic advice has had only minor impact on final decisions and the social aspects can be regarded to contribute only through politicians' tendency to please their electorates. However, the reform of the CFP prepares the way for wider stakeholder participation in the decision processes. On the other hand, the practices of considering the economic aspects do not seem to change. Nevertheless, I found two ways to increase the impact of economic advice on the CFP. The first, through Regional Advisory Concils (RACs) can be regarded as a short term solution. In the long-run the reform of institutions that provide the scientific advice towards bioeconomic stock assesment, enables the research resources to be allocated in a more productive way.

Finnish society has been familiarized with decreasing fishing effort trough compensation payment. This may prepare the way for the acceptance of market-oriented fisheries management. I argue that individual transferable quotas (ITQs) would provide the best solution for the sharing issues related to Baltic salmon. Furthermore, the bottom-up approach adopted in the CFP through RACs may enable the potential Finnish ITQ-system to lead to EU-wide ITQs for Baltic salmon.

Conceivable extensions of current work are threefold. Firstly, increasing the influence of economic advice on fisheries management proposals for ICES modelling framework changes towards multi-species bioeconomic modelling is needed, as well as a popular presentation of the basic methods and results of fisheries economics. Secondly, the Baltic salmon ITQ-system proposed by Mickwitz (1993) should be updated and submitted to public debate. Finally, institutional changes within the CFP would provide a fruitful ground for game theoretical analysis.

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