



UNIVERSITY OF GOTHENBURG

Gothenburg University Publications

Exploring the phronetic dimension of stakeholders' knowledge in EU fisheries governance

This is an author produced version of a paper published in:

Marine Policy (ISSN: 0308-597X)

Citation for the published paper:

Linke, S. ; Jentoft, S. (2014) "Exploring the phronetic dimension of stakeholders' knowledge in EU fisheries governance". *Marine Policy*, vol. 47 pp. 153-161.

<http://dx.doi.org/10.1016/j.marpol.2013.10.010>

Downloaded from: <http://gup.ub.gu.se/publication/188698>

Notice: This paper has been peer reviewed but does not include the final publisher proof-corrections or pagination. When citing this work, please refer to the original publication.

Exploring the Phronetic dimension of stakeholders' knowledge in EU fisheries governance

Sebastian Linke & Svein Jentoft

The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom. (Isaac Asimov)

Abstract

Fisheries management is said to be in a perpetual state of crisis, both globally and in Europe. The causes and possible remedies of these problems often create political controversy. Is the solution more and better science or more and better politics? Does one need to improve the former, the latter or both? Or is something else missing? This paper investigates these questions by drawing on social theory and theories of knowledge. The issue of science versus politics and the role of different knowledge perspectives from stakeholders in decision-making are discussed with reference to the *Regional Advisory Councils* within EU fisheries, in particular, the council for the Baltic Sea. It is argued that a lost 'value-rationality' and the aspects of phronetic knowledge and research need to be included in the highly instrumental and science-based EU fisheries policy system to establish environmental and social sustainability in the sector.

Keywords: *Phronesis*; fisheries governance; stakeholder participation; Common Fisheries Policy; Baltic Sea Regional Advisory Council

1. Introduction

Discussions about sustainable fisheries governance are increasingly related to problems regarding knowledge, politics and social justice in addition to implementing and enforcing a (natural) science-based policy and decision-making system. Worldwide and particularly in the European Union, fisheries governance is suffering from a narrow focus on the techno-scientific aspects of managing fisheries, e.g., fishing quotas, technical measures, closed or restricted areas and seasons. This governance model rests on the modern idea that scientific knowledge, predictions and advice can easily be applied to political decisions and administrative implementations and that this will ultimately result in sustainable fishing practices. However, this "ideal causal chain" model of coordinated events in fisheries governance [1] has failed in practice to establish sustainable fisheries systems. This paper illustrates how this failure lies, at least partially, in an insufficient idea of how fisheries systems should be governed. It shows that the social aspects and knowledge dimensions of fisheries are inadequately theorised and represented.

This paper aims to contribute to an emerging area of research that emphasises the social dimensions of knowledge and stakeholder contributions in modern fisheries governance. The overall objective is to bring together theories from social and political thought from within the social sciences with current problems and challenges in EU fisheries governance. More specifically, this paper examines if and how the Aristotelian concept of *phronesis* (meaning 'prudence', 'practical experience' or

‘wisdom’) can be applied in understanding the relevance and contribution of stakeholders and their experience-based knowledge¹ in fisheries governance. This paper also makes a case for integrating the social sciences more thoroughly in fisheries governance; under the current system, this field of study is largely under-represented and ignored, especially compared to the natural sciences and their contribution of ‘epistemic’ knowledge, to use the other label introduced by Aristotle. A recent source of inspiration for this study is Flyvbjerg’s work on phronetic social science and his views on what is required to make social science more relevant [2,3]. This paper is also a follow-up of an article published by Jentoft [4] on the relevance of Flyvbjerg’s arguments for fisheries governance.

The first part of this paper analyses classic theories about knowledge distinctions and their attendant rationalities for current discussions about the value and input of the social sciences to governance problems observed in fisheries management. Second, these theoretical explorations are applied to a case study discussing how stakeholders’ knowledge perspectives must be made relevant for an appropriate integration into the governance context of EU fisheries. As an illustration, this paper concentrates on the Baltic Sea *Regional Advisory Council* (BS RAC) and the process surrounding the development of a new management plan for salmon. Our perspective also has relevance beyond fisheries, given the move towards more interactive forms of governance emphasising stakeholder engagement, which is now occurring in many sectors of society, as a result of making policy decisions more participatory and democratic and thus more socially legitimate and robust.

2. Theoretical background

Fisheries scientists often declare that political decisions should simply implement consensual scientific recommendations, e.g., reducing fishing effort, and the problems of fisheries would be solved – the rest takes care of itself. Politics in this view just serves to complicate issues and compromise on environmental protection measures (e.g., [5] quoted in [4]). Similarly, in environmental discourse, the argument is made that a top-down, command-and-control mechanism is needed to be effective. Democracy just slows down decision-making and, hence, leads to unsustainable compromises. Given the urgency of most environmental problems, an authoritarian approach seems more adequate than one that allows grass-roots opinions and participation to play a role.

In essence, this is an old debate dating back at least to the controversy between John Dewey and Walter Lippman on public involvement in policy decision-making [6]. In the context of global warming, in Science and Technology Studies (STS) as well as in discussions about fisheries governance, this appears to be a recent debate. The issue, however, remains pertinent: should politics be restricted to allow the ‘ideal causal chain’ of scientific advice to work without disturbance, or on the contrary, should science temporarily be abandoned in certain contexts? The latter case has been argued by Sarewitz, for example, who observes that “science makes environmental

¹ As used here, the term “knowledge” should not be mistaken with the factual categories of non-scientific knowledge often referred to in discussions about ‘local ecological knowledge’, ‘traditional ecological knowledge’ or ‘fishers’ knowledge’ and the analytical approaches for integrating it into science-based management [cf. 43,44,45].

controversies worse” [7] when inappropriately addressed. He argues that the “value bases of disputes underlying environmental controversies must be fully articulated and adjudicated through political means before science can play an effective role in resolving environmental problems” [ibid, p. 396].²

The crucial question addressed below is what is needed to improve the basic policy system of fisheries governance in Europe and elsewhere, as these issues are experienced all over the world. How and in what way can politics and science contribute to more socially robust and sustainable fisheries governance? What type of science is one then referring to? For this task, a review of some classic theories from the social sciences seems warranted.

2.1 Instrumental- versus value-rationality

As Flyvbjerg [2, p. 53] notes in his now seminal book *Making Social Science Matter* and in the follow-up *Real Social Science: Applied Phronesis* [3], writers as early as Aristotle observed the most important task of social and political studies in contributing to the development of the “value-rationality” (a term first coined by Weber [8]) of societies in contrast to scientific and technological rationality, which Weber calls “instrumental rationality”.³ According to Weber, the former type of rationality stresses the inherent values of social phenomena not because they serve a particular purpose but because their very existence is cherished – they have value in themselves and do not need approval because of their contribution to a particular end. Social justice is hence a quality of a good society regardless of the consequences and contributions it provides, such as for the sustenance of a predefined social order. Social justice is also a concern in fisheries governance [9]. It is an ethical value, something society holds to be right in and of itself and not just because it makes fisheries management more effective, for example, in terms of increased compliance [10]. Weber argued that throughout recent centuries, value-rationality has incrementally given way to instrumental rationality, which has become the dominant vision.

The important distinction between the two different types of rationalities was later taken up and further developed by social scholars, such as Michel Foucault and Jürgen Habermas – the latter introducing the concept of “communicative rationality” to this issue ([11] see also [12]). As Flyvbjerg describes, Aristotle had no doubt that value-rationality was more important for society and that it should influence its counterpart, instrumental rationality, and not vice versa [2]. For Aristotle, value-rationality was a matter of a governance principle. It comes first and serves as a yardstick for instrumental action and is, therefore, a prerequisite to the means-ends of governance. Value-rationality represents the criteria with which to determine what goals are worth pursuing. This view has largely been lost since Aristotle and especially since European Enlightenment and modernity, and the instrumental rationality position has taken over. Weber identified this shift as the “disenchantment

² This has been specifically performed with Nuclear Waste Management in Germany, for example, where a new government, in 1998, established a memorandum for scientific and technological explorations to solve the heated value conflict in the region surrounding Gorleben.

³ The terms instrumental rationality and value-rationality refer to Max Weber’s famous distinction between *Zweckrational* action and *Wertrational* action. Value-rationality may also be called “substantive rationality” [cf. 2, p. 53].

of the world”. It is for this reason that we, according to Habermas [11], have let the state and the market “colonize the life world”. Likewise, Flyvbjerg [2, p. 54] observes that “The Rationalist Turn has been so radical that possible alternatives, which might have existed previously are beyond our current vision, just as centuries of rationalist socialisation seems to have undermined the ability of individuals and society to even conceptualise a non-rationalist present and future”. He therefore sees the need for a return of the value position:

“Today the Aristotelian question of balancing instrumental rationality with value-rationality is forcing its way back to the foreground. Problems with both biosphere and sociosphere indicate that social and political development based on instrumental rationality alone is not sustainable” [ibid, p. 53].

Flyvbjerg believes that alternatives to instrumental rationality are needed today. Fishers and their problems are hardly exempt in this sense. Therefore, the positions raised in this article are as pertinent to the governance of fisheries as they are for any other societal sector. Flyvbjerg argues that today’s problems with respect to the biosphere and humankind call for a re-introduction of the fundamentals of the social sciences as the classic domain for analysing social values, interests, norms, power and ethics. Finding a new balance between the two basically different approaches of instrumental rationality and value-rationality, therefore, seems to be of acute relevance. He contends that it is precisely at this point where the social sciences can and should make their contributions [ibid, p. 62]. These contributions can be explored more closely by drawing on the Aristotelian distinctions between three basic knowledge types, or ‘intellectual virtues’, as he called them, the *episteme*, *techne* and *phronesis*. These knowledge types relate to the ontological differences between the social and natural sciences and carry important implications for all interdisciplinary work on societal questions. The distinctions are also of paramount importance for understanding the problems, challenges and possible solutions in fisheries management [4, p. 627] and should, therefore, not be conflated.

2.2 *Phronesis versus episteme*

Phronesis in Aristotle’s explanation relates to practical knowledge, ethics and sound judgement. It is concerned with ‘doing things right’, making decisions according to ethically and socially justified goals, such as equity and equality. In other words, the phronetic dimension takes care of those aspects that stakeholders would refer to as being the reasonable thing to do, even if these things may go against what one would regard as rational from an instrumental point of view. *Phronesis* is often translated as ‘practical wisdom’ or, in Aristotle’s own terms, as being ‘prudent’. Here are his own words from the ‘Nichomachean Ethics’:

We may grasp the nature of prudence [*phronesis*] if we consider what sort of people we call prudent. Well, it is thought to be the mark of a prudent man to be able to deliberate rightly about what is good and advantageous ... But nobody deliberates about things that are invariable ... So ... prudence cannot be science or art; not science [*episteme*] because what can be done is a variable (it may be done in different ways, or not done at all), and not art [*techne*] because action and production are generically different. For production aims at an end other than itself; but this is impossible in the case of action, because the end is merely doing *well*. What remains, then, is that it is a true state, reasoned, and capable of action with regard to things that are good or bad for man ... We

consider that this quality belongs to those who understand the management of households or states. (*Italics in original*, [13] quoted in [2, p. 56])

This quote highlights the Aristotelian distinction between “things that cannot be otherwise” (*episteme*) and “things that can be otherwise” (*phronesis*). As Jentoft [4] argues in the context of fisheries, *phronesis* is what the notion of governance adds to management. Governance is the more inclusive concept, which invites a more reflexive, deliberative and value-rational methodology than the instrumental, means-end oriented management concept, which Aristotle conceptualised as *techne*. The phronetic dimension of fisheries governance implies the possession and exertion of practical wisdom, i.e., the knowledge about how to behave ‘right’ in a concrete context. This means, as Flyvbjerg [2, p. 57] expresses it, “a sense of the ethically practical rather than a kind of science” which “cannot be articulated in terms of theoretical axioms, but is instead grasped by *phronesis*”.⁴

Phronesis is hence what stakeholders are supposed to bring to fisheries governance, for example, via the RACs. They are supposed to draw on their experience and practical knowledge about the particular fishery that is being discussed to improve governance. Whether that is the case or not, in what form they contribute *phronesis*, and with which consequences, is an empirical question. The Baltic RAC is therefore a useful locus for investigating this dimension of fisheries governance.

3. The Regional Advisory Councils within the Common Fisheries Policy

This section describes the Regional Advisory Councils (RACs) within the Common Fisheries Policy (CFP), with an emphasis on why they came into existence, how they are designed and how they work in practice. Particular attention is devoted to the RAC that has been established for the Baltic Sea, which has been studied by the authors through a project titled “How knowledge informs decisions: Communicative turns and stakeholder participation for sustainable fisheries management” that was funded by the Swedish Research Council. In total, 16 BS RAC meetings were attended and numerous informal communications with RAC members occurred. In addition, the authors sat in on several workshops in which the RACs were central topics of discussion. The issue investigated in this project is the role that different types of knowledge play in informing the CFP through exchange between RAC members and in the process of reaching consensus on what advice should be conveyed to the EU Commission. The questions informing the research presented here are as follows: How do the RAC members employ *phronesis* when raising and arguing about issues that are on the table? What happens when *phronesis* meets *episteme*? For the purpose of illustration, the deliberations pertaining to a new management plan for salmon in the Baltic Sea are analysed (section 3.3).

⁴ In Aristotle’s writings, one can develop the impression that *phronesis* always means “good”. This is not necessarily so, as can be shown when introducing the concept of power, which implies different meanings of good and bad in relation to interests and values [cf. 2, ch.7-8].

3.1 *The Common Fishery Policy*

While being “perhaps the most top-down fisheries management system on the planet” [14, p. 189] and “perhaps the most science-dependent sector in the EU” [15, p. 563], a CFP reform in 2002 emphasised the need to take into account the considerable diversity of fisheries sectors in Europe as well as the differences between regional seas. Hence, a demand for regionalisation and a “broad involvement of stakeholders at all stages of the policy from conception to implementation” was pronounced [16, p. 6; 17]. The most noticeable outcome of the CFP after 2002 was the institutional establishment of RACs as new forums for stakeholder involvement, designed to ensure “that they include all the interests affected by the Common Fisheries Policy while recognising the primacy of the fishing interests given the effects on them of management decisions and policies” [18, p. 17].

Between 2004 and 2009, seven RACs were established, representing a significant step towards addressing fisheries management in Europe in a new, more inclusive and interactive mode of governance. The RACs have representatives from the fishing industry and various other parties (on a two to one allocation ratio), such as environmental organisations, consumers, recreational fisheries and aquaculture. Sissenwine and Symes [19, p. 66] describe the RACs as “the first formal attempt to generate a network of multi-national, multi-interest advisory organisations with a strong regional focus”. Overall, the RACs seem to have been able to do what they were created for, as evaluated by the EU Commission [20]. However, as Long [21, p. 294] observes, “the impact so far of the RACs on decision-making within the CFP is less striking than their organisational structure and continues to be the subject of on-going debate”. What the next CFP, to be launched in 2014, will bring for the future role of the RACs is still an open question at the time of this writing.

3.2 *The Baltic Sea RAC*

Established by the EU Commission in 2006, the BS RAC includes stakeholders from all riparian states bordering the Baltic Sea, except for Russia. It consists of an annual General Assembly, with more than 30 stakeholder groups and an Executive Committee (ExCom) that meets more frequently than the General Assembly. These groups include fishers’ associations, producer organisations, processors, market organisations, environmental organisations, aquaculture producers, consumers, women’s networks and recreational and sport fishers (see <http://bsrac.org>). The membership is partially open: anyone who can claim to have a stake in Baltic Sea fisheries policies can apply to become a member. Scientists are not formal members of the RACs but hold observer status and are frequently invited to exchange information on specific issues under discussion.

The ExCom has 24 members and makes decisions on recommendations and communications to the EU Commission, governments and, eventually, other stakeholders, such as the science system represented by the *International Council for the Exploration of the Sea* (ICES). The organisation is primarily reactive to requests from the Commission but in some instances puts forward its own proposals on various issues pertaining to fisheries. Approximately 30 people normally attend the meetings. The chair of the RAC is elected by the General Assembly and comes from the fisheries sector as a result of its formal majority representation. To avoid problems related to the position of the chairperson, who would naturally side with the particular group he represents, a co-chair from *World Wildlife Fund* (WWF) was installed. The BS RAC has three working groups for salmon, pelagic and demersal fisheries. The

chair of each group is a representative from the fishing sector, and members vary in accordance with the issues being addressed.

The formally assigned representative ratio, with the dominant role of fisheries stakeholders, has been a matter of dispute that has, at times, proven difficult to resolve. As a consequence, the BS RAC has attempted to avoid putting decisions to a vote, as this decision-making procedure tends to frustrate the minority group, a tendency that can be observed in BS RAC documents for the EU Commission where majority statements recommending increased quotas (mirroring the fisheries' interests) are accompanied by minority statements recommending decreasing the same quotas (put forward by the one-third minority group [cf. 22]). Members know that when this situation arises, the recommendations are less able to influence decision-making in the EU Commission [14,18,23]. This failure to present coherent, unanimous advice is a flaw of the BS RAC that has been difficult to avoid. From a *phronesis vs. episteme* perspective, it is relevant that NGO representatives base their arguments on the latter i.e. research studies, publications, agency reports and so on, while representatives of the fishing industry typically refer to the former i.e. their own practical experiences from being at sea. Discussions are sometimes heated and emotional, and in some instances, even hostile [cf. 24]. Most of the time, the majority of the RAC members remain silent, and the discussion tends to occur between a few key people. From a participatory perspective, this is less than optimal.

Another issue pertains to the modes of interaction between BS RAC members and scientists. When spokespersons from ICES appear at BS RAC meetings to present the annual quota recommendations, they are met with distrust from the fisheries stakeholders. Their advice has been characterised as “completely flawed”, based on “silly assumptions”, and resting on “insufficient data sources” and/or “inadequate models” (pers. observations 2011). Hence, the atmosphere in the BS RAC meetings does not always accommodate a constructive discourse where different knowledge types, i.e., *episteme*, *techne*, and *phronesis*, are allowed to work in harmony. For some members, attending the meetings can be frustrating, and the respect for the other viewpoint may be low, eventually leading to a conflictive dialogue that can result in a hung RAC and split advice.

Stöhr and Chabay [25, p. 350], who also studied the BS RAC, conclude “The scientific advice cannot overcome the conflict between the different rationalities of, for example, nature conservationists and fishery representatives”. In our conceptualisation, this idea expresses a typical clash between *episteme* and *phronesis*. Whether such a conflict can be resolved is an important issue in determining the extent to which the RACs will be able to serve as an arena where stakeholders engage in meaningful and constructive dialogue that has an impact on decision-making at higher levels of the EU fisheries governance system. However, a robust RAC should be able to function, despite the conflicting rationalities of different stakeholder groups. As exemplified with the case of the salmon management plan, this is easier said than done.

The next section describes the difficulties that arise in fisheries management and in the BS RAC in particular, when social and value aspects (*phronesis*) are not openly discussed but are instead implicitly addressed in discussions of scientific issues (*episteme*); in this case, concerning the management of Baltic salmon.

3.3 Management plan for the Baltic salmon

Directly after the Baltic RAC was formed in 2006, a working group for salmon and sea trout was formed and put forward a new management plan proposal for salmon in the Baltic Sea [26]. The Baltic salmon was then, as it is today, in a critical state as a result of habitat destruction, a particular disease (called M74, affecting reproduction) and fishing pressure. A former so-called “Salmon Action Plan” (SAP), established in 1997 under the previous policy regime with the *International Baltic Sea Fisheries Commission* [27], was set to expire in 2010, and therefore, a new management plan under the CFP-regime, within a recently enlarged EU, in the Baltic Sea was urgently needed.⁵

In its recommendation from 2007, the BS RAC raised, in addition to well-known facts about the bad state and dynamics of salmon stocks, a number of other issues, such as socio-economic concerns within coastal fishing communities; a growing seal population impacting the salmon stock and its fisheries; an increasing conflict between angling, fishing tourism and commercial fisheries that had not been addressed earlier; and misreporting between salmon and sea trout in landings. In addition to fish stock protection within safe biological limits, the report recommends, as a management goal, that commercial, recreational and sport fishers should be able to utilise the fishing opportunities that arise as a result of the sustainable management of Baltic salmon. Therefore, better cooperation between scientific research and stakeholders was seen as immediately necessary. The BS RAC also proposed to evaluate the consequences of the management measures used and their actual effects on different fishing sectors, particularly on the small-scale coastal fisheries sector.

Both in the 2007 report and in the years following, the BS RAC and its salmon working group regularly expressed appreciation about their formal involvement in the new advice-structure of the reformed CFP and tried to be actively engaged in the process of further developing the salmon management plan as well as in its subsequent implementation and monitoring. The RAC also argued for the need to resolve the increased tensions of contradicting user demands between recreational fisheries and the commercial sector. It concluded that for “securing healthy and viable fish stocks enabling future sustainable fishing and value to society”... “a thorough discussion to solve the conflict, problems and possibilities related to the situation is needed” [26]. To address the political dimensions and conflicts of Baltic Sea salmon fisheries in a democratic manner, the BS RAC desired a fruitful and open discussion, which would optimally include all stakeholders and their different interests, values and worldviews into the process of forming a new long-term management plan for Salmon in the Baltic Sea. The proposal deliberately avoided a unilateral declaration of fishing interests, as stated in the recommendation: “The future management of salmon will not reach its goals unless also other sectors than the fisheries sector become involved” [ibid]. In fact, the original proposal from 2007 was an early ‘success story’ of the young BS RAC because it was put forward as a unanimous report to the EU Commission and was endorsed by the fisheries sector as well as by NGOs and other interest groups.

⁵ The Baltic salmon is a very difficult species to manage due to an ecologically complex system, with wild salmon stocks in 27 rivers under highly different conditions, while commercial fishing draws from a common sea stock. Secondly, the political system is equally difficult, with nine countries placing different values on salmon and its inland/offshore fisheries. Additionally, salmon management is only partly under the jurisdiction of the CFP and partly under the jurisdiction of the Habitats Directive of the DG Environment.

However, the visions, expectations and hopes that were enthusiastically expressed by the BS RAC in 2007 of being formally involved in the development process of a Baltic salmon management plan have not come true. In fact, the opposite has happened: due to frustration and bitter disappointment, the salmon working group decided to give up in 2012 – after a long period of engaged work to influence the process and waiting in vain for political progress and responses from the EU Commission. As the working group chair expressed at a BS RAC meeting in May 2012:

“When I accepted to chair the salmon WG six years ago, I still believed in the possibility to get influence by good arguments in order to save the small-scale fishery dependent on salmon from extermination. I have to admit I was wrong. ... I am naive, true, I am a Don Quixote type; I believed in the promises from the Commission that if the professional fishermen and the 1/3 group agreed, the Commission will not only listen to us, but try to follow our advice. But the naked truth is that the Commission has not once followed our advice. Not once during six years!” [28].

Admitting his mistaken assumptions about the actual chances for stakeholders to be involved in and able to influence political decision-making, he despaired and announced the end of salmon fisheries in the Baltic Sea:

”I dare to say that with the help of the green sector, the Commission and the Council have deliberately pushed the small-scale fishery to the edge, or over the edge, to extermination. In all principal speeches the small-scale coastal fishery is honoured and desirable, but it showed up as only talk. ... Only this year the quota cut is 51%. ... What is left for me this summer is maybe two weeks of fishing” [ibid].

Declaring “salmon is a political species and there is obviously no room for normal, sound, rational considerations,” he expressed deep frustration over all of the efforts that have been made in vain by the BS RAC members: “There is no use for all of us, grown-up people, to spend three days to read and understand the report from ICES..., travel thousands of kilometres, spend two days to discuss and produce our recommendation with no effect at all but further diminished fishing possibilities”. He, thus, ultimately concluded, “We have been prepared to compromise for the sake of salmon and other stakeholders, and tried to find solutions suitable for all, but we have come to an end”. [ibid]

This incident reveals what can happen when the phronetic contribution from stakeholders becomes marginalised or neglected in the governance process. Because their value-perspectives and contextual knowledge were not received in a proper forum for advancing phronetic arguments and discussions, the formal invitation to the stakeholders and the actual purpose of the RACs – to contribute with their knowledge and experience to benefit the policy process of the CFP [16] – resulted in the contrary: Despite their effort, good will and hope, the stakeholders felt ignored and excluded and thus deeply frustrated over the process. They concluded that policy- and decision-makers did not effectively consider their input. Thus, the neglect of *phronesis*, i.e., the value-rationality and the knowledge concerning the social, cultural and political context of the fishery and the lack of a real opportunity to voice it in the policy process has negated the desire of stakeholders to participate via RACs, yielding frustration, discouragement and the impression of being even more excluded from the

policy-making process than they were to begin with. As a fisheries representative noted in a discussion with a member of the EU Commission at a RAC meeting in 2013, “...you must discuss this [the salmon issue] with ordinary people, those who actually fish and know what is a sustainable fishery ... you cannot only discuss this in a room together with a marine biologist”.

The salmon management plan process described here raises questions about the reasons for such a governance failure: Why has the Commission not taken up the RAC’s recommendations and treated them in earnest, i.e., so that the stakeholders would feel they had been taken seriously? Why has the formal institutional structure of including stakeholder perspectives via the RAC failed to achieve its goal in practice? A detailed evaluation of this complex process, occurring, at least to some extent, behind closed doors, as well as its yet un-known consequences, is beyond the scope of this paper. Still, one can clearly see the problems with the unarticulated phronetic aspects of the salmon management plan process: Because important value issues (such as “should there be a salmon fishery at all, who should be allowed to fish, do we want a big or small predator seal population in the Baltic Sea, do we want small-scale fishing communities, and how should we compensate for the hydropower loss of wild salmon,”⁶) and relevant socio-economic aspects of the fisheries concerned have not been addressed to the satisfaction of the stakeholders, these issues have instead been absorbed in discussions around scientific and technical issues (i.e., *episteme* and *techne*), for instance, related to data problems, theories about genetic pollution of wild salmon or stock assessment methods where the phronetic issues are misplaced.

Therefore, the discussions may have contributed to even more confusion instead of providing solutions to the difficulties of managing such a fishery, which is as much a social issue (*phronesis*) as a techno-scientific one (*techne* and *episteme*). In this way, salmon science may have served to “make environmental controversy worse”, to use an expression from Sarewitz [7] because scientific knowledge and research provided stakeholders with what he coined an “excess of objectivity,” which is not helpful for solving value-based conflicts of environmental controversies. In fact, science in such cases can obscure the actual political problem because “for a given value-based position in an environmental controversy, it is often possible to compile a supporting set of scientifically legitimated facts” [7, p. 389]. The salmon case, hence, reveals the adverse consequences of relying on the “excess of objectivity” that occurs when science is the only cure for solving such a deeply rooted and value-based political conflict. What finally occurred is that “all parties lost in this issue” and “now we look into no future”, as a fisher’s representative expressed it in a BS RAC meeting in January 2013. Similarly, an NGO representative stated on the same occasion that while there was a consensual proposal from the BS RAC in 2007, the salmon management plan has been an “intellectual clash”. In the end, the salmon case has frustrated all parties involved, not only the RAC stakeholders but also policy-makers, managers and scientists. As a scientist presenting the ICES advice to the BS RAC in

⁶ For example, Norway has “accepted” the extinction of wild salmon in some of its rivers, where hydropower has been established, and has compensated by releasing salmon in these rivers. In Sweden, this strategy has been a topic of (largely silent) controversy between environmental NGOs in favour of protecting wild salmon and therefore against release programs and the fisheries interest, for which this seems paradoxical, as expressed by a fishing representative in a BS RAC meeting: “ICES follow a political agreement that is impossible to reach if you want to make an economic exploitation of salmon at sea ... we have to accept to give up some wild salmon rivers or to give up the fishery”.

2012 described his personal feelings, “It is depressing to present the same advice every year,” while noting that “nothing has changed over the last four years”. The upfront presentation of scientific advice could not help solve the acute management problems that RAC members tried to address and therefore often clashed with the stakeholders’ perspectives, as expressed by a Finish RAC member toward the same scientists: “Do you also think of sustainable yield for the fishermen? They cannot cope with the socio-economic consequences of this advice”. A fisheries representative from another country then tried to correct the impropriety of addressing this question towards science, stating, “You ask the right question but you have to address it to this evil man [pointing to the EU Commission’s representative] and not to this one [pointing to science]”.

The incident illustrates how value-conflicts raise contentions in scientifically framed discussions, which are not capable of addressing and handling these issues appropriately. What is instead needed are more appropriate methods and techniques and a policy system that is able to address conflicting social values and their attendant rationalities in a more systematic fashion, i.e., one that is not purely instrumental and based on natural scientific ‘facts’ (*episteme*). Phronetic social science, as Flyvbjerg notes, is the discipline that can help bring these value-rational aspects to the fore and address them adequately to agree upon which social issues and choices must be addressed by the governance system. Only when this occurs can these social choices be discussed, negotiated and weighed against one another in a democratic process of political decision-making. The basic value-rational questions, however, to which stakeholders often alluded to in the process of developing recommendations for a new salmon management plan, were regarded by the current system as obfuscations to the process instead of well-respected and welcomed contributions. The plan proposed by the BS RAC was, therefore, dismissed, and at the time of this writing, the EU Commission has still not released a management plan.

5. Discussion

It has been argued here that any successful fisheries governance system, to be effective and socially just, needs a broad knowledge base. Using the terms of Aristotle (and Flyvbjerg), decisions about how to manage a fishery sustainably require *episteme*, which is the knowledge that natural science, most prominently marine biology, provides. Modern fisheries management, as it is practiced within the European Union, cannot function without it. The determination of the Total Allowable Catch (TAC) as the central management tool is solely dependent on the input that biologists contribute via the ICES system, as described with the “TAC-machine”, an expression introduced by Holm and Nielsen [29]. These authors highlight how the CFP places marine epistemic science in a pivotal role of the policy-making system. Therefore, in this governing system, better management is tantamount to better science, i.e., better data, more research and more sophisticated modelling. Thus, there is always a demand for more epistemic research that can never be fully met.

However, as this paper has established through case study research of the Baltic RAC and through the investigation of the discursive processes within similar institutions, such as the North Sea and the South Western Waters RACs [e.g. 14, 30], *episteme* is not the only type of knowledge that the people involved draw on when they argue amongst themselves about the strengths and weakness of fisheries

management in Europe. As stakeholders deliberate about how the management and policy-system should improve in response to their advice to the Commission, they emphasise other aspects that they believe are also relevant for political decision-making and its subsequent management outcomes. This type of knowledge is defined by Aristotle as *phronesis*. Notably, Aristotle was convinced that *phronesis* was the most important form of knowledge for societal development. There can be no doubt that fisheries governance also relates to such development as it decides about the operation of the fisheries sector, which has an important role to play in coastal communities and, in many instances, for the entire national economy. As explained above, *phronesis* is the knowledge that comes with experience, from knowing the particular context within which management decisions are taken and should function. *Phronesis* is, in essence ethical, based on the sound judgement of what constitutes a good life, a good society, and a good management process and outcome. It involves social choices and a reasoned stand on how to confront dilemmas on a day-to-day basis as well as in formal settings when important interests and social values are at stake.

A major limitation of the CFP and its subsidiaries at regional levels, i.e., the RACs, is that they are designed primarily to provide a ‘calibrated’ *episteme*. This process is such that the data presented by the science community via ICES are left to stakeholders to consider and build their advice to the Commission on. *Phronesis* is not meant to play any role in this linear science-policy process as instituted by the TAC machine. At present, the RACs are, therefore, not designed to work as arenas for advancing and providing phronetic advice nor are they asked specifically by the EU Commission to deliver such advice. The CFP does not request any clear demand for phronetic advice but leaves this issue rather open: as specified in their mandate, the RACs are expected to enable the CFP “to benefit from the knowledge and experience of the fishermen concerned and of other stakeholders and to take into account the diverse conditions throughout community waters” [16, p. 4]. This formulation does not exclude phronetic advice, which may often be what the Commission receives from the RACs, as shown in the salmon case. However, because this advice is not scientifically based and because social science has no presence in neither the RACs nor in the CFP, the phronetic advice has not undergone an empirical evaluation procedure similar to that imposed by the *episteme*, which is thoroughly prepared, reviewed and presented by ICES. One could argue that on this latter point, the RACs, as the entire CFP, are not an exception to the rule: Social science plays a marginal role in the governance of fisheries all over the world as well as in many other domains of society, such as natural resource and environmental management.

However, the distinction between *episteme* and *phronesis* in fisheries management is not as clear-cut as it might appear to be from the arguments presented here. Natural scientists do not always hesitate to express their views on social issues. It is also necessary to recognise that it is difficult to make any “clean” epistemic argument, as STS research has shown [e.g. 31]. Although the dominant view of science (and of EU fisheries management with the ICES system in particular, cf. [12]) is that those distinctions could and should be made, in reality, it is not as straightforward as one is often led to believe. STS research has shown the socially constructed nature of scientific (epistemic) knowledge and emphasised the difficulties of drawing a clear boundary between science and politics [cf. 32,33]. The borderline is, hence, much fuzzier than scientists typically would have it, and ICES is a typical case in this regard [cf. 34,35]. Also for the RACs, there is, therefore, often confusion

with regard to the different roles and interfaces between the natural ‘facts’ of *episteme* and the values, images and principles of *phronesis* and their factual claims on social issues. Moreover, in practice, there are few opportunities to discuss and clarify these distinctions and draw a boundary for balancing epistemic and phronetic knowledge claims for a decision-making process.

The risk is always that knowledge belonging to the phronetic realm be disguised as *episteme*, particularly when presented by scientists. Rather, the epistemic advice is infused with *phronesis*. The *episteme*, therefore, becomes overburdened and subject to interpretation because of its phronetic content, i.e., its infusion with values, ethics and social aspects that are better addressed and discussed elsewhere, such as in a context where *phronesis* is made valid and not simply implied and redefined as *episteme* just because it is presented by scientists. If epistemic and phronetic knowledge can be concurrently considered and still be treated as something inherently different, it will be easier for participants to see which value position people come from when they argue about the various aspects of fisheries governance, whether they convey empirical evidence or personal opinions.

In the RAC deliberations, stakeholders frequently raise issues that are beyond the realm of *episteme* and therefore are typically considered to be irrelevant, beside the point, and, hence, not useful from the perspective of the management system. From the perspective of stakeholders, however, the *phronesis* they often base their arguments and judgements on is close to their hearts. They insist that this is relevant knowledge, which the other stakeholders and the Commission should not only listen to but also take seriously. When this does not happen, they feel frustrated and discouraged and feel that they are wasting their time by participating on the RAC. Although they are formally represented via the RAC and are, thus, a part of the institution of EU fisheries governance, these stakeholders are, in reality, still more or less excluded from the system. They are at best backbenchers or token alibis, with no real voice. When this happens, as has been the case with the Baltic salmon management plan, they lose faith in the system and feel fooled. As a consequence, they opt for “exit” rather than “voice” to express their dissatisfaction [36]. When stakeholders are asked to contribute to the development of such a plan, for example via the BS RAC, they may not be taken seriously despite extensive effort. It would require further empirical research to decide whether this is also the case with other RACs. Our observations of the salmon process described here are consistent with those of Gray and Hatchard [37, p. 554] who find that the Commission “paid only lip-service to ... a bottom-up system of governance – and the outcome of the 2002 reform has been a shift in the opposite direction, strengthening the pre-eminent authority of the Commission”.

What is important at this point, however, is that the negative sentiment among stakeholders is sufficient to undermine the legitimacy of the entire RAC system, which opposes of the original purpose of its formation. The regional reform leading to the RACs was observed by the Commission and stakeholders alike as a move towards stakeholder empowerment, more participatory democracy in fisheries management and, hence, increased legitimacy.

As noted in a previous publication on the Baltic RAC [24], the organisational design of the RACs, with their skewed representation in favour of fisheries interests relative to other stakeholders’ interests, is such that the former group tends to dominate in the deliberations and to decide the vote. This has also been observed for

the North Sea RAC [14] and in the South-Western Waters RAC [30]. Consequently, other stakeholders feel that their phronetic voice is often snubbed and, sometimes, even ridiculed by the phronetic voice of the fishing sector. Thus, even if *phronesis* is allowed to play a role in fisheries management and may help to broaden the knowledge base, this is no guarantee of increased harmony and equity becoming a part of the generated advice. In fact, any consensus reached is of a more formal nature and in reality suppresses the minority voices. Again, this may lead stakeholders to question their roles and efforts in the RAC, as in the North Sea RAC, where, according to Degnbol and Wilson [14, p. 194], there “is an ongoing debate among the conservationists about the extent to which their participating is achieving conservation goals or “green-washing” the desires of the industry that holds the majority of the seats”.

Legitimacy has no chance if conflicts are suppressed or the concerns that are important to some are hidden. The “ideal speech situation”, as described by Habermas [38], requires a deliberation free of discursive dominance, one that places stakeholders on the same footing, where minority voices have a chance to be heard and respected by other parties with conflicting interests and views. Therefore, Flyvbjerg’s additional question regarding the issue of power with respect to the phronetic dimension of Aristotle is relevant in this context. It is, according to Flyvbjerg [2], always important that social scientists ask who are the winners and losers of a particular social arrangement. The question is, of course, of no less relevance as far as fisheries governance is concerned, where the distribution of quotas and rights of access are key to securing profits, livelihoods and sustainable solutions. One simply cannot make a sound judgement on such matters without a firm ethical perspective. Why a certain viewpoint or interest should have priority as far as distributional justice is concerned is not a scientific question belonging to *episteme*; rather, it is one of the discursive ethics of *phronesis*. This, as Flyvbjerg [2, p. 91] argues, requires the ability and willingness of people to empathise with each other’s validity claims. Then, he continues, “existing power differences between participants must be neutralised such that these differences have no effect on the creation of consensus (power neutrality)” [ibid]. This is not what is occurring today within the RACs [cf. 24].

Anything less than the “ideal speech situation” should not be considered a failure. Few democratic institutions are capable of living up to such demands. As Flyvbjerg [2] and Dahl [39] remind us, lack of time is always a limiting factor when the aim of the deliberations is to reach consensus. The RACs do not meet that frequently, and the number of people in the room and the time available do not always allow everyone to speak as much as they would prefer. From the authors’ observations upon observing the meetings, in the Baltic RAC, only a handful of people lead the deliberations. What ideally should be a free and open discourse is, in practice, a hegemonic one, not least due to rhetoric discrepancies in using English in sometimes heated negotiations. Therefore, the lack of legitimacy not only results from the external influences of the Commission or ICES but is also generated from within the RAC itself, which empowers some stakeholders, while alienating others.

6. Conclusion

In a recent paper, Symes [17] finds the prospects of the regionalisation policy and RACs within the EU to be in a legal limbo. He fears that regionalisation within the CFP “will be decided on legal and procedural grounds rather than from a perspective of good governance and what is best for the fisheries”. In our estimation, this does not bode well for the RACs. It is not yet fully clear what the new CFP will say on this issue. Will they continue to receive support, or will they be phased out as another experiment that did not live up to its promises? Only time will tell if policy declarations and the formal institutional reform will live up to their promises.

The integration of both epistemic and phronetic knowledge into the political system of EU fisheries, within which the RACs could potentially play an even more important role than they currently do, would imply a redefinition of who is a legitimate stakeholder in fisheries governance, i.e., which actors should contribute to policy-making via advisory organisations, such as the RACs. Those whose knowledge is both epistemic *and* phronetic must be allowed to come forward, be listened to, and be taken seriously in a process of deliberation and interactive learning on a levelled playfield. If the two virtues (*episteme* and *phronesis*) are included and discussed in a meaningful way, e.g., within the RACs, contributions from both natural and social science would be required, as is the case with the Regional Fisheries Management Councils in the US [cf. 40,41].

Flyvbjerg regards the contribution of social science as predominantly phronetic, i.e., not in terms of universals but with knowledge that is contextual. Social science provides the “double hermeneutics” that Giddens [42] talks about – a layer on top of the hermeneutics of stakeholders who have a direct, experience-based knowledge of fishing practice from being at sea and from pulling fish out of the water. Notably, stakeholder’s knowledge claims would also benefit from the empirical validation that social science research can provide. Social science does yet not deny the need for an instrumental rationality of fisheries management, which certainly needs to function and fulfil its goals.

To put it differently, for the RACs to have a meaningful role in policy-making, they need the knowledge of what happens under the water, which is information that natural science contributes to fisheries management. However, they also need the supplement of social science research regarding what happens on the water and above the water: the value-perspectives and conflicts between different user demands. The deliberations about what advice to give would benefit from a social scientific ‘reality check’ of the truth claims that stakeholders make, for instance, when pertaining to the conflict between recreational and commercial fisheries or on conservation versus the socio-economic perspectives of the industry. Statements expressed about nature and society cannot be taken at face value but need empirical verification. At present, the social science aspects of fisheries are not systematically addressed compared to the information about ecosystems and fish resources provided by the ICES system. There is, in fact, yet no real social science input to the policy system of EU fisheries governance today.

Social science stresses the need for the “value-rationality” that Weber emphasised – the need to justify what constitutes good goals in fisheries governance. This includes an emphasis on the process, i.e., that decisions should be reached in

procedures where ethical considerations are evaluated. Stakeholders who participate on the RACs are, of course, not neutral i.e. only committed to finding out what is and what cannot be otherwise. They are equally concerned with what should or should not happen, that is, how things can be made different. In short, they are concerned with everything that is ‘social’. Denying the right of these aspects of fisheries governance to be negotiated in the RAC process and thus addressed in their recommendations is a recipe for a lack of legitimacy, as demonstrated with the Baltic salmon management plan.

Not taking *phronesis* seriously within fisheries management and the RACs is, therefore, not a good idea, even though it may interfere with (natural) science. Social reality is political, interest-dominated and morally legitimised, not purely scientific and technical. Ruling politics and *phronesis* out of the process would, hence, threaten the legitimacy of the entire CFP. As argued, these threats come not only from outside the RACs, from its relationship and interaction with the Commission, but also from within the RACs themselves, given their mandate and design that leaves little room for *phronesis* to make a real difference. They are, hence, relational, and work across different scales of governance. They, therefore, depend on how the RACs interact with higher and lower authorities, including the science system (ICES), as well as how stakeholders who are represented within the RACs interact with each other. Both these relationships and their interactions are essential to the governability of the RACs and their ability to deliver on their assigned responsibilities and must, therefore, be clarified to a greater extent within the new CFP than they have been in the past.

Acknowledgements:

Funding from the Bank of Sweden Tercentenary Foundation (Riksbankens Jubileumsfond) and the Swedish Research Council (Vetenskapsrådet) is acknowledged.

References:

- [1] Gezelius S. The problem of implementing policies for sustainable fishing. In: Gezelius S, Raakjær J, editors. Making fisheries management work. London: Springer; 2008. p. 1-25.
- [2] Flyvbjerg B. Making social science matter: why social inquiry fails and how it can succeed again. Cambridge: Cambridge University Press; 2001.
- [3] Flyvbjerg B, Landmann T, Schram, S. Real Social Science: Applied Phronesis. Cambridge: Cambridge University Press; 2012.
- [4] Jentoft S. Beyond fisheries management. The phronetic dimension. *Marine Policy* 2006; 30: 671-80.
- [5] Hannesson R. Fisheries mismanagement. The case of the North-Atlantic cod. Oxford: Fishing News Books; 1996.
- [6] Marres N. The issues deserve more credit: Pragmatist contributions to the study of public involvement in controversy. *Social Studies of Science* 2007; 37(5): 759-80.
- [7] Sarewitz D. How science makes environmental controversies worse. *Environmental Science & Policy* 2004; 7: 385-403.
- [8] Weber M. *Economy and Society*. Berkeley, CA: University of California Press; 1978.
- [9] Jentoft S. Social Justice in the Context of Fisheries – A Governability Challenge. In: Bavinck M, Chuenpagdee R, Jentoft S, Kooiman J, editors. Governability of

Fisheries and Aquaculture: Theory and Applications. Dordrecht: Springer; 2013. p. 45-65.

[10] Jagers SC, Berlin D, Jentoft S. Why comply? Attitudes towards harvest regulations among Swedish fishers. *Marine Policy* 2012; 36: 969-76.

[11] Habermas J. *The Theory of Communicative Action Reason and the Rationalization of Society*. Boston: Beacon Press; 1984.

[12] Wilson DC. *The paradoxes of transparency – Science and the ecosystem approach to fisheries management in Europe*. Amsterdam: Amsterdam University Press; 2009.

[13] Aristotle. *The Nicomachean Ethics*. Harmondsworth: Penguin; 1976.

[14] Degenbol D, Wilson DC. Spatial planning on the North Sea: a case of cross-scale linkages. *Marine Policy* 2008; 32: 189-200.

[15] Griffin L. Scales of knowledge: North Sea fisheries governance, the local fisherman and the European scientist. *Environmental Politics* 2009; 18: 557-75.

[16] EC Council Regulation No 2371/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy. Brussels; 2002.

[17] Symes D. Regionalising the Common Fisheries Policy: context, content and controversy. *Maritime Studies* 2012; 11(6): 1-21.

[18] EC Council Decision of 19 July 2004 (585) establishing Regional Advisory Councils under the Common Fisheries Policy. Brussels; 2004.

[19] Sissenwine M, Symes D. *Reflections on the common fisheries policy*. Report to the General Directorate for Fisheries and Maritime Affairs of the European Commission. DG MARE: Brussels; 2007.

[20] EC Communication from the Commission to the Council and the European Parliament. Review of the functioning of the Regional Advisory Councils. COM/364. Brussels; 2008.

[21] Long R. The role of Regional Advisory Councils in the European Common Fisheries Policy: legal constraints and future options. *International Journal of Marine and Coastal Law* 2010; 25: 289-346.

[22] Linke S, Dreyer M, Sellke P. The Regional Advisory Councils: what is their potential to incorporate stakeholder knowledge into fisheries governance? *AMBIO* 2011; 40(2): 133-43.

[23] Astorkiza K, del Valle I, Astorkiza I, Hegland TJ, Pascoe J. Participation. In: Motos L, Wilson DC, editors. *The knowledge base for fisheries management*. Amsterdam: Elsevier; 2006. p. 239-66.

[24] Linke S, Jentoft S. A Communicative Turnaround: Shifting the Burden of Proof in European Fisheries Governance. *Marine Policy* 2013; 38: 337-45.

[25] Stöhr C, Chabay I. Science and participation in governance of Baltic Sea fisheries. *Environmental Policy and Governance* 2010; 20: 350-63.

[26] BS RAC. Recommendation on a Salmon Management Plan for the Baltic Sea. 1.March 2007.

http://bsrac.org/archive/Dokumenter/Recommendations/2007/RecommendationSalmon010307_2.pdf.

[27] IBSFC. Resolution IV Salmon Action Plan 1997-2010,

http://ec.europa.eu/dgs/maritimeaffairs_fisheries/consultations/baltic_salmon/action_plan_en.pdf.

- [28] BS RAC. Report from the BSRAC General Assembly 3rd May 2012; URL: http://bsrac.org/archive/Dokumenter/General%20Assembly/03052012/FINALMinutesGenAss030512_1.pdf.
- [29] Holm P, Nielsen KN. The TAC Machine. Report of the Working Group on Fishery Systems. WGFS Annual Report, Copenhagen: ICES; 2004. p. 40-51.
- [30] Tørrissen Guerreiro VD. The European Union's Regional Advisory Councils – A governability assessment of the South Western Waters. Master Thesis, University of Tromsø; 2013.
- [31] Gieryn TF. Cultural Boundaries of Science: Credibility on the Line. Chicago: University of Chicago Press; 1999.
- [32] Bijker WE, Bal R, Hendriks R. The Paradox of Scientific Authority. The Role of Scientific Advice in Democracies. Cambridge, MA: MIT Press; 2009.
- [33] Jasanoff S. editor. States of knowledge—the co-production of science and social order. London: Routledge; 2004.
- [34] Nielsen KN. Science|Politics: Boundary construction in mandated science The case of ICES' advice on fisheries management. PhD Dissertation, University of Tromsø; 2008.
- [35] Linke S, Gilek M, Karlsson M, Udovyk O. Unravelling science-policy interactions in environmental risk governance of the Baltic Sea: comparing fisheries and eutrophication. *Journal of Risk Research* 2013; DOI: 10.1080/13669877.2013.794154
- [36] Hirschman AO. Exit, Voice, and Loyalty Responses to Decline in Firms, Organizations, and States. Cambridge, MA: Harvard University Press; 1970.
- [37] Gray T, Hatchard J. The 2002 reform of the common fisheries policy's system of governance—rhetoric or reality? *Marine Policy* 2003; 27: 545-54.
- [38] Habermas J. Towards a theory of communicative competence. *Inquiry: An Interdisciplinary Journal of Philosophy* 1970; 13(1-4); 360-75.
- [39] Dahl RA. On Democracy. New Haven: Yale University Press; 2000.
- [40] Hanna S. Will structural reform fix fishery management? Policy Recommendations and the Regional Fishery Management Council System. *Bulletin of Marine Science* 2006; 78(3): 547-62.
- [41] Miller ML. Utilization of Social Science in Federal Management of U.S. Marine Fisheries. Strong Commitment to Research Will Improve Management Outcomes. In: *Managing Marine Fisheries in the United States. Proceedings of the Pew Oceans Commission Workshop on Marine Fishery Management*; 2002.
- [42] Giddens A. New rules of sociological method. Stanford CA: Stanford University Press; 1993.
- [43] Holm P. On the Relationship Between Science and Fishermen's Knowledge in a Resource Management Context. *Maritime Studies* 2003; 2(1): 5-33.
- [44] Daw T. How Fishers Count: Engaging with fishers' knowledge in fisheries science and management. Doctoral Thesis, Newcastle University; 2008.
- [45] Verweij MC, van Densen W, Mol A. The tower of Babel: different perceptions and controversies on change and status of North Sea fish stocks in multi-stakeholder settings. *Marine Policy* 2010; 34(3): 522-53.