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Who should set the total allowable catch? Social preferences and legitimacy in fisheries management institutions

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ABSTRACT

This article presents a decision-making model based on situations that are typically encountered in fisheries management when setting the total allowable quota. The model allows assessing the differences in outcomes when different management institutions make the decision under uncertain conditions. Social preferences are considered to measure the social expected costs raised by different institutions. Moreover, stakeholder participation and the notion of "legitimacy cost" are taken into account, the latter being defined as the cost of actions that stakeholders may take when they do not agree with decisions made by the management authority. Within this context, economic policy choices are discussed in terms of what type of institutions will generate a higher expected welfare depending on social preferences and legitimacy costs in specific contexts. Finally, this article also discusses what aspects should be considered when designing stakeholder and scientific boards in the TAC setting process.

1. Introduction

One important management tool in commercial fisheries is the setting of a total allowable catch (TAC). This tool is central for different types of management systems ranging from Global Quotas to Individual Transferable Quotas. In fact, the decision about the TAC level must reconcile individual demands of different fishermen with the conservation of a fishing stock. This paper analyses collective decision-making done by different institutions that are delegated the task of setting the TAC under conditions of uncertainty about the state of the fishery. It focuses particularly on two issues: stakeholders' perception of the decision maker's legitimacy, and the degree of alignment between socially optimal preferences and the preferences of the delegated institution.

Although the TAC decision-making process is only one specific issue in fisheries governance, it has been shown to be a very difficult problem to solve. Jentoft and Chuepagdee [1] define fisheries and coastal governance as a "wicked" problem because there is no right or wrong approach to solve it. This suggests that applying collective decision making theory to study how decisions are made in fisheries management can be fruitful [2]. One reason for this is that there exist several sources of uncertainty in this decision, including biological and socioeconomic sources. On the biological side, decision makers are uncertain about the size of the stock, as well as its age structure, growth rate, natural mortality, and geographic distribution, and consequently the impact that a higher or lower TAC will have on stock conservation. On the socioeconomic side, the decision maker is uncertain about the social and economic effects of reducing or increasing quotas, including not only economic benefits but also social effects such as local unemployment and poverty. All these sources of uncertainty create important challenges to decision makers when setting TACs.

Additionally, different actors, including not only fishermen but also workers and local communities, might have different objectives and preferences that affect the optimal size, from their viewpoint, of the TAC. These objectives, such as short run income and employment, are not necessarily consistent with each other and with the long run conservation of the fishing stock. Moreover, some actors might mistrust the decisions taken by other actors, generating legitimacy costs that make more difficult to set the TAC.

Thus, uncertainty about the stock and conflicting objectives/preferences imply that the socially optimal TAC cannot be easily

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determined, even when it is crucial for the long run conservation of the fish stock and for fulfilling socioeconomic expectations on the fisheries. The Magnuson–Stevens Fishery Conservation and Management Act in the US, the Common Fisheries Policy in Europe, and other institutions around the world have failed to keep the stock at sustainable levels for a significant number of fisheries [3,4]. From a political point of view, some of the reasons for this failure have been that, on the one hand, TACs have been set higher than scientific recommendations [5] and, on the other, there is a lack of sufficient enforcement to ensure perfect compliance with TACs [6,7]. These facts are closely related to uncertainty, social preferences and legitimacy of management institutions.

As discussed below, countries differ in the degree of user participation in the decision-making process of the TAC. However, a case that motivates this paper occurred during the fisheries law reform discussion in Chile, during 2012. In that occasion, one of the most heavily discussed issues was the potential responsibility that the stakeholder participation in the quota setting process could have had on TACs set in excess of scientific recommendations over several years. Three alternative decision schemes were discussed: (a) Government should set the quotas, (b) a change in the stakeholder composition of the (already existing) National Council of Fisheries should be considered, and (c) the quota should be set by a committee of experts and scientists. Finally, the new fisheries established that a committee of scientific experts should have the responsibility of setting the TAC[1].

The paper develops a model of decision-making based on the constraints that are typically encountered in fisheries management when deciding on the TAC. The purpose of the model is to analyse the differences in the outcomes when the decision making process is led by different decision-making institutions. This clarifies the factors that explain the outcome differences, and establishes the circumstances in which the different institutions are to be preferred. To achieve this goal, the paper adapts the model developed by Li, Rosen and Suen [8–10] about decision making processes in different situations to the particular case of fisheries management. An additional contribution of the paper is to introduce the role that social preferences and costs relate to the legitimacy that the management institution has during the TAC decision-making process.

The remainder of the paper is organized as follows. First, the article presents motivation for why legitimacy should be included in the model. Then, the basic decision model is presented. Thereafter, the article introduces the information updating process. In this context, the paper establishes the basic reference case, which is when the central authority decides on the TAC, followed by two particular cases, when the authority delegates the decision to a team of experts and when it delegates it to a stakeholder committee. Finally, a policy-oriented discussion ends the paper.

2. Institutions and participation in the decision-making process in fisheries

Every fishery needs to be managed, either by some authority or by its stakeholders. From authoritarian governments to democracies, some agent or institution has to make the decisions regarding fisheries management. Jentoft and McCay [11] studied 11 countries and classified the type of fisheries administration depending on the degree of user participation in the decision-making process, ordering them from one-way communication to co-management. The key lesson from their analysis is that user participation provides a "two-way channel for communication of information and knowledge between industry and government [which] are a means of producing support and of sharing responsibility for hard decisions" (p. 233). Moreover, the effectiveness of the system depends on how it is designed and implemented. Two key issues are raised by the authors, namely representation and scale. On one hand, if some group does not feel properly represented in the decision-making process, there is a risk that the group boycotts or sabotages the regulations that have been decided. On the other hand, small-scale institutions are more homogeneous and allow more effective user participation, although they might be inappropriate for managing transient stocks and fleets. The model presented in this paper concentrates on the first of these issues.

The question about who should be considered a stakeholder with the right to participate in the decision-making process remains open. Naturally, fishermen are first-order candidates to be represented in the process, but they are a heterogeneous group with different preferences and goals. Moreover, other users, such as consumers and processing plants, may also claim that their welfare is affected by fish availability and therefore they have the right to have an opinion. Yet other relevant actors in all countries studied by Jentoft and McCay [11] were those that held scientific knowledge. Scientists usually give advice about decisions but they are not necessarily entitled to make the decision because "it is a scientific question to determine the size of the biomass, but it is a political issue to decide how big it should be (by deciding the level of stock extraction)" (p. 240).

The heterogeneity of the actors involved implies that their opinions about the optimal level of the TAC will probably diverge. In fact, the discussion about the optimal harvest, which continues among scientists [12–15], is partly due to the lack of agreement on the objectives at which fisheries should aim [16]. One of the reasons for these disagreements is the difference in goals and preferences of different stakeholders.

Ultimately, once the TAC is set, "fishermen control to what extent a management system will work or not, almost no matter how much government spends on policing" [11] (p. 241). If they set the TAC too low, fishermen would not only complain, but they might also overfish if enforcement is weak. Therefore, rational decision makers should consider legitimacy when setting the TAC, particularly under weak enforcement situations.

Enforcement of fisheries rules is a key component of fisheries management. Arnason [17] states that neither the management system nor the measures selected for fisheries management can control the fishery. Instead, he suggests that "the actual control of the fishery is by enforcement of the fisheries management measures selected" (p. 361). In particular, enforcement of fisheries management rules under weak conditions could create illegal fishing, discarding and other problems [18–23]. Clearly, fighting the incentives for illegal fishing create important costs to society that should be recognized and accounted when analysing fisheries management.

Out of the cost of fisheries management in OECD countries, on average 44% is spent on enforcement, 22% is spent on research and 34% is spend on administration services [24]. In Iceland, Norway and Newfoundland, close to 60% of the fisheries management cost is dedicated to enforcement, while 34% is dedicated to research and only 7% to the actual administration of the fishery [25]. Moreover, when the TAC is not optimally set, society faces an important additional opportunity cost related to the forgone benefits from mismanagement. In fact, the World Bank has estimated that the forgone benefits, excess capacity and subsidies to cost society more than US$50 billion yearly [26]. Nevertheless, to the best of our knowledge, the literature has failed to recognize that there are other important cost of fisheries management, such as the cost in which the society incur when it needs to negotiate

[1] For more details on the previous structure of the National Council of Fisheries in Chile see Leal et al. [8].