DETERMINING THE IMPORTANCE OF FISHERIES MANAGEMENT CRITERIA INCORPORATING INTEREST GROUP DIVERSITY[1]

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Summary*: In determining the importance of criteria in the management of fisheries, two key issues stand out: that is the definition of a succinct list of criteria; and the determination of which interest groups play a defining role in the management development process. This is indeed the case for all natural resource management problems, and many other environmental problems as well. The analytic hierarchy process (AHP) provides an effective framework for the analysis required. This paper considers the development of a representative criteria hierarchy, and uses data obtained from a pairwise comparison survey based on a UK fishery to investigate the effectiveness of the procedure. Alternative approaches for the sub-problem of measuring the importance of interest groups in the management structure are also considered.*

Extended Abstract

In the field of natural resources, the problem of defining management strategies that are acceptable to all interest groups is an overriding aim. It is a feature that is apparent in many fields of study, but particularly noticeable in the natural resources due to the diversity of interests that exist. For example, typically workers, managers, politicians, environmentalists and scientists amongst others all have an acute interest. In situations where the industry does not impact heavily on the environment, then the conflict appears more limited. However, as in the field of fisheries management, where typically key stocks are considered to be over-fished, conflict between groups is heightened due to the sensitive nature of species protection versus the difficulties surrounding employment where there is significant intrinsic stochasticity in the system.

This paper attempts to analyze the effects of interest group activity in a specific case study of fisheries where this diversity of interest groups exists. The AHP (Saaty 1977 and 1980) provides an effective framework for the elicitation of preferences for management objectives in such a system. However, there are several subsequent options to analyze preference aggregation between interest groups within the management structure. Several methods have been suggested for the development and aggregation of group preferences, to measure the importance between groups. Ramanathan and Ganesh (1994) summarize the two main approaches and offer a general discussion on the two main methods of aggregation employed. These approaches treat the group as either a homogeneous or heterogeneous entity. The two basic aggregation methods applied to this are the geometric mean and (weighted) arithmetic mean. Articles by both Van Den Honert and Lootsma (1996) and Forman and Peniwati (1998) further develop the arguments introduced by Ramanathan and Ganesh (1994). Additionally, Forman and Peniwati (1998) discuss the use of these aggregation methods.

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Examples of studies where the AHP itself has been used to develop weights to measure the importance of groups in the management process are Ramanathan and Ganesh (1995) and Malczewski et al. (1997). The former study surveys individuals as an accompaniment to the elicitation of preferences in the main AHP survey. However, the latter study does not say whether a single decision-maker was chosen (termed a "supra decision maker" by Ramanathan and Ganesh, 1995) or a survey was undertaken for this.

This paper considers the development of a representative criteria hierarchy for the complex fisheries of the English Channel, and uses data obtained from a pairwise comparison survey to investigate the sensitivity of the procedure towards interest group preferences. Alternative approaches, with similar aims to those described above and others, for the sub-problem of measuring the importance of interest groups in the management structure are also considered and validated against known activity of the groups. The results show that such a framework of analysis offers useful information to the management process, potentially assisting in the definition of policy.

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