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Corporate-cooperative management of fisheries: A potential alternative governance structure for low value small fisheries?

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ABSTRACT

While the economic and environmental benefits of fisheries management are well accepted, the costs of effective management in low value fisheries, including the research necessary to underpin such management, may be considerable relative to the total economic benefits they may generate. Co-management is often seen as a panacea in low value fisheries. Increasing fisher participation increases legitimacy of management decision in the absence of detailed scientific input. However, where only a small number of operators exist, the potential benefits of co-management are negated by the high transaction cost to the individual fishers engaging in the management process. From an economic perspective, sole ownership has been identified as the management structure which can best achieve biological and economic sustainability. Moving low value fisheries with a small number of participants to a corporate-cooperative management model may come close to achieving these sole ownership benefits, with lower transaction costs. In this paper we look at the applicability of different management models with industry involvement to low value fisheries with a small number of participants. We provide an illustration as to how a fishery could be transitioned to a corporate-cooperative management model that captures the key benefits of sole management at a low cost and is consistent with societal objectives.

1. Introduction

The appropriate management model for a particular fishery should, in principle, maximise the objective function of society (the owners of the fish resource). A key tenet to all fisheries management is the biological sustainability of the stock. In addition to this, the management of a fishery should ensure economic returns to the fishery are maximised. In all cases, the management of a fishery needs to be cost-effective. In practice, the choice of fisheries management model is related to the overall value of the fishery.

High value fisheries are an attractive proposition for rights based management, which are generally assumed to achieve both economic efficiency and biological sustainability simultaneously [1,2]. In contrast, low value fisheries lack the ability to justify high management costs and require a different focus. Low value fisheries may be low for two reasons – they may involve many fishers who catch a product that has itself low value, or they may contain few fishers that catch a low quantity of potentially high valued species. The former is often considered "small-scale" in the literature, and is typified by potentially many operators using relatively low levels of capital and are typically dominant in developing countries [3]. Such fisheries are often considered an important vehicle for income generation and employment in their regions, and it is in these fisheries that co-management models have gained increasing attention.

The second category of low value fishery involves relatively few participants, reflecting the size of the resource. These fisheries may involve medium to high value species, and may (or may not) be relatively capital intensive, but involve a relatively small number of participants taking a relatively small total catch. Such a fishery is constrained either geographically (i.e. small area) or biologically (i.e. small stocks). These fisheries are also often characterised by limited biological and economic data as well as the lack of regular (or any) stock assessments. Such fisheries are often managed through simple decision rules (e.g. catch rate triggers), with strong industry involvement [4,5]. Increasingly, co-management is seen as a means to assist in the management of such fisheries, mainly to reduce the perceived costs of management to government. However, with few participants to share the burden of co-management, this may potentially shift the management costs onto those fishers who engage in management while other non-participants share in any benefits.

A further variant of industry driven management is corporate management [6–8]. Corporate management involves total devolution of management responsibilities to a corporation that

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effectively operates the fishery as a sole owner. Hence, many of the economic benefits of sole ownership [9] might be realised – benefits that individual transferable quota (ITQ) and other imperfect rights based system aim to achieve but often fall short due to imperfect property rights and other impediments to the market based instruments that prevent their full functioning.

Since its proposal in 1995 [6,8], corporate management has not been formally implemented in any fishery,[1] although variants of the approach have evolved organically in several fisheries. For example, New Zealand's Bluff Oyster and Challenger Scallop fisheries [11], and Australia's Exmouth Gulf prawn fishery [12] have all developed variants of the corporate management model, fundamentally having a single industry manager directing catch and marketing. Within the US, the Northeast tilefish fishery [13], the Alaskan Chignik Salmon fishery [14], the pacific whiting fishery and the Bearing Sea pollock fishery [15,16] have also developed a self-management based system with an industry organisational structure for making collective decisions for its members. This variant of corporate management may best be termed corporate-cooperative management (CCM), where producers combine to manage the fishery as a single entity in a cooperative structure, each with a share and stake in the fishery.

The focus of this paper is low value small fisheries, and how CCM may be an effective governance structure for small fisheries in which other rights based measures may be impractical. It is argued that such a system is likely to provide many of the economic benefits of an ITQ system, and may even avoid some of the perceived social costs. Such low valued small fisheries provide a substantial challenge to fisheries managers as data are limited, the cost of implementing rights based management approaches are high relative to the benefits they may generate, but failure to adequately address the issue of lack of appropriate property rights may result in available resource rents being dissipated. To present this case, first the counterfactual, namely management of high valued fisheries and the move towards increased rights based approaches, is considered. The tendency towards co-management in lower value fisheries is discussed, and an alternative model that moves the fishery more towards CCM is considered. Finally, an approach by which CCM could be implemented in such fisheries is presented.

2. High value fisheries and rights based management

In the management of high value fisheries, there is an *a priori* assumption that there is "value" for society in ensuring that the maximum resource rent is extracted. The use of economic incentives in the management of such fisheries to maximise economic profits has gained increased interest over recent years [17–19]. High value fisheries have the capacity to support rights based fisheries model models that are underpinned by objective data from expensive scientific input (e.g. biological and economic research). Foremost of these instruments is the use of individual transferable quotas (ITQs), which introduces a limited form of user rights and is generally believed to result in improved economic performance of the fishery [1,2,20].

Management costs under such systems are high, but their potential to generate positive net economic profit and resource rent (even though it may not be extracted) has seen a push towards right based fisheries. ITQs in particular have been successfully introduced into high value fisheries with many operators include NZ [21,22] and Icelandic fisheries [23]. In Australia, which has an explicit management objective of maximising the returns to society [24–26], ITQs and individual transferable effort (ITE) quotas have been implement in key high valued fisheries.

However, it is not a case of one size fits all. ITQs are often considered inappropriate for some fisheries. For example, ITQs require an estimation of a total allowable catch (TAC). For some short lived species, such as many species of prawns and other short lived species, annual stock abundance is highly influenced by environmental fluctuations [27], and estimating an accurate TAC is difficult, and even where possible could be costly [28]. Underestimation of the TAC can potentially result in substantial economic losses to the industry through forgone fishing opportunities, while overestimation could lead to dissipation of any rent generated.

It is not unreasonable to assume that the validity of rights based management of high valued fisheries is assured by individual fishers achieving positive economic profits. Interestingly, the extent to which the "cost effectiveness" of rights based fisheries has been examined in the literature is limited. Furthermore, the extent to which management costs are recovered from high valued fisheries is also not extensively addressed in the literature. Recovery of management costs may be in place (e.g. fishing levies etc.) though costs are often covered through a mixed contribution from fishers and the public purse.

Key management costs include (1) the information needed to assess and manage the fishery, (2) the management decision process, (3) research and (4) enforce/compliance [5]. These costs are not trivial. Earlier studies [29] suggest that the costs of fisheries management may range from 3 per cent (in Iceland) to 25 per cent (in Newfoundland) of the gross value of fish landings. More recent Australian studies suggest that while management costs may be low as a percentage of the gross value of landings, in some cases these exceed the economic benefits generated (Table 1). While this may reflect other considerations, it does demonstrate that state-of-the art management may not always be the most cost effective management.

3. Low value small fisheries, incentive based approaches and the potential for co-management

There are particular problems for the management of low value fisheries that make adoption of some of these rights based instruments difficult. In low value fisheries, the key management objectives are commensurate with high value fisheries management models (e.g. biological sustainability of the stock and generating positive economic returns to fishers).

However, low value fisheries do not have the capacity to support high end scientific data collection and research.

The cost of economic and biological assessments is relatively fixed for a fishery irrespective of its number of participants, but does vary based on number of species to be assessed. Low value, multispecies fisheries are particularly disadvantaged. As the estimation itself is often costly, the pay-offs from this research in terms of improved profits may be low if not negative for relatively low value fisheries. These fisheries are also often data poor as a consequence, as generally no data are collected nor assessments undertaken. Even if an estimate of an appropriate TAC could be undertaken cost effectively, the cost of ITQ management is also considerably higher than other forms of management [19], and this may be an additional impediment to their implementation in low value fisheries.

Appropriate incentives can be generated through mechanisms other than the traditional rights based instruments. Interest by both industry and management in greater industry involvement in management decision making is also increasing internationally.

[1] In contrast, corporate management models have been implemented in water resource management successfully [10].