Territorial Use Rights for Fisheries (TURFs): State of the art and the road ahead

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ABSTRACT

Emerging as an innovation for improving the management of overexploited fisheries around the world, rights-based fisheries management systems are being implemented in the form of either species- or area-based management. While there are numerous reviews on species-based management, there have been none on area-based management. To fill this gap, we undertake a critical review of the literature on area-based management systems known as “Territorial Use Rights for Fisheries” (or TURFs). Following an exhaustive search, seventy-nine peer-reviewed journal papers discussing the evolution, effectiveness, enforcement, and management context of TURFs were identified and selected. Review of these papers reveals that there is a growing interest in investigating the real-world effects of TURFs, both positive and negative. The variability in TURF performance appears to be due to design features, enforcement behavior of fishers, and specific contextual conditions, namely, biological fishery characteristics, socio-economic aspects of fishers, and institutional arrangements. The bulk of the published research has focused on theoretical analysis and empirical evidence based on fishers’ perception and experience. And there has been little research on enforcement issues or how design features and management contexts influence performance. This review emphasizes the need for rigorous empirical analyses of TURF effects, including assessment of the cost-effectiveness of different enforcement schemes and the effects of contextual conditions on TURF performance. Addressing current shortcomings in the literature could improve the design, implementation and performance of TURFs worldwide.

1. Introduction

Over the last twenty years, both species and area-based management, which are types of rights-based management, have been among the most important developments in fisheries management [1]. This is because, while conventional management tools (e.g. limited entry, buyback programs, gear and vessel restrictions) seem to have been unsuccessful in helping fisheries resources overcome the problem of overexploitation [2–5], rights-based management tools, by contrast, seem to have proven their effectiveness in eliminating overexploitation in many parts of the world [6].

In 1998 paper published in this journal, Squires et al. [7] reviewed species-based management systems for fisheries; and that study was followed by several other reviews (e.g. [8–12]). However, no similar review has to date been done for other types of fisheries management, particularly area-based ones. This paper complements the above reviews and fills an important gap by critically evaluating area-based management systems.

Currently, area-based management systems take the form of Territorial Use Rights for Fisheries (TURFs). TURFs are operated as a spatial form of property rights in which individuals or a group of fishers are granted access privileges and fishing rights to exploit fisheries resources within a designated area [13–16]. TURFs have been seen as necessary to tackling the problem of overexploitation or unsustainable fishing practices. Such practices can be due to a variety of causes, but TURFs have been designed to directly address problems related to the lack of sufficiently well-defined property rights [17–19], which characterize most cases of overexploitation in small-scale fisheries [20,21].

TURFs form a system which partially or totally privatize fishing areas for groups of users. It is analogous to the privatization of common and unclaimed land where overgrazing was a serious problem [22–26] in the sense that both of these systems provide resource users with a bundle of rights including some or all the following: access, withdrawal, management, exclusion and alienation [27]. Resource users are capable of controlling access to the resource, intensity of its use as well as selling or leasing management of resource rights. By establishing well-defined property rights, TURFs allow fisheries man-

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agers to deal with the underlying cause of overexploitation, eliminate the “race to fish” and its related consequences such as economic waste and rent dissipation. In other words, unlike conventional fisheries management tools, TURFs can incentivize fishers to manage fisheries in a more sustainable manner.

It is not surprising, therefore, that TURFs have been implemented to manage small-scale fisheries where overexploitation is due to ill-defined property rights. Compared to species-based management, TURFs are more suitable for small-scale fisheries due to their ability to accommodate fishery characteristics (e.g. multiple types of gear, multiple species, unreliable biomass estimates [34]) [35–37].

Given this popularity of TURFs as a flexible management tool, it is important to improve our understanding of how well they have been researched, what has been learnt and what the unresolved questions for future research are. For this purpose, this paper systematically reviews and synthesizes the literature on TURFs. We focus on four main research areas: TURF evolution, effectiveness, enforcement, and the context in which TURFs are set up. We specifically attempt to investigate: (1) how have TURFs evolved in terms of institutional structures and design features? (2) what are the impacts of TURFs on the sustainability of fisheries and how are these impacts measured? (3) how important are enforcement rules relative to other elements of TURF design and what factors affect the compliance and (co)-enforcement behavior of fishers? and (4) what other contextual elements influence the performance of TURFs?

This review aims to complement previous reviews on species-rights based schemes and provide a more comprehensive understanding of rights-based fisheries management. The rest of this paper is structured as follows. In the next section, we describe the approach we have used to identify and select published papers for this review. The scope and the research issues covered in the literature on TURFs are discussed and evaluated. This is followed by a discussion of the main findings. Next, the review highlights key gaps in the literature and directions for future research are suggested. Finally, the review concludes with a summary of the main findings and implications.

2. Materials and methods

Studies were selected through an exhaustive review of peer-reviewed journal articles in English related to TURF systems. Google Scholar, Scopus and Web of Science were used to search for the following key words: territorial use rights for fisheries, exclusive fishing rights, marine user rights, fisheries management, right-based fisheries management, area-based management, place-based rights system, marine tenure, spatial marine zoning, co-management, effectiveness, enforcement, and monitoring, and illegal fishing. All English peer-reviewed journal articles discussing TURF systems in terms of evolution, effectiveness, enforcement, and context were selected for review in a first stage. In a second stage, the bibliographic references in these papers were examined to identify additional papers relevant to the scope of this review. In total, 79 papers investigating TURF systems between 1975 and 2015 were selected for in-depth analysis (See Appendix A). These papers were categorized by research area. Descriptive statistics were used to provide an overview of the trends in the research, the number of papers associated with each research area, and the corresponding research issues.

There has been a dramatic increase in the number of TURF-related papers published in peer-reviewed journals over the period from 1975 to 2015 (See Fig. 1). The rate of publication increased from 3.6 papers for every five-year period between 1975 and 2000–30 papers for 2011–2015, an 8-fold increase. This suggests that TURFs have become a hot topic among researchers and fisheries managers around the world. This can be attributed to two main reasons. First, overfishing is increasingly recognized as a serious issue worldwide. The need for a better understanding of fisheries management tools (such as TURFs) has been well recognized by researchers. Second, TURF systems have a particularly long history in managing small-scale fisheries. However, TURFs still remain poorly understood when it comes to their potential for improving the sustainability of fishing and, this explains the growing interest in studying them.

TURFs have been implemented in many developing countries such as Chile, Indonesia, Korea, Sri Lanka, and Vietnam. Two countries, Japan and Chile, have been studied much more extensively than any other. Information on the number of studies on TURF systems conducted across different countries is provided in Appendix B. Fig. 2 depicts the major areas of research focus in this literature. The 79 peer-reviewed papers are organized into four major subject areas: evolution of TURFs; effectiveness of TURFs; enforcement of TURFs; and the impact of context on the performance of TURFs. A single paper can cover multiple research areas. In each of these areas, the corresponding research issues are identified. It appears that the majority of the papers discuss the impacts of TURFs on the sustainability of fisheries (35 papers out of 79 papers), while a smaller number of papers (14) have focused on the enforcement of this system. The impacts of contextual elements on the performance of TURFs have been investigated by nearly a quarter of the papers (20 papers). The number of studies on the evolution of TURFs is 19.

The key research issues under each research area are shown in Table 1. There are several issues associated with a given research area, highlighting the importance of understanding to what extent these issues have been studied. Our review will summarize existing findings and point out research gaps across these issues.

3. Results and discussion

This section has been organized in terms of the research areas identified in Table 1.

3.1. Evolution of TURFs

Anthropologists have observed that, under pressures from population growth and resource deterioration, fishing societies have gradually adapted to sustain their livelihoods by establishing various kinds of institutions to limit entry to fisheries, such as forming fishing associations and setting up customary marine tenure to exclude outsiders [39–44]. The rise of TURFs can be considered as one of the essential
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