

Inland fisheries of the Mayan Zone in Quintana Roo, Mexico: Using a combined approach to fishery assessment for data-sparse fisheries

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Abstract

In Southern Mexico and Central America, inland fisheries form part of the livelihood portfolio of an as-yet unknown number of rural communities. This paper reports on the first comprehensive study of such fisheries located in common property lands (*ejidos*) of the Mayan Zone in Quintana Roo, Mexico. Given the “data-sparse” nature of these fisheries, with a lack of data available on their current status and on participation levels, a fishery assessment approach was used which included methods from both the natural and social sciences, with a focus on survey methods applied to fishery users, water, fish and creel surveys. Moreover, local knowledge of community residents complemented scientific knowledge in a substantial part of the research. The results, from 48 fishing sites (four with sub-saline waters, the remainder freshwater) indicated (1) a resource base of multi-specific nature with a total of 18 bony fish species in the study area, (2) artisanal (small-scale) fisheries, with very basic technology (notably hand-lines) utilized primarily through barefoot fishing along the shores, or with the aid of rafts and canoes, (3) seasonal fishing, primarily during the dry season (February to May), due to greater accessibility of the sites in those periods, but also related to the end of work on major local livelihoods, (4) both indigenous (Mayan) and non-indigenous fishers, of ages ranging from teenage to senior adults, for most of whom the major occupation was slash-and-burn agriculture, and (5) a mainly male-oriented fishery, but with some women involved in five out of nine *ejidos* studied. While the key motivation of fishers was subsistence, the study found, for the first time in this form of fishery, that recreation was also a significant goal of many participants. In terms of methodology, the study demonstrated the importance of cross-validating the accuracy of information from informants interviewed in the type of social surveys used here. This combined assessment approach proved effective in providing new information on these previously under-studied fisheries, and may be useful in similar data-sparse situations elsewhere.

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1. Introduction

In the Yucatan peninsula of southern Mexico, the karstic limestone nature of the land has produced a network of underground rivers, sinkholes (“cenotes”) and associated water bodies that provide the only sources of freshwater in the region. Recent scholarly literature has also indicated that some of these water bodies are used for fishing by local people (Estrada-Lugo, 2005), although most past research in the area has overlooked the importance of these aquatic resources, due to a focus primar-

ily on agricultural and forestry systems (e.g., Jorgenson, 1993; Hostetler, 1996).

The present paper reports on research to better understand the freshwater fishes, the corresponding small-scale fisheries, and their role as part of the livelihood portfolio of an as-yet unknown number of rural communities in the Yucatan peninsula—which forms a key part of the homeland of the Mayan people, who have been living here (and elsewhere in Southern Mexico and Central America) for the last three millennia (Toledo et al., 2001).

The fact that, to date, the freshwater fisheries of the Yucatan peninsula have been little studied has produced a ‘vicious circle’ such that in Quintana Roo (one of the states of the Yucatan peninsula of Mexico), inland fisheries are not recognized by governments as among the primary human activities, and hence there are no data collected regarding the annual catches, the

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species caught, the resource users, nor the frequency and the seasonality of the activity. This is compounded by the fact that the water bodies used for fishing are located in remote areas of common property holdings locally known as “*ejidos*”, within highly marginalized areas (INEGI, 2000). For these reasons, the fisheries in question are considered, from a fishery science perspective, to be “data-sparse fisheries” (Arce-Ibarra, 2007).

This research focuses particularly on assessment approaches suitable for such data-sparse situations. Given that (a) the gaps in knowledge of Quintana Roo’s inland fisheries encompass a combination of socioeconomic, biological and management aspects, (b) there is a lack of ‘hard data’ as sources of statistical information, and (c) the fishing sites are located in remote areas, this research adopted a combined approach to fishery assessment, with the use of methods from both the social and the natural sciences, together with the use of local people’s knowledge.

This approach seems best able to address the gaps in knowledge of local fisheries, which in turn will benefit governmental agencies dealing with the management of resources at a regional level, together with the local communities, in which those with appropriate rights (the “*ejidatarios*”) own the land in common

with one another (see articles 9th and 12th of the Mexican Agrarian Law (Ley Agraria) at DOF, 1992, 1993). This paper reports on a freshwater fishery assessment undertaken in the Mayan Zone of Quintana Roo. In particular, the assessment examined: (a) the natural resource base used for fishing; (b) the resource users, including gender aspects; (c) the underlying motivations involved in pursuing fishing; and (d) the fishing methods and seasonality of fishing. The results of this form of multi-faceted assessment are drawn upon to produce insights that may be useful in similar data-sparse situations elsewhere in the world. The paper is organized as follows: Section 2 describes the methods used, Section 3 presents the research results and Section 4 presents a discussion of the results.

2. Methods

2.1. Study area

This study was undertaken in Quintana Roo state, located on the Mexican Caribbean, and specifically within a number of common holdings (called *ejidos*) located in the “municipio” of Felipe Carrillo Puerto (Fig. 1). The geographical setting of

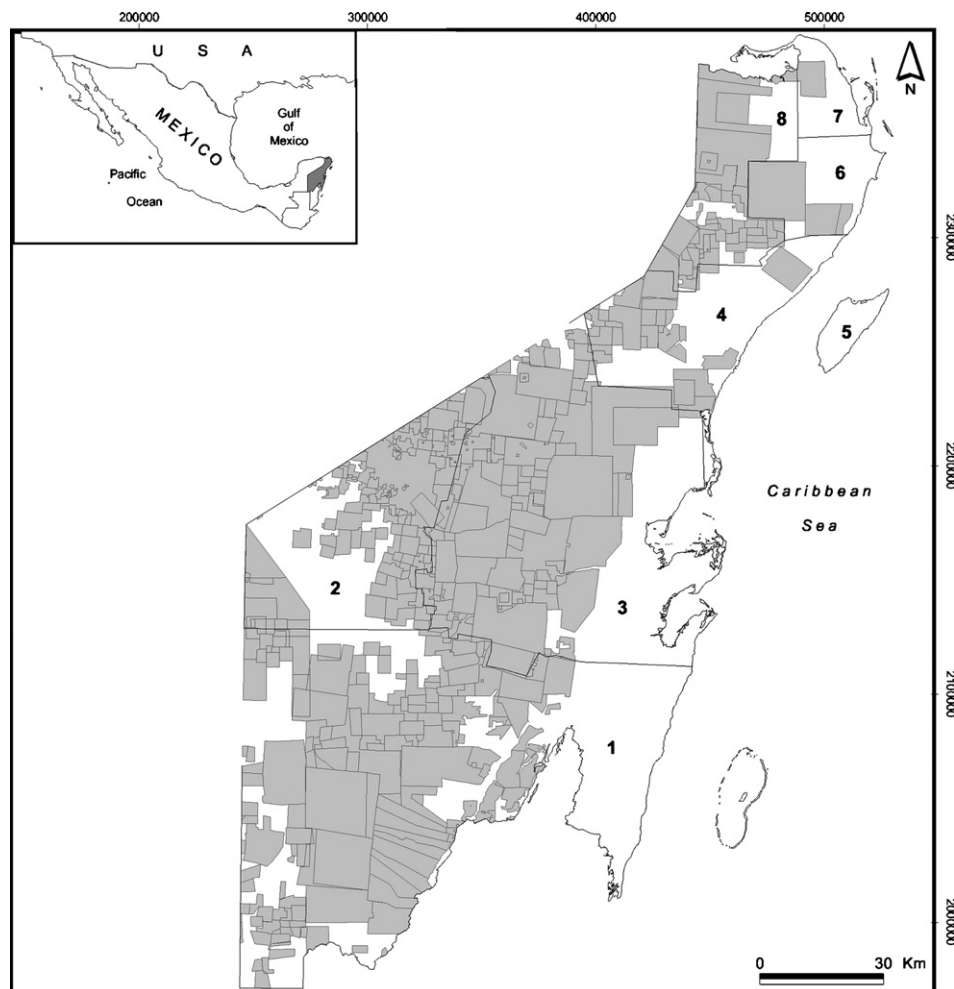


Fig. 1. Study Area. Quintana Roo state with its eight “municipios”: The Mayan Zone comprises “municipios” numbers 2 (José María Morelos) and 3 (Felipe Carrillo Puerto). Shaded areas represent the common property holdings or *ejidos*.

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