



Neither bust nor boom: Institutional robustness in the beach seine fishery of southern Sri Lanka



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ABSTRACT

Many fisheries authorities in the world have been compelled to accept community-based management as an invaluable means to formulate fisheries management due to failures of small-scale fisheries exclusively managed by centralized units. Beach seine fishing practices in Sri Lanka are known to be institutionalized by traditional community-based coastal fisheries management systems. Eight beach seine fisher communities in southern Sri Lanka were studied, using standard ethnographic methods, to ascertain and document the rules and norms that are in general not formerly codified in writing, and evaluate empirically the compliance of institutional arrangements with Ostrom's modified design principles for long enduring common pool resources (CPR) management systems. Fishing rights were vested to the villagers as a residential proximity right. Due to this tradition, ownership of a beach seine and fishing rights at fishing territory vested them as; exclusive, primary or secondary rights. The sole authority for governing CPR was vested to community organization termed "madel samithi" (beach seine society), which can be treated as the local administrative unit. Institutions governing the CPR addressed the excludability problem by defining fishing territory, eligibility rules and intercommunity access rule, while subtractability problem was addressed by gear rules, temporal allocation rules, first comer rules, fishing behaviour rules, conservation rules, and rules for distribution of benefits. The study highlighted that institutional architecture of beach seine fishery of southern Sri Lanka comprised all modified design principles and, 90.9% of those exhibited higher compliance (54.5% – high compliance and 36.4% – very high compliance) with modified design principles. Higher compliance of institutional arrangements with modified design principles indicates robust and stable self-governing institutions. Beach seine fishing in southern Sri Lanka is therefore an example for community-based coastal fisheries management system that relies on strong, locally crafted rules as well as evolved norms, where institutional and governance mechanisms have essentially averted the tragedy, providing significant contribution to coastal economy. Study provides the starkness to the notion that local actors in tropical community-based marine resource systems overcome the CPR dilemmas through robust self-governing institutions.

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1. Introduction

Commons, natural or man-made resource systems that are sufficiently large as to make them costly (but not impossible) to

exclude potential beneficiaries from obtaining benefits from them (Ostrom, 1990), share two universal characteristics referred to as exclusion problem and subtractability problem (Feeny et al., 1990). Commons, also known as common pool resources (CPR), hold in one of four basic property right regimes; viz., state property, private property, common property (communal property) and open access, all of which but open access may, under various circumstances lead to sustainable resource use (Berkes, 2009). In Garret Hardin's seminal paper (1968), the expression "the tragedy of the commons" inspired a generation of scientists as the only way in which CPR were conceptualized until 1980s (Dietz et al., 2003; Berkes, 2009).

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Albeit, [Berkes \(2009\)](#) who studied in Cree Indian village of Chisasibi, James Bay in eastern subarctic Canada had identified that Hardin's model was not fit for communities self-governing their CPR, contradicting the predictions of the "tragedy". Hardin's theory was aptly criticized as oversimplification of the context ([Feeny et al., 1990](#)). Due to negative prognosis, CPR theory underwent major transformations in concept that many communities were successful against threats of resource degradation by maintaining self-governing institutions ([Dietz et al., 2003](#)). [Ostrom \(1990\)](#) defined the institution as a "set of working rules that are used to determine who is eligible to make decision in some arenas, what actions are or are not constrained, what aggregation rules will be used, what procedure must be followed, what information must or must not be provided and what payoff will be assigned to individuals dependants on their action." Although successes and failures were noticed, for thousands of years, communities over the globe rely on a variety of common property institutions, and appropriators often devise long term, sustainable institutions for governing CPR ([Basurto, 2005](#); [Feeny et al., 1990](#)). Institutions are identified as a mechanism for reducing uncertainty in complex, unpredictable environments. By reducing uncertainty, trust and norms of reciprocity may be built and sustained, and collective action may become possible.

[Ostrom \(1990\)](#) posited a set of eight design principles that characterize the efficiency of multiple types of rules and set of rules for managing CPR. Primary role of the design principles is to explain under what condition trust and reciprocity can be built and maintained to sustain collective action. Substantial volume of literature has amassed concerning the usefulness and validity of these design principles. Although [Ostrom's](#) design principles have primarily been developed by examining local commons involving natural resources, [Stern \(2011\)](#) has evaluated their application for global resources and risk CPR. [Cox et al. \(2010\)](#) also evaluated [Ostrom's](#) design principles directly and indirectly in the context of communities that use common property arrangements to manage CPR. Consequently 1st, 2nd and 4th design principles were further divided into subcomponents, and labelled as 1A, 1B, 2A, 2B, 4A and 4B, endorsing 11 principles termed modified design principles (see [Cox et al., 2010](#) for details).

Community-based fishery management has a strong tradition in Sri Lanka ([Deepananda et al., 2016](#)). One kind of traditional fishery in coastal Sri Lanka known as beach seine fishing is an example of a community-based management system, and an alternative to the bureaucratic, centrally managed coastal fisheries in Sri Lanka ([Alexander, 1977](#); [Deepananda et al., 2015](#)). Beach seining in Sri Lanka has a long history and fishers were using small beach seine at least a century earlier. The modern large beach seine "ma-dela" was introduced by migrant fishermen from Madras coast around 1860 ([Alexander, 1977](#)). Being primary fishing gear of Sri Lanka, beach seine was considered as the backbone of the marine fishery industry, and was the single most important contributor to coastal fisheries in the early days ([Samaranayake, 2003](#)). Latest statistics indicates that a total of 1098 operating beach seines are spread off the coast of the island and 169 of those (15.4%) are being operated in southern Sri Lanka ([MFARD, 2015](#)). Although beach seining in Sri Lanka sustain for a long period, providing significant contribution to food security of the country, studies are scanty on the context focussing how resource users overcome CPR dilemmas.

Continued commitments of appropriators are substantial to sustain the system for long run ([Ostrom, 1990](#)). There is a concern however, that rapid development of coastal areas of the country, especially the tourist sector, may impose serious pressure on existing traditional community-based coastal fishery systems, affecting commitments of appropriators. Moreover, there has been an increasing attention on how community members are able to

devise rules to control access to avoid overexploitation of their CPR ([Ostrom, 1999](#)), but much less attention has been given to the question of how access and use controls operate once they are in place. Furthermore, there is an increasing interest in understanding the architecture of the institution ([Cox et al., 2010](#)). A reconnaissance survey and anecdotal evidences lead authors to postulate the hypothesis that beach seining of southern Sri Lanka sustains in the long run due to robustness of the institutions. In light of this, specific objectives of the present study were to: (1) ascertain and document the rules and norms that are generally not formerly codified in writing; (2) evaluate empirically the compliance of elements of customary governance through the framework of modified design principles, to elucidate the importance of institutional robustness to successfully overcome the tragedy. Study has important implications for institutional analysis of contemporary community-based coastal fisheries management that draws on elements of customary governance.

2. Materials and methods

2.1. Study area and communities

The study area is located in the coastal belt of southern province of Sri Lanka, which comprises of three fisheries administrative districts, namely: Tangalle, Matara and Galle. For effective management, each fisheries administrative district has been further divided into fisheries inspector (FI) divisions, which is considered as the lowest fisheries administrative division. Consequently, Tangalle comprised of 12 FI divisions, while other two fisheries districts comprised of 9 FI divisions each. Eight rural coastal villages each of which has a beach seine fisher community ([Fig. 1](#)), were selected for the study carried out from September 2011 to April 2014 based on the accessibility to key persons who assured the willingness-to-participate on voluntary basis to the process of data collection.

2.2. Data collection strategy

Primary data were gathered in three phases (i.e. Phase I, II and III) by means of: (1) semi-structured interviews, (2) participant observation, (3) focus group discussions, and (4) key informant interviews. Semi-structured interviews were the prime instrument used to collect data, which was recognized as a standard ethnographic method for gathering information in an open-ended format ([Briggs, 1986](#)). All the discussions with respondents were carried out in "Sinhalese", i.e. their native language. Three phases of data collection were essentially interconnected and objective oriented. The secondary data, including those pertaining to fish landings were obtained from Statistical Division ([MFARD, 2015](#)), Legal Officer attached to the Ministry of Fisheries and Aquatic Resources Development (MoFARD), District Fisheries Officer (DFO) and FI assigned to the respective areas.

In Phase I, a fulltime reconnaissance survey was conducted to identify the beach seine fisher communities in the study area. The total of 162 individuals, including DFO and FI were interviewed, in turn. This helped to identify fisher community leaders, active fishers with know-how, having long-term knowledge, experience and skills in fisheries, ecosystem and community, hereinafter termed as traditional fishers, and other stakeholders who had strong influence with fishers, including direct buyers and various middlemen in the supply chain.

Phase II of data collection process was based on the Phase I of data collection and characterized by series of interviews carried out with DFOs ($n = 2$); FIs ($n = 8$); community leaders ($n = 8$) and traditional fishers ($n = 64$) identified using snowball sampling method ([Biernacki and Waldorf, 1981](#)). Community leaders and

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