

Key Requirements for Co-management in Small-Scale Fisheries

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Abstract

The contribution of small-scale fisheries (SSF) to nutrition, food security, employment generation, and poverty alleviation in the developing world is substantial. Co-management, which is a participatory fisheries management approach involving the fishers, state, other stakeholders, and relevant external agents, is endorsed by many practitioners as an effective strategy to address major issues in SSF caused by the increased dependence on ecosystem services, economic globalization, and climate change. In most parts of the world, co-management is now well-established as a mainstream approach to addressing major issues in SSF. In this paper, a systematic literature review with content analysis of selected case studies was employed to explore the key problems in the SSF and to examine how co-management has intervened to resolve major SSF issues. Finally, it attempted to explore the key requirements for operationalizing co-management. The paper builds on lessons learned from case studies from Uruguay, Zambia, Timor Leste, and Sri Lanka, where SSF plays a significant role in fisheries. The paper emphasizes the role of Ostrom's modified principles, which demonstrates the ability of common pool resource users such as small-scale fishers to manage their resources sustainably. We take the position that the existence of Ostrom's modified design principles is a significant requirement for operationalizing co-management. The presence of strong, committed, and respected local leaders, unity, and cohesion of community networks, availability of strong local organizations, and enforcement of indirect regulations such as community-based protected areas and closed seasons, and strong local knowledge base on ecological systems are recognized as key requirements for operationalizing co-management. The results also show that healthy socio-economic conditions and appropriate ecological settings enhance the drive for co-management.

Keywords: Community participation, Fisheries management, Sustainable development

Introduction

Small-scale fisheries (SSF) is a dynamic and diverse sector, engaging both men and women throughout its value chain and providing food and livelihoods for millions of people around the world (Pittman et al, 2019). SSF contributes to about half the global fish catches and employs more than 90 percent of the world's 39 million capture fishers and fish workers (FAO, 2019). Basurto et al., (2017) are of the view that it is not possible to have a universal definition for SSF due to its diversity. Nevertheless, this sector is primarily characterized by fishers operating smaller crafts, using a small amount of capital, fishing in shallower waters, targeting local and domestic markets, and home consumption (Amarasinghe and Bavinck, 2017; Koralagamage, 2020; Pathmanandakumar, 2017).

The coastal fisheries sector, which is identified as the Small-scale fisheries (SSF) sector in Sri Lanka makes an important contribution to nutrition, food security, sustainable livelihoods, and poverty alleviation in Sri Lanka (Amarasinghe and Bavinck, 2017). Around 93 percent of Sri Lanka's 59,000-strong fishing fleet is engaged in small-scale fishing, accounting for 63 percent of the total fish production of the country (Ministry of Fisheries, 2021). Although their contribution to food security, employment generation, and poverty alleviation is enormous, it is widely accepted that small-scale fishers face difficulties due to their vulnerability to social, environmental, and economic issues (Jentoft et al., 2017). They struggle under various stresses emerging from poverty, powerlessness, and marginalization (Jentoft et al., 2017). The sustainable development of SSF remains a considerable challenge, particularly in the contexts of poverty, the high dependence of increasing populations on ecosystem services, economic globalization, and climate change (Evans et al., 2011). Conflicts in respect of fisheries tenure, access, and user rights in fisheries socio-economic systems are other salient problems in this sector (Dahlet, et al., 2021).

As set out in the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication, endorsed by the FAO Member States in 2014, the remedies include secure tenure, access to fairer markets, better education, improved health, etc., within a human rights framework (FAO, 2015; FAO, 2017; Jentoft et al., 2017). The significance of community involvement as an alternative approach to bringing

remedies to issues in SSF is widely acknowledged (Evans et al., 2011: Kosamu, 2015: Trimble and Berkes, 2015).

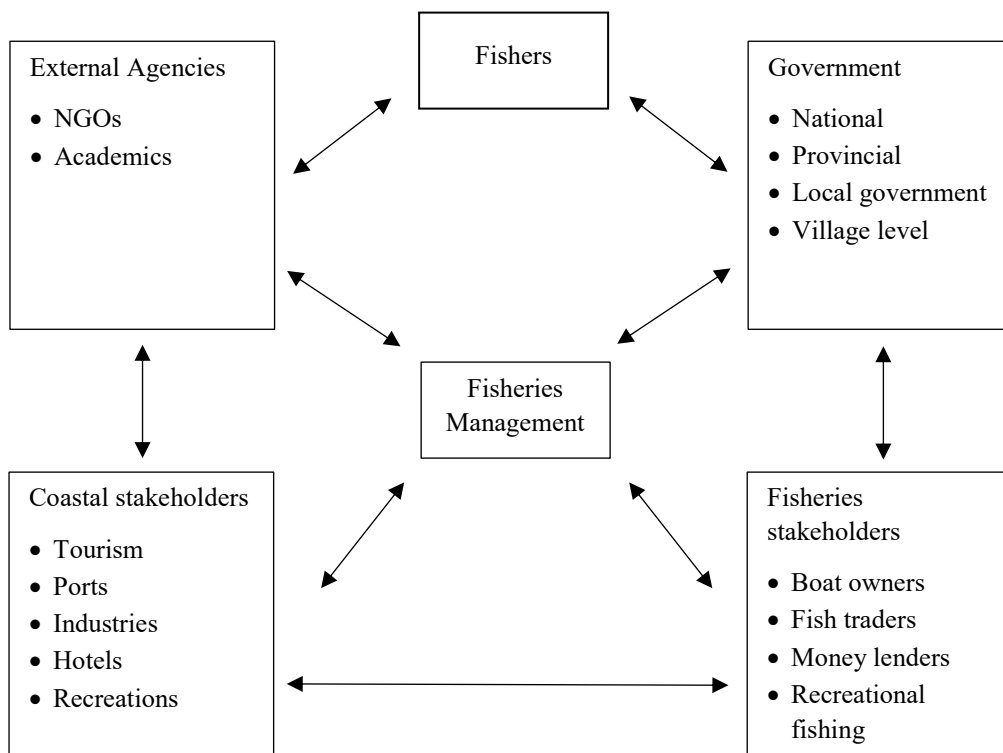
The highest form of community involvement in fisheries management is generally termed co-management. Co-management is often considered as a relationship between a resource user group and other organizations for fisheries management in which some degree of responsibility and authority is conferred to both parties (Evans et al., 2011). Co-management programs have been implemented in multiple countries and contexts to increase the participation of fishing communities in the management and improve the long-term sustainability of resources (Quimby and Levine, 2018). The philosophy behind co-management is that those who are affected by management (e.g., fishers and other resource users) should be involved in making management decisions, thereby improving the legitimacy of the state involvement in fisheries management through more inclusive and transparent decision-making processes (Cavallé, et al., 2020: Evans et al., 2011: Pathmanadakumar, 2017: Pomeroy and Rivera-Guieb, 2005). Co-management is also called participatory, joint, multi-party, or collaborative management (Pomeroy and Rivera- Guieb, 2005). In a more descriptive analysis, Pomeroy and Rivera-Guieb (2005) define co-management as a partnership arrangement in which the community of local resource users (fishers), government, other stakeholders (boat owners, fish traders, boat builders, business people, etc.), and external agents (non-governmental organizations (NGOs), academic and research institutions) share the responsibility and authority for the management of the fishery where responsibilities and rights in management, referred to as ‘negotiated power’ are established.

Benefits of co-management are identified in terms of ensuring sustainable fishing, reducing the cost of fisheries management, obtaining the support of fishers to avoid breaking rules (Gutiérrez et al., 2011: Pathmanadakumar, 2017), using the wealth of knowledge and experience of fishers for management process (Gammanpila, 2018: Gutierrez et al., 2011), empowerment of communities (Jentoft, 2004), ecological benefits such as preservation of resources (Gutierrez et al., 2011: Pomeroy, 2003), social benefits such as strengthening of the communities (Gutierrez et al., 2011: Quimby and Levine, 2018), conflict resolution (Kaluma and Umar, 2021), increased compliance with regulations through peer pressure; and better

monitoring, control, and surveillance by fishers (Gutierrez et al., 2011). Nevertheless, the success stories of co-management are not widespread (Jentoft *et al.*, 2017; Pathmanadakumar, 2017; Pittman et al., 2019).

Figure 1

Co-management as a partnership



Source: *Pomeroy and Rivera- Guieb (2005)*

Objectives of the Study

Traditional fisheries management strategies have failed to take into account the precautionary approach to maintain and protect sustainable fisheries, biodiversity, and marine ecosystem and the conflicts among resource users. Therefore, there is an urgent need to move towards a more participatory, co-management model of governance (Arceo, et al., 2013). Pathmanandakumar (2017) mentions that though the government institutions in Sri Lanka, from time to time, have supported establishing and implementing co-management measures in the SSF sector through various policy and project initiatives, the

existing co-management initiatives are not very satisfactory. Therefore, it is timely to examine the issues in the SSF sector and to explore what is required to establish effective co-management initiatives.

The objectives of this paper include the identification of existing issues in SSF, examination of the success of the co-management interventions and to explore the key requirements for successful co-management regimes. The overriding objective of the study is to recommend the key requirements in SSF where co-management platforms would thrive.

Methodology

A multi-step procedure was used to compile a list of participatory management efforts in the SSF, along with any corresponding information on evaluations or assessments of such initiatives. The procedure involved two main phases: i) a literature survey through an electronic search for published literature and ii) the systematic selection of case studies with available and appropriate data for analysis.

The first step in the literature search involved a comprehensive search for various electronic library databases (including Google scholar, Web of Science, WorldFish Library Catalogue, and Scopus) using keywords (different combinations of co-management, participatory fisheries management, community participation in fisheries) and following up references therein. Through the electronic literature search, a total of 108 fisheries co-management-related articles were retrieved. From this sample, 64 articles were excluded because they did not refer to qualitative or quantitative impacts of co-management related to fisheries or aquatic systems in developing countries. This left 44 articles from which to identify potential case studies, issues in SSF, potential solutions, prerequisites, and appropriate conditions for co-management.

This paper proceeds in three stages. First, the issues and problems in the SSF are identified using selected literature. Secondly, it attempts to examine how the co-management efforts had intervened to solve burning issues in SSF by using several case studies found in the literature. The analysis of case studies using Ostrom's modified design principles was conducted to identify different issues in the SSF. The following modified principles were used: i) The Common pool resources (CPR) has clearly-defined boundaries (effective

exclusion of external unentitled parties) ii) There is congruence between the resource environment and its governance structure or rules iii) Decisions are made through collective-choice arrangements that allow most resource appropriators to participate iv) Rules are enforced through effective monitoring by monitors who are part of or accountable to the appropriators v) Violations are punished with graduated sanctions vi) Conflicts and issues are addressed with low-cost and easy-to-access conflict resolution mechanisms vii) Higher-level authorities recognize the right of the resource appropriators to self-govern viii) In the case of larger common-pool resources, rules are organized and enforced through multiple layers of nested enterprises. Finally, the paper attempts to explore the key requirements for operationalizing co-management in SSF through the selected case studies.

Results and Discussion

Issues in the SSF Sector

According to the selected case studies, there are many issues in the SSF sector. Overexploitation of resources is identified as a primary issue in the global SSF sector since the 1990s (Basurto, et al., 2017). Therefore, sustainable use of resources has become a primary area of concern in the SSF. Conflicts in respect of fisheries tenure, access, and user rights in fisheries socio-economic systems are other salient problems in this sector worldwide (Dahlet et al., 2021). The rights of fishers are violated due to the acquisition of beach areas for tourism and other commercial activities, leading to the loss of anchorage sites, beach-seining sites, and space available for craft and gear repair, and fish processing (Amarasinghe, 2020). There are ample examples of such conflicts in the SSF sector (Bavinck, 2015; Gammanpila et al, 2018; Ibrahim, 2020; Pethiyagoda and Amarasinghe, 2015; Wickramasinghe and Bavinck, 2015). Pethiyagoda and Amarasinghe (2015) note that when diverse resource users with different interests work towards maximizing their benefits, it causes negative externalities on others, leading to conflicts. Among other issues related to SSF are the lack of community involvement in areas such as training and capacity building in scientific fish handling, the failure of community organizations to take up fish marketing aiming at breaking middlemen's oligopolies, and the lack of an 'early warning mechanism (Amarasinghe, 2020). The high rates of resource exploitation, unregulated technology change,

increasing fishing pressure, etc. too pose threats to the total ecosystems, leading to resource degradation (Sri Lanka Forum of Small-scale Fisheries, 2019).

Climate change is also considered an important factor affecting the SSF (Sri Lanka Forum of Small-scale Fisheries, 2019). The rise in sea level has resulted in the loss of landing centers, beach-seining sites, fish-drying sites, displacement of fishing populations, etc. (Sri Lanka Forum of Small-scale Fisheries, 2019). Seawater intrusion has also affected Lagoon ecosystems, causing a decline in productivity (Sri Lanka Forum of Small-scale Fisheries, 2019). Among many populations, those living in coastal areas experience the highest climate change risks which have very serious consequences on the well-being of fishing communities who form the most important coastal stakeholder group (Deepananda, et al., 2016a: Sri Lanka Forum of Small-scale fisheries, 2019).

Role of Co-management in the SSF

According to the literature, co-management has been adopted in many small-scale fisheries in developing countries as a management mechanism. It is widely accepted that common-pool resource users such as small-scale fishers are capable of successfully managing their resources under a proper participatory management process (Cox et al., 2010: Ostrom, 1990: Pomeroy, 2003: Pomeroy and Rivera- Guieb, 2009: Sandstrom and Rova, 2010). In this essay, we consider several examples of co-management in SSF to demonstrate the role of co-management in effectively managing the SSF.

Several researchers have studied the co-management efforts in the yellow clam fishery in Uruguay (Defeo et al., 2016: Pittman et al., 2019). Uruguay's yellow clam fishery began as a small and stable open-access fishery in the 1960s and continued in the same manner until the 1980s when a period of rapid expansion began (Defeo et al., 2016). Landings from 1981 to 1985 increased by 3.5 times their pre-1980 levels but catches were greatly reduced by the 1980s due to severe reductions in stock, resulting in the shutdown of the fisheries from 1987 to 1989 – a strategy agreed upon by both fishers and the government agencies (Defeo et al., 2016). The shutdown provided an opportunity to improve the governance of the fishery, which reopened in 1989 with a new governance scheme and fresh management tools in place (e.g.

quotas, and spatial-temporal zoning). Most importantly, the new tools and previous experience of stock collapse led to the high, voluntary participation of the fishers themselves in deciding and implementing rules –creating a de facto co-management regime. This had positive effects including the reduction of landing sites to low levels; an increase in species availability, unit prices, and revenues per unit of effort; and reduced variability in many fishery indicators (Defeo et al., 2016). This first co-management phase was therefore very successful and lasted until late 1994 (Defeo et al., 2016). Pittman et al., (2019) found that fishers in Uruguay had a high level of satisfaction with co-management initiatives. The case study of the small-scale yellow clam fishery in Uruguay provides an excellent example of how longstanding co-management regimes can improve the capacity of small-scale fishers to address the issues affecting small-scale fisheries (Pittman et al., 2019).

In 2011, participatory fisheries management was introduced in Zambia through the revised Fisheries Act number 22 of 2011 (Haambiya et al., 2015; Kaluma and Umar, 2011). Before this, the state was entirely responsible for fisheries management. The Act of 2011 expected the active participation of communities in fisheries management through village fisheries management committees (Kaluma and Umar, 2011). Once the 2011 Fisheries Act was promulgated, it was expected that local fishing communities would engage in fisheries governance across all main fisheries in Zambia. The system of Village Fisheries Management Committees (VFMC) was introduced to strengthen co-management. Potential VFMC members were nominated by fishers through community meetings held with several stakeholders including traditional leaders, officials from the Department of Fisheries, and fishers. The nominated fishers were trained and appointed by the Department of Fisheries as Village Fisheries Management Committee members. They act as the main agents of managing the fishery (Kaluma and Umar, 2011).

Tilley et al., (2019) have used two case studies in Timor Leste; i.e., the Biacou community on the north coast and the Adara community on the west coast. Both case studies reveal the functioning of co-management persists in Timor-Leste and is implemented for fisheries management of near-shore coastal resources at limited scales, by building on locally legitimate institutions (Tilley et al., 2019). Co-management operates in Timor Leste, by utilizing or interacting with these traditional, legal, and religious institutions, connecting with state mechanisms to manage diverse fisheries issues (Tilley et al., 2019).

They find that co-management is a valuable and important tool for the development of local rules, and for facilitating the engagement of resource owners and stakeholders in multi-scale governance.

Several scholars, including Amarasinghe and Bavinck (2011), Amarasinghe and Bavinck (2017), Cohen et al. (2021), Deepananda et al. (2016), Fernando et al. (2015), Gammanpila et al. (2018), Joseph (2015), Pathmanadakumar (2017), have paid attention to co-management or community-based fisheries management initiatives in Sri Lanka. Cohen et al., (2021) note that very few examples of successful co-management initiatives can be observed in the coastal fisheries sector in Sri Lanka. However, there are a few examples of successful co-management initiatives including beach seine fisheries (Deepananda, et al., 2016a) and stilt fisheries (Deepananda et al. 2016b) of the southern coast and inland fisheries (Fernando, et al., 2015). In these instances, communities demarcate their fishery areas in agreement with the local fisheries inspectors. Communities are effectively involved in the management of their demarcated areas and provide valuable information on physical and biological factors back to the fisheries authorities at the beginning and end of each fishing season (Deepananda et al. 2015). Joseph (2013) views that most of the co-management initiatives in Sri Lanka were project-driven. He claims that there is a clear need for the policy on co-management to be translated into strategy and brought into the mainstream, and not allow it to operate in 'project mode'. Joseph (2013) further notices that lack of legal and institutional arrangements for wider stakeholder participation, lack of fisheries development and management plans, lack of institutional strengthening, and lack of tangible benefits from co-management are other major deficiencies identified in co-management initiatives in Sri Lanka.

Key Requirements for Co-management

In 1990, Ostrom introduced 08 design principles for sustainable governance of common-pool resources (CPR), which earned her esteemed Nobel Prize. Gutiérrez et al., (2011) recognize Ostrom's intervention as a landmark conceptual development in fisheries management, where community-based management or co-management was accepted as a solution to the dilemma of CPR users explained by Hardin (1968) as the tragedy of commons. Ostrom's principles include i) The CPR has clearly-defined boundaries (effective exclusion of external unentitled parties) ii) There is congruence between the

resource environment and its governance structure or rules iii) Decisions are made through collective-choice arrangements that allow most resource appropriators to participate iv) Rules are enforced through effective monitoring by monitors who are part of or accountable to the appropriators v) Violations are punished with graduated sanctions vi) Conflicts and issues are addressed with low-cost and easy-to-access conflict resolution mechanisms vii) Higher-level authorities recognize the right of the resource appropriators to self-govern viii) In the case of larger common-pool resources: rules are organized and enforced through multiple layers of nested enterprises. Hence, Ostrom (1990) notes that the ability to agree on the rules, and the ability to monitor each other's activities, are key pre-conditions for a community to make rules successfully. In addition, she highlights the importance of a system of threats or punishments, if rules are continuously broken ("graduated sanctions"). Ostrom's principles can be recognized as a basis and framework for successful community-based management of resources (Araral, 2014: Pinkerton and Weinstein, 1995: Frischmann, et al., 2019).

However, there are disagreements on Ostrom's (1990) theory, where it is argued that Ostrom (1990) has not clearly distinguished the difference between commons and private property rights and she believes that private property is possible only if the government protects and enforces it (Block and Jankovic, 2016). Cox et al (2010) analyzed 91 studies to evaluate and analyze resource systems and modified Ostrom's (1990) design principles. They found that Ostrom's (1990) principles were empirically well supported but reformulated principles 1, 2, and 4 after a qualitative analysis and divided each of these three principles into two, establishing 11 design principles in total. Principle 1 originally stipulates the presence of well-defined boundaries around a community of users and boundaries around the resource system of this community. Each component helps to internalize the positive and negative externalities produced by participants and bear the costs of appropriation and receive some of the benefits of resource provision. The main complaints concerning this principle are that it is too rigid and that, in many systems, loose social or geographic boundaries are needed to facilitate more flexible, ad hoc arrangements between participants. Therefore, they suggest 02 conditions to fulfil principle 01. 1) Individuals or households who have the right to withdraw resource units from the common pool resource (CPR) must be clearly defined. 2) The boundaries of CPR must be properly defined.

Ostrom's (1990) second design principle refers to the "congruence between appropriation and provision rules and local conditions." Cox et al., (2010) argue that like the first principle, this principle also stipulates two separate conditions. 1) Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions. 2) The benefits obtained by users from a CPR, as determined by appropriation rules, are proportional to the number of inputs required in the form of labour, material, or money, as determined by provision rules. Cox et al., (2010) also suggest two separate conditions for principle 4; effective monitoring by monitors, who are part of or accountable to the appropriators as mentioned. 1) Monitors are present and actively audit CPR conditions and appropriator behaviour. 2) Monitors are accountable or are the appropriators.

Several researchers have shown the applicability of Ostrom's design principles in different SSF settings. Hence, the presence of modified design principles can be recognized as a significant requirement for operationalizing co-management. Gammanpila et al., (2019) have tried to assess the institutional robustness of the community-based management system of the brush park fishery in Negombo, which is a small-scale fishery where traditional ecological knowledge (TEK) is utilized, using Ostrom's modified design principles. Gammanpila et al., (2019) find those remnants of community-based fisheries management (CBFM) exist in the brush park fishery of the Negombo estuary. For example, somewhat strong property rights such as exclusive rights that come from generation to generation exist in the fishery, which helps to prevent CPR issues (Gammanpila et al., 2019). However, the intensification of brush park fisheries in the Negombo estuary was not reported in the recent past (Gammanpila et al., 2019). The knowledge of brush park fishers about productive seasons and lean seasons with seasonal salinity variations in the estuary caused by monsoonal rains and the effect of wind conditions on the harvest was found to be accurate, which indicates that brush park fishers possess a wealth of indigenous knowledge that has been gathered through their experience (Gammanpila et al., 2019). Opinions expressed by members of the fishing community about the institutional robustness of community-based management in the brush have indicated a wide variation. Of the 11 Ostrom's modified design principles, only three (i.e., congruence between appropriation and provision, monitoring of users, and monitoring of resources) had a mean score of 4 representing high compliance.

Four design principles (i.e., congruence with local conditions, conflict resolution mechanisms, minimal recognition of rights to organize, and multi-level institutional structure) had low compliance in the brush park fishing community indicating the need for intervention of state or a centralized management unit (Gammanpila et al., 2019). The design principles of the lowest compliance in the fishing community were those related to clearly defined user boundaries, clearly defined resource boundaries, and graduated sanctions (Gammanpila et al., 2019). They conclude that the degree of community-based management is not effective in the successful management of the fishery and it has not developed to a level of a strong co-management framework. However, they are of the view that there is a potential for integrating some institutional design principles through the intervention of centralized management authorities. The formation of brush park fisher societies that support intercommunity linkages to facilitate the sustainable use of resources through a co-management system has been recommended as a suitable measure to sustain this traditional fishery (Gammanpila et al., 2019).

Deepananada et al., (2016) have studied 08 beach seine communities in southern Sri Lanka to examine the compliance of their management practices with Ostrom's modified design principles. Their findings indicate that the beach seine fisher community of southern Sri Lanka manages its CPR through self-governing institutions, and they show high compliance with modified design principles for a CPR management system. They conclude that beach seine fishing in southern Sri Lanka is an example of a community-based coastal fisheries management system that relies on strong locally designed rules as well as evolved norms where institutional and governance systems contribute to sustainability.

Reviews of case studies have revealed some patterns or commonalities among successful cases, which demonstrates certain requirements for successful co-management. Gutierrez et al. (2011) and Haambiya et al., (2015) identify the presence of community leaders as one condition that facilitates the success of co-management. They are of the view that leadership is critical for the successful co-management of fisheries. The presence of at least one person with entrepreneurial skills, well-motivated, respected as a local leader, and personally committed to the co-management implementation process, was essential (Gutierrez et al., 2011). The traditional authorities or skilled, committed, and motivated local leaders act as an entry point through which

the state can involve the entire community. Strong local leaders with intentions of promoting collective gain at the expense of self-interests promote strong social cohesion among the resource users and reinforce success in co-management (Gutierrez et al., 2011). Unity of the community and its togetherness and cohesion founded on local norms, trust, communication, and connectedness in networks and groups was also an important global attribute leading to successful fisheries co-management (Gutierrez et al., 2011). According to Kosamu (2014), the sustainability of small-scale fisheries depends mainly on the strength of the collective social capital of the local communities, and, with weak local social capital, degrees of government involvement does not make any difference. The results of Gutierrez et al., (2011) show that additional resources should be spent on efforts to identify community leaders and build social capital rather than only imposing management tactics without users' involvement. Amarasinghe and Bavinck (2011) identify that the availability of strong local organizations such as Cooperatives in Sri Lanka is a great source of social capital promoting collective action. 'Direct regulation' mechanisms such as Total Allowable Catch (TAC) in form of individual and community fish quotas and enforcing 'indirect regulations' such as community-based protected areas, closed seasons, limiting the number of resource users, and community restrictions on the type, size, and gears permissible contribute positively towards co-management (Gutierrez et al., 2011; Kaluma and Umar, 2011). Increasing the legitimacy of regulations is another condition that re-enforces strengthening co-management schemes (Kaluma and Umar, 2011). Amarasinghe and Bavinck (2017) stress the importance of considering broader ecological systems in co-management rather than isolated fisheries issues. Sandstrom and Rova (2010) are of the view that the ability to foster an adaptive management process in which rules are continuously revised and changed according to what is known about the ecological system is another important requirement to sustain co-management efforts. Gutierrez et al. (2011) also find that robust social capital, combined with clear incentives through catch shares and conservation benefits derived from protected areas also strengthens the efforts of co-management.

The legitimacy of community engagement has also been recognized as an important requirement. Tilley et al., (2019) highlight the need for a set of guiding principles to ensure legitimate community engagement, and avoid

external intervention that may reinforce the marginalization of certain user groups or traditional power hierarchies.

Conclusion

The review of the literature shows that operationalizing co-management is a well-recognized mechanism for addressing major issues in the SSF. However, co-management regimes would not be successful unless appropriate conditions or requirements are met within the community concerned. According to the results, characteristics of many successful co-management regimes comply with Ostrom's modified design principles. The presence of strong, committed, motivated and respected community leaders driven by a passion for community engagement, legitimacy of community organizations, availability of strong social capital, unity, and connectedness of community organizations are important requirements for operationalizing co-management.

The results also show that the success of co-management differs according to the socio-economic conditions of the resource users and the ecological setting. The situations with better socio-economic conditions are more likely to establish stronger co-management regimes. Co-management would be more effective in benthic and demersal fisheries over multi-species fisheries. Providing the necessary legal frameworks and strengthening the legitimacy of regulations or the 'rules of the game' are also important requirements for operationalizing co-management in SSF.

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