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STUDENT POLICY REPORT • APRIL 2024

Blue Foods for Indonesia: A Human & Planetary Health Action Lab

Small-Scale Fisheries:

Lessons Learned from Global Examples of Fisheries Co-Management

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This report was produced by a team of students participating in a ten-week Action Lab offered by the Stanford Center for Ocean Solutions and the Human & Planetary Health Initiative, of the Stanford Doerr School of Sustainability, and Stanford Law School. The course was taught by Jim Leape, Janet Martinez, Richard Nyiawung, and Eric Hartge, with support from Colette Wabnitz, Zach Koehn, Josheena Naggea, and Liz Selig. The Action Lab experience was supported by staff from the Stanford Human & Planetary Health Initiative: Kathy Burke, Allison Phillips, Erika Veidis, and Katie Vogelheim. An editing and formatting review was completed by Molly Glickman.

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Contents

Executive Summary 3

1. Introduction 4

Co-management for small-scale fisheries 4

Team approach & methodology 5

2. Case Studies 7

2a) Chile 7

Background 7

System map 9

Outcomes 10

2b) The Gambia 13

Background 13

System map 15

Outcomes 18

2c) Mexico 19

Background 19

System map 20

Outcomes 25

2d) Philippines 27

Background 27

System map 29

Outcomes 32

3. Key Takeaways 34

4. Conclusion 36

5. References 37

Executive Summary

Indonesia's fisheries sector is dominated by small-scale actors, who not only produce a large share of national marine catch yet also rely heavily on fishing as a source of livelihood, nutrition, and food security. Securing the sustainability and overall health of Indonesia's small-scale fisheries (SSF) is therefore critical to unlocking the potential of the country's blue foods sector. Yet multiple stressors, including overfishing and the unfolding impacts of climate change, continue to affect the viability of Indonesian SSF. In recent decades, co-management approaches have become increasingly popular for SSF across the globe, showing great potential to produce effective, contextually relevant, and sustainable management outcomes. In the following report, we adopt a case study approach to examine SSF co-management approaches in four countries: Chile, The Gambia, Mexico, and the Philippines. For each case, we describe the conditions enabling governance transformation and analyze key outcomes of the co-management regime. Importantly, each regime entails some program of exclusive use rights for fishing, which we deemed a critical principle of SSF empowerment. The second key principle of SSF empowerment that we identified is the formality of fishers' role in management structures. Our high-level findings evaluating principles of empowerment for each case are compiled in the third section of this report. We ultimately submit that a balanced devolution of management powers and authority to the local level is a key element in safeguarding the livelihoods of coastal communities and empowering small-scale actors as stewards of the marine ecosystem.

1. Introduction

Co-management for small-scale fisheries

Over the past two decades, co-management approaches have become increasingly popular for small-scale fisheries (SSF) across the globe. This rise in co-management regimes reflects a paradigm shift in fisheries governance moving away from top-down management models and towards more inclusive and participatory approaches. Co-management is defined as the collaborative sharing of management authority between the state and local resource users[1], and it is thought to produce more effective, contextually relevant, and sustainable management outcomes for fisheries. In promoting a decentralized governance structure, co-management is also thought to improve the adaptive capacity of fisheries by allowing resource users to identify and respond to local threats[2].

Co-management is a broad term that encompasses diverse arrangements of power sharing and differing degrees of resource user empowerment. Therefore, co-management is not a panacea capable of solving the wide range of dilemmas facing small-scale fisheries today[3]. In some cases, the centralization of fisheries management systems has led to the erosion of customary practices that guided the allocation and sharing of resource benefits in small-scale fisheries for generations. Given the power imbalance between small-scale fishers and other actors such as large-scale fishing operations and foreign fishing operations, governments need to work with small-scale fishers in the design, planning, and implementation of appropriate management systems that are participatory in nature and recognize the legitimate tenure rights of small-scale fishers[4].

Fisheries co-management can be evaluated based on two key principles – use rights and access, and formality of governance[5]. The former principle concerns the allocation of resource-related rights to fishers, whereas the latter principle pertains to the formality of fishers' role in management structures. Importantly, each principle in isolation will not guarantee the empowerment of small-scale fishers. It is increasingly recognized that the convergence of use rights and formality of governance is essential for realizing the full potential of fisheries co-management. While legal frameworks establishing rights regimes for fishers represent a crucial step towards co-management, they are insufficient without mechanisms for devolving power and decision-making authority to the local level.

[1] Pomeroy and Williams, "Fisheries Co-Management and Small-Scale Fisheries."
[2] Ebel, "Moving Beyond Co-Management."
[3] Chuenpagdee and Jentoft, "Step Zero for Fisheries Co-Management."
[4] Kurien, John. "Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication: summary." (2015).
[5] Short et al., "Harnessing the Diversity of Small-Scale Actors Is Key to the Future of Aquatic Food Systems."

Team approach & methodology

Our approach is rooted in a comprehensive understanding that Indonesia's SSF sector, which accounts for over 90% of the nation's fishing fleet, is currently facing multiple stressors including overexploitation and illegal fishing, habitat degradation, income insecurity, and a lack of formal identification and legal support. Recognizing the need for effective and collaborative governance to secure the sustainability of the SSF sector, our team adopted the following case study approach:

Literature Review and Case Study Selection: We began by conducting extensive literature reviews focusing on successful co-management cases for small-scale fisheries across the globe. With an aim to represent diverse geographic regions and co-management frameworks, we narrowed our scope to seven countries. From there, we further narrowed our focus based on the availability of up-to-date research, shared context with Indonesia, and elimination of redundancy. This led to our final section of four country cases: Chile, The Gambia, Mexico, and the Philippines. Our hope is that, by exploring various contexts and systems of resource user empowerment from South America to Southeast Asia, this report can enable BAPPENAS to understand the approaches and strategies available for empowering its own SSF sector.

Case Study Analytic Framework: Drawing on the key co-management principles of use rights and formality of governance, we assess existing regimes of co-management in each of the four country case studies. Based on the idea that exclusive use rights are a necessary precursor – but not a sufficient determinant – for successful co-management, our report focuses specifically on the formality of governance principle. We rely on the following system map (Figure 1), which specifies five key steps for the enactment of rights regimes, to evaluate degrees of SSF empowerment and formality of governance for each country's case.

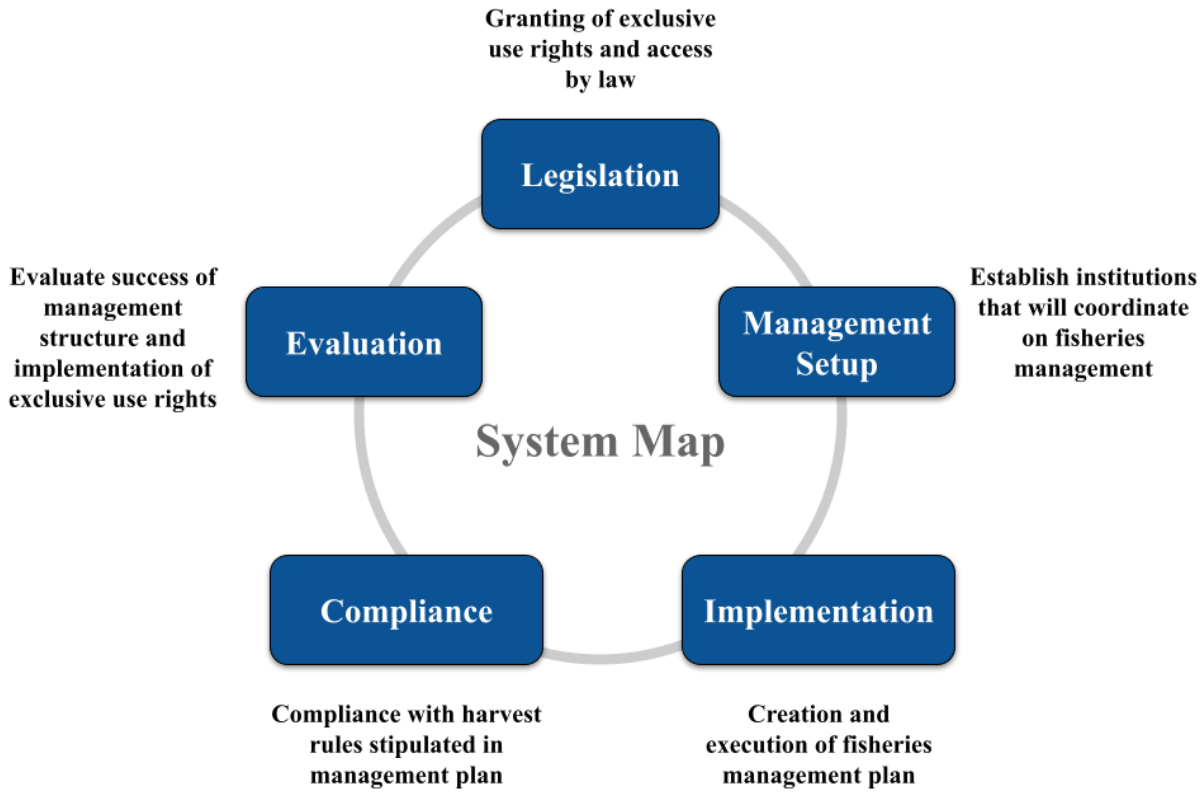

Figure 1: System Map for Implementation of Rights Regimes in Small-Scale Fisheries

Case Study Analysis and Interviews: Through eight interviews with a range of experts from related fields of fisheries science and management, we delved into the specific contexts of the selected country case studies. This process allowed for a deep understanding of the practical applications and outcomes of different co-management strategies, providing valuable insights into the complexities and dynamics of SSF management.

Synthesizing Key Learnings: The culmination of our research involves synthesizing the key learnings from each case study, focusing on identifying opportunities and constraints specific to the Indonesian context. This synthesis will highlight crucial takeaways and suggest areas for further research, aiming to inform policy decisions and practical interventions for the SSF sector in Indonesia.

2. Case Studies

2a) Chile

Background

Chile is among the top ten producers of fish globally. With over 4,000 kilometers of resource-rich coastline, the country is known for its nearshore artisanal sector that consistently dominates national marine production. In 2022, a total of 100,117 artisanal fishers landed 1,710,983 tons of marine resources – meaning the artisanal sector accounted for over 40% of national fisheries catch[6].

Artisanal fishers are the only group permitted to operate in Chile's 'nearshore zone' that extends the first five nautical miles from shore. To be granted such status, fishers must register themselves with the National Fisheries Service and their vessel must not exceed 18 meters in length and 80 tons in storage capacity[7]. There are two main groups of artisanal fishers: the first harvests reef fish, inshore finfish, benthic invertebrates, and seaweed from small boats or by hand (i.e. diving and coastal gathering), while the second group harvests finfish and small pelagic species from larger boats[8]. Most artisanal fishers are organized within coves, or *caletas*, along the Chilean coast.

The harvest of nearshore benthic resources, carried out by the smaller-scale group of artisanal fishers specified above, is an important source of income for many coastal and rural communities in Chile. Since 1991, a Territorial Use Rights in Fisheries (TURF) policy – known in Chile as the Management and Exploitation Areas for Benthic Resources (MEABR) – has been in place for the co-management of artisanal benthic fisheries[9]. The TURF system is currently operative in over 500 distinct areas along the Chilean coast, making it one of the largest area-based fishing rights programs in the world[10]. At a high level, the TURF system operates by allowing organized small-scale fishers to apply for exclusive access to a certain exploitation area and the benthic resources found therein on the condition that they take primary responsibility for managing, under permanent governmental supervision, the harvest of the species.

Artisanal benthic fishers in Chile harvest over 60 species of predominantly shellfish, sea urchin, and limpet. Though some of this catch is consumed domestically, most is exported to Taiwan,

[6] "Anuarios Estadísticos de Pesca y Acuicultura."
[7] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."
[8] Gelcich et al., "Navigating Transformations in Governance of Chilean Marine Coastal Resources."
[9] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."
[10] Albornoz and Glückler, "Co-Management of Small-Scale Fisheries in Chile From a Network Governance Perspective."

Japan, and China[11]. The most economically important benthic species is the Chilean abalone, or *loco*, with a value of 300 million U.S. dollars per year [12].

The near collapse of the Chilean loco fishery in the late 1980s is widely seen as the main trigger for the implementation of the TURF system that exists today. Yet the regime shift in Chile from dictatorship to democracy during the same period also played a significant role in shaping the political and economic conditions enabling governance transformation.

From 1973 to 1990, under Augusto Pinochet's dictatorship rule, fisheries in Chile saw rapid exploitation due to conditions of unregulated access, high export pressure, and illegal take[13]. In particular, the liberalization of markets under Pinochet, aimed to promote economic growth and attract foreign investment, increased pressure on marine resources as fishing fleets sought to meet the growing demand. The loco fishery, which at the time operated under an open access regime with few controls on species harvest and landings, was particularly affected by the conditions of economic liberalization. By the mid-1970s, the loco export market was booming and stocks were rapidly declining. In attempts to reduce overexploitation, fisheries managers implemented numerous conventional management approaches, such as season and catch limits, but restrictions were continuously exceeded.

In 1990, a total closure of the loco fishery was enacted. During the same year, Pinochet's dictatorship came to an end, and the transition to democracy provided an opportunity to address widespread fisheries collapse. Notably, the Fishery and Aquaculture Law (FAL) of 1991 was passed, drastically transforming fishing rights and paving the way for more sustainable resource management. At the same time, the transition to democracy brought about a renewed emphasis on participatory governance and community empowerment. Under these conditions of legal and institutional reform, widespread governance transformation – and eventually rights-based management through TURF policy – emerged in Chile.

When the loco fishery reopened after four years of closure, it was under new FAL regulation. Included in this legislation was the introduction of the Benthic Exploitation Regime, which established a total allowable catch for loco that was allocated into individual quotas among registered fishers. This management regime, which would become a key starting point for TURF policy, was derived from two experimental no-take zones administered by universities in the 1980s in central and southern Chile[14]. Research from these experiments was not only beneficial to understanding human influence on intertidal ecological dynamics; it also laid the groundwork for

[11] Jarvis and Wilen, "The Political Economy of the Chilean Nearshore Fisheries Reform."
[12] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."
[13] Ebel, "Moving Beyond Co-Management."
[14] Gelcich et al., "Navigating Transformations in Governance of Chilean Marine Coastal Resources."

future learning and collaboration between fishers, researchers, and government officials[15]. In 1997, following preliminary implementation in the loco fishery, the TURF system was enacted on a widespread scale for Chile's benthic artisanal fisheries[16].

System map

In Chile, engagement in the TURF system is not mandatory. Instead, for those fishers interested in claiming exclusive access rights, there is a complex application-based process that takes about one year and consists of the following five steps:

I. Formation of fishing associations

The TURF system allocates user rights to groups, rather than to individual fishers. Therefore, in order to request exclusive access over a specific exploitation area, fishers must first organize and formally register themselves into fishing associations. Notably, all fishers involved in each association must reside, at least part-time, in the *caleta* adjacent to the target exploitation area. In 2006, 75% of all registered artisanal fishermen were organized into formal associations[17]. Starting in 2013, an amendment to Chile's FAL has required TURF-seeking associations to expand their membership to include diverse stakeholders, such as representatives from aquaculture, Indigenous tribe members, and government officials. The intention of this amendment was to transition away from binary models of power-sharing between fishers and government and towards polycentric models that integrate multiple stakeholders into governance[18].

II. Development of baseline study

When an organized fishing association applies for a TURF, they are required by law to submit an initial baseline study that includes assessments of the ecological attributes of the exploitation area (e.g., target species, benthic communities, etc). To perform the baseline study, fishing associations must hire and work alongside external consultants (i.e., scientists and researchers) to collect relevant data and establish a species catch limit. Between 1997 and 2017, 94 consultants participated in the TURF system, representing a range of organizations, including private consulting firms, research institutes, and qualified universities[19].

III. Provision of management plan

Based on the results of the baseline study, fishing associations must design and submit a management plan for the harvested resources. The plan must specify a proposed exploitation

[15] González, "The Chilean TURF System: How Is It Performing in the Case of the Loco Fishery?"
[16] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."
[17] Leuvan, "Catch Shares in Action: Chilean National Benthic Resources Territorial Use Rights for Fishing Program."
[18] Ebel, "Moving Beyond Co-Management."
[19] Albornoz and Glückler, "Co-Management of Small-Scale Fisheries in Chile From a Network Governance Perspective."

strategy (including fishing methods and gear), intended research and conservation measures for ongoing species protection, budget and financial sources, and market information. Similar to the baseline study, the management plan must be developed in concert with scientists or consultants under hire by the fishing associations.

IV. Allocation of use rights & TAC

Upon receiving the baseline study and provisional management plan, the Undersecretary of Fisheries (governmental body) evaluates the information and elects whether to authorize the specified harvest. If the state approves the plan, exclusive rights to the resource are leased to fishing associations. Importantly, assigned rights are not transferable nor can they be rented to other fishing associations. Until recently, the use agreement allocating fishing rights was renewable every four years, but, under the 2013 FAL amendment, agreements are now indefinite as long as fishers comply with regulations[20].

Upon TURF approval, fishers become bound to an annual catch limit (also known as a Total Allowable Catch, or TAC) that is determined by the state. The TAC ranges from 15 to 25 percent of the total species stock inside the exploitation area, and its purpose is to maintain biologically sustainable harvest levels[21]. The fishing association divides the TAC into individual quotas (IQs), which are then allocated among members of the fishing association based on internal criteria.

V. Follow-up assessments

Every fishing association granted a TURF is required to conduct yearly follow-up assessments of the management area that report on species health – including estimated abundances and trends of target species – landings data, current and projected management measures, and budget and financing updates. As of 2013, yearly reports must also include information on the economic and social performance of the TURF. If the fishing association does not submit these reports, or if members exploit resources in a non-approved fashion, the use agreement is canceled and the TURF is revoked.

Outcomes

The Chilean TURF system is widely seen as a successful example of the transition from a regime of open access to a regime of rights-based management for small-scale fisheries. Indeed, in several regions across Chile, the intended objectives of the TURF system have been realized and a host of associated ecological and socioeconomic benefits have emerged. However, these benefits are not universal across all TURFs, and, in many cases, there are significant limitations to the system of rights-based management. The following section presents and analyzes the key outcomes of the Chilean TURF system. Figure 2 seeks to link the positive and negative outcomes of the TURF

[20] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."
[21] Marín et al., "Disaster Impacts on Co-Management Networks."

regime to explicit step(s) in the system map (as described in section 3aii). Specifically, positive outcomes (green) are linked to the management setup stage of the system map whereas negative outcomes (red) are linked to the implementation and evaluation stages.

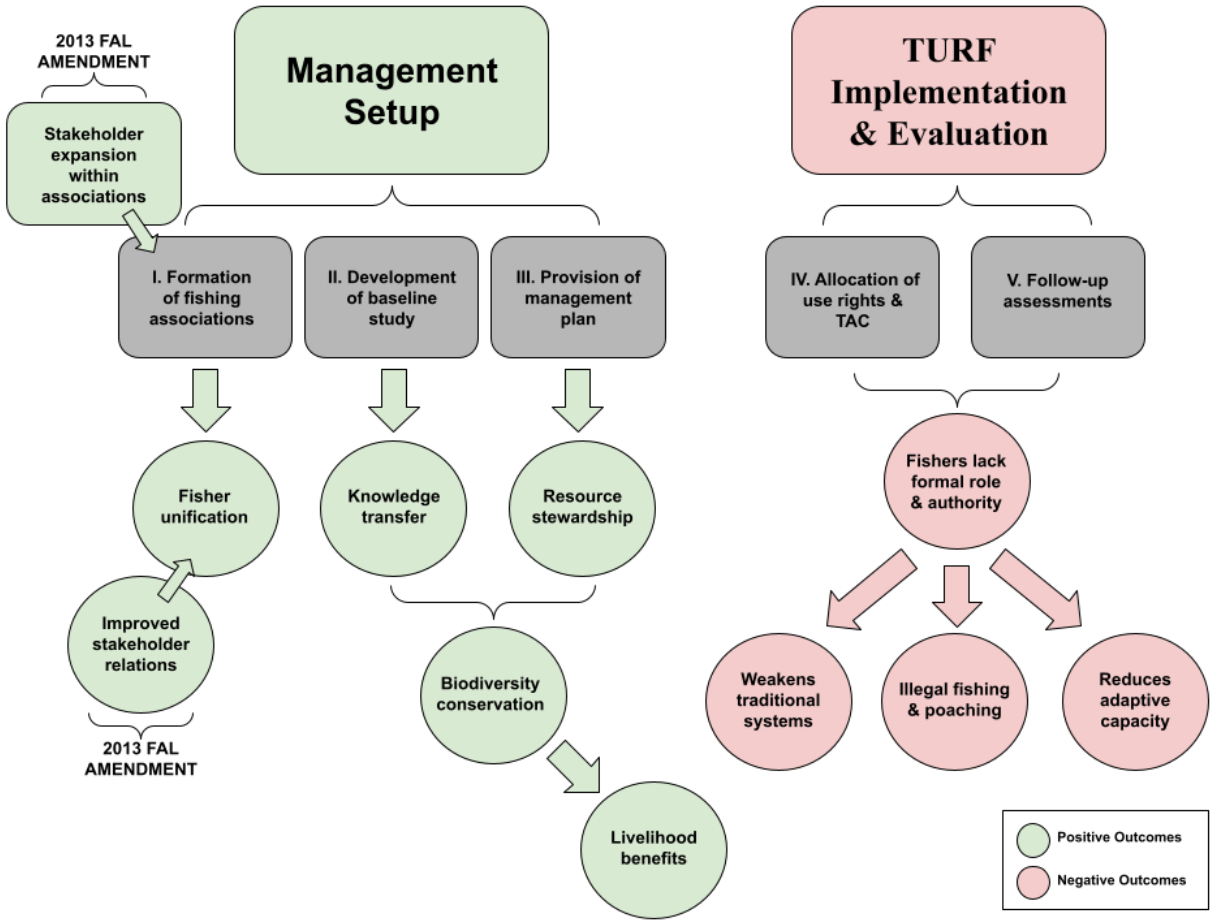

Figure 2: Positive and Negative Outcomes Associated with the Chilean TURF System

Positive Outcomes: Management Setup

The management setup stage of the TURF system has created favorable outcomes for both natural ecosystems and human livelihoods. Notably, the prerequisite for the organization of fishers into associations has improved social relations among fishers and fostered a sense of cooperation, solidarity, and power-sharing[22]. With the 2013 FAL amendment stipulating the inclusion of diverse stakeholders within fishing associations, constructive social interactions have expanded beyond the fisher network to external actors, such as consultants, scientists, and government officials[23].

[22] Schumann, "Co-Management and 'Consciousness.'"
[23] Ebel, "Moving Beyond Co-Management."

The collaborative development of the baseline study and provisional management plan has led to significant expansions in the knowledge of fishers, especially as it relates to the ecological implications of their actions[24]. This improved environmental consciousness has been described as "going beyond [fishers'] economic interest in conserving the resource"[25] and has been primarily attributed to greater access to learning about harvest management practices, biological aspects of the resource, and interactions of the target species with other elements of the ecosystem.

As fishers' awareness of the ecological effects of their actions increased, so too did their sense of environmental stewardship – in keeping with the 'ownership leads to stewardship model' that has become popular within the field of fisheries management[26]. Greater environmental stewardship by fishers has created significant benefits for the marine ecosystem, particularly from a biodiversity conservation standpoint. When compared with open-access areas, TURF regions have often seen significant increases in the biomass, abundance, and richness of both managed and unmanaged marine species[27]. In several regions, harvest species that were once overexploited have reached their natural productivity, and the most economically important species, the loco, has stabilized to historically high levels that only existed prior to the opening of foreign markets[28].

The recovery of overfished populations and overall improvements in marine biodiversity have positive implications for Chilean fishers' livelihoods. Since the implementation of the TURF system, fisheries landings have increased as much as five-fold and catch-per-unit-effort has gone up, allowing fishers a more reliable stream of income[29]. Both the prices and value of landings have also increased, meaning fishers can plan and time their harvests according to market and climate fluctuations and take up alternative employment during non-harvest periods.[30]

Negative Outcomes: TURF Implementation & Evaluation

Despite the ecological and economic benefits that emerge from fishers' participation in the management setup stage of the TURF system, the absence of true and formal delegation of power and authority to the local level reveals systemic limitations of the Chilean case.

As is apparent in the system map outlined in section 2a, key enabling decisions for the Chilean TURF system rest with the state. When it comes to TURF implementation, the government wields

[24] Schumann, "Co-Management and 'Consciousness'"; Gelcich et al., "Fishers' Perceptions on the Chilean Coastal TURF System after Two Decades"; Gelcich et al., "Comanagement of Small-Scale Fisheries and Ecosystem Services"; Franco-Meléndez et al., "Territorial Use Rights for Fisheries (TURF) in Central-Southern Chile."
[25] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."
[26] Schumann, "Co-Management and 'Consciousness.'"
[27]Gelcich et al., "Comanagement of Small-Scale Fisheries and Ecosystem Services"; Franco-Meléndez et al., "Territorial Use Rights for Fisheries (TURF) in Central-Southern Chile."
[28] Gelcich et al., "Navigating Transformations in Governance of Chilean Marine Coastal Resources."
[29] González, "The Chilean TURF System: How Is It Performing in the Case of the Loco Fishery?"
[30] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."

ultimate authority over whether a TURF is approved, and, in the case of approval, is responsible for determining the Total Allowable Catch (TAC) limit for the harvest species. Just as the state governs the allocation of fishing rights and the establishment of harvest guidelines, it also oversees the evaluation and potential revocation of TURFs.

The top-down nature of the Chilean TURF system has been noted by several researchers, with some describing the relationship between fishers and the state as "a division of labor" with "no formal sharing of power"[31]. Indeed, fishers describe a lack of empowerment in the decision-making process and see their role as limited mostly to planning and data collection[32]. Though this role has led to productive relationships between fishers and the biological consultants with whom they collaborate, it has eroded trust and diminished rapport between fishers and state officials[33].

In addition to undermining fisher-state relations, Chile's hierarchical and highly centralized model of governance creates a range of negative outcomes at multiple scales. First, fishers' sociocultural norms and patterns of behavior are weakened by the TURF system's dependence on formal scientific research at the expense of traditional knowledge[34]. The alienation of fishers from the formal management system has also hampered grassroots innovations in governance and reduced the overall adaptive capacity of fisheries[35]. This consequence is perhaps best exemplified by the growing threat of illegal fishing. At the state level, weak enforcement and surveillance create opportunities for illegal fishing, and, at the local level, fishers' lack of authority to monitor and protect their resources has allowed the problem to rapidly proliferate[36].

2b) The Gambia

Background

The Gambia's fishing sector consists of both an artisanal sector, characterized by small-scale operations and low levels of technology, and an industrial sector, characterized by high-cost fish production systems. The artisanal sector provides direct employment to 25,000 to 30,000 people, while the industrial sector provides direct employment to approximately 2,000 people[37]. Fishers in Gambia comprise of both Gambian nationals and foreign nationals, such as those from Senegal, Ghana, Guinea, and Mali.

[31] Schumann, "Co-Management and 'Consciousness.'"
[32] Albornoz and Glückler, "Co-Management of Small-Scale Fisheries in Chile From a Network Governance Perspective."
[33] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."
[34] Gelcich et al., "Co-Management Policy Can Reduce Resilience in Traditionally Managed Marine Ecosystems."
[35] Marín and Berkes, "Network Approach for Understanding Small-Scale Fisheries Governance."
[36] Moreno and Revenga, "The System of Territorial Use Rights in Fisheries in Chile."
[37] Ocean Risk, "Gambia Factsheet", May 2023.

Given the pivotal role of the Gambia's artisanal fishing sector in poverty reduction, food security and national economic growth, the development of fisheries and aquaculture has remained a high priority for the Gambian government. Since 2007, it has enacted a series of policies around fisheries management that emphasize principles of sustainable resource use, responsible fisheries management, and collective decision-making[38]. Fisheries management in the Gambia today is still regulated by the 2007 Fisheries Act and the 2008 Fisheries Regulation.

Over 500 marine fish species have been recorded in Gambian waters; they are usually classified as demersals (bottom dwelling) and pelagics (surface dwelling)[39]. The demersals include: shrimps, groupers, sea breams, grunts, croakers, snappers, etc. The high value demersal species (shrimps, sea breams, lobsters and cephalopods etc.) are mostly supplied to fish processing factories for export, mainly to the EU, North America, and Asia. The small pelagics group consists of the two sardinellas, the bonga/shad, horse mackerels and mackerel. Small pelagics are mainly consumed locally, in fresh or traditionally processed product form, or exported regionally. In the inland sector, fish resources are found within the Gambia river system, which runs through the entire length of the country. The freshwater species found in the river system include the freshwater catfish and the tilapia. The river and its ecology also serve as a transitional phase for many marine fish species as they spend part of their life cycle there to reproduce, feed, and nurse.

For management and conservation purposes, only artisanal fishing vessels (canoes) can operate within the zone that is nine nautical miles from shore (increased from seven nautical miles in 2008, following a review). However, there have been illegal, unreported, and unregulated operations of industrial trawlers within this zone reserved for artisanal fishers. These operations also target fish used for fishmeal, such as bonga shad, which is critical to the livelihoods of small-scale fishers[40]. Other challenges faced by small-scale fishers in Gambia's artisanal fisheries sector include lack of access to fisheries infrastructure – such as ports, cold storage, and distribution and market systems – pollution by fishmeal processing plants, and increased frequency and severity of weather events. Studies have also pointed to the need for training and awareness of fish handling and preservation along the supply chain, the need to develop handling, storage and transportation facilities, and the need to improve sanitation standards and reliability of water supply at fish landing sites[41].

[38] Gambia Ministry of Fisheries, Water Resources and National Assembly Matters, "Fisheries and Aquaculture Policy of The Gambia", January 2018.
[39] UNCTAD, "The Fisheries Sector in the Gambia: Trade, Value Addition and Social Inclusiveness, with a Focus on Women", 6 March 2014.
[40] Ocean Risk, "Gambia Factsheet", May 2023.
[41] Ministry of Fisheries, Water Resources and National Assembly Matters, "Socioeconomic Study of the Fisheries Sector, The Gambia", January 2017.

System map

Legislation

The 2007 Fisheries Act provides the legal basis for co-management of artisanal fisheries in the Gambia. Under the 2007 Fisheries Act, the Minister of Fisheries, Water Resources and National Assembly Matters has the authority to designate special management areas for the purpose of community-based co-management in the interest of conservation, management, and sustainable utilization of fisheries resources. The act also gives power to the Minister to establish Community Fisheries Centers (CFCs) for the purpose of community-based fisheries conservation and management of Special Management Areas or parts of it.

CFCs in Gambia were first introduced through the Artisanal Fisheries Development Project funded by the European Union (EU) that was implemented between 1979 and 1982. Subsequent CFCs development projects were funded by the EU, Government of Italy, and the Government of Japan, which led to the creation of CFCs in both coastal and inland fishing villages. CFCs were each provided modern fishing amenities such as ice making machines, boats, cold-room, and other fishing gears to boost fishers' income generation and contribute towards their food self-sufficiency. CFCs are created by the Ministry of Fisheries, Water Resources and National Assembly Matters, but management responsibility of the CFCs are devolved to fishing communities. The activities of the CFCs are intended to be supervised, monitored, and coordinated by the Ministry through its extension unit at the Department of Fisheries[42]. The CFCs are all structured with a Central Management Committee (CMC), Sub-Committee, and Management Committee. The Management Committee reports to the Sub-Committee, which reports to the CMC.

The CFC Management Committees employ people from the community on casual or permanent bases including a secretary, a watchman, a cleaner, and a pump mechanic. Many CFC services are provided free of charge, but some facilities are rented to users and charges are levied against certain other services (e.g. water). These fees and service charges are collected and used for the upkeep, maintenance, and expansion of the facilities and part of the profits generated are used to support other development activities in the villages. Each Management Committee operates a bank account into which excess monies are deposited and withdrawn. The Management Committees also administer a revolving fund of loans to artisanal fisherfolk. The loans are channeled through the user group associations to individual members.

CFC Sub-Committees comprise representatives of the different fishing industry groups (e.g. fishers, fish traders, fish smokers and fish dryers) following the traditional model of the "Kafo" (a group of people in the same trade); a representative of the Village Development Committee, and

[42] National Audit Office, "Performance Audit Report: Management of the Community Fisheries Centers (CFCs) by the Ministry of Fisheries and Water Resources", April 2018.

the Village Head (Alkalo) as Chairperson. The inclusion of fish industry group representatives in the Sub-Committee was a deliberate move to ensure that fisherfolk are in the majority.

Overall, the CFCs have led to profound physical, social and economic changes to the artisanal fish landing sites over the last few decades. Many of the CFCs have been transformed into business points for various socio-economic engagements giving rise to other economic activities such as restaurants, canteens, mechanical workshops, petty trading in basic household commodities, transportation, and fuel stations. While critical to the development of the artisanal fishing industry, the CFCs were not involved in fisheries resource management and sustainable fishing practices until the implementation of the 2007 Fisheries Act[43].

Management Setup

Despite the introduction of the 2007 Fisheries Act, the provisions of the act were not implemented until 2009, with the development of the first fisheries co-management plan. The framework for the plan was developed through a Marine Stewardship Council (MSC) pre-audit for the sole artisanal fishery. The MSC pre-audit is needed to determine if the fishery is ready to enter MSC's "fishery-in-assessment" process. A US Agency for International Development (USAID)-funded Gambia-Senegal Sustainable Fisheries Program (Ba Nafaa), implemented by the University of Rhode Island provided key support for the development of the co-management plan, at the request of the Department of Fisheries and the Gambian Artisanal Fisheries Development Association (GAMFIDA), which aims to strengthen cooperation amongst artisanal fisheries and support conflict resolution between fishing communities. Harvested sole is mainly supplied to fish processing plants in Gambia, where they are transformed into value-added products such as filets and exported primarily to European Union markets.

The co-management plan involved the set up of the National Sole Fishery Co-management Committee (NASCOM), and the associated Landing sites co-management Committees (LACOMS), which represented community-based organizations and are affiliated with the CFCs in the landing sites of Gunjur, Brufur, Sanyang, Tanji, Batokunku/Tujereng, Bakau and Banjul. NASCOM and the seven LACOMS had exclusive use rights to the sole fisheries in the special management area and were responsible for the sustainable management of sole fishery resources in the area. The area for Gambia's sole complex was also delineated, a Special Management Area of 121245 ha stretching from the Atlantic shoreline and shorelines adjacent to the estuarine areas of The Gambia River out to 9 nautical miles[44].

[43] University of Rhode Island, Coastal Resources Center, "An Overview of Marine Fisheries in the Gambia and preliminary Governance Baseline", 2009.

[44] Ministry of Fisheries, Water Resources and National Assembly Matters, "Fishery Co-management Plan for The Gambia Sole Complex", January 2012.

The NASCOM consists of representatives from the fishing communities, fish traders and processors, LACOMs, GAMFIDA, the National Association of Artisanal Fishing Operators (NAAFO), municipalities, the Department of Fisheries, and the industrial sector. Advisors to the NASCOM include the Fisheries Advisory Committee and the Ba Nafaa Project. The Fisheries Advisory Committee was created by the 2007 Fisheries Act and includes a representative from the aquaculture sector, representatives from the environmental and maritime sectors and a representative of the Navy.

Implementation

The co-management plan was gazetted in December 2013, making it legally enforceable. Between 2009 and 2013, a series of steps were taken to design management measures and build the capacity of co-management institutions.

The management measures include i) annual seasonal closure of one nautical mile from the coastline from May 1 to October 31 for all fish species and gear types; ii) minimum fish size; iii) minimum mesh size; iv) ban on use of drift nets for The Gambia River mouth. It should be noted that since there is little published information about the biological characteristics of the sole species at the time of the management plan designing, much of the knowledge about sole was provided by the fishers using local knowledge data gathering methods and confirmed through collaborative research techniques. Fishers were familiar with the distribution and migration patterns of sole - for example they observed that the red sole is commonly captured in shallower waters than the black sole. Fishers observed that the sole fish appear in Gambian waters starting in January and move back to deeper water in August. They believed the soles migrate from the deeper and cooler waters into warmer shoal water for spawning. The no-take zone of one nautical mile from the coastline from May 1 through October 31 was created based on fishers' observations of the months that constitute the spawning period.

Capacity building of co-management institutions involved training officers at the Department of Fisheries in stock assessment; formalizing the status (NASCOM was officially registered as an association with the Gambia government in 2012), structures and operation processes of NASOM.

Compliance

Compliance with management measures is overseen by NASCOM and the Department of Fisheries, with LACOMs required to prepare and present quarterly enforcements to the former two institutions. NASCOM and the Department of Fisheries may authorize the Department of Fire and Rescue Services to conduct monitoring, control, and surveillance of the no-take zone, and LACOMs were also allowed to appoint fishers to conduct monitoring, control and surveillance of the no-take zone. Penalties were imposed on fishers who possessed fish captured in closed areas, who possessed undersized fish, who violated mesh size and drift net restrictions. NASCOM

received and managed 100% of the revenue from fines, with seven violations resulting in $900 in fines in 2013[45].

Evaluation

The Department of Fisheries and NASCOM met on an annual basis to review progress on meeting the objectives of the co-management plan. The review included evaluation of existing harvesting rules, such as if a minimum fish size of 25 cm is sufficient to prevent overexploitation of juvenile sole fish, and whether a minimum mesh size of 80mm is an effective management tool. NASCOM eventually approved an increase in the allowed mesh size from 80 mm to 92 mm stretch length to address concerns of overexploiting juvenile sole fish[46]. An assessment conducted on species caught in a sole net showed that there was a medium risk of the sole fishery causing an overexploitation on other retained species, such as catfish, and there were subsequent efforts to move the sole fishery management plan to a multi-species management plan to include catfish in 2013[47].

Outcomes

The first fisheries co-management plan alleviated some pressures on sole stocks at the seven landing sites, but a lack of resources undermined management efforts. NASCOM reported that artisanal fishers were complying with the no-take zone and operating beyond one nautical mile during the closed season, but this led to increased investments in terms of materials and time. Furthermore, the forty-two locally made spar buoys used to mark out the no-take zones were not resistant to heavy wave conditions and only five were still in position after one season. In addition, NASCOM found that illegal night fishing continued, and the need for nighttime monitoring and enforcement is still a challenge due to limited resources.

However, NASCOM did receive requests from non-participant fishing communities by 2014 to expand the co-management plan to other areas, based on the perception that the closed season has led to a positive impact on ecosystem health[48]. In addition, active evaluation of the sole co-management plan did demonstrate the clear need for joint sole management between Gambia and Senegal, given how sole is a shared stock between the two countries, and annual bilateral discussions on joint management of the sole fishery were carried out between Gambia and Senegal stakeholders in 2012 and 2013. It is unclear if these bilateral discussions continued following the end of the USAID's Ba Nafaa Project.

[45] USAID, "Gambia-Senegal Sustainable Fisheries Project (USAID/Ba Nafaa) Final Report", April 2014.
[46] University of Rhode Island, Coastal Resources Center, "The Gambia Sole Fishery: Towards MSC Certification and Use of an Eco-label - An FIP-like Process", April 2014.
[47] Ibid.
[48] USAID, "Gambia-Senegal Sustainable Fisheries Project (USAID/Ba Nafaa) Final Report", April 2014.

To contextualize the impact of this co-management pilot, it may be useful to compare the number of landing sites and fishers involved in the co-management plan with national numbers. While there are seven landing sites involved in the plan, there are approximately 155 artisanal fish landing sites within the country. There are in total 4236 artisanal fishers in 2016, according to the Department of Fisheries[49], and sole fishers are about 10% of the total fishers population. The co-management pilot demonstrated potential for wider impact on Gambia's fisheries sector. However, after the completion of USAID's Ba Nafaa project in April 2014, the lack of funding for a MSC pre-assessment - NASCOM will need to secure $30,000 - $50,000; led to the decline of NASCOM. In the latest socioeconomic study of Gambia fisheries sector published in 2017, NASCOM was not mentioned a single time[50].

The sustainability of a co-management structure like NASCOM is also brought into question due to the poor governance of CFCs. According to a 2018 Performance Audit Report on the management of CFCs in landing sites of Banjul, Bakau, Tanjie and Gunjur between years 2013 to 2016, it was found that the Department of Fisheries did not regularly monitor or supervise the work of CFCs, and that staff posted out to CFC to work with fishers on fisheries management issues were themselves inexperienced and unfamiliar with existing regulations. This has led to continued illegal fishing activities and overexploitation of juvenile stocks. Other issues include poor financial management by the CFCs, lack of proper training and capacity building of current CFC staff[51].

One lasting impact of the sole co-management plan seems to be the designation of a one nautical mile width zone from the coastline as a no-take zone from May 1 to October 31. The no-take zone will now apply to all fish species and gear types to allow the reproduction and replenishment of stocks. This no-take zone was likely inspired by the harvest rule set out in the sole co-management plan and would generate continued buy-in from the fisher communities already complying with the harvest rule. It remains to be seen whether compliance for wider fisher communities will be effective.

2c) Mexico

Background

Small-scale fisheries in Mexico consist of about 350,000 fishers who are responsible for approximately 40% of the national catch[52]. Mexico has a long history of community-based

[49] Ministry of Fisheries, Water Resources and National Assembly Matters, "Review of the Fisheries Sector, The Gambia", August 2019.
[50] Ministry of Fisheries, Water Resources and National Assembly Matters, "Socioeconomic Study of the Fisheries Sector, The Gambia", January 2017.
[51] National Audit Office, "Performance Audit Report: Management of the Community Fisheries Centers (CFCs) by the Ministry of Fisheries and Water Resources", April 2018.
[52] Espinosa-Romero et al., 2014

management approaches and is often regarded as the benchmark in territorial use rights for fisheries (TURF) approaches[53]. As found by Aceves-Bueno et. al, the literature tended to be skewed toward successful case studies of Mexican fisheries. Many of these successful examples are a result of fishing cooperatives with fishing concessions, a form of TURF[54]. The concession approach to fisheries governance in Mexico has a long history dating back over 150 years[55,56].

In the late 19th century to early 20th century, the first iteration of concessions was used as a policy tool to attract both national and foreign capital as well as promote colonization in remote areas[57]. Through the issue of fishing concessions, the Ministry of Development, foreign companies (e.g., Japanese, British) were given exclusive rights to many concessions (e.g., pearls, abalone, tuna, shrimp)[58,59]. Many of the workers were Mexican citizens and ended up moving to those previously uninhabited regions[60,61].

System map

In Mexico, the foundation of small-scale fisheries (SSF) revolves around the management setup and compliance stage, which are fundamental in determining the operational efficacy of these fisheries.

Legislation

After the Mexican Revolution, the State focused on the empowerment of the workforce[62] and based on the Constitution of 1917, initiated a reconstruction phase[63]. This period lasted until the 1980s with a focus on strengthening the social aspects of fisheries[64]. Under the Fisheries Law of 1925 fishing zones were implemented and reserved for the preferential use of adjacent coastal communities[65]. The most lucrative fishing permits were given to cooperatives[66], thus concessions were used as incentives to empower collective groups of workers within coastal communities[67]. During this timeframe, there was notable encouragement for the formation of fishing cooperatives, as highlighted in an interview with Dr. Elena Finkbeiner. This initiative was further reinforced by

[53] Aceves-Bueno et al.,2023
[54] Dr. Xavier Basurto interview Feb 21, 2024
[55] Aceves-Bueno et al.,2023
[56] McCay et al., 2014
[57] Aceves-Bueno et al.,2023
[58] Ibid.
[59] McCay et al., 2014
[60] Aceves-Bueno et al.,2023
[61] McCay et al., 2014
[62] Interview with Dr. Elena Finkbeiner, Feb 8, 2024
[63] Tello-Ferandez and Montes-Vega et al., 2018
[64] Aceves-Bueno et al.,2023
[65] Ibid.
[66] Interview with Dr. Elena Finkbeiner, Feb 8, 2024
[67] Aceves-Bueno et al.,2023

the passage of the 1936 general fisheries law by the federal government[68]. This law introduced a regulation that reserved specific species for cooperatives. Subsequently, these provisions were formalized and expanded upon in the Fisheries Law of 1947, which granted exclusive access rights to fishing cooperatives[69].

During the 1980s, Mexican politics transitioned towards adopting free-market principles aimed at the deregulation of markets and the removal of free barriers culminating in the signing of the North American Free Trade Agreement (NAFTA)[70] and the Fisheries Law of 1992, reflecting this transition[71,72,73]. The objective of this law was to enhance fishing efficiency and attract private investments[74,75] thereby revoking the preferential treatment of cooperatives which included the elimination of their exclusive right to capture certain high-value species[76]. In the mid to late 1990s, there was a significant increase in fishing concessions, as cooperatives sought them to access historically preferential resources and improve competitiveness in the free market[77].

Management Setup

Fisheries management in Mexico is primarily under federal jurisdiction, overseen by the National Commission for Fisheries and Aquaculture (CONAPESCA)[78]. CONAPESCA maintains central offices in key industrial fishing ports such as Mazatlán, Sinaloa, and operates state offices with local branches across the country, ensuring a comprehensive presence[79].

Efforts to decentralize fisheries decisions to coastal states in Mexico have been advanced through legislative measures such as the Law of Sustainable Rural Development of 2011 and the General Law of Fisheries and Sustainable Aquaculture of 2007[80]. These laws have enabled the establishment of state fisheries councils and local committees, empowering coastal communities to play a more active role in managing their fisheries resources[81].

By decentralizing decision-making authority, these initiatives aim to bolster the sustainability of Mexico's fisheries sector while fostering greater community involvement and ownership over local

[68] McCay et al., 2014
[69] Aceves-Bueno et al.,2023
[70] North American Free Trade Agreement, 1994.
[71] FAO 2024. Mexico. Text by Spreij, M.. Fisheries and Aquaculture Division [online]. Rome. https://www.fao.org/fishery/en/legalframework/mx/en?lang=en
[72] Interview with Dr. Elena Finkbeiner, Feb 8, 2024
[73] Aceves-Bueno et al.,2023
[74] Ibid.
[75] McCay et al., 2014
[76] Aceves-Bueno et al.,2023
[77] Ibid.
[78] Espinosa-Romero et al., 2014
[79] Ibid.
[80] Mendez-Medina et al., 2021
[81] Espinosa-Romero et al., 2014

marine resources. This devolution of power theoretically empowers coastal states, state fisheries councils, and local committees to customize management strategies to the specific needs and circumstances of their respective regions, fostering more effective and responsive governance of Mexico's marine ecosystems.

In Mexican fisheries, governance predominantly operates at the community level, as noted in the Basurto interview. However, it is essential to recognize that CONAPESCA establishes fisheries measures. Nevertheless, cooperatives, through their federation, can influence the formulation of fisheries regulations. Additionally, cooperatives have the autonomy to establish their own norms and rules.

At the community level, small-scale fisheries (SSF) are organized into fishing cooperatives or patron-client systems (see Table 1). These cooperatives are then aggregated at the regional level into federations. Subsequently, these federations are integrated into the national confederation, which is responsible for representing SSF cooperatives[82].

Table 1. Summary of Actors involved in Fishing Concessions [83]

Actors	Role & Responsibilities
Small-scale Fishers (individuals and cooperatives)	a. Require fishing permits, authorizations, or concessions from the government. b. Can be members of fishing cooperatives or private permit holders (permisionarios).
Fishing Cooperatives	a. Collective entities granted fishing permits by the government. b. Democratic processes for decision-making in large "community" cooperatives. c. May have multiple small-scale fishing boats within the cooperative. d. Responsible for fisheries management and resource monitoring within their designated areas.
Patrons/Buyers (Permisionarios)	a. Individuals or entities are granted fishing permits by the government. b. Control fishing means of production and access rights. c. Often act as buyers and provide equipment (boats, motors, nets) and funds for fishing trips. d. Contract independent fishers (pescadores libres) to carry out the harvest.

[82] Ibid.
[83] Frawley et al., 2024

Federal Government	a. Grants fishing permits, authorizations, or concessions to fishers and cooperatives. b. Oversees and regulates the fishing activities to ensure compliance with laws and regulations.

Fishing Cooperatives:

Small-scale fishers who specialize in high-value species demonstrate adaptability within their fishing boundaries. If climatic variations occur over short periods, they can leverage their expertise to adapt quickly by adjusting fishing techniques or targeting different species[84]. However, if climatic variations persist for longer durations, their adaptability may be constrained[85]. In such cases, the fishers may face challenges in adjusting to prolonged shifts in species distribution or abundance, potentially impacting their ability to sustain their livelihoods.

Patron-Client Systems:

A patron-client system is a hierarchical arrangement between the fish buyer/patron and the client/fisher. The patron holds power or influence over resources or opportunities as they typically provide essential support while the client in return offers loyalty, labor, and goods in exchange[86]. Fishers in these systems do not have their own autonomy and are reliant on the patron for access to fishing resources and economic support, creating a hierarchical relationship characterized by dependency[87]. As their fishing efforts are more generalized, rather than focusing on specific high-value species, fishers in this type of system are often more flexible in adapting to changes, including those brought about by climate change[88]. Their adaptability stems from their ability to switch between different species or fishing grounds as needed, depending on factors such as climate variations or shifts in fish populations[89].

This generalist approach allows them to diversify their fishing activities and spread their risk, which can be advantageous in uncertain environmental conditions. While the hierarchical dependency on the patron remains, the flexibility in fishing practices may offer some resilience to the challenges posed by climate change within this system.

Implementation

The implementation of concessions in Mexican aquaculture is subject to detailed regulations outlined by CONAPESCA. As per the current Mexican Fisheries Law (amended 2001), concessions can be granted to individuals or legal entities like cooperatives or businesses, for single or multiple species[90] for a maximum of 50 years[91]. Typically lasting between 5 to 20 years,

[84] Interview with Dr. Elena Finkbeiner, Feb 8, 2024
[85] Dr. Xavier Basurto interview Feb 21, 2024
[86] Basurto et al., 2013
[87] Interview with Dr. Elena Finkbeiner, Feb 8, 2024
[88] Dr. Xavier Basurto interview Feb 21, 2024
[89] Dr. Xavier Basurto interview Feb 21, 2024
[90] Ibid.
[91] FAO 2024

concessions are renewable, allowing for long-term investment and planning in the fishing industry[92,93].

Applicants are required to submit comprehensive technical and economic studies as part of the concession application, covering various aspects including technical-biological indicators, species cultivation, location specifics, infrastructure, and financial analysis[94]. Additionally, an environmental impact assessment is mandatory[95]. Concession holders are bound by specific obligations, including the exclusive cultivation of authorized species within designated areas, regular reporting on project status and production data, adherence to technical and economic conditions, and compliance with environmental preservation measures[96]. Furthermore, they are required to assist in environmental conservation efforts and collaborate with authorities on aquatic programs[97].

Mexican TURFs – Archetypes

The analysis of the Mexican TURF system, carried out by Aceves-Bueno et al. identifies eight archetypes based on the sector in charge, concession management system, and the number of resources managed[98] (Figure 3). Of these archetypes, five are currently present in Mexico. Archetype I involves a concession granted to a single cooperative for harvesting a specific species or species group (see footnote[99]). Archetype II expands on this by allowing the same cooperative to harvest multiple marine species within their exclusive fishing territory. Archetypes III and IV entail concessions jointly managed by two or more cooperatives, either for a single species or multiple species. Lastly, Archetype V entails a concession granted to a private entity for a single species. While evidence for Archetypes VI-VIII, involving concessions granted to private entities for multiple species or jointly managed, is lacking in literature or concession documents, they remain viable under the current Mexican regulatory framework.

[92] Aceves-Bueno et al.,2023
[93] McCay et al., 2014
[94] FAO, 2024
[95] Ibid.
[96] Ibid.
[97] Ibid.
[98] Aceves-Bueno et al.,2023
[99] e.g., the Vigía Chico fishing cooperative manages a single species concession, the Caribbean spiny lobster (Panulirus argus) comprised of 80 fishers who share access to fishing gear and boats.

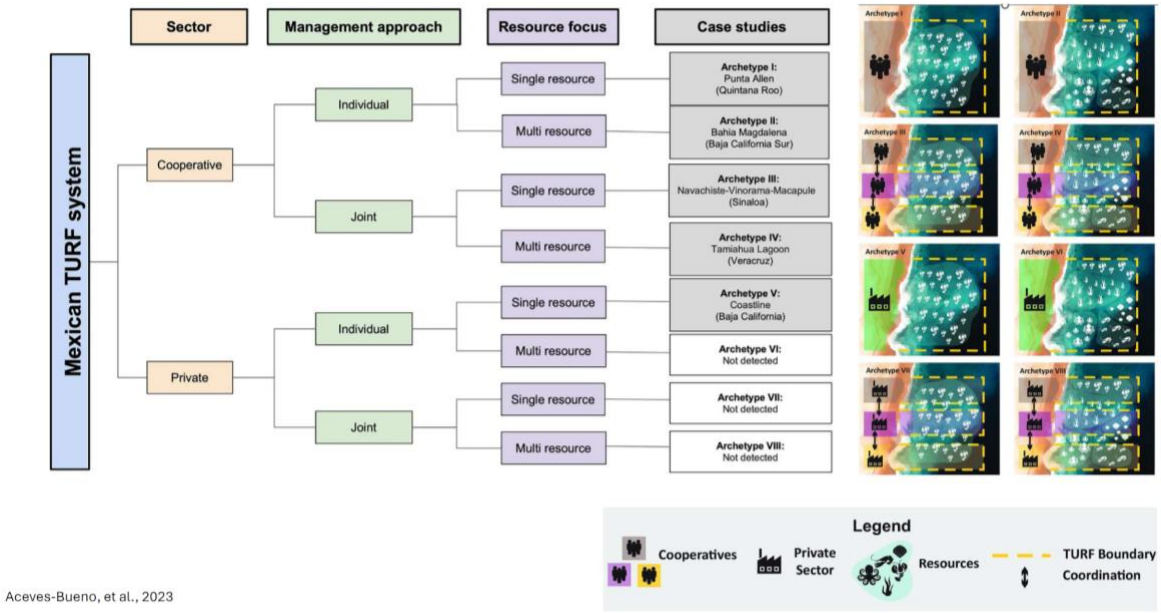

Figure 3. Characterization of concessions into the eight archetypes according to sector in charge, management structure in place, and resource focus.

Outcomes

Compliance

The Pacifico Norte Cooperatives[100]

The Pacifico Norte cooperatives have two identities – co-manager and self-manager. While the cooperatives have limited formal autonomy due to federal government control over natural resources, they have established a strong basis for co-management through collaboration with federal government scientists and managers. The concessions offer incentives for stricter resource management decisions beyond government mandates. Through the research carried out by McCay et. al, findings suggest that community-based, relatively insecure (term-limited) rights represented by the concessions can promote stewardship-related tradeoffs against immediate exploitation. The length of concessions, such as 20-year terms, may vary depending on species (e.g., abalone may warrant longer concessions than lobster where 20 years would suffice) and the likelihood of concession renewal.

Co-management did not naturally arise from the existence of cooperatives or concessions but emerged in response to a fishery closure threat in 1982-1983, prompted by a major El Niño event. Facing the potential closure of the lucrative abalone fishery, cooperatives agreed to severe austerity measures. Through negotiations, they accepted increased responsibility for ensuring sustainable

[100] McCay et al., 2014

and cooperative management of the fishery. In return for this commitment, they were granted permission to continue fishing, albeit at significantly reduced levels and under strict regulations. The terms of the 1992 concessions reaffirm the practice of co-management by mandating that cooperatives invest in fisheries management – carrying out resource level monitoring and hiring biologists and engineers.

Vigía Chico Fishing Cooperative[101]

The Vigía Chico Fishing Cooperative focuses on catching Caribbean spiny lobsters. Founded in 1968, the cooperative consists of 80 fishers using 55 small boats where they manage their designated fishing area together. To ensure they fish responsibly, they have rules in place for instance setting minimum catch sizes and banning the capture of berried females. Decision-making is democratic, involving all members and fostering collective action. The cooperative funds patrols to enforce rules and safeguard their fishing area. They also designate special areas called *casitas* to mark individual boundaries within their fishing to track catches. Additionally, the cooperative assumes the financial burden for enforcement, monitoring, and concession renewal through socio-ecological surveys.

Evaluation

To renew a fishing concession, CONAPESCA requires concession users, whether cooperatives, private entities, or individual businesses, to finance a socio-environmental study. Historically, until the 1990s, NGOs and the scientific community primarily focused on environmental concerns such as species and habitat loss. However, there has been a noticeable shift in focus since then, with an increased emphasis on collaborating with fishing communities to promote sustainable management of fisheries and ecosystems[102]. Despite efforts by fishers to patrol their own resources at the local level, there remains a risk of overexploitation[103]. To address this challenge, NGOs and the scientific community can play a crucial role in fostering an environmental ethic within fishing communities. This involves initiatives aimed at building local capacity and strengthening fishing communities to ensure more responsible and sustainable resource management practices[104,105].

[101] Aceves-Bueno et al.,2023
[102] Espinosa-Romero et al., 2014
[103] Dr. Xavier Basurto interview Feb 21, 2024
[104] Espinosa-Romero et al., 2014
[105] Dr. Xavier Basurto interview Feb 21, 2024

2d) Philippines

Background

Small-scale fisheries in the Philippines are vital for food security, employment, and cultural heritage. They are dispersed across the archipelago, with significant activities in areas like Zambales, Batangas, and Romblon. These fisheries are characterized by their community-based management approaches, often under the locally managed marine area (LMMA) framework, where local communities, in partnership with NGOs and government units, manage marine resources through practices like establishing no-take zones or imposing gear and seasonal restrictions. This approach aligns with the traditional community-based resource management (CBRM) prevalent in the country.

The Philippines has a long and evolving history in marine tenure and resource management. This ranges from traditional tenure rights to some of the first community-based fisheries tenure systems in the world to a legal system that supports marine tenure. Secure marine tenure and improved governance are enabling conditions for supporting sustainable small-scale fisheries to meet multiple development objectives.

The Philippines has been moving towards a decentralized governance structure for its small-scale fisheries, particularly through the Local Government Code of 1991. This legal framework empowers local governments, including municipalities and barangays (villages), to manage their marine resources. The decentralization aims to involve community members and local leaders more directly in the management and conservation of marine resources, recognizing that local communities often have the best understanding of their marine environments and are most affected by management decisions.

This decentralized approach has led to the development of numerous locally managed marine protected areas (MPAs) and fish sanctuaries, reflecting a significant shift towards community-based resource management (CBRM). Local governments and communities are encouraged to collaborate, with support from NGOs and academic institutions, to establish and enforce marine management measures. While this approach promotes greater local participation and can be more adaptive to local conditions, it also presents challenges, such as variability in the capacity of local governments to manage resources effectively, potential for local elite capture, and inconsistencies in the application of laws and policies.

Laws and Policies in the Philippines from the 1990s to the Present

The governance structure for small-scale fisheries in the Philippines has evolved significantly from a centralized system to a more decentralized approach, especially following the enactment of the Local Government Code (LGC) of 1991 (Republic Act No. 7160). This pivotal legislation marked

a shift from a 'top-down' management approach to a 'bottom-up' strategy, expanding participation and responsibility at the local government unit (LGU) level, covering provinces, cities, municipalities, and barangays. This devolution included resource management and environmental protection, fundamentally changing the management of municipal or nearshore waters, thus empowering LGUs to regulate fisheries within municipal waters and enforce local ordinances independently of the national government.

The Fisheries Code of 1998 (Republic Act No. 8550) further reinforced this decentralization, clarifying the designation of municipal waters and granting preferential rights to local fishing communities and organizations. This code aimed to resolve conflicts between small-scale and commercial fishing and encouraged local participation through the establishment of Fisheries and Aquatic Resources Management Councils (FARMCs).

These laws collectively have fostered a bottom-up approach in governance, where local communities and municipalities have been given significant powers and responsibilities for the sustainable management of their marine resources. The shift has been aimed at enhancing community participation, improving local governance, and ensuring the sustainability of fishery resources, aligning with global trends towards decentralized and community-based resource management.

Key Laws and Policies Enacted:
The marine tenure and fisheries management narrative has undergone several transitions in the Philippines (Table 3), as outlined by the following broad themes[106]:

- ➢ 1970s-early 1980s: Command and control
- ➢ 1980s: Community-based management
- ➢ 1980s–1990s: Coastal resource management
- ➢ 1990s: Co-management
- ➢ 2000s: Integrated fisheries management
- ➢ 1990s–2000s: Marine protected area management
- ➢ 2010s: Ecosystem approach to fisheries management (EAFM)

[106] Robert Pomeroy, Catherine A. Courtney, "The Philippines context for marine tenure and small-scale fisheries" *Marine Policy Vol. 95* (2018): 283-293.

Table 3: National laws and policies in support of marine tenure in the Philippines.[107]

Law or Policy	Year implemented	Relation to marine tenure	Reference
Local Government Code RA 7160	1991	Devolution to local government; Municipal waters; Preferential rights	26, 27
Fisheries Code RA 8550	1998	Municipal waters	29-31
Amended Fisheries Code RA 10654	2015	Preferential rights; FARMCs	
National Integrated Protected Areas System Act RA 7586	1992	Protected areas	32
Integrated Coastal Management EO 533	2006	Consultative integrated coastal management	33
Indigenous People's Rights:			
- Philippines Constitution	1987	Rights to ancestral lands	34, 35, 40
- Certificate of Ancestral Domain Claim (DENR AO 2)	1993	Rights to manage and use resources on ancestral lands	
- Indigenous People's Rights Act RA 8371	1997	Protection of ancestral rights	
Mangrove Forests: DENR EO 263	1995	Forest management agreement	44
Foreshore lands: Fisheries Code RA 8550	1998	Lease agreement	45
Fisherfolk settlement: Fisheries Code RA 8550	1998	Establishment of fisherfolk settlement	29, 30
Marine Protected Areas:			
- Fisheries Code RA 8550	1998	Establish and manage an MPA or fish sanctuary	46
- NIPAS RA 7586	1992		
Autonomous Region of Muslim Mindanao (Muslim Mindanao Autonomy Act 86 or ARMM Aquatic and Fisheries Code)	1999	Manage and protect fisheries and aquatic resources	47

These legal frameworks are aimed at empowering local communities and ensuring their active participation in the management of marine resources, reflecting a significant shift from centralized to more localized governance structures in the Philippines. This approach has brought about challenges, such as variability in local governance capacity and enforcement, but has also provided opportunities for more tailored and community-specific management practices.

System map

In the Philippines, the governance and management of small-scale fisheries (SSF) are deeply rooted in the collaboration between local barangays and higher government levels. This outlines a structured approach encapsulating Legislation, Management Setup, Implementation, Compliance, and Evaluation for SSF tenure rights management, emphasizing the critical role of legislation in incorporating barangay inputs.

Actors in the system map

In the causal pathway of governance and resource management within the Philippine small-scale fisheries (SSF) context, several key actors play crucial roles, each protected and empowered by specific policies:

[107] Ibid.

Local Barangay Leaders (Village Leaders)

- ➢ Role: Initiate local rule making, program design, and community engagement at the village level. They are the first point of contact in the governance chain, addressing local issues and needs.
- ➢ Policy Protection: Local Government Code of 1991 (Republic Act No. 7160) empowers these local leaders by devolving certain powers, responsibilities, and resources from the national government to local government units.

Municipal Government

- ➢ Role: Review, amend, and approve proposals from barangays. Implement and enforce local regulations and programs. They are responsible for coordinating larger-scale initiatives that may span multiple barangays.
- ➢ Policy Protection: Local Government Code of 1991 and the Fisheries Code of 1998 (Republic Act No. 8550) provide the legal framework for municipal governments to manage municipal waters and local fisheries.

Small-Scale Fishers and Community Members:

- ➢ Role: Participate in the development and implementation of local fisheries management practices. They are the primary stakeholders and beneficiaries of fisheries management policies.
- ➢ Policy Protection: Fisheries Code of 1998 and its amendments under Republic Act No. 10654, which advocate for the preferential rights of local communities and the establishment of Fisheries and Aquatic Resources Management Councils (FARMCs).

National Government and Agencies (e.g., Bureau of Fisheries and Aquatic Resources - BFAR):

- ➢ Role: Set overarching policies, guidelines, and support mechanisms for fisheries management across the Philippines. Provide technical, financial, and legal assistance to local governments and communities.
- ➢ Policy Protection: The Fisheries Code and its amendments outline the role of national agencies in supporting sustainable fisheries management, while the Local Government Code defines the relationship between national and local governance structures.

Non-Governmental Organizations (NGOs) and Academic Institutions:

- ➢ Role: Offer expertise, resources, and support for community-based resource management initiatives. Act as intermediaries between communities and government bodies, providing training, research, and advocacy.
- ➢ Policy Protection: Although not directly protected by specific policies, NGOs and academic institutions often work within the frameworks established by national and local laws, contributing to policy development and implementation.

These actors interact within a complex governance framework, where policies such as the Local Government Code and the Fisheries Code serve as the foundation for their roles and interactions. In the Philippines' system map framework for small-scale fisheries, Barangay leaders play a pivotal

role throughout all stages, especially in legislation. Their active involvement ensures that issues pertinent to small-scale fisheries are identified and addressed. By collaborating with local government units, they develop proposals that reflect the community's needs, facilitating their presentation to regulatory bodies and the national government. This grassroots involvement ensures that the legislative process is inclusive, echoing the local needs and aspirations of small-scale fisheries, demonstrating a model of participatory governance.

Legislation: Grassroots Empowerment through Legal Frameworks

The Philippine legal system, particularly through the Local Government Code of 1991, has enabled a decentralized governance structure, empowering barangays to actively participate in the legislative process. This empowerment allows barangays to address local issues effectively, including those concerning SSF. Barangay officials, understanding their community's unique challenges, initiate discussions within barangay councils to develop solutions addressing SSF management, environmental protection, or community development. These solutions often evolve into preliminary local ordinances or program proposals.

Barangays involve in:

- ➢ Identifying community-specific SSF challenges during meetings.
- ➢ Development of proposals in consultation with local SSF communities.
- ➢ Presentation of proposals to municipal councils for alignment with national laws and broader objectives.

Management Setup: Establishing Governance Structures

Following legislative empowerment, a robust management setup is established involving various stakeholders from municipal to national levels. This includes Municipal or City Fisheries Aquatic Resources Management Councils (MFARMCs or CFARMCs), ensuring that barangay-initiated policies are integrated into wider governance frameworks.

Barangays involve in:

- ➢ Setting up local management structures to facilitate barangay participation.
- ➢ Engaging in MFARMCs or CFARMCs for collaborative governance.

Implementation: Ground-Level Action and Enforcement

With policies and management structures in place, barangays lead the implementation of SSF management programs under municipal oversight. This ensures that initiatives align with regional and national frameworks while reflecting local realities.

Barangays involve in:

- ➢ Rolling out SSF management initiatives, with municipal support.
- ➢ Utilizing local knowledge and practices in governance to ensure community-based solutions.

Compliance: Ensuring Adherence and Community Involvement

Barangay leaders and community members play essential roles in ensuring compliance with SSF regulations. This grassroots involvement is crucial for fostering ownership and accountability among local communities, vital for sustainable natural resource management.

Barangays involve in:

- ➢ Organizing community patrols and information campaigns.
- ➢ Monitoring and enforcing SSF regulations within barangays.

Evaluation: Measuring Impact and Feedback Loop

The final stage involves evaluating the effectiveness of implemented policies and management strategies. This is where barangays, alongside municipal governments, assess the impact on fish stocks, community livelihoods, and compliance rates, providing feedback for future policy refinements.

Barangays involve in:

- ➢ Collect data and feedback from the community.
- ➢ Assess the impacts of SSF management on local ecosystems and livelihoods.

Outcomes

The integration of these elements fosters a conducive environment for the development and implementation of various fisheries management plans among SSFs. By aligning incentives with community needs, transferring necessary resources, and valuing indigenous knowledge, the Philippines could create an enabling policy environment that supports sustainable fisheries management. This holistic approach not only addresses ecological and economic aspects but also respects and preserves the cultural dimensions of SSF communities, leading to better management of the marine environment and more resilient fishing communities.

Case Study: Davao Gulf Closed Season Management

In Davao Gulf, barangay leaders initiated a closed fishing season to address declining fish stocks. Through collaboration with municipal and national authorities, including the BFAR and the DA, a regulatory measure was established in 2014[108], demonstrating the effectiveness of bottom-up policy formulation. The closed season led to the recovery of fish stocks and improved local livelihoods, exemplifying successful barangay involvement in SSF management.

The Department of Agriculture-Bureau of Fisheries and Aquatic Resources in Davao Region provided various livelihood programs to support fishermen during the closed season in Davao Gulf from June to August 2023. These programs included distribution of fishing gear, post-harvest

[108] https://www.bfar.da.gov.ph/wp-content/uploads/2021/01/DA-DILG-JAO-Order-No.-2-s.-2014.pdf

training, and subsidies. Data from 2022 showed a 27% increase in catch compared to 2020[109], indicating positive outcomes. Efforts to control illegal fishing were enhanced, highlighting collaboration with local enforcement and government agencies.

Limitations

While the decentralization and community-based approaches to resource management in the Philippines have shown significant promise, they also present unique challenges and barriers. One of the main challenges is the heavy dependence on local government leaders, particularly mayors, for the continuity and success of community-based resource management initiatives. This dependency underscores a critical vulnerability in the system: political leadership changes can lead to priority shifts, potentially undermining ongoing conservation and management efforts. Even though there is generally a low risk of mayors not supporting small-scale fisheries management being elected, the potential for such changes poses a risk to the sustainability of these initiatives.

Another significant barrier is the limited capacity and resources available to local government units (LGUs) to implement and manage community-based resource management programs effectively. Many LGUs struggle with inadequate funding, personnel, and technical expertise necessary to manage and enforce marine tenure and fisheries regulations successfully. This lack of capacity can lead to ineffective enforcement of laws and regulations, contributing to ongoing challenges such as illegal fishing, habitat destruction, and resource depletion.

Furthermore, the effectiveness of community-based management is often hampered by inconsistencies in applying laws and policies across different jurisdictions. While national laws may provide a framework for marine resource management, the interpretation and implementation of these laws can vary significantly between different LGUs. This inconsistency can lead to confusion, conflicts, and difficulties in enforcement, undermining the overall effectiveness of resource management efforts.

Additionally, community-based resource management in the Philippines is often challenged by issues of equity and representation. While the system is designed to empower local communities and small-scale fishers, it can sometimes favor certain groups over others, leading to exclusion and marginalization. Ensuring that all community members have a voice in the management process and that their rights and interests are adequately protected remains a significant challenge.

Lastly, integrating traditional and local knowledge into formal management frameworks is not always straightforward. While there is a recognition of the value of indigenous knowledge and practices, effectively incorporating this knowledge into modern management approaches requires

[109] https://www.sunstar.com.ph/davao/local-news/livelihood-initiatives-sustain-fishermen-through-davao-gulfs-closed-season

careful negotiation and adaptation. Balancing traditional practices with scientific expertise and national regulations can be complex, and there is often a need for greater support and understanding from both local and national levels to ensure that these systems can coexist and complement each other effectively.

In summary, the challenges and barriers to successful community-based resource management in the Philippines are multifaceted, involving issues of political dependency, capacity, consistency, equity, and integration of traditional knowledge. Overcoming these challenges requires concerted efforts from all stakeholders, including local communities, government agencies, NGOs, and the private sector, to build a more resilient and inclusive management system.

3. Key Takeaways

By devolving powers to the local level and fostering accountability throughout the fisheries management process, governments can effectively collaborate with SSF stakeholders. Analyzing how these aspects are addressed in each node of the co-management system lends valuable insight into the effectiveness of rights regimes for promoting sustainable fisheries resources and safeguarding the livelihoods of coastal communities.

Chile

- **Engagement in Management Setup:** In Chile, engaging fishers in the management setup stage of TURF implementation – through the co-development of an ecological baseline study and a provisional management plan – creates positive outcomes including improved social relations, resource stewardship, and biodiversity conservation.
- **Limitations in TURF Implementation:** The absence of formal delegation of power and authority to fishers in the TURF implementation and evaluation stage reveals limitations that impact the overall effectiveness of the rights-based regime. Without formal involvement in decision-making, fishers' traditional systems of management and knowledge are weakened, reducing the overall adaptive capacity of fisheries – particularly when it comes to threats like illegal fishing.

The Gambia

- **Formalizing co-management roles:** While the Community Fisheries Centers (CFCs) have existed in Gambia since the 1970s, it was not until the 2007 Fisheries Act that their role in co-management of fisheries was formalized. The first fisheries co-management plan for sole that was legislated in 2013 demonstrated the potential for participatory fishery management by the CFC-affiliated LACOMs, resulting in active compliance of fishers with harvest rules that integrated local ecological knowledge.

- **Ensuring progress towards co-management objectives:** While objectives for the co-management plan were clearly defined along the lines of ecosystem resilience and preservation of sole stocks, the ostensible goal of the sole co-management plan was still to work towards achieving MSC certification. However, once this goal seemed out of reach due to severe financial constraints in funding a MSC pre-assessment, government authorities did not continue with regular evaluation of the co-management plan to ensure that co-management objectives were met. This eroded the incentives for representatives in NASCOM and LACOMs to actively engage in sole co-management over time.

Mexico

- **Historical context and legislative frameworks:** Mexico's fisheries governance has evolved from historical concessions to post-NAFTA deregulation, highlighting the importance of legislative frameworks in laying the foundation for cooperative-based fisheries management and sustainable resource use in Mexico.
- **Local engagement for collaborative management:** Legislation empowering coastal communities through state fisheries councils, local committees, and fishing cooperatives fosters active participation in management and affords fishers a role in collective decision-making and resource management. The resulting collaboration between fishing cooperatives and the federal government promotes resource stewardship and ecological benefit, as seen in the Pacifico Norte cooperatives. Finally, collaboration with NGOs and the scientific community underscores the importance of local capacity-building and knowledge-sharing in promoting sustainable resource management.

The Philippines

- **Community-based management:** The Philippine approach emphasizes local involvement, particularly through Barangay-led initiatives, showcasing the effectiveness of community-based resource management. Notably, Barangay-led initiatives, such as successful closed seasons, demonstrate the effectiveness of a systemic approach in addressing SSF challenges while ensuring sustainable resource management and community engagement.
- **Decentralized Governance:** Laws like the Local Government Code of 1991 empower local units to manage marine resources effectively, enhancing community engagement and ownership over marine resources.

4. Conclusion

In Chile, the Gambia, Mexico, and the Philippines, the allocation of exclusive use rights for fishing (e.g., TURFs) lays important groundwork for successful co-management. Yet such programs, even when effectively implemented, do not guarantee true SSF empowerment. Devolution of management responsibilities to small-scale fishers is key in empowering them as stewards of the coastal and marine ecosystem. Through the four case studies presented in the report, we aimed to show that it is critically important for governments to pay attention to how fishers' role is formalized in governance structures, particularly at key stages of i) legislation, ii) management set up, iii) management plan implementation, iv) compliance, v) evaluation. The exercise of exclusive use rights by small-scale fishers will ultimately be most effective if small-scale fishers can work alongside the state in formalized decision-making roles related to resource governance.

Each case study offers some lessons learned specific to the five stages of devolution of management responsibilities. We summarize them in the Table 4 below:

Table 4: Key nodes of the rights regime system map and their associated case studies

Key nodes	**Relevant Country Case Studies**
Legislation	Philippines
Set up management structure	Mexico
Implementation	Chile
Compliance	Gambia Mexico
Evaluation	Gambia Chile Philippines

Based on feedback received from BAPPENAS in the final class presentation, we believe that the case studies of Chile and Philippines provide the most relevant examples of exclusive use rights implementation and devolution of management authority for Indonesia's context. The next steps of this research project would be to study the parallels between these country case studies and Indonesia's context and identify viable policies and management measures that can be better tailored to Indonesia's context.

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