

Chapter 20

Civil Society Contributions to the Implementation of the Small-Scale Fisheries Guidelines in Mexico

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Abstract. Small-scale fisheries contribute about half of global catches whilst employing approximately 90% of the people directly dependent on capture fisheries. Taking into account the importance of this sector in the global economy, and its contribution to nutrition and livelihoods, in 2015 the Food and Agriculture Organization of the United Nations published the *Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines)*. This chapter describes the contributions, challenges, and lessons learned from implementing the SSF Guidelines, from the perspective of a marine conservation civil society organization (CSO) that works on providing effective solutions for small-scale fisheries management in Mexico in direct collaboration with stakeholders. Mexico is a developing country, with a small-scale fishing force of over 74,000 registered boats, in which diverse fisheries face many challenges to secure livelihoods whilst simultaneously ensuring sustainability and adapting to changing environmental conditions. The SSF Guidelines represents a landmark document that highlights the importance of the small-scale fisheries sector and provides significant guidance to states and stakeholders for ensuring the long-term sustainability of small-scale fisheries. Finally, the chapter provides insights into and recommendations on how CSOs and other interested stakeholders can foster the implementation of the Guidelines.

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Introduction

Small-scale fisheries contribute about half of global catches whilst employing about 90% of the people directly dependent on capture fisheries (FAO 2014). Strengthening small-scale fisheries has been recognized as an important strategy not only for employment, but also for addressing food security and poverty issues. Mismanagement of small-scale fisheries has ecological, socioeconomic, and governance implications (FAO 2014).

It has been recognized that a proper fisheries management system not only involves the proper use of fish stocks, but a balance between environmental, social, and economic objectives (Charles 1988; Ahmed 1991; Hanna 1994). In 1995, the Food and Agriculture Organization (FAO) published the *Code of Conduct for Responsible Fisheries* to provide guidance on how to balance these objectives (see FAO 1995). Furthermore, in 2015, FAO published the first international instrument focused on small-scale fisheries in the context of food security and poverty eradication, the *Voluntary Guidelines to Securing Sustainable Small-Scale Fisheries* (SSF Guidelines). These guidelines provide significant advice to states and stakeholders for ensuring the long-term sustainability of small-scale fisheries, whilst sustaining people's livelihoods.

Small-Scale Fisheries in Mexico

For the past 20 years Mexico has been one of the top 20 fish producing nations in the world. During this period, annual catches have fluctuated around 1.2 million tons (FAO 2014). Small-scale fisheries account for 40% of total catch, including 74,055 registered boats (CONAPESCA 2013) and an estimated 222,165 fishers (Moreno-Báez et al. 2010). These numbers do not include the illegal, unreported, and unregulated (IUU) sector, which is estimated to be equal to, or even greater than, the legal fishing effort and catch (Cisneros-Montemayor et al. 2013). At present, 17% of Mexican fisheries are overexploited, 70% at the maximum sustainable yield (MSY), and only 13% underexploited (DOF 2012a). With 41% of the Mexican population living in coastal municipalities (CIMARES 2010) and 11,500 coastal communities with less than 15,000 habitants (Gabriel-Morales and Perez-Damian 2006) relying heavily on marine resources and ecosystems, sustainable fisheries are a necessity for securing employment, income, and food for many people.

Examples of small-scale fishers and communities taking leadership in managing their resources through sophisticated and sustainable approaches for fisheries management exist (Espinosa-Romero et al. 2014a). To create and enforce local rules for sustainable resource use, groups of fishers have used their traditional ecological knowledge, have established key alliances with other stakeholders, and have learned how to successfully implement ecosystem-based approaches in their region (see Espinosa-Romero et al. 2014a). There are examples of small-scale fisheries fulfilling international standards for sustainable fishing set by certifying bodies such as the Marine Stewardship Council (MSC) and the Seafood Watch Program of Monterey Bay Aquarium (MBA). Small-scale fishers are already implementing practices for maintaining the

health of stocks and ecosystems (e.g. Senko et al. 2014) and for building robust, participatory, and transparent governance systems (Espinosa-Romero et al. 2014b).

However, Mexican small-scale fisheries still face several challenges. Existing top-down policies in Mexico have disenfranchised small-scale fishers (Finkbeiner and Basurto 2015). The lack of socioeconomic information at the local level has limited the development of integrated public policies for inland (Mendoza-Carranza et al. 2013), coastal, and marine fisheries (Ramírez-Rodríguez and Ojeda-Ruíz 2012; Robles-Zavala 2014; Méndez-Medina, Schmook and McCandless 2015; Marín-Monroy and Ojeda-Ruíz 2016; Zepeda-Domínguez et al. 2016). The conflict between conservation and fisheries management objectives continues, and is particularly conspicuous in the Upper Gulf of California where environmental policies conflict with those who are directly dependent on fisheries (Bobadilla et al. 2011; Senko et al. 2014; López-Torre 2016; Zepeda-Domínguez et al. In press). Public participation in fisheries management faces operational challenges (Ramírez-Rodríguez and Ojeda-Ruíz 2012; Zepeda-Domínguez et al. In press) as, according to the General Law for Sustainable Fisheries and Aquaculture, only 'legal and well-organized' fishers can participate in decision-making, excluding a significant percentage of traditional fishers who operate without legal permits or access rights (Robles-Zavala 2014; Finkbeiner and Basurto 2015) and stakeholders (e.g. CSOs) who have played a significant role in fisheries management (see Espinosa-Romero et al. 2014b).

Role of CSOs in Mexican Fisheries Management

Worldwide, civil society organizations (CSOs) are playing a key role in fisheries management. They usually represent public interests in decision-making forums (Ratner & Allison 2012), have demonstrated an ability to move from problem identification towards problem solving (Dunn 2005), and have acted as bridging organizations between fishers, managers, academics, and other stakeholders (Berkes 2010). This phenomenon has been observed in Latin America (McConney, Pomeroy and Khan 2014) and continues to spread due to international tendencies towards more participatory approaches to fisheries management (Hernández and Kempton 2003).

In Mexico, the Federal Law to Promote Activities of Civil Society Organization Law (CSOs Law) states that CSOs can enhance public participation in addressing the public interest, namely; promoting the inclusion of women, the defense of human rights, the development of indigenous communities, the sustainable use of natural resources, and the creation of social capital. CSOs have the right to participate in forums and structures created by the federal government for stakeholder participation; support the government in the mentioned activities; and take part in the planning, implementation, and follow-up on policies, programs, projects, and processes led by the federal government (DOF 2012b).

In practice, national, and international CSOs operating in Mexico have moved from being environmental conservation advocates to multi-scale governance operators (Espinosa-Romero et al. 2014b; Espinoza-Tenorio, Espejel and Mattias 2015), and have found a niche in balancing conservation with livelihood and development objectives (McConney, Pomeroy and Khan 2014). In addition, they have supported capacity building programs, brought technical expertise to the fishing sector (Espinosa-Romero et al. 2014b; Méndez-Medina, Schmook and McCandless 2015), and facilitated the participation of small-scale fishers in decision-making forums (Cinti et al. 2014). Also noteworthy is the increasing number of collaborations and alliances between

CSOs, governments at different levels, and academia to work together towards the sustainability of small-scale fisheries management (Espinosa-Romero et al. 2014a, 2014b; Moreno et al. 2016).

Comunidad y Biodiversidad (COBI) is a Mexican marine conservation CSO founded in 1999. Its mission is to develop effective participatory approaches for fisheries management and marine biodiversity conservation (Espinosa-Romero et al. 2014b). A multidisciplinary team operates along four national strategies: 1) capacity building to strengthen skills of local leaders and fishing organizations for achieving sustainable fisheries; 2) implementation of international standards for sustainable fishing; 3) implementation of no-take zones for fisheries and ecosystem restoration; and 4) development of formal institutional arrangements for sustainable fishing and marine conservation (Table 20.1). COBI's programs operate in four of the 17 Mexican coastal states (Figure 20.1), where 70% of the country's total industrial and small-scale fisheries production is concentrated. COBI has actively participated in the eco-certification of four Mexican fisheries (Caribbean Spiny Lobster, Pacific Red Rock Lobster, Pacific Yellowtail, and Monterey Sardine in the Gulf of California), and promoted fisheries improvement plans in five other small-scale fisheries (abalone, clams, pen-shell, swimming crab and the snapper-grouper complex). To date, 80,000 hectares have been fully protected by communities, with COBI's support, under the three existing management instruments in Mexico (core zones in marine protected areas, fish refuges, and voluntary fully-protected marine reserves). COBI has distinguished itself from other CSOs by producing applied science papers on sustainable fisheries and marine conservation each year (an average of three academic papers) that make use of traditional knowledge and which have been utilized as a reference for fisheries management in data-poor areas. Finally, COBI's efforts have informed two initiatives at the public policy level for restoring marine ecosystems and improving public participation in fisheries management.

This chapter provides insights and lessons learned based on 17 years' of experience working with small-scale fisheries in Mexico and implementing diverse principles and elements of the SSF Guidelines. It also illustrates ways in which CSOs and other interested stakeholders can foster the implementation of the SSF Guidelines.

Table 1. COBI's national strategic lines

Effective participation of all sectors						
Strategy	Capacity building			Sustainable Fisheries	Marine Reserves	Public Policy
Goal	<i>Human development and collective action</i>			<i>Adoption of international standards for sustainable fishing</i>	<i>Fishery and ecosystem restoration</i>	<i>National impact through the escalation of local models</i>
	Community leaders	Cooperatives	Committees			
Main components	<ul style="list-style-type: none"> • Human dimensions • Technical knowledge • Implementation of sustainable fishing projects 	<ul style="list-style-type: none"> • Cooperativism values and legal framework • Administration and financial support • Investment in sustainable fisheries 	<ul style="list-style-type: none"> • Creation with key representatives of the fishery • Training program • Evaluation and adaptation of training program 	<ul style="list-style-type: none"> • Healthy stock • Healthy ecosystem • Participatory and transparent governance system • Social fairness 	<ul style="list-style-type: none"> • Design • Implementation • Monitoring • Evaluation and adaptation 	<ul style="list-style-type: none"> • Collaborative work with the Executive • Collaborative work with the Legislative • Collaborative work with the
Citizen science						

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Contributions to the SSF Guidelines

Progress was made on the implementation of the principles and elements of the SSF Guidelines prior to their publication. To analyze COBI's contributions to the implementation of the SSF Guidelines, we focus on part two: *Responsible fisheries and sustainable development* and part three: *Ensuring an enabling environment and supporting implementation* of the document.

Two external reviewers analyzed 65 documents (peer review papers, internal reports, conference proceedings, and book chapters) developed and published by COBI to identify the contributions to the main components of the SSF Guidelines as well as to identify recommendations for implementation. Following this, one external reviewer undertook 11 interviews with current and former staff members to delve in to more detail on COBI's contributions, to assure the relevant information was included, and to reflect on lessons learned.

In the following section we first present the title of each SSF Guideline, followed by a brief summary of the main components of the guideline; the Mexican context with respect to formal institutional arrangements in Mexico, specifically with regard to the General Law for Sustainable Fisheries and Aquaculture (Fisheries and Aquaculture Law), General Law of Cooperatives (Cooperatives Law), Marine Transportation and Trade Law, and General Law for Climate Change (Climate Change Law); a summary of the main contributions; and a summary of the lessons learned. Finally, conclusions and recommendations are drawn from the contributions and learning process of implementing the SSF Guidelines in a developing country.

Guideline: Governance of Tenure in Small-Scale Fisheries and Resource Management

Tenure in fisheries

Components of the SSF Guidelines Responsible governance considers equitable tenure as central for human rights, food security, poverty eradication, and sustainable livelihoods. Tenure of existing communities and cultures should be respected and protected. Tenure can play a key role in restoration, conservation, and protection of co-managed marine ecosystems. Disputes over tenure rights should be resolved in a timely, affordable, and effective manner with equitable outcomes (FAO 2015).

Mexican Context According to the Fisheries and Aquaculture Law, access rights to Mexican fisheries are through permits and concessions. Both instruments focus on individual species and may contain a spatial component. Permits can be issued from two to five years, while concessions range from five to twenty years. The process for issuing permits and concessions has to be transparent, based on the best available information, and subject to the availability of natural resources. The process is meant to seek social equity and give preference to local communities, as long as the communities are committed to sustainability (DOF 2007).

Contributions In the mid-1990s, a founding member of COBI was the first person to study the territorial use rights for fishing (TURFs) in Mexico using the Comcaác (Seri, an indigenous group from Northwest Mexico) and the swimming crab fisheries as case studies (Bourillón 2002). Further research was completed in the same area to examine the effect of territorial rights (which

was the prevalent scheme in the 1970s) on the pen-shell fishery (Basurto 2005) and compare the fishery performance with that of nearby fishing towns that lacked such rights (Basurto et al. 2012). The recognition of the importance of fishing rights for ensuring the sustainable use of resources led to the creation of a program for assisting traditional fishing organizations obtain legal access to fisheries (e.g. Sanchez-Bajo and Roelants 2011), as well as make sustainability commitments and fulfill the obligations of the Fisheries and Aquaculture Law and other applicable legal instruments.

Examples of success include a cooperative led by women in the Gulf of California (Loreto Bay National Park). The cooperative obtained fishing permits to extract aquarium species and implemented a sophisticated management scheme that includes individual quotas and no-take zones and is based on citizen science - the community and CSOs have participated in stock evaluations (Germain et al. 2015). The federal government adopted this model to create a framework to assign permits of this kind at the national level (SEMARNAT 2012). In the same region (Bahia de Kino and Puerto Libertad), four cooperatives have obtained permits to fish (clam, penshell, and octopus) and participated in the definition and enforcement of management rules (quotas, no-take zones, closed seasons, minimum sizes, gear limitations, and spatial boundaries) (Fernández-Rivera Melo et al. 2015). In addition, two of the cooperatives have recently obtained permits to repopulate penshell under a mariculture scheme, combined with quotas and no-take zones.

Lessons Learned All support to help fishers access fishing rights should be linked to sustainability. During the aforementioned processes, official access to the fisheries was not the only benefit obtained by fishers. The learning process, the capacities developed, and the changes in behavior also contributed to improving fishers' livelihoods and the sustainability of each fishery. It is important to acknowledge that many fishers have spent years (in some cases decades) dealing with corruption (internal or external to the cooperative), long delays or lack of response to permit applications, and limited access to information. Through COBI's experience, it has been observed that by having access to basic information on the process of how to access fishing rights (application and resolution), fishers are empowered to apply for permits and follow the rules (obligations under national laws). Once fishers obtain the permits, they are unlikely to continue their participation in illegitimate practices (e.g. corruption, illegal fishing) due to the risk of losing their permits. Instead, fishers are more willing to design and implement sophisticated management schemes; they want to prove that they are good candidates to possess permits and, given the increased responsibility, they will work hard to maintain them. In addition, fishers know that if they follow rules, they will also have access to other benefits such as federal subsidy programs or new markets. Finally, with permits, the catches of these fishers enter the system and are reported to, and by, the government, reducing the proportion of IUU catches and allowing science-based management decisions to be made. To ensure compliance and commitment, COBI encourages fishers to sign formal sustainability agreements as part of the requirements to receive technical support with the permit applications.

Sustainable Resource Management

Components of the SSF Guidelines Long-term conservation and sustainable use of fisheries resources should be assured. Management systems should be consistent with existing obligations under national and international laws and voluntary commitments. Small scale fishing communities should participate in monitoring and provide the information required for fishery

management. Small-scale fishers should be represented in relevant associations and fisheries bodies with special attention to the equitable participation of women, vulnerable, and marginalized groups (FAO 2015).

Mexican Context The Fisheries and Aquaculture Law indicates that fisheries should be sustainable and management decentralized (DOF 2007). Although the law does not include the principles of sustainability, one can find diverse elements that can be used as reference. For example: *fishing should be compatible with the capacity of the resources and ecosystems to recover; only selective gear types should be used to reduce the impact on the environment and fish populations; the fishing sector should be developed with a sustainability approach that balances economic, social, and environmental aspects; the precautionary principle should be adopted; impact evaluations should be undertaken to ensure sustainability.* The law also mentions that permits and concessions can be revoked if fishing activity is putting marine ecosystems at risk. There is also a penalty system for infringements. In terms of the decentralization of fisheries management, the law devolves authority to regional and local governmental agencies and defines structures for stakeholder participation at the national and subnational levels (DOF 2007). The Cooperatives Law also states that cooperatives should ensure ecological considerations are embraced by members (DOF 2009).

Contributions: COBI's approach to the inclusion of sustainability in fisheries management has evolved over time. At first, the principal strategy was the use of no-take zones for fishery and ecosystem restoration. This strategy seemed to be the most suitable, particularly in small, remote, data-poor sites (Espinosa-Romero et al. 2014b) and represents a mechanism to protect a resource for future needs (e.g. Isla Natividad, Micheli et al. 2012). With time, fishers have proposed diverse management schemes depending on the fishery. These include individual quotas, rotation of fishing grounds, and restoration through seed and larval collection, amongst others. Technical expertise was acquired by COBI to support the implementation of diverse management tools whilst ensuring that the focus on ecosystems was not lost. To account for the different dimensions of sustainability, COBI has integrated a model (Table 20.1) based on international standards for sustainable fishing (MSC, Seafood Watch Program of the MBA, and Fair Trade [FT]) that integrates four objectives: 1) stock health, 2) ecosystem health, 3) social justice, and 4) robust governance systems. The fisheries model is complemented by COBI's capacity building program for cooperatives and multi-stakeholder committees for the sustainable and transparent management of resources. The latter applies in situations where management involves diverse fisheries or multiple stakeholders.

COBI has promoted the pairing of sustainable fishing efforts with market incentives (Fujita et al. 2013). Fifteen fishing cooperatives, six in the Mesoamerican Reef (that together form a collective 'Integradora de Pescadores de Quintana Roo') and nine in the Pacific (grouped in the Regional Baja California Cooperatives Federation, 'FEDECOOP') decided to go through the MSC certification process. In 2004 the lobster fishery in the Baja California Peninsula (*Panulirus interruptus*) became the first small-scale fishery in Latin America, and in a developing country, to obtain the MSC certification (Bourillón 2009). After a decade, this fishery continues to be managed by sustainable practices (Smith et al. 2010). Eight years after 2004, in 2012, the Caribbean Spiny Lobster (*P. argus*) fishery of Sian Ka'an and Banco Chinchorro (both Federal Biosphere Reserves) obtained the MSC certification. The six cooperatives involved in the process have rigorously followed the certification requirements. One of the nine MSC certified cooperatives (Buzos y Pescadores de la Baja California of Isla Natividad) in Baja California also operates a Yellowtail (*Seriola lalandi*) fishery and decided to go through the Seafood Watch

Program. In 2014, MBA scored the hook and line yellowtail fishery in Isla Natividad as the ‘best choice’ (green).

To increase fisher participation in monitoring and management, COBI created a citizen science program directed at fishers interested in becoming surveyors of fisheries and ecosystems. This program has been successfully implemented for over a decade, initially having a focus on the evaluation of the effects of no-take zones. Now, it has been expanded to include the evaluation of fisheries. Fishers are trained and certified in SCUBA diving and biological monitoring techniques. Fishers start fishing for data. Over the last 17 years, this program has involved 222 fishers, including 28 fisherwomen. Fishers have produced data for over 300 species by undertaking 12,000 transects in three ecosystems: coral reefs, rocky reefs, and kelp forest (Fulton et al. In press). In the most successful cases, fishers have organized themselves into formalized groups and have begun hiring out their services to those in need of data. Government agencies have hired the certified fishers to conduct the monitoring of marine protected areas, fish populations, and to calculate quotas.

Lessons Learned Applying sustainability standards to small-scale fisheries requires collective action, strong cooperatives to invest in sustainability, and a clear understanding that it is no panacea to the problem of overfishing. From COBI’s experience, it is clear that sustainability can neither rely nor depend on a single stakeholder nor on a single management tool. As transitioning to sustainability always implies a cost for the fishers, it is important to anticipate how expensive the process will be and how fishers will cover the cost of this transition in the future. To address this, we included two main elements in COBI’s capacity building program: 1) administrative and financial stability, and 2) investment in sustainable fishing.

When fishers decide to be certified, the biggest challenges are covering the additional costs involved in the process (audits) and opening access to premium markets that could potentially offset some of the upkeep costs. In 2016, the lobster fishing cooperatives of Sian Ka’an and Banco Chinchorro decided to withdraw from the MSC certification because the costs of maintaining the certification were too high and they had not received additional economic benefits. When eco-certification is included as a component for sustainable fishing, the cost must be quantified in advance and included in financial plans, with the knowledge that fishers must assume responsibility for the maintenance costs in the long-term.

When managing a fishery involves diverse stakeholders, different groups face the challenges related to differing scales of governance (Espinosa-Romero et al 2014a, b). Work needs to be conducted to align scales (local, regional, and national), build shared visions, and build trust between stakeholders. From COBI’s experience with management committees, after completing the learning process, committees have built capacity to craft and enforce appropriate management rules and decision-making has moved from being self-interested (a race for fish) or sector-interested to being collective action oriented.

Finally, empowering community members to collect scientific data creates responsibility, pride, and a deeper understanding of the ecosystem in which they live and work. This in turn provides social, economic, and ecological benefits to the community and marine ecosystems ensuring the long-term sustainability of the fishery (Fulton et al. In press).

Fig. 20.2 Fiorenza Micheli (researcher at Stanford) and Miguel Castillo (fisher) comparing data after monitoring no-take zones in Natividad Island. Credits: Comunidad y Biodiversidad, A. C.

Guideline: Social Development, Employment, and Decent Work

Components of the SSF Guidelines Holistic, inclusive approaches that consider human rights and the complexity of livelihoods should be considered. Investments should be made in human resource development. Social security protection for the entire value chain should be promoted as well as access to services such as savings, credit, and insurance schemes. Improved safety at sea and reductions in the multiple causes behind deficient safety should be made following appropriate national laws and regulations that are consistent with FAO guidelines and the International Maritime Organization (IMO) (FAO 2015).

Mexican Context According to the Fisheries and Aquaculture Law, the federal government should enhance the sustainable and equitable development of fishing communities and indigenous groups, and provide incentives, resources, and technologies to these groups to increase their productive capacities (DOF 2007). The Cooperatives Law establishes that rights and obligations will be the same for men and women. It also indicates that cooperatives should create three types of saving funds: 1) a saving fund to cover periods of low income, 2) a social security fund to cover sickness, pensions, retirement packages, medical insurance, life insurance, leave of absence, education for children of cooperative members, child care, cultural and sporting activities, and other social security activities, 3) and a fund for cooperative training (DOF 2009). The Marine Transportation and Trade Law establishes the basic requirements and procedures for safety at sea (DOF 2014a).

Contributions COBI has included a component of social justice in its sustainable fishery model. This component includes promoting access rights to fish and ensuring the presence of safety equipment during fishing trips (GPS, radio, and SOS signaling device), social security benefits (including health insurance), and access to fair markets.

COBI's capacity building program has work at individual (for community leaders) and cooperative levels. The work at the individual level focuses on human development. It includes modules on leadership, common wellbeing, communication, conflict resolution, and negotiation. A final module on the technical aspects of marine conservation and sustainable fisheries to orientate fishers towards the development of future projects is given at the end. Coaching sessions and personality assessments are also given to leaders throughout the training to better understand their personality type, common behavior, and leadership style according to their level of risk, patience, capacity to follow norms, and decision-making. The program was designed by fishers, governments, and CSOs, and piloted in the Gulf of California in 2013. After three years, 20 leaders (including four women) have graduated and started marine conservation and sustainable fisheries projects in their communities. The projects range from a fisherman teaching nature photography to children to a group of women establishing a sustainable fishing cooperative (Meza-Monge et al. 2015).

Training at the cooperative level focuses on developing social enterprises. It includes modules on legal fishing, administration, competitiveness, and financial mechanisms to invest in marine conservation and sustainable fisheries. This program has been implemented in 26 cooperatives in Mexico. The modules are tailored to the cooperative's needs. Coaching sessions for the cooperative's leaders are also one of the elements of this program, and have been seen as vital for creating the conditions under which the collaborative work plans can be completed.

The SSF Guidelines mention the importance of digital inclusion to add value to fishing resources and raise awareness. In 2015, 81 interviews were undertaken with fishers on the use of digital social network (DSN). Results showed that 90% knew about DSN and 58% used it daily,

mostly to maintain communication with their family members and friends, as well as to look for information and commercialize fishing products. Fishers are using Facebook (47%), YouTube (29%) and WhatsApp (17%) mainly through smartphones (57%) (Gastelum et al. 2015). These platforms and project specific websites have been successfully used to communicate fisheries information in Mexico. Examples include Facebook pages for the community leader program and the websites for the swimming crab fishery management plan (INAPESCA, COBI 2016), the MSC certification process of the Monterey Sardine fishery (CANAIPEs 2016), and the multi-sectoral Kanan Kay Alliance (Kanan Kay Alliance 2016).

Lessons Learned The fulfillment of obligations and legal requirements for safety at sea and social security are generally lacking within traditional small-scale fisheries communities. In COBI's experience these are key elements to dignify the fishing activity. This problem cannot be addressed in isolation as fishers operating without permits or on low margins are unlikely to invest time and money in acquiring or maintaining the necessary safety equipment. Promoting safe working conditions at sea, and security nets on land, enables conditions for sustainable fishing.

Adding a human dimension approach to the leadership program has been strategic in ensuring personal development and growth of local leaders. Our program modernized capacity building in Mexico. For decades, capacity building usually focused on marine conservation and best practices for fishing. There are always coastal community leaders working towards a common wellbeing that, with a little help and skill development, can make significant changes in their communities. Through our capacity building program we have been able to create a network of change makers. This network continues to grow through exchanges and social networks such as Facebook.

Training for fishing cooperatives needs to have a business focus, beginning with a legal constitution, having robust finances and governance systems, and finally having access to financial support mechanisms (e.g. access to loans). Without any of these elements, it is unlikely that cooperatives will be able to fully engage in sustainable fisheries.

The importance of DSN for communicating information with and amongst fishers must be recognized. Fishers are highly active and informed, and build strong communities through DSN.

Guideline: Value Chains, Post-Harvest and Trade

Components of the SSF Guidelines Parties should recognize the role of small-scale fisheries post-harvest subsectors in the value chain and assure participation in decision-making, with a particular emphasis on the role of women. Traditional forms of association and capacity development in all stages of the value chain should be promoted, including support for the development of cooperatives and professional organizations. The end result should be quality and safe fishery products for both export and domestic markets, as well as robust marketing mechanisms. Effective fisheries management systems and policies should be in place to prevent over-exploitation driven by market demand (FAO 2015).

Mexican Context The importance of setting the basis for the implementation of measures to ensure high-quality, safe fish products during extraction, transportation, storing, and distribution is established in the Fisheries and Aquaculture Law. The law also establishes that the federal government should have a designated budget to strengthen the value chain for fisheries and promote production, industrialization, commercialization, quality improvement, and export

of fishery products. In addition, the federal government should promote national consumption of seafood, added value to fishing products, access to premium and international markets, capacity building to link producers and strengthen value chains, and loans and financial mechanisms for sustainable fishing, research, technology and for improving competitiveness in the value chain. Finally, the federal government will establish the basis for the implementation of traceability systems for fishing resources (DOF 2007). The Cooperatives Law establishes that financial mechanisms should be available for investment projects proposed by cooperatives that demonstrate feasibility, economic benefits, as well as financial and operational plans. It provides the basis for cooperatives to be organized through federations and confederations (DOF 2009).

Contributions COBI has focused on two main strategies: the use of market incentives such as eco-labeling and consumer guides (Fujita et al. 2013) and connecting small-scale fishers with new markets. These strategies are accompanied with a capacity development program for fishers to know which options they have for eco-labels and to give them creative communication channels to connect to better markets.

The case of the Baja California lobster fishery is particularly interesting. Fishers have stated that they have not received a better price for their lobster since certification by the MSC. They export 90% of the catch (total catch in 2014 was 1,446 tons) to markets in France, USA, and Asia (Smith et al. 2010). These markets were already paying a good price before certification and continue to do so. However, since certification, the cooperatives have become a model for sustainable fishing in Mexico, giving them access to subsidies and providing intangible benefits such as a feeling of pride for members for having certification and being leaders in the field.

Only one of the six cooperatives in Quintana Roo that were certified by the MSC perceived higher economic benefits, mostly due to the fact that the cooperative improved their negotiation skills and invested heavily in searching for markets.

Currently, a small portion (three out of 90 tons) of Yellowtail production (scored as best choice by MBA) is sold through SmartFish, an organization dedicated to improving onboard management of catch and commercialization of environmentally-friendly seafood. This label has been affordable to small-scale fishing cooperatives; however, to really maximize potential benefits, more consumer awareness is required. Whilst this label is recognized by consumers in the USA, it is not well known in Mexico.

COBI has linked fishers with main retailers in Mexico (e.g. Walmart, Chedraui) through participation in seafood fairs. The most important national event is organized by the federal government through the National Commission of Fisheries and Aquaculture (CONAPESCA). In this annual event, fishers are invited to exhibit their products and attend one-on-one meetings with the main Mexican retailers. Unfortunately, this type of business transaction is unattractive to many small-scale fishers as they often sell the product on the beach, get cash payment at the point of sale, and do not have access to processing, packaging, or transportation facilities. COBI, after taking note of these obstacles, began to change course. The current approach is to identify small-scale buyers that are willing to incentivize sustainable fishing practices. Meetings are being organized and digital platforms being created for fishers and buyers to connect. Chefs and restaurants have shown particular interest in buying small-scale fisheries products, considering the volume and season. There is a growing trend, particularly in big cities such as Mexico City to sell and consume high quality gourmet, local, and organic food.

Finally, COBI is starting to involve buyers in the fishery improvement plans to make sure buyers are aware of fisher efforts towards the sustainability of the small-scale fisheries.

Lessons Learned Three main obstacles for concretizing negotiations between retailers and small-scale fishers have been identified. First is that of volume: retailers generally expect high

and consistent volumes throughout the year, not usually possible due to resource seasonality and closed seasons. Second is the issue of payments: retailers have payment policies that imply that the seller will receive payment weeks or months after they deliver the product. Third is the logistical concern: retailers usually expect fishers to bring products to the stores, and in particular presentations.

Small-scale fisheries require links to markets that not only incentivize sustainable fishing, but also understand the characteristics of small-scale fisheries (seasons, volumes etc.). Small-scale buyers represent a good opportunity. They are willing to pay more under the characteristics of small-scale fisheries. But, they expect high quality seafood, formality, and professionalism from the fishers. Thus, fishers need to be willing to improve harvest and post-harvest practices

Although there is support from the Mexican government for the commercialization of seafood products, it is important to recognize that small-scale fisheries have to be well organized and legal before looking for access to better market opportunities. Additionally, fish buyers should be included in marine conservation and sustainable fishery efforts.

The experience with the three certification processes described above shows that cooperatives are strongly aligned to sustainability standards. The challenge has been to cover the costs of the certification process and access preferential markets that provide incentives such as higher prices for sustainably caught products. COBI's experience of working with MSC certifications for small-scale fisheries has highlighted that whilst certification may not provide economic benefits, it may bring intangible benefits that will be reflected in the governance structures, including more inclusive, transparent, and collaborative processes, as well as access to other incentives such as subsidy programs.

Guideline: Gender Equality

Components of the SSF Guidelines Gender mainstreaming should be an integral part of all small-scale fisheries development strategies including compliance with obligations under international human rights law. Measures should be put in place to address discrimination against women and improve organizational development and equal participation in decision-making processes. There should be equal access to extension and technical services, fishery relevant legal support and evaluation systems to improve women's status, develop better technologies, and generate appropriate work in small-scale fisheries (FAO 2015).

Mexican Context The Fisheries and Aquaculture Law has no emphasis on gender equality (see DOF 2007). The Cooperatives Law only establishes that there will be equity in rights and obligations for the members of cooperatives, including women (see DOF 1994). The Climate Change Law includes a wide array of mechanisms to promote gender equality. For example, it has a national program for gender equality that aims at no discrimination against women and promotes women's access to decent work and resources. It also aims for greater inclusion of women in environmental decision-making, productive projects, and evaluation processes, offers support to indigenous women, and incorporates a gender equality approach to environmental and sustainability policies, aligned to international agreements (DOF 2012c).

Contributions Fisherwomen have been invited to, and participated in, COBI's programs. Two fisherwomen cooperatives, each consisting of eight people, have self-organized and become legal fishers; four women from the Bahia de Kino community are part of the first generation of community leaders in the Gulf of California; 28 women have been trained in subtidal monitoring

to evaluate aquarium species and the effect of no-take zones; two of these 28 women collect data registered by oceanographic sensors (pH, salinity, temperature, and dissolved oxygen) as a part of a long-term project to monitor the effects of hypoxia on benthic resources reported in their community (Micheli et al. 2012) and along the California Current caused by climate change (Chan et al. 2008). In addition, in 2013 the first workshop to exchange experiences among women involved in fisheries was held in the small town (5,000 people) of Bahia de Kino. Early in 2016, one of the community leaders participated in a panel organized by the Mexican Senate and CSOs about the role of fisherwomen in fisheries management and research. Mrs. Delfina said, *‘It is our [women’s] time to show others how to fish and protect our seas for our grandchildren, the time of our husbands is over.’*

Lessons Learned Women have decided to participate in COBI’s programs because of personal challenges. However, once they have become part of projects, women have shown themselves to be great leaders, entrepreneurs, citizen scientists, and speakers on what they do and why they do it. In addition, they have demonstrated a strong commitment to marine conservation and the long term sustainability of small-scale fisheries. Including women in fisheries management and research brings new perspectives, visions, solutions, and knowledge to the table.

Fig. 20.3 Fisherwomen in Estero Santa Cruz, Sonora. The cooperative “Mujeres del Mar de Cortés” is self-organizing to have rights to fish under sustainability standards. Credits: Eunice Adorno/Comunidad y Biodiversidad, A. C.

Guideline: Disasters Risks and Climate Change

Components of the SSF Guidelines Combating climate change in the context of small-scale fisheries requires urgent and ambitious action. Actions and support should be in accordance with the United Nations Framework Convention on Climate Change (UNFCCC) and The Future We Want from the United Nations Conference on Sustainable Development (Rio+20). Strategies for adaptation, mitigation, and building resilience should be developed, including special support for small islands (where climate change may have particular implications for food security, nutrition, housing, and livelihoods), indigenous peoples, and vulnerable and marginalized groups (FAO 2015).

Mexican Context The Fisheries and Aquaculture Law establishes the importance of promoting, regulating, and implementing mitigation and adaptation actions to address the impacts of climate change. In addition, it suggests that national policies for fisheries and aquaculture need to be designed with a climate change adaptation and mitigation approach (DOF 2007). The Climate Change Law establishes the basis to address the adverse impacts of climate change. It states that policies need to be designed to take these changes into account, and highlights the importance of reducing the vulnerability of human populations, the relevance of building national capacity to respond to environmental changes, and of education, research, technology, and innovation in this field. According to this law a fund will be created to gather public, private, national, and international financial resources to be used to implement actions to address climate change. The federal government will invite Mexican society to participate in the design and implementation of a National Policy on Climate Change Adaptation and Mitigation, and will provide incentives for the best efforts in this field (DOF 2012c). The Strategic Program on Climate Change has been created. The program includes the creation of a National Oceans Policy

to address the effects of climate change, the implementation of the Code of Conduct for Responsible Fishing, and the implementation of additional safety at sea measures (DOF 2014b).

Contributions COBI, along with local fishers, has begun designing and implementing regional networks of reserves in the Mexican Pacific Ocean, Gulf of California, and Mesoamerican Reef principally as a strategy to restore fisheries and marine ecosystems, but also to adapt to environmental changes. The process in the Gulf of California is the first to include ecological connectivity and climate change into the regional design of a network of marine reserves (Suarez, Torre and Alvarez-Romero 2014).

Fishers have started to see and understand the potential benefits of marine reserves for adapting to climate and environmental changes. In 2006, the fishing cooperative Buzos y Pescadores de Baja California established two marine reserves within their fishing concession. In 2008 and 2009, two climate-driven hypoxia events produced mass mortality of benthic invertebrates leading to 75% and 50% mortality of Pink Abalone, (*Haliotis corrugate*), in the fishing grounds and marine reserves, respectively (Micheli et al. 2012). These hypoxia events have been well documented along the California Current (Chan et al. 2008), with significant drops in oxygen concentrations in shallow waters resulting from changes in upwelling intensity and patterns caused by abnormally strong winds; events that have become more common in the last two decades. After these mortality events, monitoring results showed that pink abalone inside the reserves were more abundant, larger (45% above the legal fishing size), and more mature (92%), producing 40% more eggs than in fishing areas and hence resulting in higher recruitment inside the reserves and in adjacent areas (Micheli et al. 2012). In the case of the Caribbean, no-take zones established in 2012 in the Sian Ka'an Biosphere Reserve have shown significant increases in spiny lobster abundance (Fulton et al. 2015). Additionally, despite heavy rains through the 2013-2014 lobster season, which reduced state-wide catches by half due to freshwater influx in fishing grounds, lobster abundance in the no-take zones remained the same and in some cases continued to increase (Fulton et al. 2015).

Lessons Learned The inclusion of oceanographic monitoring equipment is vital for adequately monitoring components of climate change in the marine reserves and fisheries. Using the example from Isla Natividad (Micheli et al. 2012), if there had not been access to physical data generated in the marine reserves during the hypoxia events, mass mortality could have been attributed to some other factor, limiting the management options available. In some areas, implementation of oceanographic monitoring has been slower than desired. Unfortunately, it is often difficult to justify the installation of expensive oceanographic equipment *before* unpredictable climate variations occur. However, not having this equipment means the most critical data is lost before monitoring begins. Luckily, fishers are much attuned to their environment and act as early warning systems for adverse events. In most areas, their openness, willingness to share information, and find a solution with groups with whom they have long collaborated creates favorable conditions in which to come up with proposals aimed at adapting to climate change.

Guideline: Ensuring an Enabling Environment and Supporting Implementation of the SSF Guidelines

Components of the SSF Guidelines All parties are encouraged to support, communicate, and monitor the implementation of these Guidelines, including the facilitation of national platforms in

collaboration with CSOs to oversee implementation. States should recognize the need for policy coherence with regard to national and international laws and agreements, institutional coordination (ecosystem approaches, marine spatial planning, and integrated coastal zone management), and collaboration (international, regional, sub regional and with CSOs, fisheries cooperatives, etc.). Fisheries information systems should be used to promote effective decision-making, transparency, sustainability, research, and communication. Capacity development should be in place to improve participatory decision-making, benefit from market opportunities, develop co-management arrangements, and improve knowledge transfer (FAO 2015).

Mexican Context The SSF Guidelines have not been explicitly incorporated into national policies. However, as mentioned above, some of the principles were implemented before the SSF Guidelines were published. To be systematic, the implementation and monitoring of the SSF Guidelines should be incorporated into national policies.

Contributions Efforts have been made to create enabling environments along with communities of change makers who can help continue the implementation and enforcement of the SSF Guidelines and improve policy coherence as well as transparency and participation in decision-making and management schemes.

For example, COBI has implemented a marine conservation course directed at decision-makers (mainly legislators from the Senate Chamber) and graduate students to increase the national capacity for addressing Mexican marine conservation and fisheries issues. In the course, participants analyze the current situation of marine fisheries and ecosystems and develop creative and feasible solutions. The course has been run four times and has facilitated the development of new relationships between decision-makers, experts (including fishers), and students.

COBI also organizes a fisher exchange called ‘Pescador a Pescador’ (Fisher to Fisher). Four exchanges have happened thus far, each time bringing together up to 100 fishers, mostly from Mexico, but also at times from USA, Guatemala, Argentina, Belize, Chile, Philippines, Jamaica, Honduras, Colombia, and Brazil. These events create dialogue spaces for small-scale fishers and allow discussion of common problems. Each meeting has a theme: 2003 – *Improving fishing through the use of marine reserves*; 2006 – *The responsibility of the fisher in creating an ordered and sustainable fishery*; 2011 – *Fishers’ role in fisheries management*; and 2015 – *Organization is key*. These interchanges build long lasting connections between fishers that the confidence of fishers, and allow the exchange of ideas aimed at coming up with common solutions for sustainable fisheries.

In collaboration with other CSOs, governments, and researchers, COBI is part of a citizen’s initiative to improve public participation in fisheries management and research in the Fisheries and Aquaculture Law. This initiative has been presented to the Senate and was well received.

Lessons Learned Most of the recommendations of the SSF Guidelines rely heavily on state intervention; however, a diverse set of other stakeholders also play an important role in building policy coherence, institutional coordination, collaboration, capacity development, and monitoring the implementation of the SSF Guidelines. Creating enabling environments and alliances with diverse sectors and disciplines are key for the design, implementation and monitoring of the SSF Guidelines.

Much of the work in which COBI has been involved has consisted of multi-sectoral collaboration in which researchers, users, governments, CSOs, and other stakeholders work towards a common goal and provide important perspectives on the work being completed. Alliances and exchanges bring diversity of knowledge, resources, and expertise to the management of a resource, co-production of knowledge, and social learning. This helps make

more informed and collective decisions, and improve transparency and trust between the different sectors. And as mentioned above, the use of platforms to report progress on national and international goals and projects is essential for increasing participation, collaboration, commitment, as well as transparency.

Main Lessons and Challenges

The SSF Guidelines provide significant impetus for the long-term sustainability of small-scale fisheries. They can be used as a framework to document experiences and guide local and national initiatives. From the Mexican experience of implementing the principles on small-scale fisheries, the following can be ascertained:

Property and access rights are fundamental for the sustainability of small-scale fisheries
In Mexico the Fisheries and Aquaculture Law allows exclusive access to marine resources in the form of permits and concessions, but does not allow for property rights *per se*. Access rights are sufficient to promote long-term sustainability in many fisheries, however in many parts of Mexico, small-scale fishers do not operate under these schemes. In many cases this is simply because they have not requested them, given the lack of information and misconceptions over what the process entails. Many fishers end up getting trapped in a downward cycle of disorganization or corruption and continue to fish illegally. It was observed in some cooperatives and organized groups that sharing even the most basic information on how to apply for a permit can result in radical changes in fisher behavior. Fishers are willing to follow this process and commit to sustainability in order to get and maintain permits. Preference for receiving fishing rights should be given to traditional small-scale fishers to ensure that the rights are not concentrated in the hands of a few powerful players, a situation that is common in some areas and one that can lead to unregistered fishers and illegal fishing.

Capacity building with fishers, leaders, and fishing organizations is of utmost importance
Coordinated, collective action is a key component of movements towards sustainability, but it is recognized as particularly difficult in the remit of fisheries (Feeny et al. 1990). In the first half of the 20th century, Mexican public policy favored the creation of fishing cooperatives and organizations (Cruz-Ayala and Igartúa-Calderón 2006); however, in the last 30 years policies and privatization in the fishery sector has removed many of the incentives for fishers to organize. COBI's experience has been that working with organized fishers is more likely to lead to successful implementation of sustainable fishing projects. Thus, investments should be made in creating leaders, transforming cooperatives into social enterprises, and creating multi-stakeholder management committees with common goals and objectives.

International standards for sustainable fishing can be used as a framework for small-scale fisheries
Sustainability has been extensively defined. International standards can provide the framework and main elements for sustainable fishing. In COBI's experience, the fulfilment of the sustainability requirement of eco-certifications requires collective action, strong cooperatives that are prepared to cover the transition to sustainability, and the understanding that there is no panacea: multiple tools may need to be applied depending on the resources and governance system. The costs of maintaining certifications are often too high for small producers. It is important to explore the diversity of financial mechanisms available to fishers to ensure that they can absorb the costs of certification in the mid to long term.

Market incentives are yet to guide small-scale fisheries towards sustainability Whilst market incentives do help, access to preferential markets is not necessarily easily obtained (at least in Mexico where only a few exceptional sustainable fishery cases have had access to premium markets), and hence cannot be relied upon as the sole means for fishers to commit to sustainability. In addition, the idea that major retailers can be linked to sustainable small-scale fishers has not come to pass in Mexico as of yet, due to the small catch volume, variable fishing seasons, and logistical hurdles. COBI is currently exploring the opportunity of connecting small-scale fishers directly with small-scale buyers, financial institutions, and novel options for making these connections (digital platforms and events) more viable. It is important to recognize that small-scale buyers focus on the quality of the product. For small-scale fishers to access these markets, they have to improve the way they catch and manage products onboard and during processing.

Gender equality is essential for sustainable fisheries The role of women has been widely recognized but poorly quantified. In Mexico, the role of women is not explicitly addressed in the Fisheries and Aquaculture Law or in decision-making processes more generally. By including women in such processes richer discussions, more representative visions, and more creative solutions to fisheries matters can be obtained. In Mexico, fisherwomen have proven to be great leaders, entrepreneurs, and fisheries scientists.

Environmental change is happening Fisheries management tools have to consider changing environmental conditions as part of design and implementation. No-take zones have proven to be effective tools to cope with these changes but more work is needed. Examples on how to incorporate environmental change into marine reserve designs are being developed. Fishers in the meantime are adapting and obtaining experience of how to adapt. Resource distribution and seasonality are shifting fishing patterns and frameworks based on the SSF Guidelines need to be in place to ensure that small-scale fisheries continue to provide food security and livelihoods to the people that depend on them.

Alliances create enabling environments and support implementation Multi-sectoral collaborations are vital for the successful implementation of the SSF Guidelines. Trust must be built between sectors, based on transparency, openness, and mutually-beneficial objectives. Having fishers participate in public policy and speak directly top-level government officials helps transmit the message that organized fishers and organized citizens (the CSOs) together are pushing the move towards implementation of sustainable fishing practices.

Conclusions

The SSF Guidelines are a landmark document that highlights the importance of the small-scale fishery sector and provides the framework on which FAO member organizations should base their efforts to not only ensure the survival of the sector, but allow it to thrive, particularly in developing countries. As mentioned in the SSF Guidelines, an enabling environment should be created in each state that promotes collaboration between the state, fishing organizations and CSOs. Whilst the guidelines highlight the importance of the role of the state in the implementation of the SSF Guidelines, other stakeholders can use these principals to assist the transition towards sustainability. CSOs should not be limited to filling the gaps left by states because the latter do not have the necessary resources to adequately manage an extensive coastline and diverse fisheries. Using examples from Mexico, we have described how a CSO,

working in direct collaboration with fishers and fishing communities, can use the framework and guiding principles of the SSF Guidelines to create replicable models of social development, gender equality, and sustainable resource use in the coastal communities of a developing country. The long-term success of these models will be measured by the number of successful replicas. We intend that these replicable models result in a paradigm shift in sustainable fisheries management at the national level.

There continue to be many challenges on the path towards sustainable small-scale fisheries that balance conservation and livelihood objectives; however, CSOs are bridging the gap between the state and fishers, and the SSF Guidelines provide vital guidance and direction.

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Fig. 20.1. Map of Mexico highlighting locations mentioned in the text.

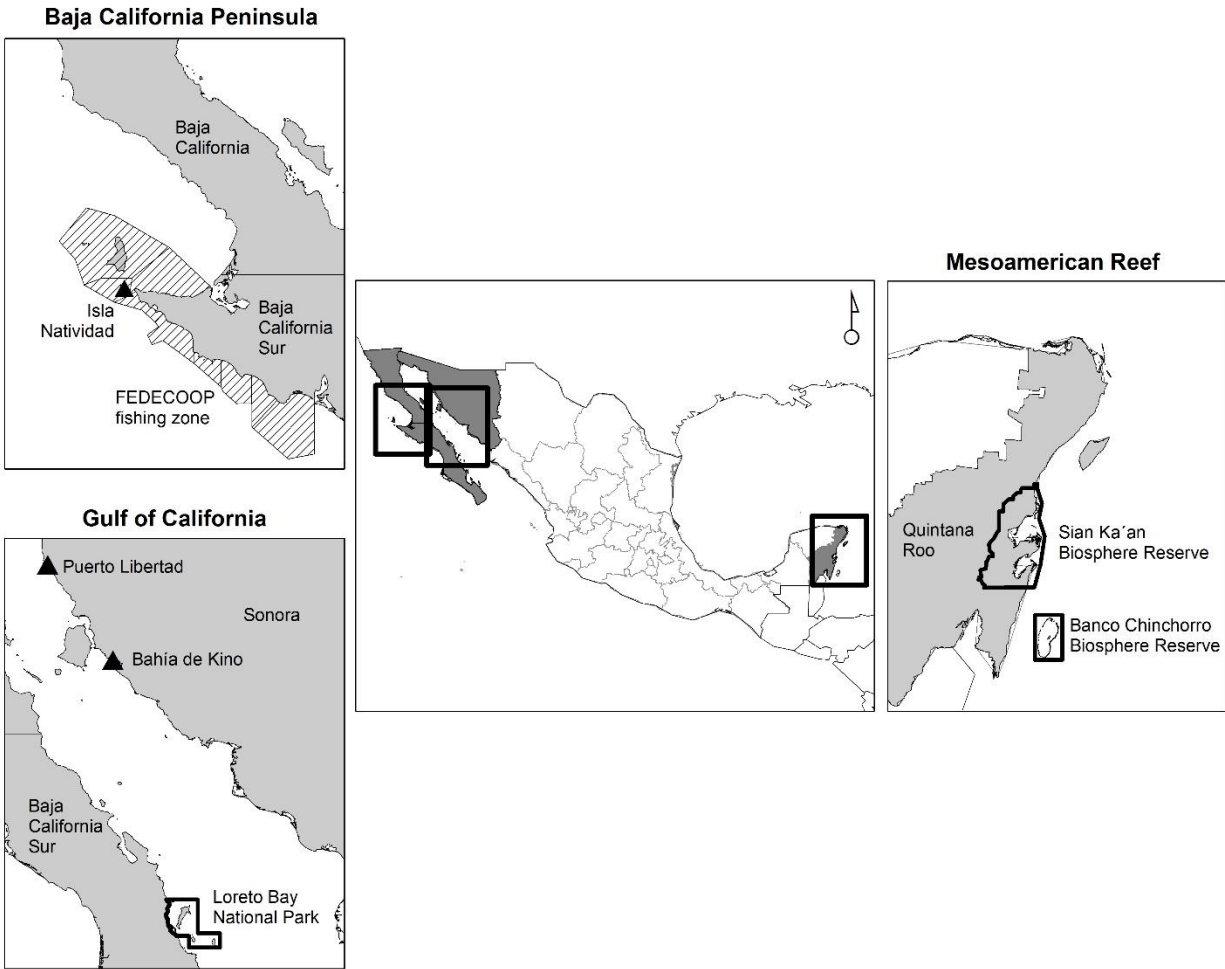


Fig. 20.2 Fiorenza Micheli (researcher at Stanford) and Miguel Castillo (fisher) comparing data after monitoring no-take zones in Natividad Island. Credits: Comunidad y Biodiversidad, A. C.



Fig. 20.3 Fisherwomen in Estero Santa Cruz, Sonora. The cooperative “Mujeres del Mar de Cortés” is self-organizing to have rights to fish under sustainability standards. Credits: Eunice Adorno/Comunidad y Biodiversidad, A. C.

