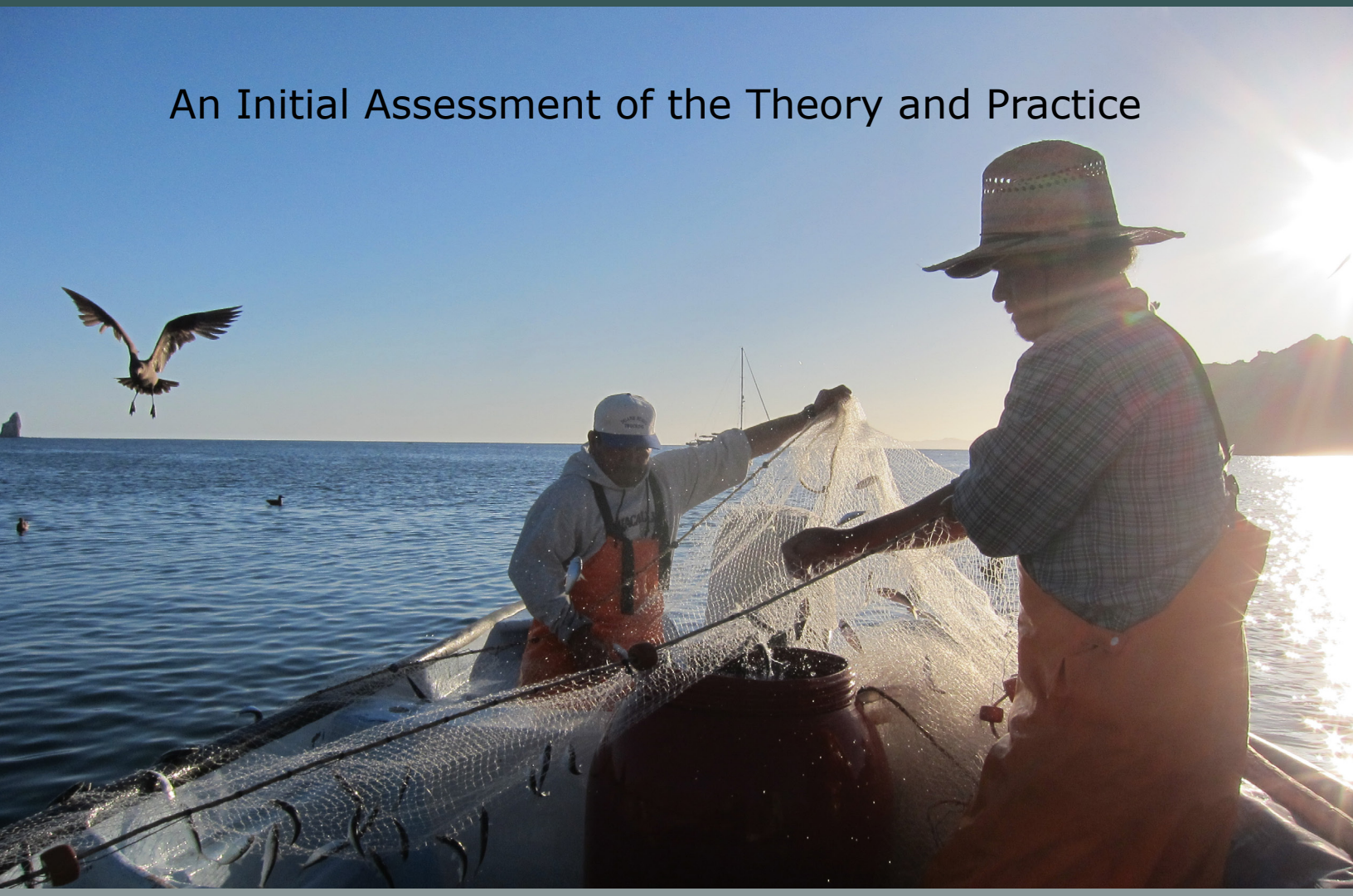
Strengthening Governance of Small-Scale Fisheries

An Initial Assessment of the Theory and Practice



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An Initial Assessment of the Theory and Practice

Xavier Basurto, John Virdin, Hillary Smith, and Ryan Juskus

Acknowledgments. This report was prepared with support from the Oak Foundation. The report and supplementary materials are available at: www.oakfnd.org/environment. We started this project by defining the scope of our global scan on small-scale fisheries (SSFs). To do so we convened a Duke-UNC advisory group of experts on fisheries from a variety of academic and policy perspectives including human geography (Professor Lisa Campbell), area-based planning (Research Scientist Daniel Dunn), geospatial ecology (Professor Pat Halpin), political economy (Professor Elizabeth Havice, UNC), environmental policy (Senior Policy Associate, Kay Jowers), natural resource sociology (Professor Grant Murray), and environmental economics (Professor Marty Smith). As a result of a one-day workshop in Beaufort North Carolina where we discussed data availability and knowledge gaps, this group recommended to focus our research effort on the theme of "governance," as an area of high theoretical and practical need. Marine Lab Librarian Janil Miller and many student research assistants helped construct the small-scale fisheries library and database and conducted analysis between 2009 and 2015. In alphabetical order they are Sharon Benjamin, Jessica Bonamusa, Nicole Carlozo, Mary Clark, Sarah Finn, Caitlin Hamer, Miller Muller, Mateja Nenadovic, Douglas Perron, Kirby Rootes-Murdy, Zack White. From 2016 to the present we would like to thank Alejandro Garcia, Caitlin Starks, Sarah DeLand, and Claire Yang. Kelsey Dick assisted with analysis and logistics and Jill Hamilton with the ocean funding/aid database and preliminary analysis. We also are indebted for the excellent administrative support received from David Bjorkback and Nancy Kelly. The Duke Kenan Institute for Ethics provided further research and support for the ethics analysis of the small-scale fisheries scientific literature. Kay Jowers (Senior Policy Associate), David Toole (Professor), and Kara Slade (PhD student) contributed to this work. We thank Editrudith Lukanga, Margaret Nakato and all the Delegates of the World Forum of Fish Harvesters and Fishworkers (WFF) for inviting us to their 5th General Assembly in Salinas Ecuador. We also thank Rare Conservation for their willingness to collaborate on the finance data and all of the colleagues for their time to participate in the survey. We received excellent comments for different sections of the document from Ratana Chuenpagdee, Matt Elliott, Imani Fairweather-Morrison, Nicolás Gutierrez, Anne Henshaw, Bob Pomeroy, Kelly Wachowicz, and Lena Westlund.

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GLOSSARY OF TERMS USED

Artisanal Fishery: See small-scale fishery (terms are used interchangeably here as in many other reports—e.g. World Bank et al. 2012). Specific definitions refer to traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption. In practice, definition varies between countries, e.g. from gleaning or a one-man canoe in poor developing countries, to more than 20 meter trawlers, seiners, or long-liners in developed ones. Artisanal fisheries can be subsistence or commercial fisheries, providing for local consumption or export (FAO 2016d).

Capture Fishery: The sum (or range) of all activities to harvest a given fish resource. It may refer to the location (e.g. Morocco, Gearges Bank), the target resource (e.g. hake), the technology used (e.g. trawl or beach seine), the social characteristics (e.g. artisanal, industrial), the purpose (e.g. (commercial, subsistence, or recreational) as well as the season (e.g. winter) (FAO 2016a).

Coastal indigenous peoples: Include recognized indigenous groups, and unrecognized but self-identified ethnic minority groups, whose cultural heritage and socio-economic practices are connected to marine ecosystems that are central to their daily lives and key to their nature-culture dynamics and concepts of surroundings, language, and world views (Cisneros-Montemayor et al. 2016).

Commercial fisheries: Includes both large and small-scale fisheries subsectors aimed at generating cash revenues. With the possible exception of recreational fisheries, all fisheries are likely to have some commercial component. (World Bank et al. 2012).

Culture: Refers broadly to "people's shared knowledge, including knowledge about their language, history, mythology, religious beliefs, world view, values, normative behavioral patterns, prevailing means of subsistence, and customary modes of social, economic, political and religious organisation" (McGoodwin, 2001, p.8; in Béné 2008).

Governance: The process of discussing, agreeing, designing, and implementing informal and formal rules (i.e., procedures, laws) to allow for members in society to have orderly and productive interactions with one another for a specific goal.

Industrial fisheries: The large-scale, commercial fishery subsector most often conducted from motorized vessels greater than 20 meters in length operating inshore and/or on open oceans (World Bank et al. 2012).

Large-scale fisheries: Often associated with high capital costs and sophisticated technologies. They tend to substitute labor with technology and tend to have an urban rather than rural or community base. Large, concentrated landings tend to require specialized catch preservation and distribution, and the economic benefits accrue directly through labor and indirectly through profit distribution and taxation. (World Bank et al. 2012).

Post-harvest Activities: Take place after the capture and landing of fish and include cleaning, storing, wholesaling, retailing and other processing before consumption (World Bank et al. 2012).

Recreational Fishery: Harvesting fish for personal use, fun, and challenge (e.g. as opposed to profit or research). Recreational fishing does not include sale, barter or trade of all or part of the catch (FAO 2016e).

Subsistence Fisheries: A fishery where the fish caught are shared and consumed directly by the families and kin of the fishers rather than being bought by middle-(wo)men and sold at the next larger market

(FAO 2016f). World Bank et al. (2012) characterize subsistence fisheries as a sub-sector in which the majority of fishers are poor and captures are primarily consumed by local households without entering the value chain. Only surpluses are sold. Additionally, FAO defines "subsistence fishers' as those who catch fish and gather other forms of aquatic life to provide food, shelter and a minimum of cash income for themselves and their household (FAO 1999). World Bank et al. (2012) suggest that pure subsistence fisheries are rare because excess production is sold or exchanged for other products or services even in the smallest fishery. In this respect, subsistence fisheries are partly a component of small-scale commercial fisheries.

Value chain: Comprises all economic activities and subsectors that directly or indirectly contribute to capture and post-harvest processing and marketing of fish (World Bank et al. 2012).

ACRONYMS

AU	African Union
COFI	Committee on Fisheries
CPR	Common pool resources
CSO	Civil Society Organization
FAO	Food and Agriculture Organization of the United Nations
FENCOPEC	National Federation of Fishing Cooperatives of Ecuador
GEF	Global Environment Facility
ICSF	International Collective in Support of Fishworkers
IPC	International Planning Committee for Food Sovereignty
ISSF	Information System on Small-Scale Fisheries
ITQ	Individual transferable quota
LMMA	Locally managed marine areas
MPA	Marine protected area
MSY	Maximum sustainable yield
NGO	Non-governmental organization
NORAD	Norwegian Agency for Development Cooperation
OECD	Organization for Economic Cooperation and Development
SDG	Sustainable Development Goal
SOFIA	State of World Fisheries and Aquaculture report
SSF	Small-scale fisheries
TBTI	Too Big To Ignore network
TEK	Traditional ecological knowledge
TURF	Territorial use right fishery
UN	United Nations

UNCED	United Nations Conference on the Human Environment
UNCLOS	United Nations Convention on the Law of the Sea
WFF	World Forum of Fish Harvesters and Fishworkers
WFFP	World Forum of Fisher Peoples

EXECUTIVE SUMMARY

What are small-scale fisheries?

The term "small-scale fisheries" (SSFs) refers to a large proportion of the world's fishers and fishing vessels. Because it is so broad and diverse, scholars and practitioners agree a universal definition is neither possible nor useful. To date the characterization and approach with the most input from fishers and fishworkers worldwide can be found in the SSF Guidelines1. These Guidelines stress that small-scale fisheries are diverse, dynamic, and often anchored in local communities and their cultural practices and livelihoods. By contrast, definitions and characterizations in scientific literature and State laws have frequently overemphasized the role of technology with characteristics such as fishing vessel length and fishing gear type to differentiate SSFs from industrial fisheries, often contributing to unintended consequences for the development of sustainable and responsible fishing practices.

Why study small-scale fisheries?

Often hidden in national statistics, these fisheries have been poorly measured at a global level, and in the past often ignored in states' policy-making. Yet estimates suggest their aggregate global contribution to nutrition, food security and poverty eradication is massive. The most recent estimates available suggest that small-scale fisheries account for over 90 percent of the world's commercial fishers, processors and other persons employed along the value chain, equivalent to over 108 million people. Roughly half are employed in the ocean and the other half in inland fisheries—making small-scale fisheries far and away the ocean's largest employer (greater than oil and gas, shipping, tourism, etc.). This level of activity translates into a large portion of the global fish catch: an estimated 46 percent of the total, and 38 percent of the fish caught in the ocean. SSFs are also estimated to provide over half the animal protein intake in many of the world's least developed countries, and over half of the fish for domestic consumption in developing countries more broadly. In sum, in many regions of the world SSFs provide both incomes to help reduce poverty and safety nets to help prevent it.

Small-scale fisheries are predominantly found in developing countries (the tropics), largely in Asia and to a lesser extent Africa. Over 40 percent of the persons employed in marine small-scale fisheries were estimated to live in 6 countries: China, Nigeria, India, Indonesia, Bangladesh and the Philippines. Perhaps less often appreciated is the role that small-scale fisheries play in maintaining local culture in many regions (e.g., fishing traditional ecological knowledge and practice), and other important community-level values that cannot be measured in demographic or economic terms alone. This is particularly the case for countries and regions with smaller populations highly reliant on SSFs, for example in the subsistence fisheries among the Inuit in Alaska and other geographies outside of urban centers such as in the Western Pacific, where governance systems, formal and informal are well-developed.

[1] The full name is the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication http://www.fao.org/3/a-i4356e.pdf.

What do we know about small-scale fisheries?

As scientists have increasingly begun to study small-scale fisheries (from practically no peer-reviewed publications in the early 1960s to an annual average of over 50 per year by 2000), they have often described them as facing significant social or shared problems—from over-exploitation to multiple conflicts over space and resources. The "problem" in small-scale fisheries was initially described as "under-exploitation" or a missed opportunity for food and income (1960—1980s), then "over-exploitation" of the resources (1980—2000s), and more recently in terms of "conflict over the value and use of resources" (1990s—2000s). The pivotal shift in the scientific literature occurred in the 1980s and 1990s, from viewing development of small-scale fisheries as the main opportunity to considering over-exploitation as the central issue, with property rights commonly identified as key to any solution (based on assumptions of the "tragedy of the commons" that have since raised many questions from an ethical perspective). Several conflicts begin to emerge as central problems in the 1990s, with competing interests vying for use of the resources—e.g. conflicts between small and large-scale fisheries, between small-scale fisheries and conservation, and/or tourism. These characterizations matter, as the way problems are described shapes the scope of solutions that are considered and how policies are designed and implemented.

The role of small-scale fisheries governance

Governance has been agreed by scholars as critical to solving these problems identified in small-scale fisheries and supporting them to achieve their potential socioeconomic contributions—though the goals have changed over time. Governance is defined broadly here as the process of discussing, agreeing, designing, and implementing informal and formal rules (i.e., procedures, laws) to allow for members in society to have orderly and productive interactions with one another for a specific goal. Over time, three overlapping, salient and normative goals of governing small-scale fisheries have been advocated in the scientific literature: (i) governance to increase societal development in the 1960s, (ii) governance to support fishers and their communities in the 1970s, and (iii) governance as a means for conservation outcomes in the 1990s and after. These normative goals of governance have likely influenced prescriptions contained in a number of international policy instruments affecting small-scale fisheries, such as the global work program or action plan entitled "Agenda 21" that was produced at the first Earth Summit (1992), the Sustainable Development Goals (SDGs, 2015), the Code of Conduct for Responsible Fisheries (1995), the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (2012), and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (2015).

Findings from the scientific literature on small-scale fisheries governance

As the goals of small-scale fisheries governance have shifted over time, so too have the scientific perspectives on what works: The literature emphasized the use of centralized or state control (1950-1980), collective governance through fishing cooperatives (1960s-2000), shared authority or devolution by the state to the user groups through co-management and decentralization (mid 1990s-2000), controlling access through individual transferable quotas (ITQs) or territorial user rights (1990s-present), and integrated approaches such as interactive governance or ecosystem-based management (2000s-present). However, there is little consensus in the literature on how local conditions affect linkages between desired outcomes and different forms of governance in small-scale fisheries (i.e., there is no appropriate full-

fledged framework to understand under what conditions a particular form of government will lead to sustainable or more equitable use of marine resources in one geographic region versus another).

An analysis of the scientific literature from an ethics perspective helps reveal several common "blind spots" that may be overlooked in some SSF case studies. For example, property rights function not only as an institution, but also as an idea (e.g., a vision of how members of a society ought to relate to one another or the values embedded in property institutions), with the latter frequently overlooked in the literature. Thus, implicit or explicit promotion of property-rights as "the solution" is flawed without considering the work they do in shaping values about human relationships. Additionally, the labor of women in small-scale fisheries is often made invisible in the scientific literature, even though they constitute an estimated 46 percent of the workforce in small-scale fisheries. Lastly, the literature rarely accounts for assumptions about why certain actors ought to be the primary agents of fisheries governance such as the state, cooperatives, development agencies, the market or researchers. Other actors such as religious bodies, kinship networks, individuals, migrants, women and children, need to be better accounted for as agents affecting SSFs governance.

Findings from the practice of supporting small-scale fisheries governance

Beyond the scientific literature, we turned to practitioners and representatives from a diverse group of organizations around the world, to gauge who is providing what type of support to small-scale fisheries governance. The diversity of organizations supporting SSFs around the world is almost as great as the diversity of these fisheries, and ranges from a community-based non-governmental organization (NGO) in the southeast corner of Sulawesi in Indonesia, to the Belize Federation of fishers, or a United Nations specialized agency such as the Food and Agriculture Organization (FAO). Although a range of categories or typologies could be used to classify these vastly different organizations for analysis, we identified the following: academic organizations, civil society organizations, philanthropies, government aid agencies and intergovernmental organizations (including research agencies, regional agencies, financing agencies and technical agencies). Additionally, though still a nascent phenomenon, in recent years a number of mission-driven private investors and investment organizations have also begun to assess opportunities to support SSFs.

While "chaotic" and relatively uncoordinated, the landscape of support to small-scale fisheries governance shows some patterns depending on the types of organizations and their implicit "comparative advantages." Civil society organizations surveyed or interviewed are almost uniformly delivering support at the local level, e.g. with individual communities or fisher organizations, even the larger international organizations. Interestingly, the capacity of small-scale fishers and communities to organize at local, national and even global levels has grown over the last decade, offering a new entry point for collaboration and support. Philanthropies are also generally delivering support at the local level (often via civil society organizations), while also supporting work with national government agencies in some cases. Alternatively, academic networks and intergovernmental research agencies focused more on support at the international level, in terms of global research or networking, though in some cases providing on-the-ground expertise at local or national levels. Bi-lateral aid agencies may work directly with communities and civil society organizations at the local level, but also are often working with government agencies at the national level, as are intergovernmental financing organizations such as regional development banks or the World Bank. Lastly, the intergovernmental technical agencies of the United Nations, such as FAO, have supported national government agencies and civil society organizations in leading global policy discussions, as well as working directly with national governments to implement international policy instruments.

Across the different organizations, several common types of interventions have been supported in order to strengthen small-scale fisheries governance, generally differing by the scale at which the organization operates. These include: (i) support for science and research, (ii) capacity building for all aspects of governance, (iii) bridging functions across different organizations and geographies, (iv) policy development, (v) policy delivery, (vi) alternative livelihoods/compensation for reduced fishing, and (vii) technology innovations.

Aid flows to small-scale fisheries

The level of financing provided to support small-scale fisheries governance varies according to the financier, but worldwide is likely to be relatively small. Based on an ocean funding database of the fisheries sector and focusing on SSFs, preliminary results from 39 organizations suggest an active portfolio of funding to ocean fisheries and their supporting ecosystems of US$2.68 billion in 2015, of which almost three quarters was provided by the Global Environment Facility and the World Bank (with the latter as the largest provider, totaling some $1.4 billion). Of these organizations, over 70 percent of the active funding to ocean fisheries was targeted to six countries or regions: the coral triangle (33 percent), India (14 percent), West Africa (8 percent), the Pacific Islands (6 percent), the Southwest Indian Ocean (6 percent) and Vietnam (5 percent). Although the data is not always clear, an initial scan suggests a total of some $321 million of the $2.38 billion provided by government funding agencies, regional development banks and multilateral aid agencies was explicitly targeted to "coastal," "artisanal" or "small-scale" fisheries and/or fishing communities. This is likely an underestimate, but is on a similar order as estimates generated by Rare Conservation, suggesting some $107 to $363 million in annual funding from regional development banks and multilateral funding agencies in projects that are "potentially relevant for small-scale fisheries."

The challenge of spatial scale

Where solutions and impact have been documented in small-scale fisheries, they are local and scattered amongst coastal villages around the world. A central challenge is how to achieve small-scale fisheries governance reform at a larger spatial scale, e.g., at the scale of ecosystems or value chains. Or framed differently: how to support empowerment of small-scale fishers and fishing communities to govern these fisheries and supporting ecosystems in a manner consistent with the Small-Scale Fisheries Guidelines and at a spatial scale large enough (in aggregate) to meet and expand the Sustainable Development target 14(b) to "provide access for small-scale artisanal fishers to marine resources and markets." In other words, can we make a global push to support strengthened SSF governance, rather than ad-hoc, village-by-village efforts—e.g., can we move from supporting 15 communities to 15,000?

Recommendations from practitioners

Through surveys and a global workshop, we asked practitioners around the world this question—how to support small-scale fisheries at a large scale. Their recommendations focused on various ways to help empower more small-scale fishers and fishing communities to govern the fisheries resources and ecosystems that they use, through support in three broad areas—while raising at least one unanswered question:

- Building a new global research agenda to fill in knowledge gaps on small scale fisheries and communities;

- Supporting agents of change, by establishing a capacity building platform for SSFs to better organize;
- Expanding direct support to SSF communities to govern in a manner consistent with the Guidelines, and with support of state agencies where needed; and
- Unanswered questions of how best to address overcapacity within SSFs in each context.

One: SSF research agenda. Recommendations for an expanded SSF research agenda reflected a sense that we do not yet know enough about these fisheries and the communities that they support. Despite the thousands of local examples of SSF governance observed and supported throughout the world, there is still relatively little knowledge of outcomes and impacts from different types of governance interventions in various contexts—particularly the social dimensions. The Too Big To Ignore Network (TBTI) has begun to coordinate existing information and build the field of SSF knowledge, and for example now provides a growing set of experiences from which lessons could be drawn. There are now many opportunities to build on this network and expand the global SSF research agenda. For example, a key priority should be to expand the empirical data set collected by this network and others about the conditions where SSF governance is more successful in leading to sustainable or more equitable use of the resources, including for example a "map of the practice." Additional global information needs include a global scan of tenure governing access to SSF, a map of SSF value chains, measures of the size and distribution of SSFs and support to facilitate SSF communities to tell their story more broadly.

Capacity building for SSF organizations. Working with the knowledge that we do have, much of the recommendations focused on increasing support for capacity building, particularly for emerging SSF organizations and associations to be agents of governance reform. Although much of the scientific literature on SSF that we reviewed paid relatively little attention to the agents of governance changes, a relatively recent phenomenon in SSF has been the emergence of more national, regional and global fishing organizations and associations. These organizations could provide an entry point for greater support to small-scale fisheries and fishing communities, and hence the recommendations to support efforts to build their capacity to work with their members. These recommendations included (i) conducting a diagnostic of SSF organizations working at national and regional levels; and (ii) supporting a capacity building platform for SSF organizations (potentially linked to TBTI) that could provide training and leadership opportunities for young SSF leaders, form collaborative research partnerships with universities and research agencies - including provision of real-time advice on demand, facilitate greater exchange of knowledge and learning among practitioners, and convene annual workshops of practitioners and stakeholders to help build coalitions and share lessons learned. Recommendations for "bridging support" to help connect more of the local SSF bright spots around the world included increasing support for global, regional and multi-local networks and partnerships of SSF organizations and communities, collecting lessons learned on successful fisher networks.

Empowering SSF communities. Beyond expanding a global research agenda and capacity building for potential agents of SSF governance reform, the core of the recommendations revolved around continuing and expanding the long and complex task of working with relevant leaders and SSF groups to exercise greater governance over the use of the resources and supporting ecosystems, considering the wider social context in which they occur. This is where most of the effort to support SSF has been focused over recent decades in a variety of ways, and recommendations suggested to "stay the course" by keeping direct support to SSF communities and governments—just doing a lot more of it. At the national level in countries with significant SSF, such recommendations included supporting government agencies to incorporate SSF into national economic and planning frameworks—ensuring consistency with the SSF Guidelines—and where there is spatial overlap between industrial fisheries and SSF, consider supporting their separation. Nearshore zones where industrial fisheries are excluded were cited as examples that

could be expanded depending on the context, particularly given recent technologies to enhance surveillance of fishing activity (e.g. satellite monitoring systems, drones, etc.). Perhaps most importantly, the recommendations focused on expanding the level of support to local, place-based institutions to take a greater role in governing the use of SSF resources and ecosystems, drawing as needed upon science and monitoring and legal recognition of tenure to help regulate access—recognizing that fisheries policy is social policy and the latter is fundamental to any changes to SSF governance.

An outstanding question. While the recommendations here focus on increased support for the field of knowledge on SSF governance and the capacity of SSF communities and organizations to act as agents of reform, relatively little discussion emerged on conflicts over resource use within SSF. Where SSF effort has grown beyond the capacity of the stocks and ecosystems to sustain desired yields, overexploitation and food insecurity could be a risk—even in the event where fishers and fishing communities are empowered to govern. There are a number of questions that remain largely unanswered as to proven reforms or methods to support addressing such "overcapacity," in a manner consistent with the SSF Guidelines.

Financing more support to SSF governance

These recommendations could inform a round of increased global support for SSF, as part of the movement to achieve the Sustainable Development Goals (SDGs). However, turning them into reality, and supporting SSF governance reform widely enough to make global progress toward the SDGs, will likely require much more capital—including more public aid and private investment. Initial analyses suggest aid levels to SSF are relatively low, given the case for their role in the wider development context, e.g. providing nutrition, incomes and safety nets to help coastal communities meet the first two SDGs focused on ending poverty and hunger respectively. In fact, given this case –a global financing mechanism linked to implementation of the SSF Guidelines would seem justified. Currently the largest pool of public capital supporting SSF is likely with multilateral aid agencies, who often host global and regional financing mechanisms to help identify and design investments towards shared objectives. One option could be to establish an SSF Fund at a multilateral agency, as a catalyst for increased investment to support governance of these fisheries systems that is more consistent with the SSF Guidelines.

OVERVIEW OF THE RESEARCH GOALS AND METHODS

Research goals

Given the global contributions of small-scale fisheries (SSF), and some of the common problems they face across diverse contexts, this one-year research project (from April 2016 to April 2017) aimed to conduct a global scan of SSFs and answer the following questions:

- Which are the main quantitative trends available about SSFs?
- What can we learn from a review of all scientific literature on SSFs, in terms of:
    - Which are the countries receiving most attention in terms of SSFs publications?
    - How has this attention changed over time?
    - What is the distribution of industrial vs. small-scale or marine vs. freshwater, or natural vs. social science attention, spatially and temporally?
    - How are problems in SSFs and their proposed solutions characterized in the literature?
    - How does the literature characterize what are the goals of governing SSFs?
    - What are the most preferred forms of governance?
    - What are the main shortcomings and gaps in the literature?
- What can we learn from the different practitioners and organizations working to support SSFs, in terms of:
    - Who are some of the main SSFs actors in the global stage?
    - What are different groups of SSFs stakeholders doing in support of SSFs governance?
    - At what level do they operate and what kinds of interventions they support?
    - What does a global snapshot of aid flows to SSF looks like?
    - What do experts/practitioners think has been effective in support of SSFs?

The objective of this research is to help build the field of research on SSF governance, and to synthesize recommendations for future support to the diverse SSFs around the world.

Methods summary (What we did and how)

- We convened a Duke-UNC advisory board of experts on fisheries from a variety of academic and policy perspectives. This board suggested focus the global scan around the theme of "governance." to define the scope our global scan on small-scale fisheries (SSFs);
- We synthesized information about the nature of SSF activity around the world from existing FAO data and gray literature and from the World Bank, including additional key studies when referenced by FAO (e.g. Chuenpagdee et al. 2006). to provide a baseline for the research;
- We created a global library and database of all publications (ongoing at n=2,693) on SSFs (1960-2016). to understand the scope of research conducted in relation to governance in the peer-reviewed scientific literature, its geographic coverage, and temporal trends;

- We analyzed the scientific literature to identify major geospatial and temporal trends across several key attributes (e.g. the water system, the field of study, primary focus of the article, etc.);
- We complemented this descriptive analysis of major attributes in the literature with a qualitative analysis of the scientific discourse to deductively understand how this corpus of knowledge has conceptualized and analyzed "governance" over time (1960-2005);
- Because how something is represented in discourse determines, to a significant extent, what our ethical relation to it ought to be, we conducted an ethics analysis of a sample of 83 papers, adding texture to the governance analysis and providing a unique perspective of this literature; and
- Beyond the academic and theoretical dimensions, we also conducted a global scan to understand the scope of support in practice to SSFs. To understand what the different groups of stakeholders are doing in the space of SSFs we conducted an online survey (n=16) followed up by semi-structured interviews (n=15), and document analysis with many the most prominent SSFs actors around the world between September and December of 2016. Interviewees included a cross-sectional sample of SSFs practitioners, philanthropic organizations, non-academic experts, civil society organizations (CSOs), fishing association representatives, and intergovernmental, multilateral and bilateral agencies.
- We also participated as observers in the 5th General Assembly of the World Forum of Fish Harvesters and Fishworkers (WFF) that took place in Salinas Ecuador (Jan 25-29, 2017). This forum provided valuable feedback about the challenges and needs of support from national and regional fishers' organizations in more than 22 countries around the world.
- We conducted a global scan of financial flows. To do so we assembled a global database of aid to ocean fisheries capturing all grants and concessional loans active in the year 2015 (meaning the total amount of any grant or concessional loan with a duration that included 2015). This work was carried out in collaboration with Rare Conservation, given they conducted a similar exercise in 2016. The database includes grants and loans targeted towards ocean fisheries and supporting ecosystems, from philanthropies, government aid agencies, regional development banks, and multilateral aid agencies contained in a diversity of source materials: Such as membership-only (Foundation Center Database) and publicly available databases, grey literature, websites and verifications with the agency's staff where possible.
- On February 7 and 8, 2017, we hosted a global workshop at Duke University of over 60 experts and practitioners to share experiences and suggest recommendations for future directions of support to SSF governance, based on an early draft of this document as a discussion paper. Participants included representatives from academia, fisher associations, international non-governmental organizations, regional agencies, philanthropies, research agencies, FAO and the World Bank among others. Discussions from small groups and the plenary provided insights captured in the recommendations later in this document.

INTRODUCTION: SUMMARY OF GLOBAL ESTIMATES OF SMALL-SCALE FISHING ACTIVITY[2]

Defining "small-scale fisheries"

Globally-agreed definition—or lack thereof. The world's capture fisheries are incredibly diverse, with the term encompassing activities ranging from catching fish with a spear to operating nets from large fishing vessels longer than a football field (World Bank et al 2012). To describe this diversity, capture fisheries are often categorized according to a range of characteristics, such as the location, resource targeted or purpose (i.e. commercial, subsistence or recreational), or often by the scale of technology used (FAO 2016a). Based in part on the scale of technology used, the world's capture fisheries are frequently divided into "small-scale fisheries" and "large-scale" fisheries, or alternatively, "subsistence fisheries," "artisanal fisheries" and "industrial fisheries" (FAO 2016b; World Bank et al. 2012; Berkes et al. 2001).

The term small-scale fisheries gained prominence after Thomson's table entitled "the World's Two Marine Fishing Industries" was published in 1980, presenting selected characteristics of large and small-scale fisheries designed to illustrate the "preferability" of the latter, e.g. number of fishers employed, annual catch used for human consumption, capital cost per job created on fishing vessel, etc. (Béné 2006). However, some 37 years later, no single, agreed definition of the term exists (FAO 2015b). In November 2003, FAO through its Working Party on Small-Scale Fisheries concluded that it was neither possible nor useful to formulate a universal definition of the term, considering the diversity and dynamism of small-scale fisheries (Béné 2006, World Bank et al. 2012). Rather, the group agreed upon the following description:

"Small-scale fisheries can be broadly characterized as a dynamic and evolving sector employing labor intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources. The activities of this sub-sector, conducted full-time or part-time, or just seasonally, are often targeted on supplying fish and fishery products to local and domestic markets, and for subsistence consumption. Export-oriented production, however, has increased in many small-scale fisheries during the last one to two decades because of greater market integration and globalization. While typically men are engaged in fishing and women in fish processing and marketing, women are also known to engage in near shore harvesting activities and men are known to engage in fish marketing and distribution. Other ancillary activities such as net-making, boat-building, engine repair and maintenance, etc. can provide additional fishery-related employment and income opportunities in marine and inland fishing communities. Small-scale fisheries operate at widely differing organizational levels ranging from self-employed single operators through informal microenterprises to formal sector businesses. This sub-sector, therefore, is not homogenous within and across countries and regions and attention to this fact is warranted when formulating strategies and policies for enhancing its contribution to food security and poverty alleviation" (FAO, 2003).

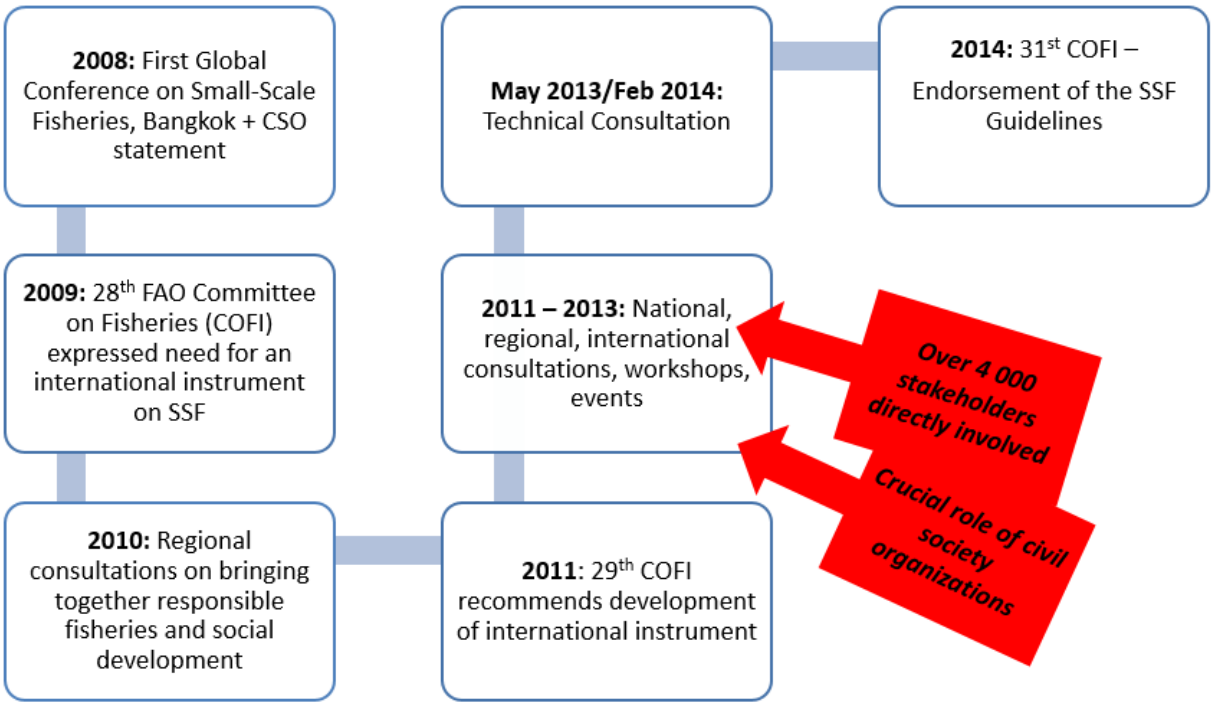
---

[2] This section provides a brief synthesis of global measures of small-scale fishing activity that have been taken or utilized by the United Nations Food and Agriculture Organization (FAO). Established by 44 governments in 1943 as a permanent international organization for food and agriculture, FAO compiles and analyzes fisheries statistics in a publicly available data set that constitutes the global reference for measuring fishing activity (FAO, 2015a).

In 2014 the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (SSF Guidelines) were adopted. In it SSF are described as follows: "Small-scale and artisanal fisheries, encompassing all activities along the value chain—pre-harvest, harvest and post-harvest—undertaken by men and women play an important role in food security and nutrition, poverty eradication, equitable development and resource utilization. Small-scale fisheries represent a diverse and dynamic sub-sector, often characterized by seasonal migration. The precise characteristics of the subsector vary depending on the location; indeed, small-scale fisheries tend to be strongly anchored in local communities, reflecting often historic links to adjacent fishery resources, traditions and values, and supporting social cohesion" (FAO 2015b).

The SSF Guidelines represent global recognition for the small-scale sector and were crafted through the participation, hard work and consensus of a wide range of actors including several civil society organizations that represent small-scale fishers (see Figure 1 below). Rather than offer a narrow definition or conception of small-scale fisheries, the guidelines take a broad perspective on their potential forms (see adjacent box). Similarly, while acknowledging the complexity and difficulty in defining small-scale fisheries, we adopt the guidelines' broad conception of small-scale fisheries as the basis for this document.

Figure 1. Process for Development of the SSF Guidelines



Source: Franz 2017

Shared Global Characteristics of SSFs According to FAO

- Highly dynamic,
- Labor-intensive (with labor often the largest component of operating costs),
- Require a relatively low capital investment in boats and equipment per fisher on board compared to more industrialized operations,
- Employ a wide range of low-level fishing technology with low catch per fishing craft and productivity per fisher (using relatively smaller vessels in a given region or in some cases none at all, e.g. beach seines or fish traps, etc.),
- Cover a relatively short geographic range (though migration is a feature of many small-scale fishers),
- Target multiple species, and
- Require minimal infrastructure for landing with catch sold at scattered landing points (FAO 2016c; FAO 2008—2017a; Béné 2006).

In practice, small-scale fisheries may represent the overlap of a few different activities and even sectors, as shown in Figure 2 below:

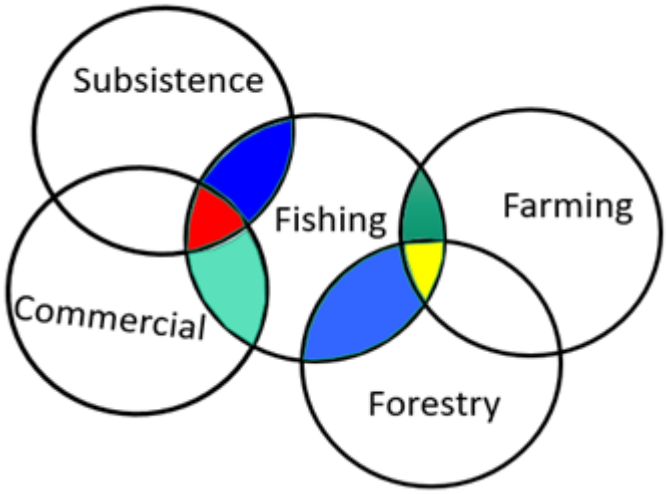


Figure 2. Small-Scale Fisheries Viewed as the Intersection of a Range of Activities and Sectors

Various Definitions used by States. While many states do classify their small-scale fisheries as a distinct category (in some cases including artisanal and subsistence fisheries), the definitions used vary widely and are often based on the technology used (World Bank et al. 2012). Chuenpagdee et al. (2006) developed a database of information on small-scale fisheries for 140 coastal and island nations based largely on FAO's country profiles, finding a definition or characterization of the term in 70 percent of the cases, roughly two thirds of which used boat size as the key factor—measured in length (meters), weight (gross tons) and/or engine size (horsepower). Interestingly, Chuenpagdee et al. (2006) found enough

overall consistency in the definitions and/or characterizations of the term small-scale fisheries to imply commonalities among countries and a generalized research approach.

As Chuenpagdee et al. (2006) note, the term can also be a legal category in many countries, as highlighted by the definitions in the relevant policy instruments in a sample of 9 tropical countries with significant small-scale fisheries (see Appendix II for more detail). Table 1 below summarizes some examples of the definitions or characterizations used in different tropical countries.

Table 1. Non-Exhaustive Examples of National Definitions of Small-Scale Fisheries (see Appendix II)

Country	Size of Vessel (in length or weight) and/or Engine, and/or Type of fishing gear	Other Characteristics
Brazil	<18 meters	
Cambodia	<50 horsepower	Largely subsistence fishing
Ghana		Traditional canoe fishing, i.e. any planked, dugout or fabricated vessel with or without engine
Guinea-Bissau	<18 meters, <60 horsepower	
India		Motorized and non-motorized vessels including catamarans, plank-built craft, fiber-reinforced polymer and other craft, ring seiners, dugouts
Indonesia	<5 gross tons	Small-scale fishers defined - as those who fish for daily life or needs
Liberia	<18.3 meters, <40 horsepower	
Philippines	<3 gross tons where "municipal"	Small-scale commercial fishing defined nationally as vessels between 3.1 and 20 gross tons
Senegal		All canoes (i.e. "pirogues"), though some can be over 15 meters with more than 20 crew members
Sierra Leone	<18.3 meters	
Tanzania		Fisheries in shallow waters <4 kilometers from the shoreline, using small-sized vessels and gears

table continued

Thailand	<5 gross tons	
Argentina*	3-5 miles reserved to SSFs	Vessel length is less (<13m) if closed deck. Also SSFs cannot do trawling and other destructive practices.
	<17.0 meters	

Sources: Authors; World Bank et al. 2012; *interview by the authors at the World Forum of Fish Harvesters and Fishworkers (WFF) in Salinas Ecuador, January 25-28, 2017.

Socio-economic contributions of small-scale fisheries

Estimates of the number of people employed in small-scale fisheries. One measure that has been almost universally adopted by analysts studying small-scale fisheries is their size, in terms of the number of people worldwide who participate in this activity (Béné 2006). FAO has traditionally collected data on the number of fishers operating in each of 245 countries (including fishers operating domestic vessels landing in foreign ports), based on an annual questionnaire circulated to government fishing agencies and statistical offices, requesting information on: (i) time worked as a fisher (full-time, part-time or occasional), (ii) occupational category based on the four categories in the International Labor Organization's classification system since 1995 (aquatic life cultivation, inland waters fishing, marine coastal waters fishing and marine deep-sea waters fishing) and (iii) gender (FAO 1999).

In reality, the data provided by most national statistical offices are often given as a total and do not allow for a correct estimate of global totals for each of these categories, and in many cases, fail to capture seasonal shifts (FAO 1999). Additionally, small vessels are often not subject to registration in countries as larger vessels are, and so may not be reported in national statistics (FAO 2016c). Since 2003, the FAO Committee on Fisheries (COFI) has promoted efforts to improve the profile of, and understand the challenges and opportunities facing, small-scale fishing communities in inland and marine waters (FAO 2012). Although FAO has made significant efforts to improve the reliability and quality of data on small-scale fisheries, the information still relies upon the initial national statistics provided by individual countries (Béné 2006). Currently, through the Guidelines to Enhance Fisheries and Aquaculture Statistics through a Census Framework,[3] FAO is encouraging countries to provide more data on small-scale fishers and fisheries through census and survey questionnaires (FAO 2016c).

As a result of these challenges, data on small-scale fishers have not traditionally been published frequently, and global estimates were made by FAO for 1970, 1980 and 1990 (i.e. years for which population censuses are generally taken), which were admittedly incomplete (FAO 1999).

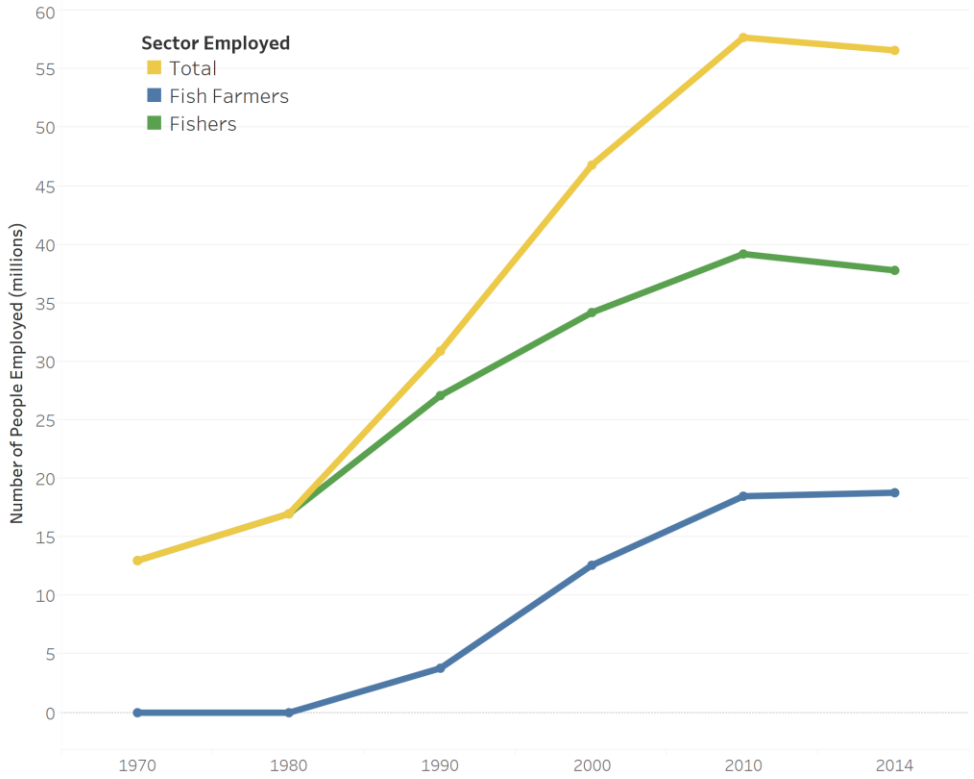
As indicated in Figure 3, globally the aggregate number of capture fishers (persons employed full or part-time in the primary sector[4]) roughly tripled between 1970 and 2010 before stabilizing at roughly 37 million in 2014, largely within Asia and to a lesser extent Africa (while generally decreasing in countries with capital intensive economies such as most European countries, North America and Japan). In addition

[3] Global Strategy. 2015. Guidelines to Enhance Fisheries and Aquaculture Statistics through a Census Framework. Rome. 165 pp. (also available at http://gsars.org/en/tag/fisheries/), in FAO (2016).

[4] Primary sector refers here to harvesting activities up to the point of landing fish catch. Béné (2008) notes that multiplier values for additional jobs generated along the value chain for each of those in the primary sector have rarely been estimated, and more empirical evidence is needed.

to the roughly 57 million persons estimated to be employed in the primary sectors of capture fisheries and aquaculture in 2010, in 2012 FAO estimated that another 160 to 216 million (i.e. some three to four related jobs for each one in the primary sector) were employed along the value chain, and assumed that each jobholder provided for three dependents or family members—such that fishers, fish farmers and those supplying services and goods to them would have assured the livelihoods of about 660 to 820 million people, or 10 to 12 percent of the global population at the time (FAO 2012). FAO has also estimated the gender composition of the fisheries and aquaculture workforce, suggesting that women account for roughly 90 percent of those engaged in processing activities (FAO 2016c).

Figure 3. Millions of People Employed Globally in Primary Sector of Capture Fisheries and Fish Farming



Source: Data given from most recent FAO publication of the State of the World's Fisheries and Aquaculture (SOFIA): years 1970, 1980 from SOFIA 2002, 1990 from SOFIA 2012 and years 2000, 2010 and 2014 from SOFIA 2016

As challenging as accurate measures of total fishers worldwide may be, generating credible estimates of the proportion of them participating in small-scale fisheries has been even more difficult. While no definitive statistics exist, of the world's almost 60 million fishers and fish farmers, some 37 million (over 60 percent) are estimated to be employed by the small-scale sector (or in some cases as high as 50 million), of whom 90 percent are in Asia, supported by an additional 100 million persons along the value chain (FAO 2008-2016a; FAO 2008-2016b). In terms of small-scale capture fisheries, a number of estimates have been attempted over the years according to Béné (2006) and World Bank et al. (2012), including among others:

- 1988: over 12 million small-scale fishers (Lindquist 1988);
- 1994: 14 to 20 million people were dependent upon small-scale fisheries for their livelihoods (Pomeroy and Williams 1994);

- 2001: 26 to 28 million persons associated with small-scale capture fisheries, including processing (FAO 2001);
- 2001: 20 million primary producers plus another 20 million processors, marketers and distributors for a total of 40 million people directly employed by small-scale fisheries, supporting the livelihoods of more than 200 million people worldwide using a 1 to 5 multiplier for dependents and supporting services (McGoodwin 2001);
- 2001: 50 million (99 percent of 51 million fishers), of which 95 percent from developing countries, supporting the livelihoods of some 250 million people worldwide, again using a 1 to 5 multiplier for household size (Berkes et al. 2001); and
- 2006: over 12 million small-scale fishers (Pauly 2006; Chuenpagdee et al. 2006).

Similarly, in 2002 FAO utilized the employment dataset from 1990 (FAO 1999) to assume that 90 percent of all marine fishers are small-scale, except for those specified on the questionnaire as deep-sea fishers (FAO 2002). Since that time, a standard estimate given has been that small-scale fisheries employ more than 90 percent of the world's capture fishers, with a much higher proportion in Asia and Africa than elsewhere (FAO 2012, 2014).

In 2012 the World Bank, FAO and WorldFish Center updated the estimates of the world's capture fishers, disaggregated by small and large-scale, based on case studies from 17 developing countries[5] that represented over half of the people globally associated with the fishing industry, using official statistics, published data, gray literature and in some cases primary data collection.[6] The study estimated some 35 million commercial fishers globally, with an additional 85 million persons employed along the value chain (roughly half of whom were female), for a total of 120 million jobs supported globally by capture fisheries (116 million

The Global Fishing Fleet

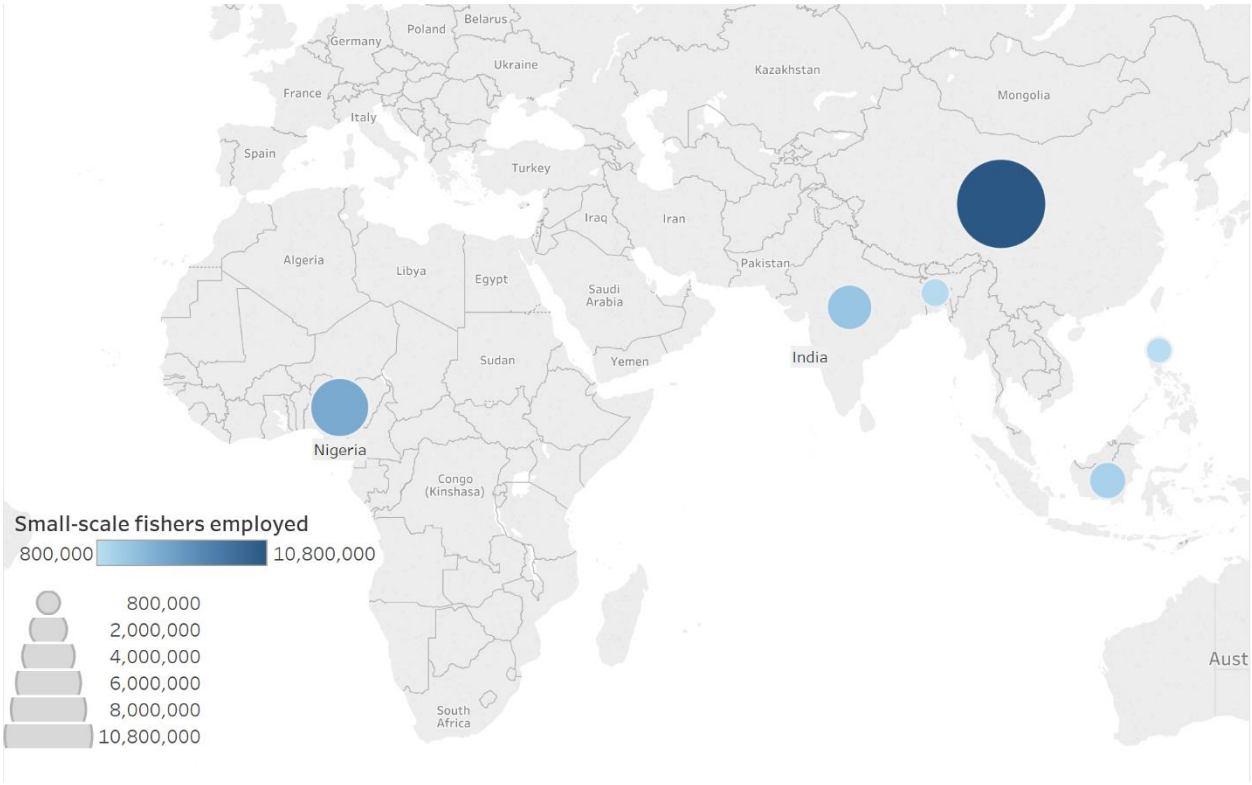
In 2014, 2.5 million of the world's 4.6 million fishing vessels were less than 12 meters in overall length, and hence likely to be considered as small-scale vessels (FAO 2016c). While FAO does not report the number of marine fishing vessels for that same year, assuming the distribution of the global fleet between marine and inland waters remained the same as in 2012 (68 percent marine and 32 percent inland), then a marine fleet of some 3.1 million fishing vessels was operational in 2014 (FAO 2014). The total fleet size has remained relatively constant in recent years, and of the 3.1 million vessels fishing in the ocean, the estimated number that were at least 24 meters long in 2014 was only some 64,000 (FAO 2016c). Vessels less than 12 meters long constituted the majority of the fleet in all regions, but particularly in Africa (90 percent of motorized fishing vessels are less than 12 meters long), Asia (75 percent) and Latin America and the Caribbean (over 90 percent) (FAO 2014). For example, in Mexico over 90 percent of the motorized fishing fleet is less than 24 meters, and in Myanmar over 95 percent (FAO 2016c). Of the marine fishing vessels, roughly 64 percent were motorized in 2014, but only some 36 percent in Africa, as compared to 68 percent in Asia, and almost all (>95 percent) in Europe and North America (FAO 2016c). FAO (2012) notes that while the bulk of the global fishing fleet is composed of small-scale vessels less than 12 meters long, this is the component of the fleet for which reliable information is least available.

[5] Bangladesh, Brazil, Cambodia, China, Ghana, India, Indonesia, Kenya, Mozambique, Myanmar, Nigeria, Philippines, Senegal, Tanzania, Thailand, Uganda and Vietnam.

[6] The final report, entitled "Hidden Harvests," summarized work carried out over a number of years through "the Big Numbers Project" led by WorldFish Center and FAO, with the preliminary report in 2008 available here: http://pubs.iclarm.net/resource_centre/Big_Numbers_Project_Preliminary_Report.pdf

or 97 percent of whom were in developing countries and 91 percent of whom were in Africa and Asia). Over 90 percent (>108 million) of these 120 million persons were estimated to be employed in small-scale fisheries (confirming the estimate used by FAO), 52 million of whom were employed in marine small-scale fisheries (96 percent in developing countries). Some 41 percent of the persons employed in marine small-scale fisheries were estimated to live in 6 of the countries studied, though of course this does not reflect the relative contribution of small-scale fisheries in a given country—e.g. employment per capita (Figure 4).

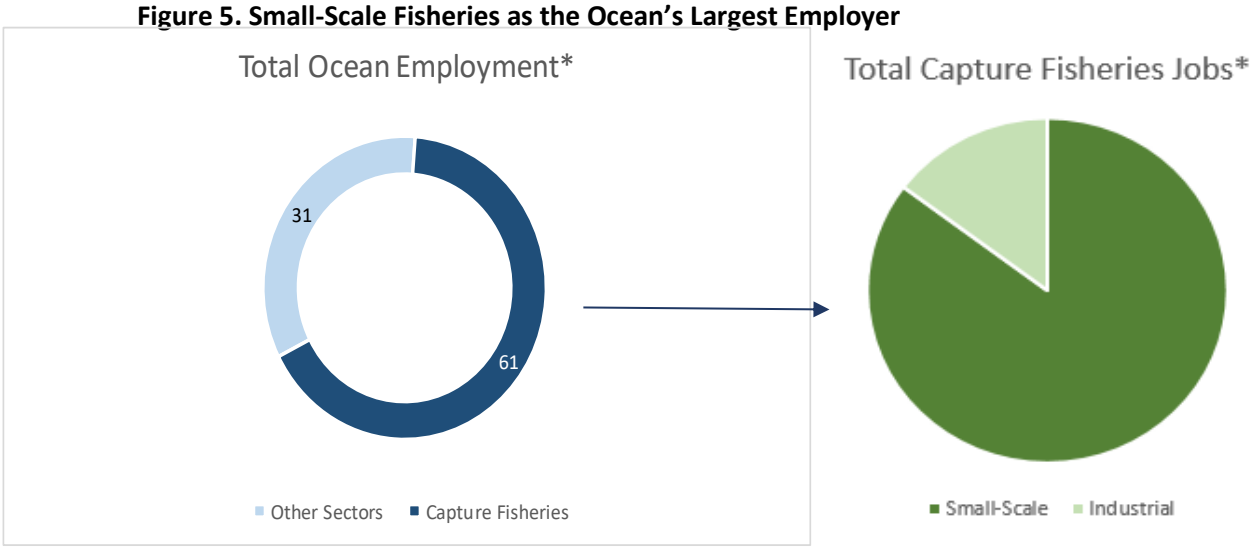
Figure 4. Estimated Areas of Highest Employment Concentration of Marine Small-Scale Fishers*



*China: 10.8 million, Nigeria: 4.5 million, India: 2.6 million, Indonesia: 1.7 million (primary sector only), Bangladesh: 1.0 million, and Philippines: 0.8 million (primary sector only). Source: World Bank et al. 2012.

To put these estimates in context, in 2016 the Organization for Economic Cooperation and Development (OECD) estimated employment in most other major sectors of the ocean economy at 31 million globally, making small-scale fisheries far and away the ocean's largest employer (see Figure 5) (OECD 2016).

Figure 5. Small-Scale Fisheries as the Ocean's Largest Employer



Synthesis of selected socioeconomic indicators of the contribution of small-scale fisheries. In addition to the number of small-scale fishers, a range of other socioeconomic indicators are frequently cited by FAO to measure the contribution of small-scale fisheries. Broadly speaking, FAO states that small-scale fisheries make an important contribution to nutrition, food security, sustainable livelihoods and the eradication of poverty by providing food, income and employment to millions of people worldwide (FAO 2008-2016a; FAO 2016c). The organization suggests that these fisheries may constitute up to half of the landings of the world's capture fisheries (FAO 2016c).

> "Small-scale fisheries are often part of diverse and complex livelihoods nested in a local fishery economy that underpins the social, economic, and cultural cohesion of isolated communities; are essential for food security and as social safety nets; are frequently dispersed over large areas with multiple landing points; require different management approaches and knowledge pathways and more discursive than coercive enforcement; are highly vulnerable to threats, including overfishing in inshore and inland areas, competition from large-scale fishing, and exposure to natural disasters such as typhoons and floods; and are subject to increased prevalence of HIV/ AIDS, particularly in fishing communities in Africa and Southeast Asia."
>
> Source: World Bank et al. (2012)

One of the more comprehensive summaries of available indicators was provided by the World Bank et al. (2012), synthesizing various updates to the Thomson table from 1980, provided by Lindquist (1988); Berkes et al. (2001) and Pauly (2006), as shown below in Table 2.

Table 2. Comparison of Studies Estimating the Socioeconomic Contribution of Marine Small-Scale Fisheries

Indicators Measured	Thomson 1980		Lindquist 1988		Berkes et al. 2001*		Pauly 2006	
	Small-Scale	Large-Scale	Small-Scale	Large-Scale	Small-Scale	Large-Scale	Small-Scale	Large-Scale
Annual catch for human consumption (million tons)	20	24	24	29	20-30	15-40	~30	~30
Annual catch reduced to meals/oils (million tons)	-	~19	n/a	~22	n/a	n/a	-	20-30
Fish and other sea life discarded at sea (million tons)	n/a	n/a	0	6-16	n/a	n/a	-	8-20
Number of fishers employed (millions)	<8	~0.45	>12	0.5	50	0.5	>12	~0.5
Annual fuel consumption (tons)	1-2	10-14	1-2.5	14-19	1-2.5	14-19	~5	~37
Catch (tons) per ton of fuel consumed	10-20	2-5	10-20	2-5	10-20	2-5	4-8	1-2

*Includes both marine and inland fisheries. Source: World Bank et al. (2012)

From the above global measures, the importance of small-scale fisheries for many of the world's coastal and rural poor has often been emphasized by FAO, and generally underestimated (World Bank et al. 2012). To highlight this contribution, in 2002 FAO utilized the 1990 employment dataset (FAO 1999) to attempt an initial estimate, calculating that 20 percent (or almost 6 million at the time) of the world's capture fishers were small-scale fishers earning less than US$1/day, with an additional 17 million income-poor people in supporting jobs along these value chains (FAO 2002). In terms of generating income and reducing poverty, FAO (2014) has estimated that small-scale fisheries in Africa contributed more to the continent's gross domestic product than large-scale fisheries. In terms of preventing poverty, Béné (2006) emphasized the function of small-scale fisheries as a "bank in the water" in many cases, providing savings and a safety net for periods of vulnerability. Where poverty is lower, Kurien (in Béné 2006) hypothesized that small-scale fisheries could play a greater role as an "engine for rural development" than agriculture, due to the "innate compulsion to trade" in fisheries that would suggest that fishing communities may likely "re-inject" a higher share of their revenues into the local economy than would farmers.

The contribution of small-scale fisheries to food security has also been an oft-cited socioeconomic indicator, though generally under-represented in economic accounting (FAO 2016c). FAO estimates that

small-scale fisheries account for over 50 percent of animal protein intake in many of the least developed countries of Africa and Asia (or even higher along the coasts), with potentially one billion people in southeast Asia relying predominantly on fish for animal protein (FAO 2008-2016c). Additional estimates suggest that in general, the countries that depend the most on fish for food and nutrition security (largely developing countries) rely primarily on catches from capture fisheries (Hall et al. 2013). Indeed, small-scale fisheries produce over half of the fish for domestic human consumption in developing countries, even where large-scale fisheries may land more fish in total (World Bank et al. 2012). For example, in the countries of Bangladesh, Brazil, China, Ghana, Nigeria, Senegal, Thailand and those bordering Lake Victoria, some 77 percent of the marine small-scale fisheries catch was utilized for local human consumption (World Bank et al. 2012). In developed countries, a sizeable and growing share of fish consumed consists of imports, increasingly from developing countries (FAO 2016c).

Perhaps less often cited is the important role that small-scale fisheries play in culture in many regions, shaped by many internal and external events and changes affecting communities over time (Béné 2006; Council-Alaska, I.C., 2015; FAO 2015b). According to Béné (2006), this cultural element can be seen as important in contributing to or maintaining self-esteem at the individual level, as members of small-scale fishing communities usually exhibit a profound pride of their occupational identity as fishers and a correspondingly high devotion to the fishing way of life that cannot be measured in economic terms alone.

In summary, perhaps the most detailed estimate currently available of some of these frequently-indicators was generated in 2012 by the World Bank, FAO and WorldFish Center, as illustrated in Figure 6 and shown in Table 3 below:

Figure 6. Annual Marine Catch (Millions of Tons)

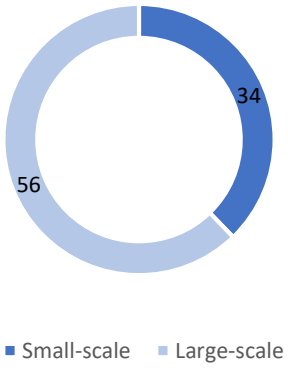


Table 3. Global Profile of Small and Large-Scale Fisheries (% in developing countries)

	Small-Scale Fisheries			Large-Scale Fisheries			Total
	Marine	Inland	Total	Marine	Inland	Total	
Production and Utilization							
Total annual catch (million tons)	34 (82%)	14 (93%)	48 (85%)	56 (61%)	1 (50%)	57 (61%)	105 (72%)
Value (US$ billions)	37 (76%)	9 (89%)	46 (80%)	49 (71%)	0 (0%)	50 (71%)	96 (75%)
Discards (% of total catch)*	4	0	3	13	3	13	8
Employment (full time and part time)							
Number of fishers (millions)	14 (93%)	18 (100%)	32 (97%)	2 (100%)	1 (100%)	3 (100%)	35 (97%)
Number of postharvest jobs (millions)	38 (97%)	38 (100%)	76 (99%)	7 (100%)	0.5 (100%)	8 (100%)	84 (98%)
Total workforce (millions)	52 (96%)	56 (100%)	108 (98%)	9 (100%)	2 (100%)	11 (100%)	119 (97%)
Women in total workforce (%)	36	54	46	64	28	60	47
Efficiency							
Catch per fisher (tons)	2.5 (84%)	0.8 (88%)	1.5 (87%)	25.7 (71%)	0.6 (100%)	18.3 (73%)	3.0 (73%)
Catch per ton of fuel (tons)	1-3	n/a	n/a	1-4	n/a	n/a	n/a

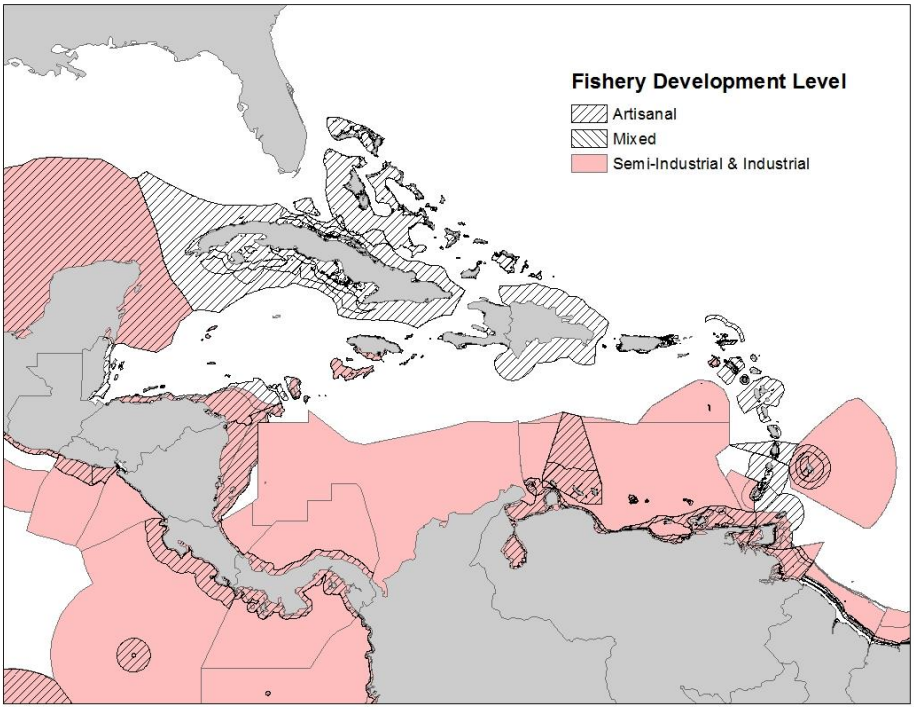
*Refers to catch that does not go to nonfood uses or that is exported. Source: World Bank et al. (2012)

Trends in the size and contributions of small-scale fisheries. A frequent caveat to the estimates and measures above is that small-scale fisheries are not static, but rather highly dynamic and heterogeneous in a number of dimensions such as (but not only) their level of mechanization and technological inputs, linkages to markets, or catch specificity, among others. For some time, for example from Berkes et al. (2001) to World Bank et al. (2012), assessments have noted that a general evolution from small-scale toward large-scale fisheries was taking place in many countries around the world, but that this trend is

neither linear or irreversible. Even when they retain traditional aspects small-scale fisheries are typically modernized (for example through use of outboard engines), and often commercial—in some cases producing high-value products for international markets (Chuenpagdee et al. 2006; World Bank et al. 2012). Technological developments in recent decades —particularly motorization, modern navigation, and communication equipment; globalization; and food safety requirements—have changed the way many small-scale fisheries operate around the world (World Bank et al 2012). The overall context within which this is occurring in most major fishing nations, is one where the share of employment in capture fisheries is stagnating or decreasing, while aquaculture is providing increased opportunities (FAO 2012).

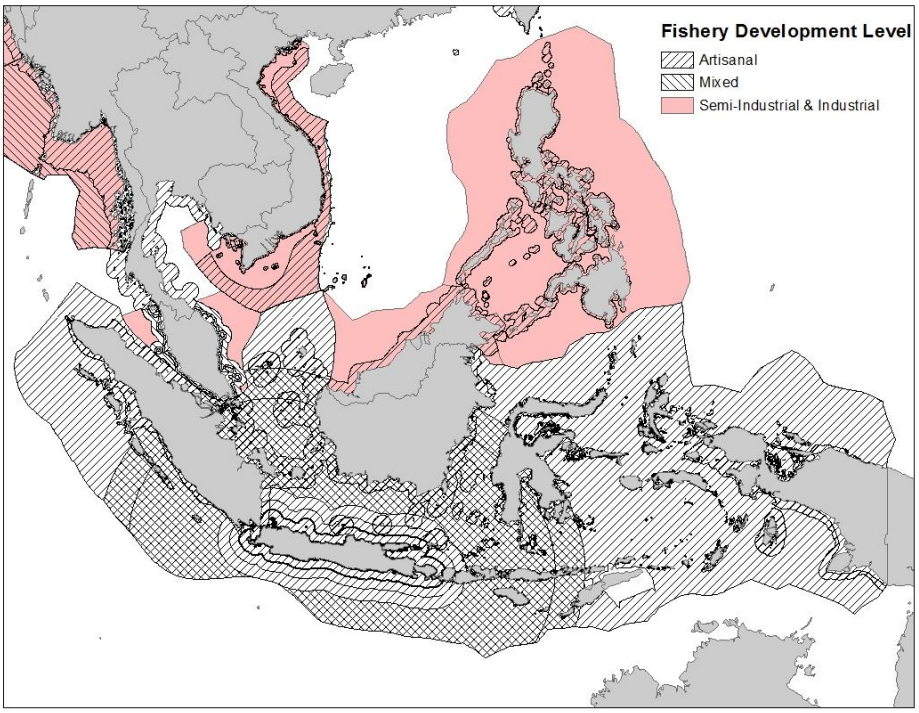
At the same time, this context is not confined to competition from similar operations, but in many places small-scale fisheries overlap with industrial vessels in the same space, leading to conflict in some cases such as in West Africa (Interpol 2014). For example, Figures 7 and 8 below were created from a database of the estimated distribution of fishing effort based on boat length, disaggregating vessels above and below 20 meters in length as indicative of overlaps in space between industrial and small-scale fisheries in the Caribbean and in Southeast Asia.

Figure 7. Indicative Distribution of Industrial and Small-Scale Fishing Effort in the Caribbean



Source: Duke University Marine Ecology Geospatial Lab (MGEL)

Figure 8. Indicative Distribution of Industrial and Small-Scale Fishing Effort in Southeast Asia



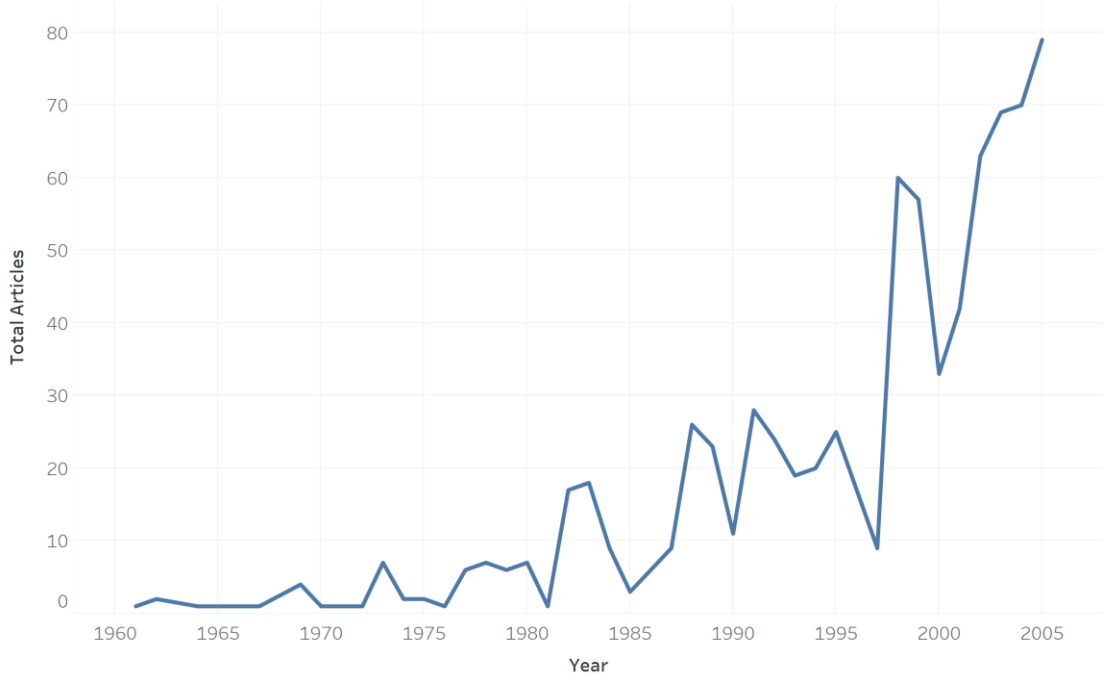
Source: Duke University Marine Geospatial Ecology Lab

THE SCIENTIFIC LITERATURE ON SMALL-SCALE FISHERIES: WHAT, WHEN AND WHERE?

In this section, we build on the quantitative (yet incomplete) data and estimates of the size and shape of small-scale fisheries presented in the previous section to examine what the scientific literature tells us about SSFs in this and the next two sections. To do so we compiled a global library and database of the peer-reviewed literature on SSFs (n=2,693), encompassing the period from 1960-2016. Here we provide description and illustrations about when and where SSFs have been studied and what have been some of the main focal areas of study. This research is still ongoing, and a review of the database from 1960 to 2005 has been completed.

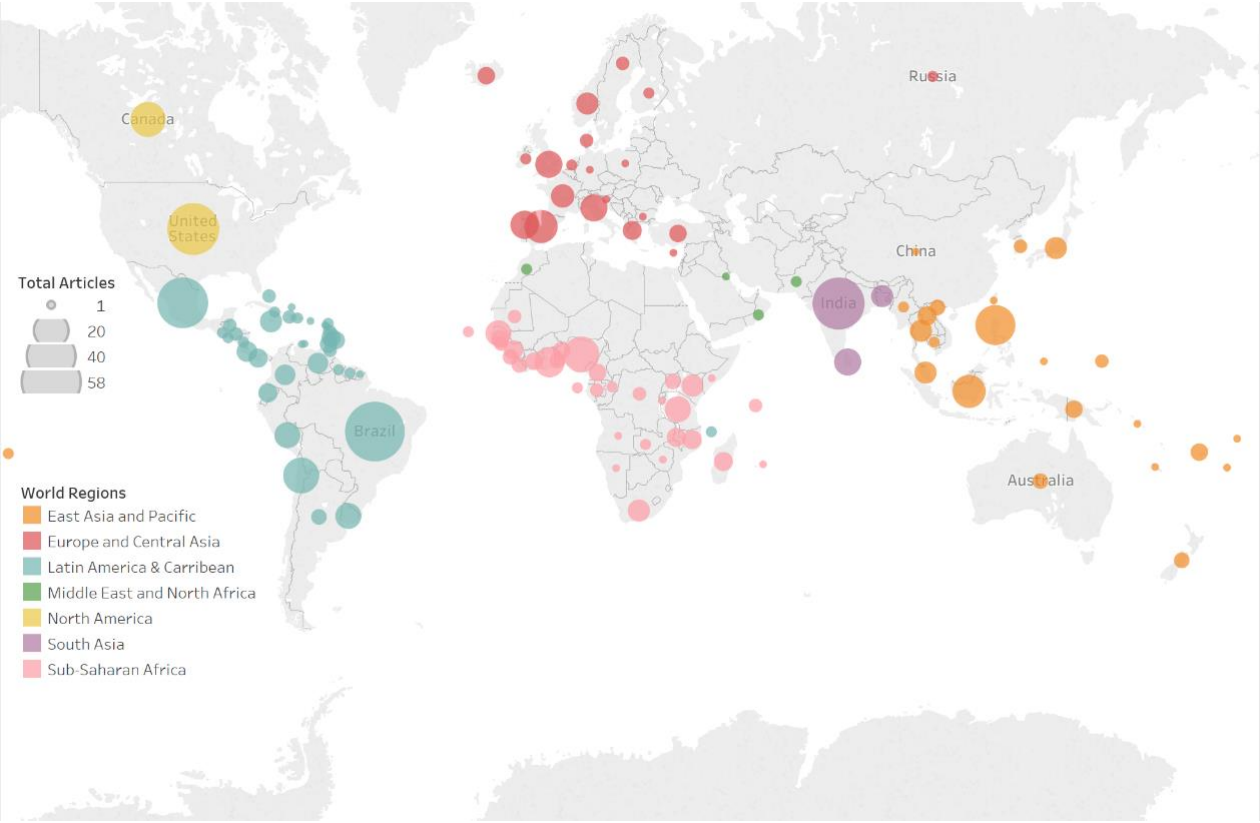
Trends: When and where research has been conducted. Based on the articles published, scientific research into small-scale fisheries has grown significantly over the recent decades (Figure 9).

Figure 9. Small-scale Fisheries Publications (1960-2005)



As shown in Figure 9 above, small-scale fisheries scientific publications have dramatically increased between 1960-2005. From 1960-1970's there are only a few publications per year. During the 1980's and early 1990s, there is a notable increase in publications. In 1998 there is a sharp increase in small-scale fisheries publications (N=60), followed by a largely upward trend in annual publications through 2005. Figure 4 below shows several distinct geographic patterns. Overall, by study area, Brazil, India, United States and Mexico had the most publications. By region, Latin America and the Caribbean had the most articles published, where 31% (N=176) of the articles in the database focused on countries in the region, followed by East Asia and Pacific (17% N=102) and Sub-Saharan Africa (17% N=99) (see Appendix III Figure A1). We further disaggregated the database by the articles primary focus: small-scale fisheries, industrial fisheries, both small-scale and industrial fisheries or other. Restricting the regional ranking to articles primarily focused on small-scale fisheries, Latin America and the Caribbean remains the region with the most publications (N=123). Within the region and overall, Brazil is the most studied country followed by India, the United States and Mexico (Appendix III, Figure A2). There were 58 articles in the database on small-scale fisheries in Brazil, of which 37 articles were primarily focused on small-scale fisheries (see Figure 10).

Figure 10. Locations of all Scientific Articles Published on Small-scale Fisheries



Other trends in the literature show that when organized by water system, most (83%) focus on marine and estuarine systems (Appendix III, Figure A3). There is greater coverage of inland freshwater systems in Sub-Saharan Africa, parts of South Asia, East Asia and Pacific, and in Brazil. We observe a distinct temporal trend with an increase in studies of marine small-scale fisheries over time (Appendix III, Figure A4), with little variation in studies of inland freshwater fisheries over the same time period.

By field of study, Latin America and the Caribbean, Europe, and Central Asia can be characterized as dominated by natural science small-scale fisheries studies (Appendix III, Figure A5). In contrast, studies in South Asia, North America, and East Asia and the Pacific are predominantly social science. Sub-Saharan Africa seems roughly proportional. By individual countries, India and the United States proportionally had the most social science studies. When looking at field of study over time, it is apparent that earlier studies of small-scale fisheries (1960 through 1995) were predominantly social science (Appendix III, Figure A6). Beginning in 1998, there is a significant shift with small-scale fisheries studies from the natural sciences rising dramatically

Collaborative SSFs Visualization Tool

We have created a "teaser" of an online portal of our SSFs database. We invite you to visit the site and explore more in-depth the spatial and temporal trends presented in the above figures and others not included here for space constraints. The site also allows the visitor to view the specific papers contained in the SSFs database. We welcome any feedback (xavier.basurto@duke.edu) on how this tool could be more useful to your own organization's goals, and to galvanize intra and inter-organizational collaborations: https://public.tableau.com/shared/6YG8DN4S7?:display_count=yes

to surpass social science studies, and continuing mostly on an upward trend through 2005. At the same time, mixed natural and social science studies were also on the rise.

WHAT IS "THE PROBLEM" IN SMALL-SCALE FISHERIES?

Previous sections identified the cultural and socio-economic contributions of small-scale fisheries (SSFs), most prominently as the largest employer in the ocean economy. We also illustrated the increasing attention scientists are paying to SSFs and the main study areas globally. The research to date has typically emphasized the importance for poverty-alleviation, food security, or market failure for example, or in some cases for the role they play towards environmental stewardship and conservation. Scholars describe SSFs as entangled within and central to a range of social dilemmas[7]. Yet, across time, the main problem has been described differently. This is important because the way problems are described shapes the scope of solutions that are considered and how policies are designed and implemented (see Table 4 and Figure 10).

> From an ethical perspective generating effective solutions to SSFs problems requires an accurate description of the problems to be solved. Yet problem description is an unavoidably ethical and political act because description cannot be divorced from evaluation. In other words, the myth that we can separate facts and values only serves to obscure and hamper processes of describing a fisheries problem.
>
> Key questions to consider are: Who gets to describe fisheries problems and the nature and roots of those problems? What biases, norms, and assumptions make their way into descriptions of fisheries problems? And how will those problem descriptions relate to the set of possible solutions generated?

Table 4. The "Problems" Characterized in the Scientific Literature on SSFs and their Proposed Solutions

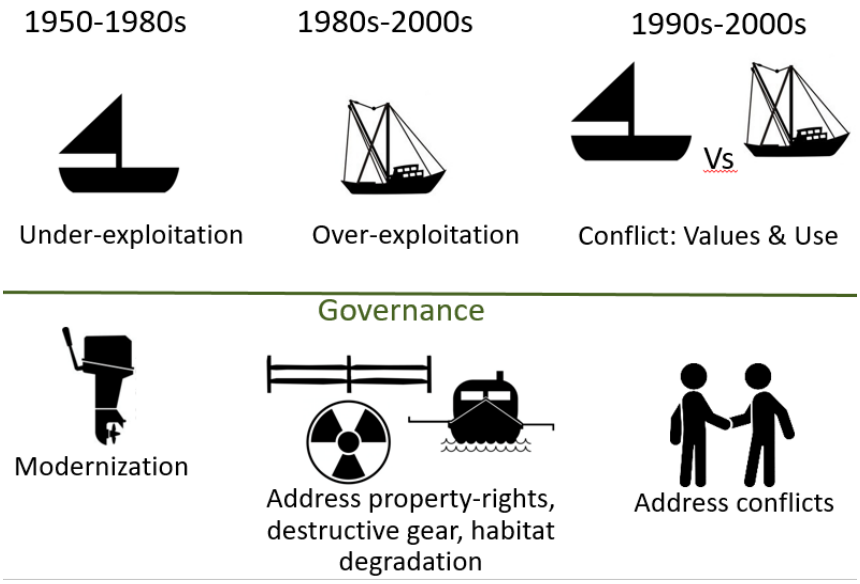
Time period	SSFs main problem	Proposed Solutions
1960-1980s	Under-exploitation (framed as a problem and opportunity)	Modernization techniques, inputs and training. Including: Marketing, financial, technical inputs, and capacity building. Integrating development with local customs and context, and a need for better data and improved scientific methods.
1980-2000s	Over-exploitation	Addresses lack of property rights, mismanagement, destructive gear, habitat degradation, population growth and poverty, urbanization and globalization, lack or inadequacy of data and methods.

table continued

[7] Social or shared problems, what social scientists have termed "social dilemmas," have been defined in various but similar formulations as situations where: (i) individuals receive greater benefits to their well-being from choices that are essentially non-cooperative, no matter what others do, yet all individuals would be better off if everyone cooperated; or (ii) everyone is tempted to take one action, but all will be better off if everyone (or most of them) take another action; or (iii) individual rationality leads collective irrationality, i.e. the pursuit of self-interest by each leads to a poor outcome for all (Olson, 1965; Dawes, 1980; Axelrod, 1984; Kollock, 1998; Ostrom, 2005).

1990-2000s[8]	Conflict over the value and use of resources	Attend to conflict between industrial and SSFs and between conservation priorities and SSFs.

Figure 10. The "Problems" Characterized in the Scientific Literature on SSFs and their Proposed Solutions



Problem 1: SSF are under-exploited. In the period between 1960-1980 the scientific discourse characterizes SSFs as an under exploited sector with high development potential. In their underdeveloped state, SSF are not maximizing rent, contributing to developing nations emerging economies, or sufficiently supporting food security, especially in less developed countries. Developing SSF is presented as an opportunity to address these shortcomings: to maximize rent and expand developing countries' economies (Thompson 1961, Rack 1962, Anonymous 1969, Berkes and Kislalioglu 1989, Brainerd 1989), and achieve food security (Thompson 1961, Anonymous 1969, Berkes and Kislalioglu 1989, Brainerd 1989). Articles that identify underdevelopment as the problem typically identify several modernization techniques and inputs SSF need. These include:

Perspective from Brazil:

"Internal problems have prevented Brazil from realizing the full fisheries potential of her long seaboard. With outside aid and internal stability, this could become one of the major expansion areas of the world, with beneficial results to the economy." (Anonymous 1969)

[8] The 2000s witnessed the emergence of literature referring to the wickedness of the issues facing SSFs and some of the proposed approaches to address them such as resilience thinking, adaptive or interactive governance, among others. These approaches are not yet dominate in the overall literature and thus do not figure in our Table but we recognize they represent valuable alternative approaches that are quickly gaining prominence in the most recent literature on SSFs.

technical inputs, financial inputs, and capacity building. A second main theme is the need to better integrate development plans with local conditions for development schemes to succeed (Rack 1962). A third theme in these articles is the need for better data, methods and techniques to study SSF and, therefore, scientifically manage and effectively exploit SSF. In some cases, it is suggested that all SSF, through development, can evolve or scale-up to industrial fisheries—and that this is desirable (Campleman 1973).

Problem 2: SSF are over-exploited. There is a pivotal shift in the literature occurring in 1980-1990's, from viewing under development of SSF as the main problem, to viewing over-exploitation as the central issue. This shift begins with a few early voices and concerns raised in the 1980's, and becomes the dominant problem orientation by the 1990's. Earlier studies that raise concerns about over exploitation in SSF in the 1980s appear to come from the experience and new science of industrial fisheries and management (Lawson and Robinson 1983). Property rights (and assumptions about a lack of property rights and the tragedy of the commons) are commonly identified as the key to over-exploitation (Campleman 1973). Other concerns include mismanagement (Milich 1999), destructive gear types (Christensen 1993), coastal habitat degradation, poverty and over-population (Pauly 1997), urbanization/globalization, and a general lack of reliable scientific data to effectively limit fishing effort.

Perspectives from the Philippines:

The prevailing open access in fisheries has resulted in wasteful exploitation of the resource as each fisher is unable to regulate his catch, economic waste brought about by too much effort on too small a resource, decline in fishers' income, and the development of conflict among fishers using the same gear for the same resource, or those using different gears for the same resource (Hardin, 1968; Christy, 1982)" (Siar, Agbayani and Valera 1992)

Perspective from Thailand

"Although the story of the success of Thailand's industrial fisheries is well known… what is little known… is the bleak experience of thousands of small-scale fishermen along the coast… Well-meant development assistance has benefitted the largescale sector, while even a parsimonious reservation of coastal fishing grounds for small-scale fishermen has proved impossible to enforce." (Panayotou 1980)

Problem 3: Conflicts over values. In the 1990's several conflicts in SSF emerge as central issues, with competing interests vying over the value and best use of marine resources. These conflicts include the impending conflict between industrial and artisanal fisheries (Vásquez León and McGuire 1993) and between fisheries and conservation and tourism (White and Palaganas 1991). Conflicts between industrial and SSF occur over multiple issues including inequitable relations and competition between the two industries (Lawson 1977, Panayotou 1980, Vásquez León and McGuire 1993), governments' preferential treatment of industrial fisheries (Panayotou 1980, Pauly 1997), conflicts over access/rights to fishing grounds (Begossi 1995), and gear conflicts (Sunderlin and Gorospe 1997).

With rising interest in the conservation of aquatic resources in the 1990s, SSF are increasingly seen as an activity at odds with non-consumptive uses of these resources such as conservation and tourism. Fisheries departments in some cases adopted mandates of conservation and environmental protection, rather than fishing per se, and were seen as taking sides in this conflict opposing SSF (Breton et al. 1996). Value conflicts are especially salient around issues of endangered species and charismatic megafauna (Kalland 1992). While conservation is often assumed to replace SSF with jobs in ecotourism and be better for the environment, others are skeptical of these assumptions (Young 1999).

GOVERNANCE AS A SOLUTION TO SSFS PROBLEMS

Prominent scholars in the field agree that for small-scale fisheries (SSFs) to realize their potential contributions it is paramount to find appropriate ways to govern them (Ostrom 1990; McCay and Acheson 1987; Berkes 1989; Jentoft and McCay 2003; Bene 2006; Armitage et al. 2007; Kooiman et al. 2008; Pomeroy 2016). Governance is the process of discussing, agreeing, designing, and implementing informal and formal rules (i.e., procedures, laws) to allow for members in society to have orderly and productive interactions with one another for a specific goal.

SSFs are no different from other types of common-pool resources (CPRs) in that they suffer problems of excludability and subtractability (Ostrom 1990). CPR theory was initially concerned in understanding the types of governance arrangements local CPR users could craft to successfully address issues of excludability and subtractability for the benefit of the users and the CPR on which they depended to sustain their livelihoods. A number of valuable lessons of successful local governance have emerged over time and some have been synthesized in (Drama of the commons 2002). A lasting challenge, however, and particularly relevant for SSFs consists in understanding how actors at different levels can successfully coordinate and cooperate.

In this section, we do not aim to synthesize what factors lead to successful governance arrangements, however defined. Instead, we aimed at uncovering what researchers had determined was to be defined as "successful" governance. Said differently, we wanted to identify the main normative goals of governing SSFs as defined by the scientific community.

Our analysis of the scientific literature shows that over time three overlapping, salient normative goals of governing SSFs have been advocated: Governing them to increase societal development rose in the 1960, to support fishers and their communities in the 1970s, and as a means for conservation outcomes in the 1990s (Table 5 and Figure 11). These goals highlighted in the scientific literature reflect and likely crystallized in a number of international policy instruments that have prescribed principles for governing small-scale fisheries, and thus the importance to analyze and describe their logic and motivation in the rest of the section.

The evolution of the goals of SSFs governance overtime

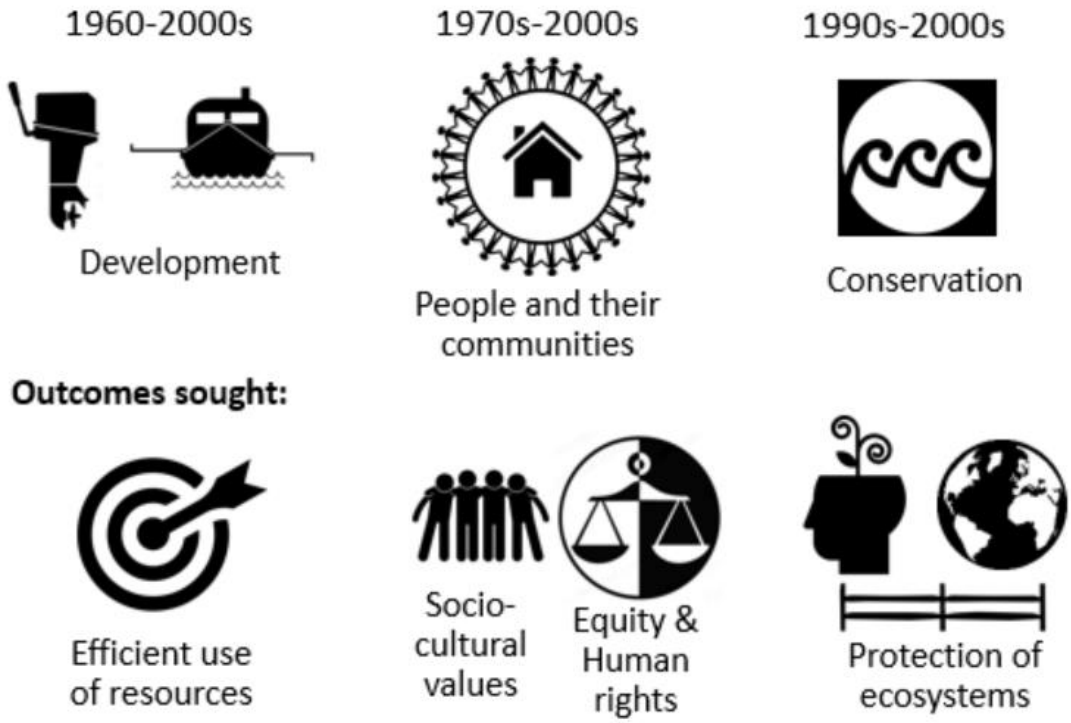
Table 5. Goals of governing small-scale fisheries

Time period	Goal	Approach/Ideology	Keywords	Types of Outcomes Targeted
1960-2000s	Development	Make SSFs more efficient, competitive and productive.	Liberalization, decentralization, deregulation, privatization, participatory, community oriented, democratic.	Participation Efficiency and optimal yield

table continued

1970-2000s	Support people and their communities	Support fishers, fish workers, communities and fishing culture.	Socio-cultural systems, marginalization, human rights, political units.	Socio-cultural values Equity and access for marginalized groups Protection of human rights for small-scale fishers Empowerment
1990-2000s	Conservation	Protection of aquatic ecosystems for non-consumptive/extractive use such as biological conservation and eco-tourism.	Preservation, protection, non-consumptive /extractive use, biological conservation, eco-tourism.	Protection of ecosystems and biodiversity

Figure 11. The Goals of SSF Governance over Time



Goal 1: Governance as development. The earliest normative goal for SSF governance present in the literature is development. In this approach, SSF governance should rationalize the sector making SSF more efficient, competitive and productive (Rack 1962, Edel 1967, Thompson 1961, Anonymous 1969, Proude 1973). This typically requires modernization and changes from "traditional" practices which are considered "inefficient" (Berkes and Kislalioglu 1989). Investments in gear, infrastructure and equipment are required, often through external funding such as structural adjustment policies. Along with the money and technical inputs comes reliance on experts, transnational partnerships, and multilateral agencies: just like development generally. Often these schemes aim to reduce the number of fishers to the most efficient fishers and locations, assuming livelihoods are substitutable (Rosa 1978, Proude 1973, Lawson and Robinson 1983, Pauly 1997). There is also emphasis on gathering baseline data, monitoring and developing models to economically maximize resource extraction (e.g. MSY). This approach emphasizes a range of characteristics considered "good governance"; liberalized, decentralized, deregulated, privatized, participatory, community oriented, and democratic.

Goal 2: Governance for people. In the 1970-2000 time period SSF are recognized for a plurality of social values which governance should uphold and protect. These include SSF as valuable social and cultural systems, SSF as marginalized groups, fishing as human-rights, and SSF as political units. There are overlaps across these sub-themes, as all identify the basis and valuation of fisheries governance beyond mere economic benefits, but instead in terms of broader social values.

Goal 3: Governance as conservation. From 1990 to the present period governance is often emphasized as a means to curtail resource exploitation (either altogether or to sustainable levels) usually by establishing restrictions on SSF through a range of mechanisms that restrict fishing effort. These may include no take zones, MPAs, or special management areas (among others). The express goal of these interventions is the preservation of biological community diversity for non-consumptive use (White and Palaganas 1991). This approach was less common in the literature reviewed (although appears to become only more popular after 2000).

Practice from Mexico

Starting in the 1920s the State incentivized organization around cooperatives through granting exclusive permits and territoriality (i.e., fishing concessions) for the harvesting of high-value species like lobster, abalone, or shrimp. From 1950-1990s the state increased the production potential of SSFs by investing in fishing means of production and processing, and on data generation, through the creation of the National Fisheries Institute. However, by the 1980s most State-sponsored infrastructure investments had dried up, and some exclusivity started to be removed from the control of fishing cooperatives.

Practice from India:

"The role of the government in safeguarding both fishing vending operations, is important in the context of creating livelihood opportunities and empowering women in traditional fishing communities. Government intervention can help provide women safe and stable access to fish markets; it can promote hygienic conditions in these markets; and finally, it can make alternative livelihood options available through promoting culture fishing to compensate for the drop in capture fishing from the Ganga." (Kumari 2015)

Practice from Mesoamerica:

Coordinated funding efforts to support the establishment of fisheries refuges, MPAs, local leadership, and organizational capacity building, have allowed the development of local, national and regional governance regimes around fishing and conservation of the second largest barrier reef in the world.

The goals of governance as reflected in international policy instruments. The governance discourse in the scientific literature has impacted the way the main international policy instruments think and talk about governance. While an in-depth analysis of how the literature has influenced policy is outside of the scope of this project, our reading of these documents suggests the goals of governance for development, conservation or for people has been integrated in a non-mutually exclusive manner. What would be interesting to understand at a later stage is what aspects of governance for conservation, development, or people got carried on into the policy arena, and which ones were left behind. As a first step towards that analysis we provide an illustration in Table 6 of some of the ways the goals from the scientific literature have been incorporated into the policy literature.

Table 6. Illustration of How the Governance Scientific Literature Has Influenced International Policy Instruments' Goals

Type of Goal of Governance	International Policy Instrument	Illustration of where Different Types of Governance Goals were Integrated
For Conservation + Development + For People	Agenda 21 action plan. Resulted from the 1992 United Nations (UN) Conference on the Human Environment (UNCED)	Chapter 17 included a number of goals for states' governance of fisheries and specifically SSFs in the waters under their jurisdiction, including to: Implement strategies for sustainable use of marine living resources, including through legal and regulatory frameworks—including small-scale fisheries *(Conservation goals)* Undertake capacity building for developing countries to conduct sustainable fisheries and aquaculture through training, transfer of technology, and multidisciplinary training and research *(Development goals)* Provide support to local fishing communities, in particular those that rely on fishing for subsistence, indigenous people and women *(for People goals)*.
For Development + Conservation	World Conference on Sustainable Development Johannesburg (2002)	The plan agreed on a number of specific goals in response the problems identified broadly in fisheries and specifically in SSF, including to: "Maintain or restore stocks to levels that can produce the maximum sustainable yield with the aim of achieving these goals for depleted stocks on an urgent basis and where possible not later than 2015" *(Conservation goals)* "Assist developing countries in coordinating policies and programs at the regional and sub-regional levels aimed at the conservation and sustainable management of fishery resources and integrated coastal area management, including through the promotion of

table continued

		sustainable coastal and small-scale fishing activities and the development of related infrastructure" (United Nations 2002) *(Development goals)*.
For conservation + Development + for People	Sustainable Development Goals (SDGs). United Nations General Assembly (2015)	Goal 14 focuses on conservation and sustainable use of "the oceans, seas and marine resources," including targets to: "effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics" by 2020 *(Conservation goals)* "provide access for small-scale artisanal fishers to marine resources and markets" *(for People and Development goals)*
	The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication FAO (2015)	The 2015 SSF Guidelines emphasize a number of internationally-agreed principles for good governance of SSF, including: respect for human rights and dignity *(for People)* equity to the present generation in fisheries, including respect of cultures, non-discrimination, gender equality and equity, and social responsibility *(for People)*. equity to future generations by emphasizing sustainable development; and inclusive, sustainable and fair governance processes, including consultation and participation, rule of law, transparency, accountability, holistic and integrated approaches *(for Development, conservation and people)*.

In addition, it is worth noticing the above policy instruments are internally linked to one another. For instance the goals articulated at the 1992 UNCED have been translated by the UN Food and Agriculture Organization (FAO) into a number of international policy instruments to guide governance of fisheries, notably the Code of Conduct for Responsible Fisheries in 1995, the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security in 2012, and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication in 2015 (the "SSF Guidelines") referenced above. The SSF Guidelines are the only international policy instrument specifically designed for SSFs. They promote an approach to SSF governance focused on the principle of respect for human rights, and particularly

poverty eradication and food security (see Figure 12) —drawing also upon the 2004 Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security (FAO, 2015b).

Figure 12. Main Thematic Areas of the SSF Guidelines Instrument

Source: Franz 2017

SCIENTIFIC PERSPECTIVES ON DOMINANT FORMS OF GOVERNANCE

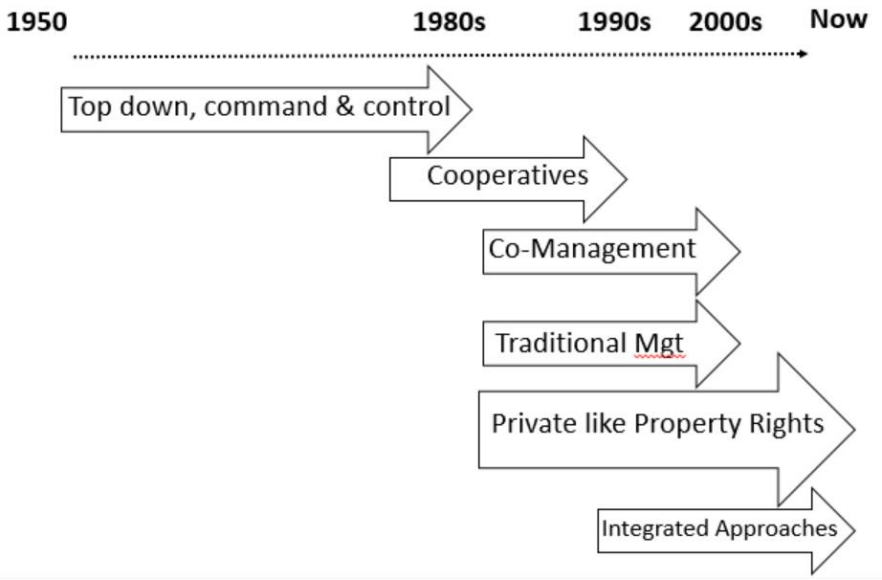
To identify the most dominant forms of governance discussed in the literature we documented mentions of different forms of governance through time. Mentions could be descriptive, or through explicit normative assessments of a "better" way to govern SSFs, or as a critique of a particular form of governance. This analysis revealed distinct shifts and trends as identified by the scientific discourse (shown in Table 7 and Figure 13).[9]

Table 7. Shifts in Scientific Perspectives on "Dominant" Forms of Governance

Time period	Trend or Form	Keywords
1950-1980	Centralized, state control	Colonialism, top-down, effort restrictions, access, marine protected areas.
1960-2000	Cooperatives	Bottom-up, collective action, association, cooperation, leadership, government support.
mid-1990-2000	Co-management and decentralization	Shared responsibility, power sharing, devolution.
1990-2000	Community-based, traditional and indigenous management	Informal and traditional tenure, credit, trade relations, local power, traditional and indigenous ecological knowledge.
1990-present	Private property and rights-based	Individual transferable quotas (ITQs), community quotas, territorial use rights (TURFs), overcapitalization, conflict, inefficiency.
2000s-present	Integrated approaches	Coastal management, ecosystem-based management, complexity.
1960-2000	Other governance issues that cross-cut structure	Aid, financing, outside consultants, technical experts, long-term support, international agreements, treaties, regional fisheries management organizations.

[9] There is considerable overlap across these—they are not mutually exclusive. As in TURFS can be both a form of co-management and rights-based approaches. There is also considerable confusion within the literature on the different between many of these terms. The categories represent our best effort to separate out substantive meaning among them, despite the general confusion within the literature about the difference between these terms.

Figure 13. Shifts in Scientific Perspectives on "Dominant" Forms of SSF Governance



Centralized management. Top-down fisheries management was widely implemented in the early 20th century, spread through colonialism, and remained the dominant form of governance as many newly independent nations transitioned and formed their own resource management institutions (Rack 1962, Thompson 1961, Anonymous 1969, Lawson 1977). Centralized management and state intervention in SSFs are discussed both in relation to developing and increasing SSF exploitation (Rosa 1978, Campleman 1973), and (later) restricting fishing activity. Therefore, throughout shifts in the discourse on "the problem" in SSF, from under-exploitation to concerns with over-exploitation and conflict, centralized management remained the dominant governance structure. Centralized government implements many forms of marine management and regulation of SSFs including direct restrictions on effort and access such as marine protected areas, marine reserves, and no-take zones, among others (White and Palaganas 1991, Bernal et al. 1999). While centralized management continues in some form up to present (in most cases), it predominantly served as the sole form of SSF governance from approximately 1950-1980. Around 1980-1990 there is a shift towards augmenting (or in rare cases replacing) centralized management with other, more diverse forms of governance in SSF that often incorporate local and community participation (in various forms).

Cooperatives. Cooperatives are a popular and enduring form of SSF governance, present in the literature throughout all decades (Thompson 1961, George 1973, Lawson 1977, Rosa 1978, Davis and Jentoft 1989, Amarasinghe and De Silva 1999). Cooperatives seem to serve as a catch all term covering a range of different types of collectives and associations, of both fishers, fish workers and processors. While some typologies of co-management consider cooperatives a type of co-management, this term appears earlier and separate from co-management (despite considerable overlap) (Amarasinghe and De Silva 1999). Within cooperatives, distinctions are often drawn based on their initiation and implementation: from bottom-up to top-down processes (Rosa 1978, Chen 1977, Breton et al. 1996). Many case studies aim to asses which factors lead to successful cooperatives including organizational loyalty (Davis and Jentoft 1989), attitudes towards cooperation (Pollnac and Carmo 1980, Baticados et al. 1998), leadership, government support, etc. Others point out how neoliberal policies have eroded the viability and existence

of cooperative structures of governance, to the benefit and profit of industrial fishing (Vásquez León and McGuire 1993).

Co-management and decentralization. Co-management is a widely-embraced approach to SSF governance where government agencies and fishers share some responsibility in the management of fisheries resources. There is a significant degree of intermixing of terms (co-management and decentralization) where co-management usually involves some form of decentralization; devolving responsibilities from the central government to the local level (Pauly 1997). Additionally, variations on the term "community-based" also are used to describe co-management systems with formalized community participation and power-sharing (van Mulekom 1999). Most emphasize formal co-management arrangements, while others highlight that co-management can also be informal (Sunderlin and Gorospe 1997). Within co-management, the literature addresses two subthemes; the inadequacy of centralized management alone (and therefore need for co-management), and the role of the community and local powers in the co-management process. The latter addresses issues of marginalization and power imbalances between communities and the state as well as assembling typologies of co-management.

Community-Based, traditional, indigenous management. These approaches recognize the existence of longstanding community-based, traditional and indigenous management regimes as valid structures for fisheries governance (Bavinck 1996, Begossi 1995, Jennings and Polunin 1996). These forms of governance may be informal (in the eyes of the state) or recognized by the state. Attention to community-based and traditional management can be sub-divided into focus on; tenure, credit and trade relations, and ecological knowledge.

"Community relations, such as peer pressure and traditional customs, can serve to reduce resource conflicts, such as illegal fishing with explosives, that government has been unable to resolve. Government agencies should act to support the local community, through education and technical assistance, and bring about collaboration among its residents for problem solving" (Pomeroy 1991).

The role of traditional (or local) ecological knowledge (TEK)

While evoked frequently in discussions of SSF governance, there are many approaches to engaging TEK present in the literature. A key issue, often not directly answered, is how and why TEK is or should be considered within the realm of SSF governance. It's apparent that when addressed at all, which it often is not, there are a range of answers to these questions relevant to SSF governance. In many cases, TEK is linked to traditional tenure systems and acknowledged and treated as valid knowledge and basis for resource management. Other approaches discuss how to usefully integrate TEK into Western systems and structures of management to improve governance outcomes. Many cases try to verify the "correctness" of traditional knowledge through the lens and metrics of science. While it is often remarked that modernization and development are eroding and displacing TEK, others document the co-existence and endurance of TEK in spite of development. For example, in the Arctic, despite market integration many traditional social, economic and ecological systems endure (Burnsilver et al. 2016).

Private property and rights-based. There is a strong and consistent turn towards various limited-entry instruments for SSF regulation starting in the 1990s. These include a range of private-like property measures and are often referred to collectively as "rights-based" approaches. Privatization can take various forms including individual quotas (ITQs) (Grafton et al. 1996, Bernal et al. 1999), community quotas (Poupin and Buat 1992, Christensen 1993), management and exploitation areas (Bernal et al.

1999), and territorial use rights (TURFS) (Siar et al. 1992, Amar et al. 1996, Bernal et al. 1999). These approaches aim to address overcapitalization and exploitation, conflict and inefficiency in SSF—yielding higher profits and better management outcomes (Grafton et al. 1996). There is also a strain within this literature that looks at the limitations or drawbacks of privatization, pointing out issues of equity and marginalization of SSF. Additionally, privatization may not deliver on curtailing over-exploitation; privatization schemes (like quotas) may address some allocation issues in SSFs but many point out that TAC can still be set too high, leading to over exploitation (Grafton et al. 1996).

Integrated approaches. It was not until the late 1990's and early 2000's that interest appears in different forms of coastal and integrated management in the SSF literature. Early works draw on literature from coastal management, extending it to their analysis of SSF governance within a broader coastal management framework (Pauly 1997). Many point out the limitations and infeasibility of single species models, especially for SSFs, and call for ecosystem based approaches (Castilla and Fernandez 1998). While there is acknowledgement that single species management models are problematic, there are major challenges to integrated management—such as the availability and reliability of data, models, and theories. While integrated approaches are desired, the complexity of social and ecological systems in SSF pose major challenges to integrated management (Castilla and Fernandez 1998).

Other cross-cutting issues: Funding/Aid. A range of issues that cross-cut any governance structure were interlaced in the scientific literature on "the best" form of SSF governance. Aid is a prevalent a feature of many forms of SSF governance and present across all decades. Aid often guides SSF governance (financing and restructuring it) in a top-down fashion with outside NGOs, bi-lateral and multi-laterals directing the process an employing outside consultants and technical experts (Rack 1962, Lawson 1977, Campleman 1973, Brainerd 1989). A major issue complicating aid-reliant SSF development and governance is the temporal scale: it takes considerable time (beyond the range of many aid-based projects) to achieve lasting and effective governance outcomes. The shorter time frames that many development projects operate on can be problematic when trying to support fisheries governance (van Mulekom 1999).

International and transnational agreements. Fostering collaboration and coordination among countries are involved in multiple aspects and types of SSF governance. These include international efforts to protect endangered species (Kalland 1992), international and regional treaties, and regional fisheries management organizations.

Linking dominant forms of governance to outcomes. Such assessment, as appealing as it might be, is not possible at this stage in the systematization of dispersed knowledge about such a complex sector as SSFs. Yet the list of dominant forms of governance in Table 6 provides us with a framework with which to link different forms of governance with potential outcomes. For instance, it is known that each different form of governance tends to favor some outcomes over others and Table 8 below provides an idealized example of some linkages. Clearly, any intervention pursues outcomes that are much more complex, but this framework could be used as a point of departure for our SSFs database to link forms of governance with more complex or multiple outcomes.

Table 8. Idealized Examples of Linkages between Desired Outcomes and Forms of Governance

Desired outcome	Form of Governance
Efficient use of marine resources	Private property and rights-based Centralized, state control.
Equitable partnerships	Cooperatives, fisher associations Co-management
Sustainable use of the marine environment	Integrated approaches, state control, cooperatives, community-based management
Cultural preservation of the marine environment	Community-based, traditional and indigenous management

SHORTCOMINGS AND REFLECTIONS OF THE SMALL-SCALE FISHERIES LITERATURE: AN ETHICS PERSPECTIVE

Having established the spatio-temporal trends, main focal areas, way in which problems are conceptualized, and goals for governing small-scale fisheries (SSFs), it becomes important to highlight what are some of the shortcomings, biases, and blind spots we found. Below we provide a summary of our findings from an ethics analytical perspective.

Property rights. In recent decades, small-scale fisheries problems are described as "open access" problems in need of effective forms of enclosure through the mechanisms of management and governance. Those mechanisms of enclosure might be licensing, quota systems, TURFs (Territorial Use Rights for Fishing), or any number of management tools that allocate powers and liabilities with respect to fisheries. This allocation of powers and liabilities to enclose the open is a system of property rights. Important to recognize is that property not only functions as an *institution* (e.g. laws, regulations, enforcement mechanisms, customary practices) but always also as an *idea* (e.g. a vision of how members of a society ought to relate to one another or the values embedded in property institutions).

> Property inescapably functions in this dual capacity as both institution and idea. However, while the academic literature on small-scale fisheries frequently addresses the mechanisms of property as an institution, it rarely addresses the values, norms, social visions, and imaginaries that property institutions reflect and reproduce.

Property institutions also allocate burdens of persuasion among various fisheries actors. When multiple parties, including the public, claim an interest in a fisheries resource, who bears the burden of persuasion? And how can those burdens be allocated to align with the values, norms, and visions of a particular society?

Gender. The labor of women in small-scale fisheries is often made invisible in the academic literature on small-scale fisheries, even though women's labor is frequently crucial to fisheries' success, sustainability, and development. In the division of fisheries labor, women might join fishing crews, repair equipment (e.g. nets), manage finances, diffuse best practices (e.g. through kinship networks), provide emotional or spiritual labor (e.g. worry, prayer), link catch to market (e.g. as vendors), or process catch. A gender analysis resists efforts to separate that which takes place on land, in the home, or within fishing communities from that which takes place in the water and on the boat.

> Greater attention to gender in small-scale fisheries will link land and water into a single economy and social ecology.

Agents of governance. Small-scale fisheries governance is carried out by governing agents, such as regulatory bodies or licensing agencies. The literature rarely accounts for why scholars assume that certain actors—primarily the state, cooperatives, development agencies, the market, or researchers—are and ought to be the primary agents of fisheries governance. A small portion of SSFs literature gives strong evidence that other agents ought not be overlooked. Some of these include religious bodies, kinship networks, individuals, migrants, women and children, or even natural/non-human processes.

Implied vision of society & nature. What is the vision of society and nature implicit in the institutions of fisheries governance? Otherwise stated, what are fisheries for? What do they do? Fisheries governance, like property, functions as both *institution* and *idea*. That is, there are the methods and mechanisms of governing fisheries, on the one side, and the particular set of relations between humans and between human and nonhuman life, on the other, that those institutions both reflect and reproduce.

Do we govern fisheries in order to ensure a sustainable supply of animal protein for human consumption and poverty alleviation? To consolidate the state's sovereignty over its resources? To grow local economies? Or to preserve a way of life? Apart from answering these kinds of questions about the ends of fisheries governance, the vision of society and nature that fisheries governance institutions serve remains implicit. However, modern history demonstrates that governance can mean anything from equitable and principled forms of negotiation and conciliation amidst conflicting views to colonial or autocratic forms of command and control built on exclusion. In addition to the need to articulate the ends of fisheries governance, there is the question about who gets to participate in casting that vision or conceiving of the ends that governance ought to serve. In other words, what are the means of fisheries governance and the means of establishing the proper ends of governance? While no universal answers to these questions exist, they will acquire unique contours in each particular fisheries context.

Fisheries governance that fails to consider what fisheries are for and what character of social and natural relations they enact risks confusion and prolongation of fisheries problems.

Taking an anthropocentric view as a given? How something is represented in discourse determines, to a significant extent, what our ethical relation to it ought to be. Marine life—e.g. fish— is variously represented in the academic literature on SSF as resource, protein source, property (national, communal, familial, common), commodity, reproducing organism (emphasizing its reproductive life), development asset, endangered species (in need of protection), cultural heritage, gods/goddesses, human prey. The most common way to represent marine life is as a resource. Is "resource" the best way to describe or represent marine life? What interests are served in describing marine life as a resource? Does marine life have any end(s) other than human projects? Should we describe marine life, such as fish or shellfish, and nonliving things, such as minerals or sand, as the same kind of thing, i.e. as a resource?

What are Different Groups Doing to Support Small-Scale Fisheries Governance?

Focusing on the scientific literature it is useful to understand the source of some of the dominant thinking embedded within policy initiatives and solutions promoted for small-scale fisheries (SSFs). Yet the scientific literature does not capture the diversity of activities and experiences taking place around the world, which also influences the range of governance approaches proposed and implemented in SSFs. Based on a series of on-line surveys and semi-structured interviews to more than 20 informants, in this section we provide a broad global scan of the types of organizations, activities, and funding levels supporting SSFs.

Overall landscape

The diversity of organizations supporting small-scale fisheries around the world is almost as great as the diversity of these fisheries, and ranges from a community-based civil society organization in the southeast corner of Sulawesi in Indonesia, to an international policy organization such as the United Nations Food and Agriculture Organization. Although a range of categories or typologies could be used to classify these vastly different organizations for analysis, we identified the following to use here based on our comprehensive literature review, online-surveys, and interviews with practitioners:

- *Academic organizations*, such as universities, who provide research and expertise;
- *Civil society organizations (CSO)*, which includes organizations operating at diverse spatial scales and with a wide range of objectives, from local or regional stakeholder groups such as unions or associations of fishers, to large international non-profit organizations operating in multiple countries around the world;

Too Big To Ignore (TBTI) Network: Information System on Small-scale Fisheries

The Too Big To Ignore network has created an Information System on Small-scale Fisheries (ISSF) that includes a database populated from online crowdsourcing, in order to capture the efforts and support provided by participating researchers and organizations. As of May 2016, the "State of the Art" ISSF layer had a total of 1702 records from (i) researchers and (ii) organizations from a wide number of countries around the world and included peer-reviewed papers (61%), reports (20%), books or book chapters (10%) and conference proceedings (3%).

In terms of researchers, the ISSF captured information on 427 SSF researchers from 62 different countries (over half of whom had Ph.D. and another quarter a Master's degree), over 60 percent of whom were from Europe and North America and another 21 percent from Latin America and the Caribbean. Most of the researchers captured in the ISSF database were based at universities, with many of the rest distributed among civil society organizations (including research centers) and government agencies. The ISSF categorized the various areas of research as: fisheries assessment, management and governance, markets, livelihoods, poverty, food security, well-being, gender issues, biodiversity, fisheries rights, and/or climate change.

In terms of organizations, the ISSF captured information on 132 organizations from 48 different countries (nearly half of the organizations were in Europe), largely civil society organizations such as fisher associations or unions, or supporting organizations. Nearly half of the organizations captured in the database were in Europe, with common activities reported as networking, marketing, capacity, collaboration and sustainability.

Source: Rocklin (2016a, 2016b)

- *Philanthropies*, often established by private companies or individuals to provide funding to help address social problems such as governance of small-scale fisheries;
- *Government aid agencies*, often agencies specifically established to provide public funding to support poverty reduction and sustainable development in low-income countries, largely in Europe, North America and southeast Asia (including Oceania); and
- *Intergovernmental organizations*, including a range of types of organizations constituted by two or more states, such as:
    - Research agencies,
    - Regional agencies,
    - Financing agencies (regional and global), and
    - Technical agencies (i.e. the United Nations).

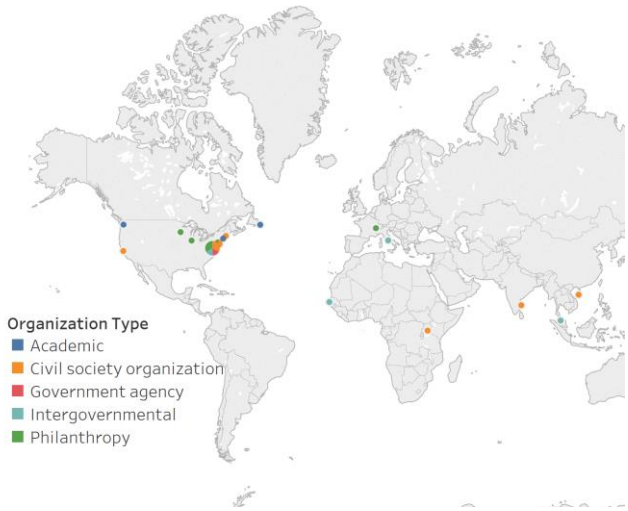
The support of these different types of organizations has not been systematically tracked and is often not coordinated, so it is difficult to globally inventory their efforts. One effort that has started to track the efforts of researchers (largely from academic organizations) and civil society organizations is the Information System on Small-Scale Fisheries (ISSF) created by the Too Big to Ignore Network of researchers hosted at Memorial University of Newfoundland, which crowdsources information from individuals and organizations around the world (Rocklin 2016).[10]

Global scan of organizations' support to small-scale fisheries

Organizations contacted. While it would be impossible to fully capture and inventory the diversity of organizations supporting small-scale fisheries around the world and provide a complete picture of their efforts, as an indication or "scan" of the horizon, we surveyed and/or interviewed to date representatives from a cross section of 22 organizations.

Figure 14 shows the headquarter locations of organizations surveyed and/or interviewed (see Appendix IV for the full list).

Figure 14. Headquarter Locations of Organizations Contacted



[10] See http://toobigtoignore.net/

Levels at which organizations are working to support small-scale fisheries. To some extent the spatial scale of the ecosystem supporting an activity such as fishing will determine the scale at which governance occurs, though there are often mismatches between the two (Crowder et al 2008). This spatial scale is somewhat determinant of the levels (or "entry points") for external support in many of the cases, between providing resources directly to communities and fisheries at the local level, or at a higher level to national government agencies and dialogue, or at the international level (e.g. through the United Nations). Many organizations report providing support at almost all levels, though effectiveness and outcomes at each level are difficult to assess using on-line surveys and semi-structured interviews. However, some patterns emerge, and advantages of some organizations in operating at certain levels can be initially compared to others. In the cases of the civil society organizations surveyed/interviewed, almost all are uniformly delivering support to small-scale fisheries at the local level, e.g. with individual communities or fisher organizations, even the larger international CSOs. In addition, in some cases CSOs are working with local or national government agencies, or to share knowledge across CSOs and participate in international policy discussions. Philanthropies are also uniformly delivering support at the local level (often via CSOs), while also supporting work with national government agencies in some cases. Alternatively, academic organizations and intergovernmental research agencies focused more on support at the international level, in terms of global research or networking, though in some cases providing on-the-ground expertise at local or national levels. Bi-lateral aid agencies may work directly with communities and CSOs at the local level, but also are often working with government agencies at the national level, as are intergovernmental financing organizations such as regional development banks or the World Bank. In some cases, regional organizations are starting to support members to enhance governance of SSF, such as in the case of the African Union (AU) where the heads of state of member countries adopted a policy framework for fisheries and aquaculture in 2014, from which the AU has developed an action plan to guide states with a priority on SSF. Lastly, the intergovernmental technical agencies of the United Nations, such as the Food and Agriculture Organization (FAO) have supported national government agencies and CSOs in leading global policy discussions, as well as working directly with national governments to implement international policy instruments.

Types of interventions supported. While it is difficult to generalize from the sample size to date, a number of common types of interventions have been supported in small-scale fisheries, generally differing according to the type of organization and the level at which it is operating (see box below).

The various types of organizations consistently supported a wide range of the interventions described in the box above, though across very different geographies and often at a very local or even micro level (see Appendix V for more detail):

Typology of Interventions to Support Small-Scale Fisheries*

Science and research

- Provision of biological and ecological information useful for localized management (i.e. knowledge about biological and ecological characteristics, diversity and structure).
- Provision of social science information useful for localized management (i.e. knowledge about demographics, socio-cultural characteristics, economics and human behavior related to production, commercialization and marketing).

Capacity building

- Building fishers' capacity to produce natural and/or social science information useful for management (e.g. training fishers on biological monitoring techniques, and/or collection of social science survey data).
- Training fishers' leadership skills (e.g. coaching, self-confidence and leadership techniques to key members of the community).
- Building CSOs' leadership and/or organizational capacity skills (e.g. coaching, training on how to lead the organization, and/or how best to organize, manage and communicate the work).
- Building CSOs' financial sustainability (e.g. coaching, training on how to become financially sustainable and access new sources of capital as needed).

Bridging support

- Facilitating the sharing of information across geographies and communities (e.g. support for bridge organizations, networks like the locally-managed marine area network; fisher exchanges; creation of bridge organizations and sustaining support; sharing information about licenses, monitoring and enforcement, etc.).

Policy development

- Facilitating/promoting the creation of new governing/management frameworks (e.g. supporting all aspects of the design and implementation of governing frameworks consistent with the SSF Guidelines).
- Facilitating/promoting the creation of fisheries management plans (e.g. supporting all aspects of working with fishers' organizations, bridging organizations and/or governments towards designing and enacting valid fisheries management plans).
- Facilitating/promoting the protection of critical fishing habitats (e.g. supporting all aspects of working with fishers' organizations, bridging organizations and/or governments towards designing and enacting marine protected areas, fisheries refugia or any other type of protected area).
- Facilitating/promoting the creation of fishers' labor and well-being standards (e.g. supporting all aspects of working with fishers' organizations, bridging organizations and/or governments towards protecting labor, gender, and other individual human rights).
- Facilitating/promoting the creation of new production and commercialization standards (e.g. supporting all aspects of working with fishers' organizations, bridging organizations and/or governments towards improving supply chain, traceability, labeling, etc.).

Policy delivery

- Supporting relevant agents in the administration of governing/management frameworks (e.g. support for implementation of rules, management plans).
- Supporting relevant agents in the enforcement of compliance with governing/management frameworks (e.g. monitoring, surveillance of fisheries).

Alternative livelihoods/compensation for reduced fishing

- Providing a range of subsidies, in-kind and cash grants (e.g. economic, technological, administrative and/or intellectual support to entice fishers to engage in non-fishing economic activities).

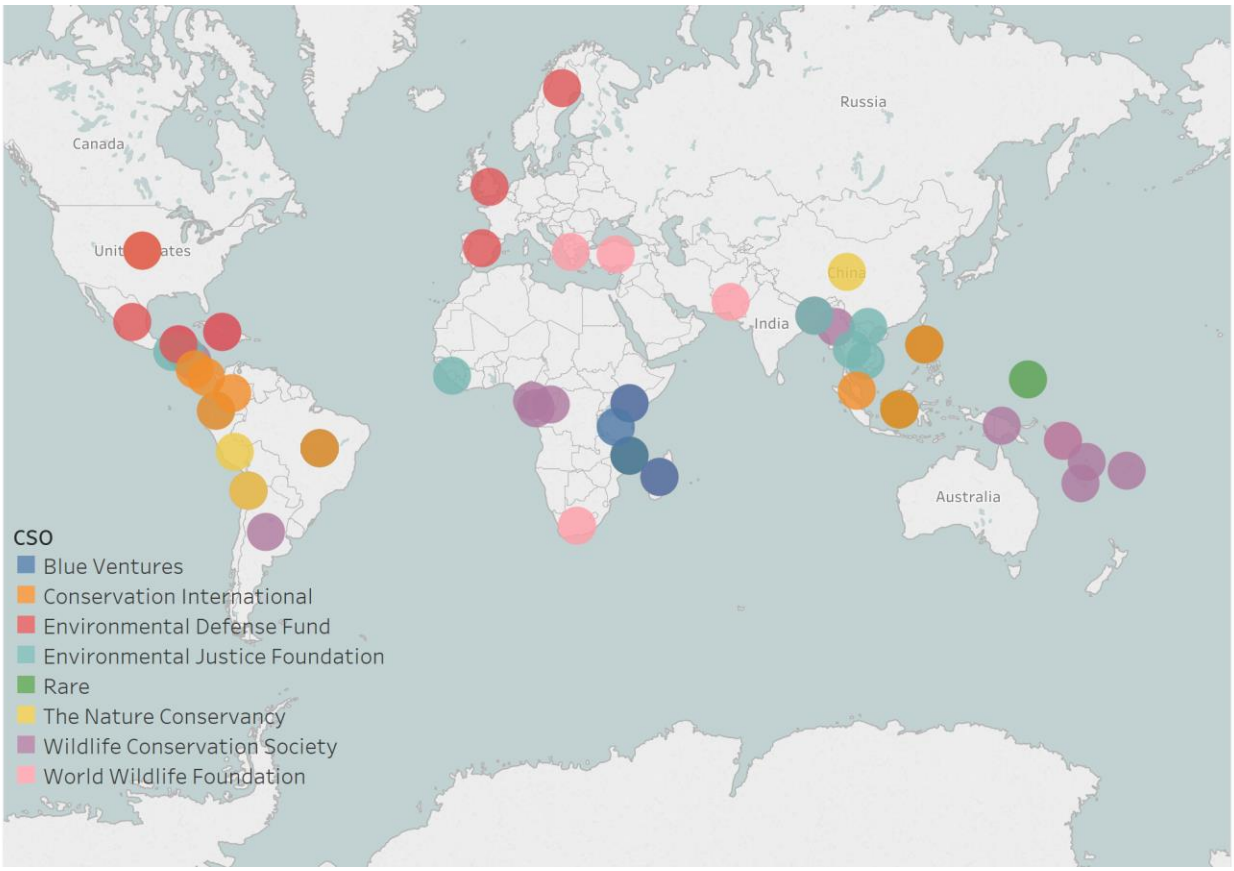
Technology innovations

- Intervening in any technical aspects of the production and/or commercialization process (e.g. design, test, implement more selective fishing gear, more environmentally-friendly fishing techniques; creation of new marketing techniques, infrastructure and more efficient processing, traceability, labelling based on technological advancements).
- Improving the monitoring and enforcement of fishing rules (e.g. training, staffing, patrols, satellite monitoring capabilities, smart phone cameras, drones, etc.).

*Non-exhaustive list based on stakeholders interviewed for this study.

Civil society organizations supported the full range of capacity building interventions in targeted communities around the world, in order to sustainably manage fisheries based in most cases on nearshore, benthic species, such as the work undertaken by Wildlife Conservation Society in East Africa, or Blue Ventures in Madagascar, or China Blue Sustainability Institute in Hainan, among others. Some organizations focused on capacity building targeted specifically to fisher organizations and associations, often on the implementation of the Small-Scale Fisheries Guidelines, such as the work of the International Collective in Support of Fishworkers (ICSF) in China, India, South Africa and Tanzania. Others focus on capacity building of local leaders to help fishing associations and communities design policy instruments, such as Rare Conservation's work in coastal sedentary fisheries to support design and implementation of territorial use rights in fishing (TURFs) and small marine reserves. [11] Additionally, some organizations focused on capacity building for sustainable financing of fishing activities by communities or companies, so that private investment into fishery-scale processing companies could enhance both sustainability and efficiency of value chains, for example the work of Encourage Capital in Chile and the Philippines, or the SmartFish social enterprise in Mexico, or the role of Rare Conservation in the Meloy Fund supported by the Global Environment Facility (GEF). Figure 15 below illustrates the geographic distribution of the efforts of some of the larger international CSOs, and for more information see Appendix VII.

Figure 15. Geographic distribution of efforts of larger international CSOs to support SSFs



[11] See http://www.rare.org/sites/default/files/2016%20rare%20fisheries%202-pager.pdf

Interestingly, the capacity of small-scale fishers and communities to organize in local, national and even global associations has grown over the last decade, offering a new entry point for collaboration and support. For example, the World Forum of Fish Harvesters and Fish Workers (WFF) is an international civil society organization (CSO) dedicated to bringing together small-scale fisher organizations from around the world to address key issues that the small-scale sector faces, including: upholding fundamental human rights, labor rights, gender equity, fishing culture, tenure security, and economic viability of fisheries. The organization is committed to supporting livelihoods and sustainable fisheries and aquatic resources along the value chain (e.g. pre-harvest, harvest, and post-harvest). WFF fills a key role by organizing fisher organizations within one platform, enabling knowledge exchanges among the representatives of small-scale fishing communities from around the world. Therefore, while the secretariat is based in Uganda at the Katosi Women's Development Trust, the scope and reach of the organization is global.

Besides a General Assembly (see box), the WFF's is composed of 2 representatives from each of the five regions: North America, Latin America, Africa and the Middle East, Europe and Asia. Among members of the Coordination Committee (10 representatives), four members are elected to positions on the Executive Committee, including; two co-presidents (one male and one female), the general secretariat, and a treasurer. The Executive Committee must be comprised of members from four different regions. Therefore, the governance structure of WFF is designed to ensure balanced representation along gender and geographic lines in order to represent the diversity of small-scale fisheries. Representatives are elected in person at the meeting of the WFF General Assembly—which is held every three to five years. Currently, funding is a major limitation for the organization, preventing the general assembly from meeting more frequently (e.g. biannually) as well as more frequent regional meetings (for each continent). General Assembling meetings and Committee communications are enabled through trilingual translation services (French, English and Spanish).

The World Forum of Fish Harvesters and Fish Workers (WFF)

WFF works to empower and connect existing small-scale fisher organizations to influence policies at the national, regional and international level that "affect their rights of access, use and control, and sustainability of the fisheries resources for improved livelihoods" (http://worldfisherforum.org/). The organization is particularly interested in issues of economic viability, climate change, food sovereignty, sustainability, gender equity, and creating a supportive legal regime for small-scale fisheries. To address these issues, WFF serves as a global forum, with a General Assembly consisting of two representatives (with gender parity) from recognized national fisher organizations for each member country. The organization currently consists of over 40 member countries from five continents. The Coordination Committee, a democratically elected body within the assembly, is responsible for admitting active members to the organization following a vetting process (e.g. to ensure the national organization is a legitimate and representative one). WWF's most recent General Assembly took place January 25th to 30th in Salinas Ecuador. The meeting was hosted by the National Federation of Fishing Cooperatives of Ecuador (FENCOPEC), the Ministry of Agriculture, Livestock, Aquaculture and Fisheries, and the Ministry of Defense.

WFF formed in response to the exclusion of small-scale fisheries from ongoing international discussions on fisheries policy in the 1980's and 1990's (e.g. UN COFI and FAO), holding their first meeting in New Delhi in 1997. They have held 5 general assembly meetings since, with several longer periods without assemblies due to lack of funding. In addition to WFF, a similar small-scale fisher CSO, The World Forum of Fisher Peoples, (WFFP) is also active and collaborates with WFF on key policy issues. One of the largest success stories, and examples of their collaboration, was their engagement and leadership in

the formation of the SSF Guidelines. In addition to their central participation in the multi-year process of drawing up, amending and passing the SSF Guidelines, both organizations are now centrally involved in the crucial (and more difficult) process of actually implementing the SSF Guidelines.

Currently, WFF requires both short and long-term funding support. To our knowledge WFF past funders include: NORAD, the Foundation Charles Leopold Mayer, the Waterloo Foundation, and the Comite Catholique contre la Faim et pour le Development. We understand current funding will soon phase out. Yet, despite limited financial means, WFF has managed to build a sound organizational structure built in principles of representation and democratic self-governance. They played a crucial role in development of the SSF Guidelines and are now positioned as an important partner for implementation. As different member countries are trying strategies to implement the SSF Guidelines, this information and knowledge is disseminated within the network, allowing members to learn from the lessons of others. Therefore, WFF plays a crucial role providing capacity building for existing fisher organizations, increasing their connectivity around key issues of shared concern for sustainable small-scale fisheries.

Some of the larger associations collaborate in the context of the International Planning Committee (IPC) for Food Sovereignty, a global umbrella association for CSOs representing small-scale food producers and rural workers. The IPC aims to promote issues related to food sovereignty at regional and global levels, and coordinates a Fisheries Working Group.[12]

Philanthropies presence and interventions touch a wide variety of aspects related to SSFs governance. For instance, philanthropies have supported science and research informing small-scale fisheries governance, almost all aspects of capacity building in the diverse geographies targeted, and policy development in some cases, including support for revisions to governance frameworks such as the preparation of fisheries management plans or establishment of marine protected areas. For example, the locally-managed marine area (LMMA) network has been supported by philanthropies since 2000, with funding provided to local CSOs or academic organizations to assist targeted fishing communities to develop rules over a given near-shore area of the sea or fishery in Fiji, Papua New Guinea, the Solomon Islands, Vanuatu and now Cuba and Indonesia. Additionally, in some cases philanthropies also supported technological innovations for market reform that help increase demand for sustainable seafood, such as certification of sustainable fisheries or increased traceability of fish products. Attention to the potential of markets to influence and support small-scale fisheries governance has been growing in the efforts of several philanthropies, particularly where small-scale fisheries are connected to large and even global supply chains (though information about these chains is still very limited). Based on our research, it is apparent that market

Philanthropy Interventions: Oak Foundation

The Oak Foundation's portfolio of grants to support SSF governance provide a useful body of experience for analysis of philanthropy interventions. These interventions have focused primarily in two areas: (i) Belize: the Mesoamerican Reef Program and (ii) Alaska: North Pacific/Arctic Program. The interventions in Belize focused on strengthening the existing extensive network of marine protected areas to protect habitats and key ecological processes along the reef and replenish fish stocks supporting SSFs. In the Arctic, the interventions focused on supporting the application of ecosystem-based management tools to build social-ecological resilience and promote sustainable use and conservation of the marine and coastal ecosystems. See Appendix VIII for more detail.

[12] See http://www.foodsovereignty.org/

interactions along supply chains are important but not presently well understood. Direct support for market initiatives may be hindered by the present lack of knowledge and proper conceptualization of these interactions.

In addition to the methods described at the beginning of this section to compile the information contained in this brief summary, we also gained access to conduct an in-depth analysis of the work the Oak foundation has conducted in two geographies during the last ten years: the North Pacific, the Arctic (mainly Alaska) and Belize. For this analysis, we were provided access to a selected sample of grants and progress reports; and conducted interviews with former grantees to better understand Oak's collective contributions to enhance knowledge capacity among organizations, resource managers, government actors, and communities. Oak's example is useful to visualize the unique role philanthropies can play when working in close collaboration with local resource users and stakeholders. For instance, in the production and democratization of knowledge and other local organizational capacities critical for the production and sustainability of responsible fishing practices outside of the control of traditional gatekeepers, such as governmental agencies for fisheries management or traditional academic institutions. See Appendix VIII for the full report.

Academic organizations and intergovernmental research organizations participating have supported a wide range of science and research on small-scale fisheries governance. TBTI for example is an open research network of over 400 researchers from 62 countries who are studying small-scale fisheries, and academic researchers also supported

Intergovernmental Research Organization: World Fish Center

World Fish Center supports science and research on sustainable aquaculture, value chains and nutrition, and resilient small-scale fisheries among others, often working at the local level in targeted areas around the world, including Bangladesh, Ghana, Myanmar, Cambodia, Philippines, Solomon Islands, Timor Leste, Vanuatu and Zambia.

The organization aims "to enhance the contribution of small-scale fisheries to poverty reduction and food security, WorldFish and its development partners' research focuses on: Resilient coastal fisheries, Fish in multifunctional landscapes and Fish in regional food systems. Critical issues include gender and other social differentiation in the control of assets and in decision-making, equitable management of resource competition, increasing the profile of fish in policy agendas, and fish trade in domestic and intra-regional food systems. Strategic investments in fisheries research, embedded in partnerships and networks, and building on the strengths of fishing communities, will sustain and improve human wellbeing and the social-ecological resilience of fishery systems."—Worldfishcenter.org

West Africa Regional Fisheries Program: Example of a Regional Program with Support to SSF

In 2009 the World Bank agreed to provide the first round of financing to the West Africa Regional Fisheries Program, aiming to support fisheries governance reform, reduction in illegal fishing and increased local processing in coastal countries from Mauritania down to Ghana. The program provided approximately $75 million over 5 years to the first four countries to participate: Cape Verde, Liberia, Senegal and Sierra Leone, with an additional $53.5 million to Ghana and $8 million to Guinea-Bissau in 2011, and in 2015 $12 million to Mauritania and $10 million to Guinea.

In many of the countries, the largest component of the financing was used by governments to increase surveillance capacity to combat illegal fishing, but also a significant component focused on pilot efforts for the state to empower fishing communities to govern designated fishing areas or fisheries.

Sources: World Bank 2009, 2011a, 2011b, 2015

the implementation of the Coral Triangle Initiative. TBTI's Information System on Small-Scale Fisheries crowd sources data from researchers on specific case studies, experiences, SSF organizations, capacity development and SSF profiles among others. Academic and research organizations have also provided capacity building targeted directly to national government agencies, including for example to incorporate the ecosystem approach to fisheries management into efforts to assist fishers and stakeholders to co-govern small-scale fisheries. At the global level, World Fish Center supports science and research on SSF in a wide range of contexts around the world (see box).

Government aid agencies and intergovernmental finance organizations have provided support directly to government agencies in many cases for a range of governance capacity building, as well as both policy development and delivery. For example, the Global Environment Facility is supporting the Coastal Fisheries Initiative with a focus on policy development and delivery in West Africa, Indonesia and Latin America, and the World Bank-funded Southwest Indian Ocean Fisheries Governance and Shared Growth Project supports policy development and delivery such as the preparation of fisheries management plans, registration of all fishing vessels, and administration of national rules governing small-scale fisheries.

The intergovernmental technical agency for fisheries—the UN Food and Agriculture Organization—provides a range of support to small-scale fisheries, from science and research, facilitation of international policy development, to capacity building of national agencies for policy implementation. For example, FAO is supporting national agencies to implement the SSF Guidelines, and also the Voluntary Guidelines on tenure. More specifically, FAO has created an "*Umbrella Program for the Promotion and Application of the SSF Guidelines*" as a partnership framework intended to host projects by multiple donors supporting the same overall goal and outcomes, with a focus on: (i) raising awareness (knowledge products and outreach); (ii) strengthening the science-policy interface (knowledge-sharing and support for

Emerging Type of Organization to Potentially Support SSFs: Impact Investment Organizations

"Private investment with a purpose," or impact investing, aims to generate social and environmental impact alongside financial return. More than $46 billion of investments under management in 2014 were considered as impact investments, with the potential to grow to $45 trillion in the next decade. As part of this emerging effort, impact investors have recently assessed SSFs for opportunity to simultaneously invest in financial, social and environmental returns. Three of the foremost examples include:

- *Althelia Ecosphere's Sustainable Ocean Fund*: An impact investment fund launched in late 2016, this fund includes potential support for SSFs, working in collaboration with civil society organizations such as Conservation International and Environmental Defense Fund.
- *Encourage Capital*: A firm that in 2013 began assessing fisheries, particularly in Brazil, Chile and the Philippines. Investment blueprints for SSFs suggested opportunities to support seafood processing companies alongside philanthropic grants for community monitoring and fishing regulation, with the aim of reducing post-harvest losses and increasing benefits to fishers (from higher prices paid to fishers).
- *Meloy Fund*: Established with $6 million in public finance on concessional terms from the Global Environment Facility, the fund is targeted to raise a total of $18 million to support enhanced seafood supply chains in SSFs in Indonesia and the Philippines, in collaboration with support provided by Rare Conservation to communities for fishing regulation.

Sources: http://www.forbes.com/sites/ashoka/2015/02/24/the-slippery-slope-of-impact-investing/; https://thegiin.org/assets/documents/pub/2015.04%20Eyes%20on%20the%20Horizon.pdf ; https://thegiin.org/impact-investing/need-to-know/#s1; Encourage Capital 2015; Global Environment Facility 2016; Althelia 2015.

policy reform); (iii) empowering stakeholders (capacity building and institutional strengthening); and (iv) monitoring of progress. Additionally, participants in the most recent COFI meeting (COFI 32) agreed on the need for a complementary mechanism to this program, in the form of a SSF Guidelines Global Strategic Framework that would function as a platform for a collective learning and monitoring (FAO 2017).

Table 9 below summarizes the different types of interventions the organizations represented in the survey and interview have supported in small-scale fisheries. Of note, there are few significant gaps even among the small number of organizations participating in the survey and interview. However, the relatively wide range of interventions supported was often at the local scale—such that support could often be characterized as "small and beautiful" in a given community or fishery, compared to "big and messy" at a higher level.

Table 9. Summary of the Types of Interventions Supported by the Organizations Participating in the Survey/Interview

Types of Interventions Supported		**Types of Organizations and Level at which Support is most often Provided**					
		Local		National		International	
		CSOs	Philant.	Gov. Aid Agencies	Intergovern. Financed. Orgs.	Intergov Tech.	Academic/ Research
Science	Biol and ecology	X	X		X		X
	Social	X	X		X	X	X
Capacity Building	Biological monitoring	X	X		X		X
	Social monitoring	X	X		X		X
	Fishers leadership	X	X		X		X
	Fisher organizations	X	X	X	X		X
	CSO leadership	X	X	X	X		X
	CSO organizations	X	X	X	X		X

table continued

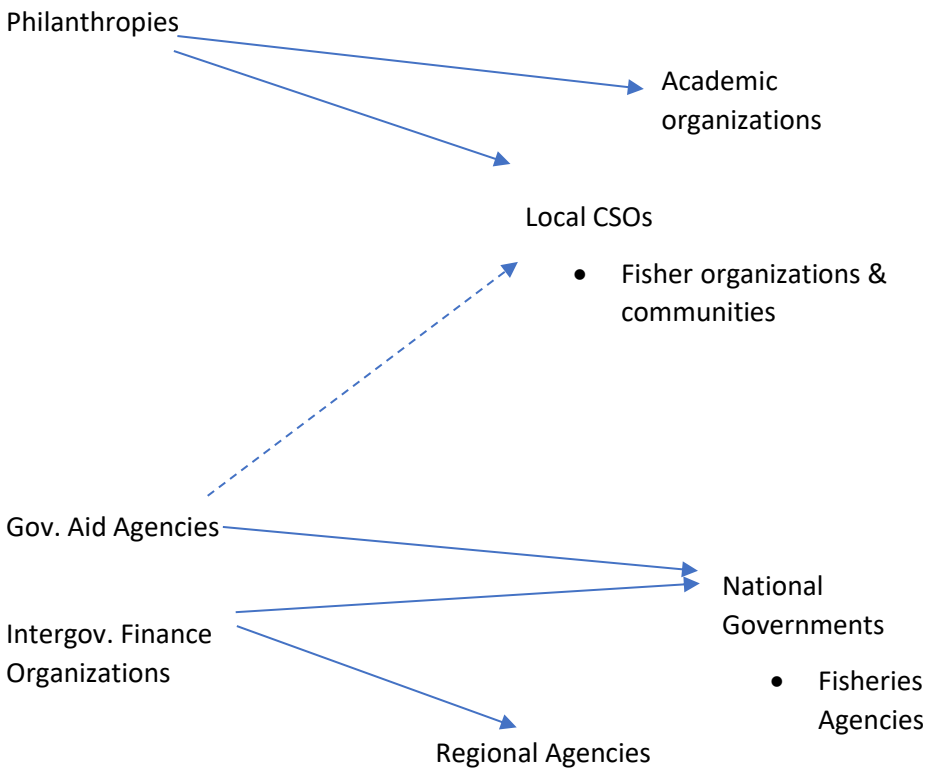
	CSO financing	X			X		
Bridging Support		X	X		X	X	X
Policy Development	Governance framework	X		X	X	X	X
	Management plans	X	X	X	X		X
	Protected areas	X	X		X		X
	Labor/Well-being Standards		X			X	
	Production/ commercialization standards	X	X			X	X
Policy Delivery	Administration of governance reforms	X			X		X
	Monitoring and enforcement	X			X		X
Alternative Livelihoods/Compensation		X			X	X	X
Tech. Innovation	Technology improvements for production and commercialization						
	Market reform	X	X		X		X
	Technology for monitoring and enforcement		X	X			

table continued

Geographies of support

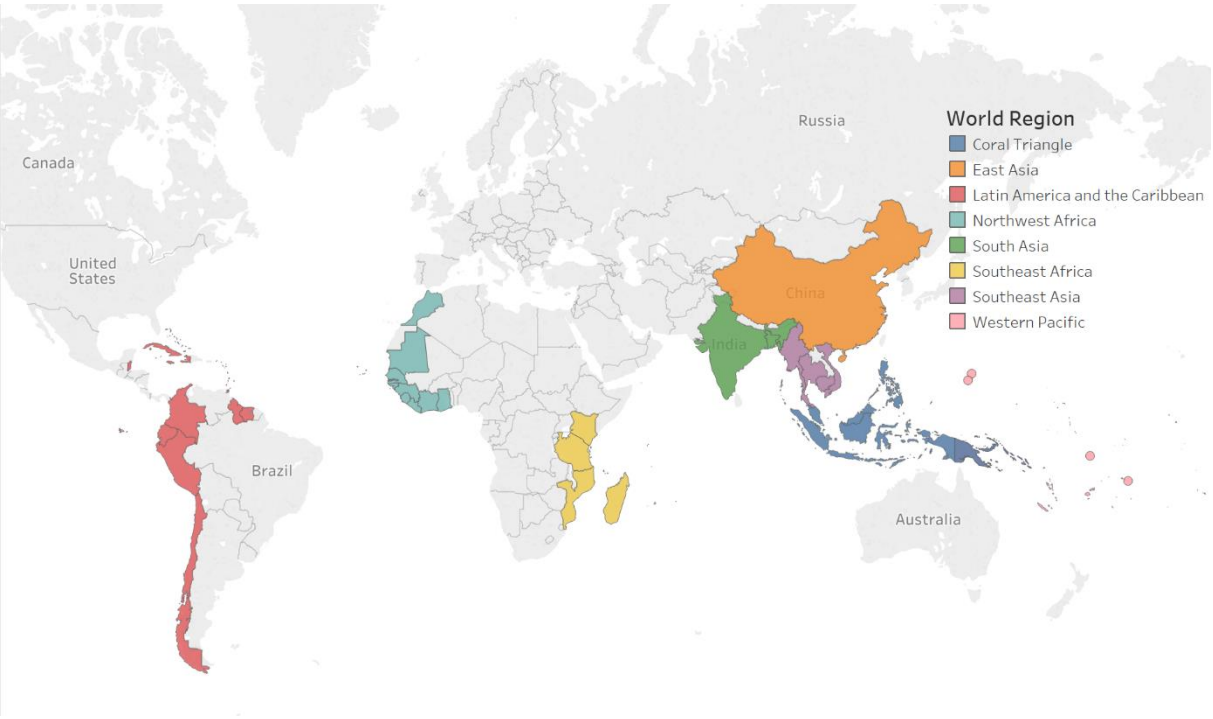
Prototype supply chains of support to small-scale fisheries. While simplistic, for indicative purposes the surveys and interviews suggest some basic or prototypical supply chains of support to small-scale fisheries that can be characterized based on comparative advantages of different types of organizations in the following Figure 16:

Figure 16. Prototypical Supply Chains of Support to Small-Scale Fisheries



These supply chains were evident most often in the geographic areas shown in Figure 17 below.

Figure 17. Countries where Small-scale Fishers are the Target of External Support (not comprehensive)



Quantifying the support to small-scale fisheries: a global snapshot of aid flows

In order to quantify the aggregate support provided to small-scale fisheries, we estimated the volume of funds flowing via a number of different finance instruments around the world, which can be categorized as either: grants (no repayment or compensation expected), concessionary capital (in the form of debt or guarantees, fixed at rates below those available on the market) or private debt and equity (capital provided at a rate of cost set by the private market) (World Economic Forum 2015; Credit Suisse et al. 2016). While private capital flows to small-scale fisheries have not yet been measured,[13] the volume of grants and concessionary capital—labeled collectively as "funding" or "aid," is more widely available. As such, we built a global database of funding to ocean fisheries (industrial and small-scale) capturing all grants and concessional loans active in the year 2015 (see Appendix VI for details on methodology and the specific organizations included). We carried this work in collaboration with Rare Conservation, given that they conducted a similar exercise during 2016. The database includes grants and loans targeted towards ocean fisheries and supporting ecosystems, for four major categories of financiers:

- Philanthropies (30 organizations included to date. See Appendix VI for specific organizations included).
- Government aid agencies (4 agencies included to date: Australia, European Union, New Zealand, USAID).
- Regional development banks (3 banks included to date: African Development Bank, Asian Development Bank, Inter-American Development Bank).

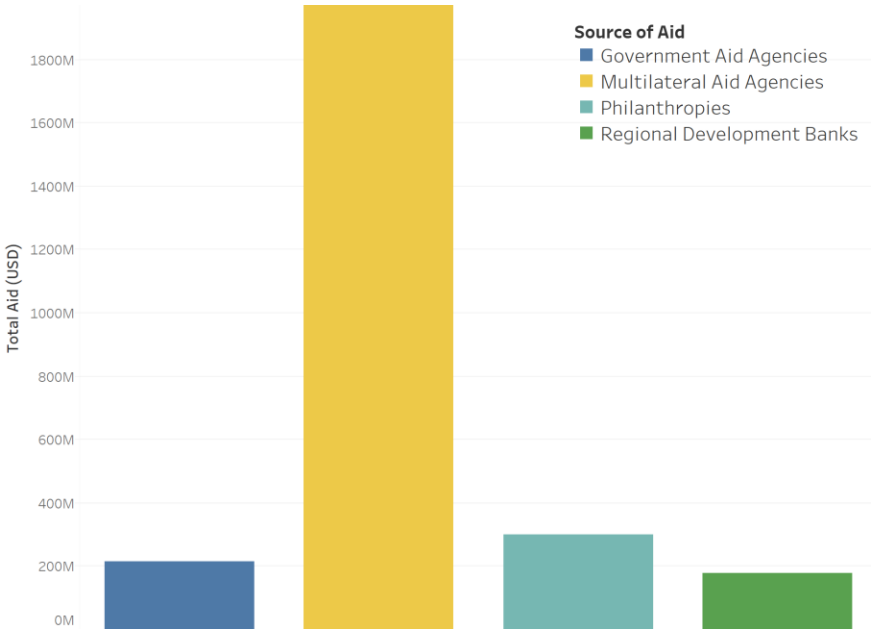
[13] While measuring private capital flows in support of small-scale fisheries can be challenging, the investments made through the endowments of philanthropies could provide a starting point.

- Multilateral aid agencies (2 organizations included to date: the Global Environment Facility and the World Bank).

Total volume of active aid to ocean fisheries in 2015, from the organizations where data was collected. For 2015, the 39 organizations included in the analysis had an active portfolio of aid to ocean fisheries and their supporting ecosystems of some US$2.68 billion, of which almost three quarters was provided by the GEF and the World Bank (see Figure 18 below). By far, the World Bank was the largest provider of funding to ocean fisheries, with a total of some US$1.4 billion in active funding in 2015 (roughly 3 percent of the World Bank's total new commitments that year)[14]—though this figure is skewed somewhat by one large project in the Philippines for roughly US$500 million. Of the 30 philanthropies included in the analysis (see Appendix VI for the full list) and shown in Figure 17, the top five by volume of funds active in 2015 were:

- The Gordon and Betty Moore Foundation,
- The Oak Foundation,
- The David and Lucile Packard Foundation,
- The John D. and Catherine T. MacArthur Foundation, and
- The Marisla Foundation.

Figure 18. Total Active Funding to Ocean Fisheries in 2015



Geographic distribution of funding to ocean fisheries. From the multilateral funding agencies assessed, over 70 percent of the active funding to ocean fisheries was targeted to six countries or regions listed below. There is no conscious strategy or overarching guiding policy within multilateral funding agencies in the

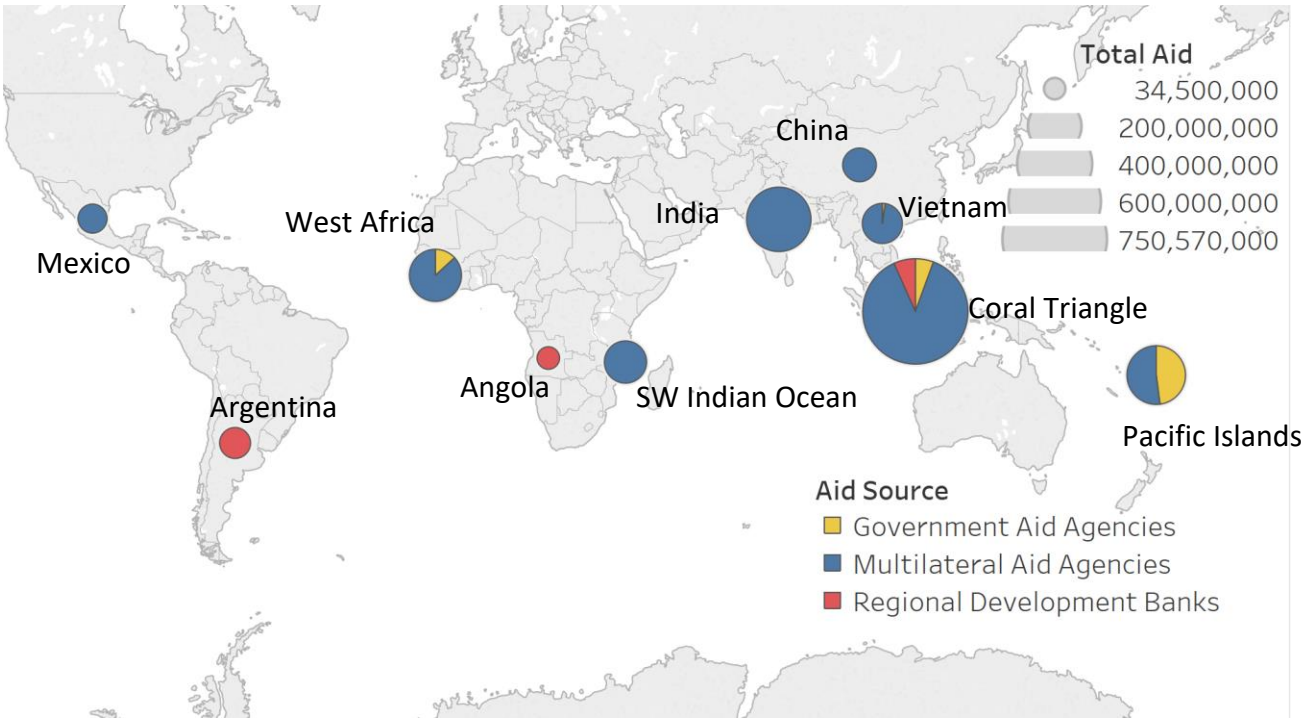
[14] Commitments only from the International Bank for Reconstruction and Development and the International Development Association, see: http://www.worldbank.org/en/about/annual-report/wbg-summary-results

selection of the regions to work in, these are demand-driven from the countries. Although there are funding path dependencies. The regions are:

- The coral triangle (Indonesia, Malaysia, Papua New Guinea, Solomon Islands, Timor Leste): 33 percent;
- India: 14 percent;
- Pacific Islands: 6 percent;
- Southwest Indian Ocean (Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Tanzania): 6 percent;
- Vietnam: 5 percent; and
- West Africa (Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mauritania, Morocco, Senegal, Sierra Leone): 8 percent.

Noticeably, relatively little amount of funding was targeted to fisheries in China and Latin America, although it is likely this reflects to some extent the priorities of the government funding agencies included in our analysis. The geographic distribution of the majority (over 80 percent) of the funding from the government aid agencies, regional development banks and multilateral aid agencies is shown in the Figure 19 below.

Figure 19. Geographic Distribution of 80% of Ocean Fisheries Aid (excludes philanthropies)



Ocean fisheries aid explicitly targeted to small-scale fisheries. While the data is not always clear, an initial scan of the project titles, and where available objectives, suggested a total of some US$321 million explicitly targeted to coastal, artisanal or small-scale fisheries and/or fishing communities, equivalent to almost 14 percent of the $2.38 billion in active ocean fisheries aid provided by government aid agencies, regional development banks and multilateral aid agencies. This is likely an underestimate, as many projects targeting fisheries broadly, have specific components or activities targeted explicitly to small-scale fisheries, that may not be captured in the summary data.

The estimate is comparable with estimates generated by Rare Conservation, looking at multilateral aid agencies and regional development banks. Rare identified a total of US$1.8 billion of aid in projects "related to small-scale fisheries" from 2000 to 2016, equivalent to some $107 to 363 million of annual aid in projects that are "potentially relevant for small-scale fisheries."

While the data are incomplete and the level of detail not always sufficient to determine exact amounts and proportions targeted to small-scale fisheries, the order of magnitude is indicative: close to $3 billion in aid provided in recent years to ocean fisheries, with at least 10 percent of that total explicitly targeted to small-scale fisheries (the ocean's largest employer).

In terms of next steps, we will aim to: (i) continue to build out the database, for example working to collect further data from government aid agencies; and (ii) expand the analysis to provide a more detailed break-out of support specifically targeted to small-scale fisheries, and aim to identify more clearly the flow of funds by geography and the organizations supported.

RECOMMENDATIONS FOR INCREASED SUPPORT FOR SMALL-SCALE FISHERIES GOVERNANCE

This section provides a brief synthesis of some of the opportunities for increased external support to SSF which were: (i) extracted from the review of the scientific literature (see Chapter V); (ii) recommended by practitioners surveyed and interviewed (see Chapter VII); (iii) proposed in the discussions held during the workshop on February 7th and 8th in Durham, North Carolina (see Annex IX); and (iv) reflected from the authors' experiences. The discussions held during the workshop constitute the majority of the data set from which these recommendations were generated. Of note, this section aims to provide a synthesis of recommendations generated from the four sources of data referenced above, rather than a formal strategy for external support to SSF consistent with instruments such as the SSF Guidelines—though could hopefully contribute to such an effort.

The starting point and common goal of recommendations

As a starting point, we asked the question to experts and practitioners: what do you think has been effective in supporting SSFs? Governance of many common pool resources such as the fish stocks and ecosystems supporting SSFs trended in the 1960s and 1970s towards government ownership and essentially nationalization (National Research Council 2002). Certainly, in the case of fisheries, with the signing of the United Nations Convention on the Law of the Sea (UNCLOS) in 1982, government jurisdiction over the use of fish resources in exclusive economic zones was internationally recognized (Wang 1992). As a result, in fisheries as in so many other common pool resources, indigenous forms of governance were typically rejected but rarely replaced by the state (as many governments did not have the capacity to monitor the resources), often leading to de facto open access conditions (National Research Council 2002). Since that time, and across diverse contexts, almost all answers to the question of what has been effective in supporting SSFs, as well as citations in many case studies in the literature, describe efforts to return more control of SSFs to fishers and fishing communities. These efforts to empower fishers and fishing communities to govern the resources and associated ecosystems have many labels and different nuances (e.g. "community-based management," "collaborative or co-management," "territorial use right fisheries," etc.), but all share this common feature of greater self-governance. There is a rich history of these efforts, but a key distinction is that these solutions are local (and more are needed). The main challenges thus are developing better understandings of how to devolve or share authority between the State and local users, and how to best communicate lessons learned from specific local examples as not to incentivize future nationalization efforts under the pretext of "scaling up success" that would repeat the history of the past.

These diverse (and arguably scattered) local level efforts to empower communities and fishers to govern SSFs, for example via co-management models, have shown positive results in many cases. Particularly now that the SSFs Guidelines have been agreed, hope was expressed among practitioners for increased support to SSF communities in order to implement these guidelines, with goals of empowerment and protection of human rights as a focus, particularly assisting fishers and stakeholders to have a political voice (e.g. through better organization to be part of the policy dialogue). Additionally, opportunities are emerging for SSF governance inclusive of the supporting ecosystems, as well as the underlying fish stocks. Some practitioners also expressed optimism in efforts to strengthen property rights in SSFs to create economic incentives for conservation and potentially wider access to capital, through support to tenure systems based on the Voluntary Guidelines for tenure.

An important aspect to these small, numerous and arguably scattered "bright spots" of local SSF governance reform worldwide, is the broader social context in which they occur. According to the scientific literature, the "problem" that governance reforms have tried to solve in SSF in recent years has been characterized as overexploitation of the resource, and increasingly conflicts over the value and use of the resources. The latter has led to a broader view of SSF governance as social policy, where fisheries are nested within wider governance challenges in a given place. This broader focus is reflected in the SSF Guidelines, and approaches that aim to address not just overexploitation but the security of human rights in a given place—or "place-based approaches." Similarly, broader perspectives have described SSF "value chains," to look at the size and distribution of economic benefits along the entire supply chain, from fishing (and preparations for fishing) to consumption.

Given these perspectives, the recommendations emerging from this process all aim to help empower small-scale fishers and communities to govern the use of the resources, and are oriented around a given place, taking into account the broader social context (though questions remain as to what governance structures or essential social services would need to be in place for fisheries-specific reform to succeed). This could almost be considered a vision for a post-UNCLOS world, where states return some or all the control over SSF to the fishers and fishing communities, helping to empower them to adjust to the larger and rapid global drivers of change affecting so many of these areas (e.g. technology development, urbanization, etc.). As such, the question today is no longer focused on whether or not states should return or share more of the governance of SSF with the users, but how.

The common goal of these recommendations for increased external support to SSF is to empower small-scale fishers and fishing communities to govern the fisheries resources and ecosystems that they use, in a manner consistent with the SSF Guidelines and at a spatial scale large enough (in aggregate) to meet and expand the Sustainable Development target 14(b) to "provide access for small-scale artisanal fishers to marine resources and markets."

Overarching principles and guidelines for increased external support to SSF. While referenced in the goal above, it cannot be repeated enough that the global policy instrument for SSF, the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (the "SSF Guidelines"), provides the overarching principles and guidelines for the following recommendations for increased external support to SSF. This instrument includes guiding principles for:

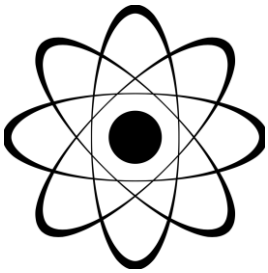
- Human rights and dignity
- Respect of cultures
- Non-discrimination,
- Gender equality and equity,
- Equity and equality
- Consultation and participation
- Rule of law
- Transparency
- Accountability
- Economic, social and environmental sustainability,
- Holistic and integrated approaches
- Social responsibility
- Feasibility and social and economic viability

Furthermore, guidelines are provided for: (i) responsible fisheries and sustainable development, including governance of tenure in SSF and resource management, social development employment and decent work, value chains, post-harvest and trade, gender equality, and disaster risks and climate change; and (ii) ensuring an enabling environment and supporting implementation, including policy coherence, institutional coordination and collaboration, information, research and communication, capacity development, and implementation support and monitoring.

Recommendations

The recommendations are organized based on the type of intervention to be supported (according to the typology developed in Chapter VII), and the level or entry point at which they would occur (global, national or local).

Science and research: what do we know about SSF? There is still relatively little knowledge of outcomes and impacts from different types of governance interventions in various contexts, and particularly the social dimensions. For instance, under what conditions is co-management or community-based management more successful at leading to sustainable or more equitable use of marine resources?



Science & Research

However, opportunities may exist to learn from other sectors where globally coordinated support has helped to change behavior, such as public health or education for example, diffusion of innovation in agriculture, or support for smallholder organizations in coffee or cocoa sectors. Practitioners shared experiences of weaknesses in public statistical systems to capture socio-economic measures of SSFs, leading to their under-representation in national policy-making. An increased global effort to support SSF governance will need sustained and enhanced coordination of research. Developing lessons learned from efforts of the TBTI network, would be desirable in order to connect the experiences from disparate and localized support.

Additionally, there is still far too little information available on a global scale about the size and distribution of SSF, and the persons and communities affected by them. Given the informal nature of many SSF activities, where they are neither regulated nor protected by the state, surprisingly little is known about the largest employment category in the ocean. To date, there is not yet even a global consensus on the definition of SSF (for example the Government of Ghana considers large canoes operated by Fanti fishers as "artisanal" or "small-scale," while the Government of Liberia categorizes them as "semi-industrial"). How SSF are defined will impact how SSF problems are defined, and subsequently the goals and responses of governance. Part of the challenge lies in the diversity and broad range of activities captured by this term "small-scale fisheries." Rather than changing the term or attempting a long process to achieve global consensus on its definition, perhaps a more useful step to support better problem definition would be agreement on sub-categories based on the purpose of the SSF activity in question, e.g.:

- Commercial—export
- Commercial—local
- Subsistence

However, even with more precise sub-categories by which to classify types of SSFs, a fundamental challenge to global analysis remains the difficulty of defining what is the unit of analysis in SSFs. Ideally discrete SSFs could be identified and inventoried around the globe, as a basis for categorizing the forms of governance in use and eventually measuring the outcomes. Yet as an activity that is inherently multi-

sectorial and inter-sectorial identifying on a map where one SSF ends and another begins is challenging, and likely only feasible based on talking to fishers and drawing upon local knowledge.

With these caveats in mind, the following five recommendations can be suggested for increased science and research effectiveness in support of SSF governance, at the global and national levels.

Global level (working with FAO and building out TBTI):

- "Crowd in" a global data set of empirical knowledge on the conditions where SSFs management is more successful at leading to sustainable, or more equitable use of SSF. Building a node on the TBTI platform, connect and expand existing data sets on case studies of external support to SSF (i.e. "map the practice"), with an agreed methodology (e.g. a common set of variables to be measured where possible) for the characteristics to be studied in the cases and data to be collected for the addition of new cases, to permit comparison (with an emphasis on any measurable outcomes) as well as enhanced coordination. For practitioners (who often compete with each other for funding and branding) to find incentives to contribute their case studies to such database a framework would need to be effectively designed so that practitioners can benefit from the "branding" of their case studies while at the same time benefiting from contributing them to a global database for analysis and collective lessons learned. Case studies and data would be presented to facilitate greater transfer of knowledge and to showcase the efforts of supporters—helping to "connect the dots" among many scattered and localized cases. For example, Sphaera's Resilience Exchange15 could be explored as a potentially useful platform for development of this node to TBTI. Additionally, as part of this effort:
    - develop a list of some of the largest external support efforts to SSF over the last 30 years to learn more in depth from that sub-set; and
    - identify pilots around the world in the use of information communication technology to enhance SSF safety at sea and reporting on fish catch and effort.
- Conduct a global scan of tenure governing access to SSF in collaboration with fishers, starting with a scan of how space is partitioned among various fisheries to determine the spatial boundaries for tenure system (considering information on any conflicts with other uses of the space), and then document the types of tenure systems in place through participatory research (including legal, informal and customary, practices). This would include mapping patters of SSF fishing effort, with a focus on highlighting overlaps with industrial fishing effort (as external risks to local tenure) based on questions to SSF organizations. Highlight those governance structures that have supported tenure consistent with the Voluntary Guidelines on tenure (as a basis for developing dynamic tool-boxes that others can use); report tenure systems in FAO's State of World Fisheries and Aquaculture (SOFIA) report. In the process of identifying existing tenure rights, such work could be contributed towards their recognition or legitimization, as well as providing a basis for political analysis to empower SSF.
- Map the SSF value chains linked to the fisheries identified above, including development of a database starting from existing data sets (such as the Fisheries Performance Indicators database), that would include the features of different fisheries, markets,

[15] See: https://resilience-exchange.sphaera.world/

structures for benefit sharing—presented in an innovative format, open source and platform tool, together with a tool kit for SSF value chain analysis.

- Facilitate SSF communities to tell their story more broadly, working with SSF associations, to collect local knowledge and stories for communication through attractive visualization tools with policy-makers and other influential actors.
- Measure the size and distribution of small-scale fisheries
    - Updating global estimates such as the 2012 Hidden Harvests study, which extrapolated from a number of case studies to estimate the size and distribution of small-scale fisheries (e.g. employment, production, etc.), and their socio-economic importance; and
    - FAO to encourage countries to provide more data on small-scale fishers and fisheries through census and survey questionnaires, to expand the global statistics on SSF, supporting national agencies to collect more data (e.g. through registration of SSF vessels).

Capacity building: can SSF organizations and associations be the agents of governance reform? As mentioned previously, much of the scientific literature on SSF reviewed focuses on forms of governance, with relatively little attention to the role of agents of governance, and/or agents of governance changes. At the same time, fishing cooperatives (i.e. collectives and associations), have shown to be a durable form of organization among fishers, and one that is growing as global and regional cooperatives emerge and develop. For this reason, many practitioners and participants in the workshop referred to the potential of SSF organizations to serve as agents of governance reform and even "entry points" for support to fishers and communities, and the opportunity to provide more support and capacity to these organizations.

Capacity Building

The following four recommendations are proposed to help build capacity of SSF organizations at various levels to act as agents of governance reform.

Global level (SSF CSOs, FAO, TBTI, universities):

- Conduct a diagnostic of SSF organizations at the national and regional levels to identify opportunities for capacity development, map organizations
- Support a capacity building platform for SSF organizations (potentially with a secretariat and link to TBTI), linking researchers to global, regional and national organizations that could begin to work with fishing communities at a larger spatial scale, including:
    - Training and learning opportunities for young SSF leaders, with a focus on women, e.g. fellowships and regional/global activities among leaders, investing in leadership and the next generation, building capacity of fishers to be their own advocates and have a greater political voice,
    - Collaborative research partnerships between SSF organizations and universities/research agencies, providing real-time advice on policy, legal, organizational aspects, human resources, etc.
    - Knowledge exchange and learning among practitioners, through creation of a neutral space for exchange and collaborative problem solving, for example through working groups on certain issues or study tours to solve specific problems, or formation of

small solution groups (e.g. 3 persons from one area and 3 from another) to work together on a given problem

- Annual workshops of practitioners and stakeholders, to help build coalitions and share lessons learned, further building a global community and common purpose amongst SSF organizations, to identify common challenges, share lessons learned and build coalitions around common issues. Follow-up surveys to the workshop conducted during this research suggested utility in continuing to bring together such a diverse group to exchange experiences of support to SSF and focus on tangible progress—potentially in an annual meeting on SSF practice.

- Link this capacity building effort to COFI meetings, to further political voice for SSF organizations to global policy-makers

National level:

- Develop and conduct trainings for government agencies to increase their support of SSF organizations and communities, including support for management of fisheries and supporting ecosystems

Bridging support: can we connect many of the local SSF "bright spots" around the world? Given the dispersed and relatively uncoordinated nature of SSF governance reform efforts across a large number of areas relatively small in geographic size, some efforts have found success in promoting extra-local and even regional or global networks between them. In connection with the recommendations for science and research to crowd source case studies under the Science and Research recommendations, and for capacity building, the following two recommendations are proposed in order to help bridge successful communities and organizations.

Bridging Support

Global level:

- Support global, regional and multi-local networks and partnerships of SSF organizations and communities, drawing upon examples such as the LMMA network, with a focus on increasing visibility of successful projects; and
- Collect lessons learned on successful fisher networks and prepare a guide.

Policy development and delivery: directly empowering SSF organizations and communities to govern (or giving back what was claimed by the state after UNCLOS). Though perhaps fewer in number, the core of all the recommendations in this report revolves around continuing and expanding the long and complex task of working with all relevant local leaders and SSF groups to exercise greater governance over the use of the resources and supporting ecosystems, considering the wider social context in which they occur. This is in fact where most of the effort to support SSF has been focused over recent decades in a variety of ways, with a number of positive outcomes documented. Practitioners emphasized the value in "staying the

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course" by keeping direct support to SSF communities and governments, just expanding to provide much more of support: if there are 500 such efforts in villages around the world, then an order of magnitude more might be needed. Of course, the timeframe for the outcomes from such efforts is long—often decadal rather than annual.

For this reason, the following recommendations suggest continued focus and expansion of such efforts, including collaboration with state agencies for any legal recognition and support needed.

National level:

- Support government agencies to incorporate SSF into national economic and planning frameworks, and ensure that relevant laws and administration are consistent with the SSF Guidelines, empowering and supporting SSF organizations and communities to take a greater role in governing fishing activity;
- Where there is spatial overlap between industrial fisheries and SSF, consider supporting separation—through for example the development, administration and enforcement of nearshore or coastal zones reserved exclusively for SSF in order to reduce conflict, drawing upon emerging technologies to monitor zones (e.g. satellite monitoring systems, drones, etc.), including enhanced transparency to make industrial fleet licenses and locations public (e.g. on a short delay or in an aggregated form to protect any commercially sensitive information); and
- Support better reporting on SSF catch and effort, as it is largely unreported (a "U" in IUU), drawing upon advances in information communication technologies, with a focus on registration of small-scale vessels.

Local level:

- Support local, place-based institutions to take a greater role in governing the use of the SSF resources and ecosystems, drawing as needed upon science and monitoring, legal recognition of tenure, to help appropriately regulate access—recognizing that fisheries policy is social policy and the latter is fundamental to any changes to SSF governance; and
- Utilize technology, social media, local NGOs, etc. to help local institutions have a greater political voice at the national level.

Recommendations to support alternative livelihoods to fishing or compensation for reduced fishing. Relatively little discussion emerged on the questions of conflicts over resource use within SSF, even in the event where fishers and fishing communities are empowered to govern. Where SSF effort has grown beyond the capacity of the stocks and ecosystems to sustain yields at desired levels, such "overcapacity"[16] could potentially drive overexploitation and food insecurity. In such contexts, can the number of boats and fishers be reduced without

Alternative Livelihoods

[16] FAO provides a range of definitions for the term "excess capacity," including: "In the short-term, fishing capacity that exceeds the capacity required to capture and handle the allowable catch. In the long-term, fishing capacity that exceeds the level required to ensuring the sustainability of the stock and the fishery at the desired level." See http://www.fao.org/faoterm/en/?defaultCollId=21

exacerbating poverty, in a manner consistent with the SSFs Guidelines? Are there proven examples of support to alternative livelihoods that have helped reduce capacity without exacerbating poverty—e.g. guaranteed lines of micro-credit for fishers and processors? Given potentially high costs, can innovative financing arrangements play a role in supporting governance reform, such as the recent "blue bond" issued by the government of Seychelles to provide public finance for fisheries governance reform, with a partial credit guarantee from the World Bank to help reduce the government's cost of capital? Perhaps experiences from other sectors could be customized to particular SSFs, such as "conditional cash transfers" for fishing communities in transition, or block grants for infrastructure and social goods under "community-driven development" schemes? Even commercial insurance packages developed for SSF where they are formalized (e.g. boats are registered)? These remain open questions that SSF groups and communities may increasingly confront, particularly in southeast Asia and west Africa.

Financing increased external support to SSF governance

As Chapter VII describes, an initial and incomplete assessment of available data suggests active aid to ocean fisheries on the order of US$2.68 billion globally (from multilateral aid agencies, government aid agencies, regional development banks and philanthropies), of which at least $321 million could be clearly identified as explicitly targeted to coastal, artisanal or small-scale fisheries (excluding philanthropic funding). While this likely underestimates the level of aid to SSF, it does provide a baseline. Of course, a more detailed assessment of needs and costs would be required to estimate the total costs of various scenarios of increased external support to SSF, from which this baseline could be subtracted to determine the SSF financing gap.

What is clear from the discussions, is that to see SSF governance reform widely enough that the aggregate impact would result in achieving the relevant Sustainable Development Goal targets, much more aid—as well as private capital and investment—will likely be required. Many practitioners suggested the need for a stronger case and narrative about the importance and challenges facing SSF, in order to generate this increased support. Such a case would provide a global synthesis of more data on the role of SSF in the wider development context—e.g. providing nutrition, incomes, and safety nets to help meet the first two Sustainable Development Goals focused on ending poverty and hunger. The case would connect both development and conservation objectives, following the SSF Guidelines, to push organizations to provide more support.

Building upon such a case, establishing a global financing mechanism for SSF over the long-term, based on the SSF Guidelines, would seem justified. As shown in Chapter VII, the largest pool of capital currently providing aid to SSF comes from multilateral aid agencies, and more specifically the World Bank. The Bank provides two types of financing relevant for SSF: (i) favorable loans to governments of middle-income countries (i.e. in larger volumes, with longer maturities than world financial markets would typically provide)[17]; and (ii) concessional loans or grants to governments of lower-income countries (at rates far below what world financial markets would typically provide. This financing invests in priorities determined by the governments to reduce poverty, which has increasingly included fisheries governance reform since 2004. However, the standard project cycle for such investments typically follows more detailed analysis and diagnosis of needs and opportunities in each sector of an economy, upon which financing priorities are developed. In the case of fisheries and certainly SSF, such activities have often been ignored or under-analyzed in the design of governments" macro-economic policies and

[17] See: http://www.worldbank.org/en/about/what-we-do/brief/ibrd

hence priorities for World Bank financing. For this reason, the Bank has often agreed to host financing mechanisms such as trust funds capitalized by other donors, for a range of purposes that may include such upstream analyses and diagnostics to better assess national policy priorities for poverty reduction—such as SSF governance reform.

After formally re-starting support to fisheries governance in 2004 (Virdin et al. 2004), the World Bank established the Global Program for Fisheries with a multi-donor trust fund to provide analytical work to identify opportunities for fisheries governance reform. During the last ten years, in part with such support the Bank's portfolio of support for fisheries, aquaculture and supporting ecosystems has increased some US$500 million to $1 billion (Patil et al. 2016). Interested donors could follow a similar model, to create a SSF fund at the World Bank, or an SSF window within the existing fund, to support national and local governance reforms consistent with the SSF Guidelines.

APPENDIX I. METHODS

Synthesis of available information on global small-scale fishing activity

We reviewed available data and gray literature from FAO estimating the size and distribution of small-scale fishing activity worldwide, as well as the socio-economic contributions of this activity. We included a 2012 global estimate of this activity conducted jointly by the World Bank, FAO and World Fish Center ("Hidden Harvests"), as well as other key studies referenced in the information available from FAO. While not exhaustive, this effort aimed to provide a baseline of existing knowledge on the global size, distribution and socio-economic contributions of small-scale fishing.

Small-scale fisheries global database: descriptive analysis

We constructed the database of articles using a variety of supporting software. First, we retrieved and imported article reference information and pdfs into an EndNote library. Then we exported reference information for each article into an Excel worksheet, where each article represented a row in the database. Additional columns were added to the database, representing attributes about each paper including the countries studied, the scale of the resource system, water system type, and whether the fishery was wild capture or farmed. Each article was read to extract information about each attribute and entered into the database. This research is ongoing, we have entered all articles from 1960-2005 so far.

From this database, a variety of summary statistics and visualizations were constructed to represent the diversity and patterns present in the small-scale fisheries literature over time. For the descriptive analysis of the scientific literature we analyzed all articles published in English from 1960-2005 (N=605) using Tableau. We created a variety of maps, charts and graphs to visualization trends in the scientific small-scale fisheries literature based on temporal and geographic scales.

Small-scale fisheries global database: discourse analysis

A database of all articles published on small-scale fisheries from 1960-2016 was constructed by retrieving articles from Web of Science, BIOSIS Previews, MEDLINE, Zoological Record, and Journal Citation Reports and the search terms; "small-scale fisher* OR artisanal fisher* OR fisher folk OR fishing community*." Additionally, we searched on PROQUEST which allowed to search on databases and journals with a focus on finding social science and humanities journals and relevant papers not accessible in the above referenced databases. This yielded a total database of N=2,634 primary and secondary peer reviewed articles but excluded books and book reviews.

For the qualitative discourse analysis, all articles from 1960-1970 (N=41) were read and coded for issues related to governance. Beginning in 1980 (due to the volume of articles) we turned to a random sampling strategy. First, using a set of 18 search terms related to governance, we restricted the data set to articles that directly addressed governance issues (included one or more of 18 key governance terms[18]). From this subset of articles related to governance, we sampled 25% of the articles from the 1980's (n=22) and 22%

[18] Key governance search terms; "governing" OR "governance" OR "govern" OR "governed" OR "comanagement" OR "co-management" OR "community based" OR "community-based" OR "tenure" OR "decentralized" OR "decentralize" OR "rights-based" OR "policy" OR "regulate" OR "open access" OR "open-access" OR "cooperative" OR "management"

from the 1990s (n=45)—for a total of n=108 articles read and coded for this analysis (32% of the total N=333 articles published from 1960-1999). This is ongoing research and we plan to continue this sampling strategy to code the articles published between 2000-2016.

Qualitative analysis followed an inductive, iterative coding strategy based on grounded theory. Grounded theory is a rigorous research procedure principally interested in the discovery of emergent core conceptual categories (Walsh et al. 2015, Strauss and Corbin 1967). Within the data, emerging concepts are conceptually sorted and related to each other until they can be relationally arranged in an outline. The focus of this analysis was to find the core concepts about governance (and their relationships) within the scientific literature on small-scale fisheries. This method leaves space for themes to emerge from the data rather than be predetermined (Walsh et al. 2015). What emerged from this deductive process was a set of core categories (that we constructed as questions) about governance that the scientific literature addresses. Within each core category there are nested subcategories.

Ethics analysis of the academic literature

As opposed to the broad approach we took for discourse analysis above, here we aimed at depth in coverage. From a subsample of 951 articles (9% total coverage) spanning between 1960-2010. We randomly selected a sample of papers for each decade. The distribution of the sample across decades was as follows: 1960s (5 articles, 100% coverage), 1970s (13 articles, 100% coverage), 1980s (10 articles, 15% coverage), 1990s (20 articles, 11% coverage) and 2000s (35 articles, 5% coverage). The analysis aimed at identifying where ethics came to play within the scientific literature, noting that they are often buried within descriptive content. The approach to ethics here, then, is not a secondary moment of evaluation and prescription subsequent to description, but is rather an uncovering of ethical content and the moment of ethics within the moment of description. In addition to identifying the site of ethics in the literature, we also aimed to frame an ethics analysis rather than prescribe particular ethical positions with reference to consequentialist, deontological, or areteological modes of reasoning. The purpose of this approach is to provide fisheries actors with robust frameworks to consider the unique particularities of their fisheries contexts.

Small-scale fisheries global database

Additionally, a separate database was constructed from the same data set (of published articles on small-scale fisheries) where attributes about each article were recorded. These include the geographic location (country, region), type of fishery (aquaculture or wild-capture), water system (inland freshwater, estuarine/marine), and scale of the resource system under study (local, regional or global). From this database, a variety of summary statistics and visualizations were constructed to represent the diversity and patterns present in the small-scale fisheries literature over time. This portion of the analysis is also ongoing. Currently, we have all attribute data for articles published up to 2006 (n=690).

On-line survey of small-scale fisheries stakeholders

We used a structured survey to facilitate a global scan of activities being conducted by a number of stakeholder groups we identified in support of small-scale fisheries. These included academics, philanthropy, fishing association representatives, non-academic experts and practitioners, civil society organizations (CSOs), and intergovernmental, multilateral and bilateral agencies.

The survey targeted professionals working with small-scale fisheries to get an overview of past and present status of activities and investments in support for small-scale fisheries. The survey was distributed purposively to 61 individuals based on their organizations known involvement in support of small-scale fisheries: we received 16 responses (response rate=26%). Survey participants were contacted through email and sent an overview of our research objectives, a confidentiality statement and a link to take the survey through Qualtrics. The survey took approximately 10 minutes to complete.

We asked respondents to name and describe the most recent activities (up to 5 activities) their organization funded in support of small-scale fisheries, the type of activity and information on the location, funding, and timeline for each. Additionally, this data supplemented and served as background information for the semi-structured interviews.

Phone semi-structured interviews

To complement and follow-up the online survey we conducted 15 phone semi-structured interviews. Generally, we asked interviewees: what was their organization doing to support SSF governance, what did SSF governance meant in the big picture for them, and which where the main opportunities they saw to externally support SSFs. Our goal was to complement and obtain more nuance to the information collected through the online survey. Because not all these interviewees participated in the online survey, this process also allowed us to increase our reach of the work a diversity of stakeholders outside of academia are conducting. Interviews generally lasted an hour and were conducted by Xavier Basurto and/or John Virdin.

Global scan of financial flows

The database includes grants and loans targeted towards ocean fisheries and supporting ecosystems, for four major categories of financiers: (i) philanthropies (30 organizations included to date), (ii) government aid agencies (4 agencies included to date); (iii) regional development banks (3 banks included to date); and (iv) multilateral aid agencies (2 organizations included to date: the Global Environment Facility and the World Bank). For the philanthropies, the Foundation Center Database was searched for the 30 philanthropies known to be most active in supporting fisheries and marine conservation, with grants included that started after 2012. For the government aid agencies, publicly available databases and grey literature were accessed from the websites and checked with staff from each agency where possible, to construct the database. For the regional development banks and multilateral aid agencies, all projects are maintained on publicly accessible databases on their respective websites. A common set of search terms was used in all cases: Ocean OR Oceanscape OR Coastal OR Marine OR Fisheries OR Fishery OR Fish OR Fishing OR Coral Reef, except for the Inter-American Development Bank database which has only been searched with Fishery or Fisheries to date. Data generated by the searches for the relevant time periods were included in the database, and then reviewed for inclusion to see where it was readily apparent the grants or concessional loans were not applicable—either for landlocked countries or where the title or objective indicated clearly that it was not relevant (e.g. a project on “persistent organic pesticides”). See Appendix VI for more detailed information on the approach used for the global scan of financial flows to support small-scale fisheries.

Global workshop of experts and practitioners

On February 7 and 8, 2017, we hosted a global workshop at Duke University of over 60 experts and practitioners to share experiences and suggest recommendations for future directions of support to SSF governance, based on an early draft of this document as a discussion paper. Participants included representatives from academia, fisher associations, international non-governmental organizations, regional agencies, philanthropies, research agencies, FAO and the World Bank among others. Discussions from small groups and the plenary provided insights captured in the recommendations.

APPENDIX II. DEFINITIONS OF SSFS OF IN NATIONAL POLICY INSTRUMENTS FOR WEST AFRICA AND SOUTH EAST ASIA

Country	Name	Definition	Source
Guinea-Bissau	Artisanal	Vessels with motors less than 60 horsepower, and length less than 18 meters	Foreign Fishing Agreement with Senegal: http://www.minpesca-gw.org/RGB-SENEGAL%202013.pdf
Ghana	Artisanal	Traditional canoe fishing carried on by a citizen. Canoe is defined as any planked, dugout or fabricated vessel which is propelled by means of sails, oars, paddles, outboard engine or a combination of any of them	Ghana Fisheries Act; Act No. 625; 2002
Indonesia	Small-Scale Fisherman	Individual that has a livelihood or source of income from capture fisheries to fulfill his daily needs, that uses a boat of less than 5 gross tons	Indonesia Fisheries Act; No. 45; 2009
Liberia	Artisanal Fishing	Small scale commercial fishing using an artisanal fishing vessel where the owner is directly involved in the day-to-day running of the enterprise.	Regulations Relating to Fisheries, Fishing and Related Activities for the Marine Fisheries Sector in the Republic of Liberia. The New Fisheries Regulations - 2010. Liberia Official Gazette, Vol. IX, No. 43
	Artisanal Fishing Vessel	Any fishing vessel, canoe or un-decked vessel of not more than 60 feet which is motorized or un-motorized, powered by an outboard or inboard engine with a capacity not exceeding 40bhp, sails or paddles, used for artisanal fishing in the "Fisheries Waters"	
Mozambique	Small-Scale Fishery	Defined as artisanal and semi-industrial fishing	Fisheries Law No. 22/2013
Philippines	Small-Scale Commercial Fishing	Fishing with passive or active gear utilizing fishing vessels of 3.1 gross tons up to 20 gross tons	Philippines Fisheries Code; Act No. 8550; 1998

table continued

Sierra Leone	Artisanal Fisheries	The traditional fishing in Sierra Leone using artisanal fishing gear and vessels	The Fisheries Management and Development Decree, 1994. Supplement to the Sierra Leone Gazette Vol. CXXV, No. 58
	Artisanal Fishing Vessel	Includes any local fishing vessel of not more than 60 feet which is motorized or not motorized but does not include vessels used for recreational fishing	
Tanzania	Artisanal Fishery	Fisheries operating in shallow waters which extend to about 4 kilometers offshore, using small sized vessels and gears including small boats, dhows, outrigger-canoes, canoes and dinghies.	Management Plan for the Tanzanian Artisanal Fishery for Small and Medium Pelagic Fish Species www.mifugouvuvi.go.tz/wp-content/uploads/2012/.../Fisheries-Management-plan.doc
Thailand	Artisanal Fishery	Fishing operation that takes place near a shoreline by using small boats with and without engines such as inboard or outboard engines (long tail boat). Fishing using mostly household labor with a small number of traditional fishing gears. Fish are caught partly for sale in local markets with the remainder for household consumption.	Thailand draft National Plan of Action to Deter Illegal, Unreported and Unregulated Fishing 2015-2019

APPENDIX III. THE WHEN AND WHERE OF SMALL-SCALE FISHERIES: SPATIO-TEMPORAL TRENDS.

Figure A1. Articles by World Region and Primary Subject

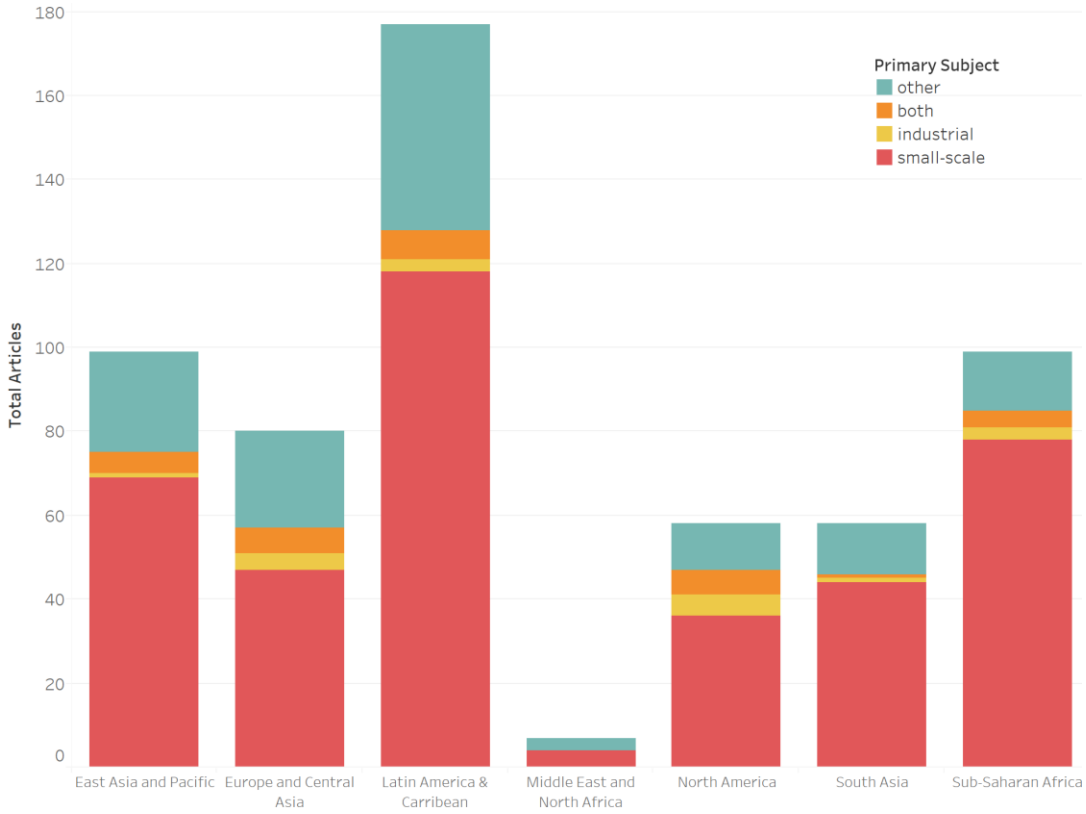


Figure A2. Top 10 Countries Studied

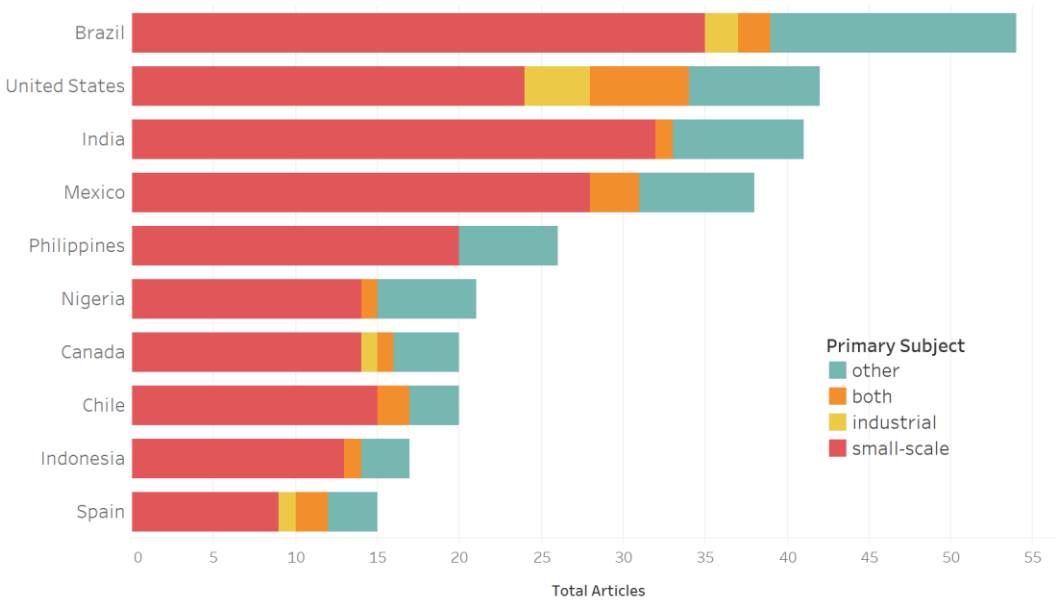


Figure A3. Locations of Articles Published on Small-scale Fisheries by Water System

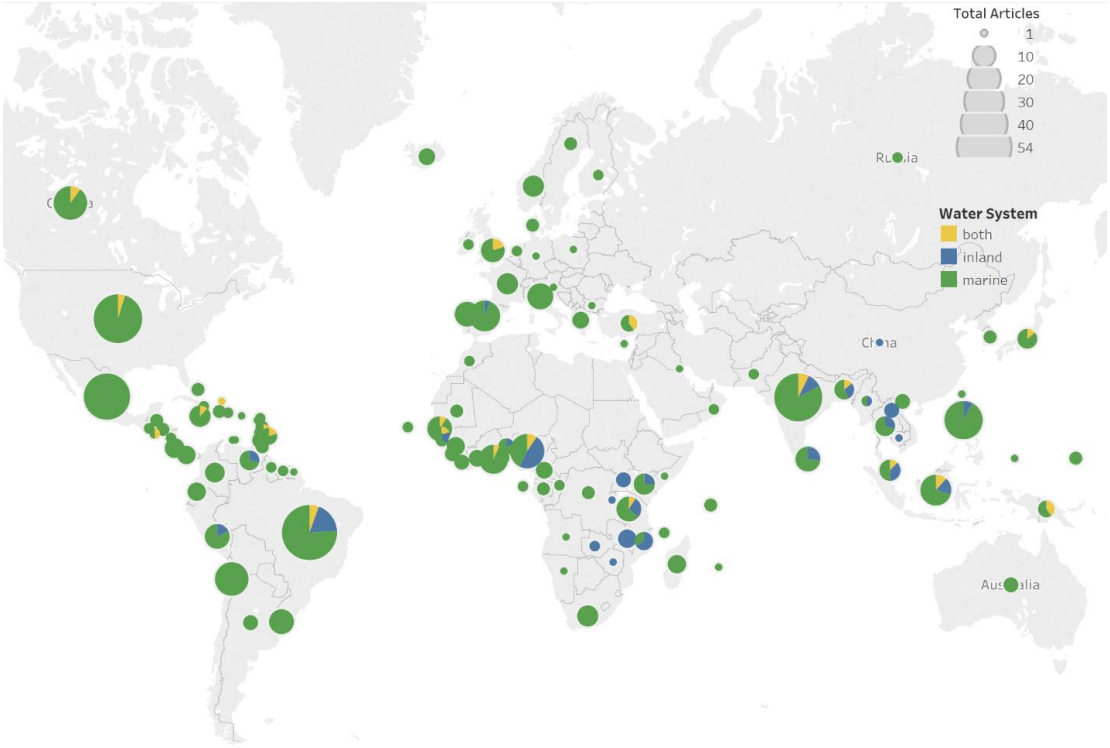


Figure A4. Small-scale fisheries Publications by Water System (1960-2005)

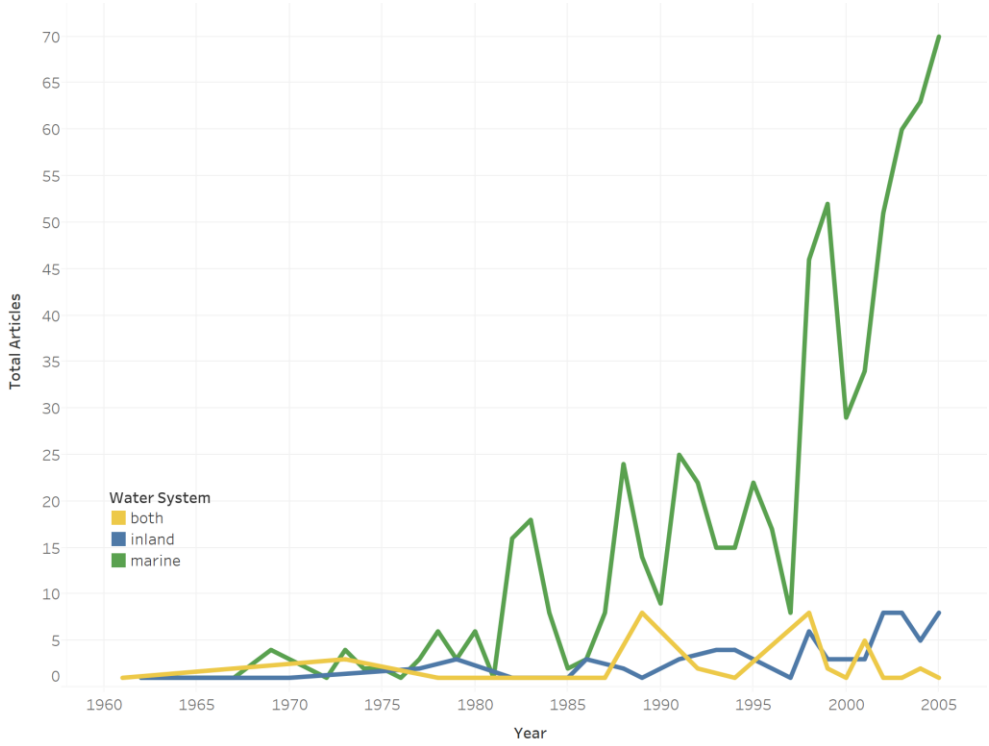


Figure A5. Locations of Articles Published on Small-scale Fisheries by Field of Study

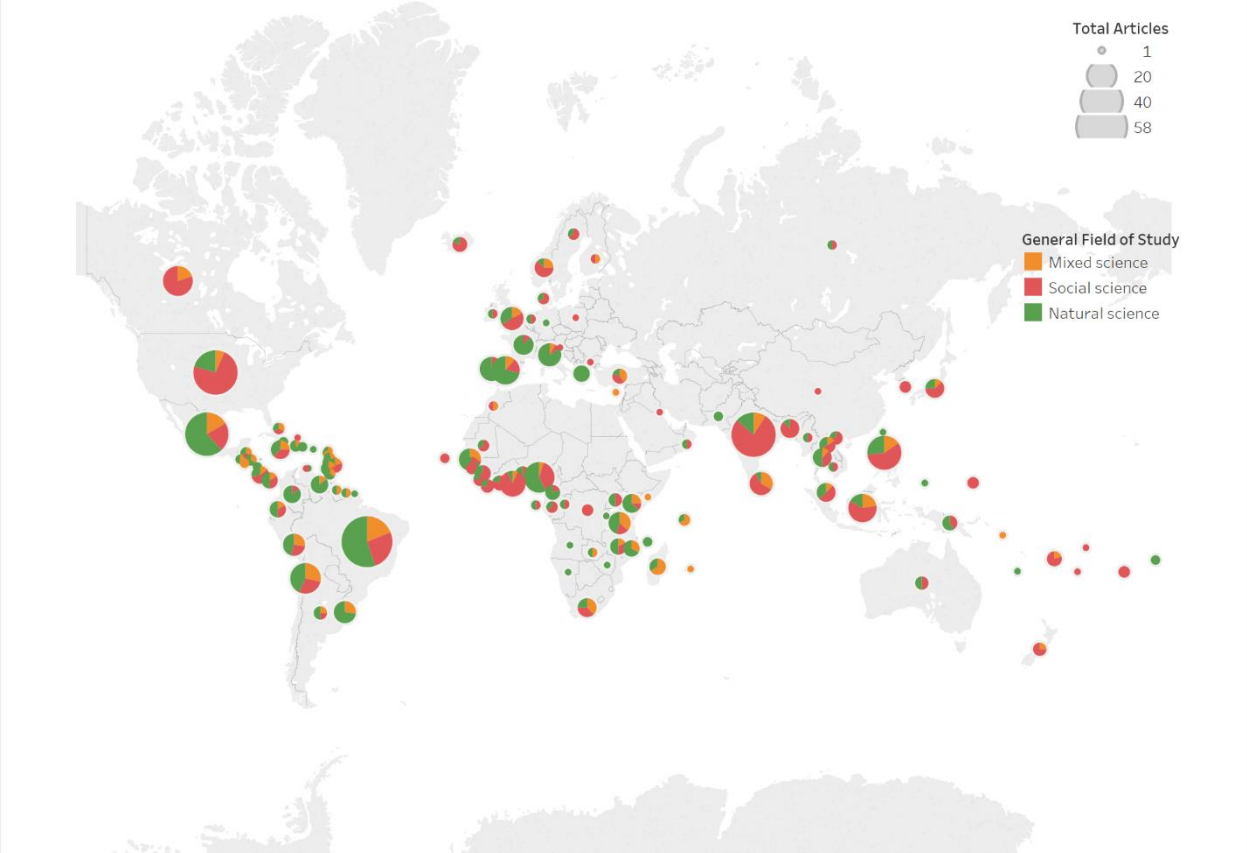
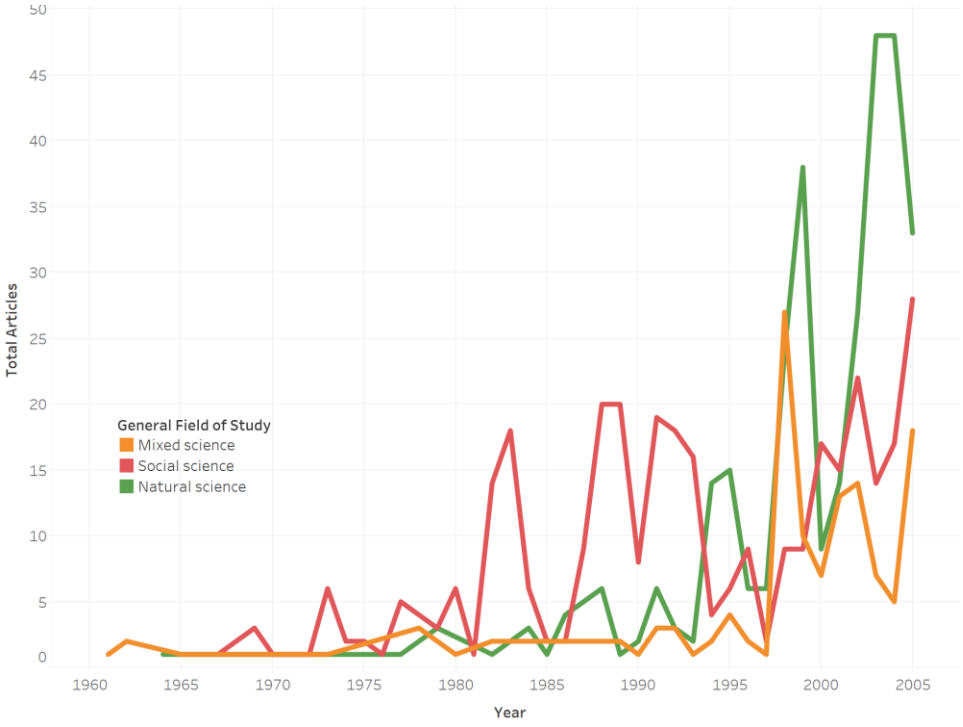


Figure A6. Small-scale fisheries Publications by Field of Study (1960-2005)



APPENDIX IV. ORGANIZATIONS REPRESENTED IN THE SURVEY AND/OR INTERVIEW

Academic Organizations

- Memorial University of Newfoundland (secretariat to the Too Big to Ignore Network)
- University of Connecticut at Avery Point
- University of Washington

Fisher Organizations

- World Forum of Fish Harvesters and Fishworkers (WFF)
- International Collective in Support of Fishworkers (ICSF).

Civil Society Organizations

- Catch Invest
- China Blue Sustainability Institute
- Environmental Defense Fund
- The Nature Conservancy
- Wildlife Conservation Society
- Maine Center for Coastal Fisheries (former Penobscot East Resource Center)

Philanthropies

- Helmsley Charitable Trust
- MacArthur Foundation
- Margaret A. Cargill Foundation
- MAVA Foundation
- Oceans 5
- Walton Family Foundation

Bi-lateral Aid Agencies

- United States Agency for International Development

Intergovernmental Agencies

- Regional Agency - West Africa Sub-Regional Fisheries Commission
- International Research - WorldFish Center
- Financier - Global Environment Facility Secretariat
- Financier - World Bank
- United Nations - Food and Agriculture Organization

APPENDIX V. TYPES OF SUPPORT PROVIDED BY THE ORGANIZATIONS REPRESENTED IN THE SURVEY/INTERVIEW

Type of Organization	Spatial scale of support (i.e. vertical linkages)	Type of Interventions Supported	Examples
Academic, Fisher representatives, Intergovernmental Research Organizations	• Local • National • Regional • International	• Science/research—notably to support enhanced social science in fisheries • Capacity building—of CSOs and fishers, and of national government agencies for governance frameworks in targeted regions, countries and communities, particularly for incorporating the ecosystem approach to fisheries management into governance of SSF (e.g. supporting communities to develop ecosystem-based fisheries management plans) • Policy development—providing input into the development of an international policy instrument for SSF (the FAO SSF Guidelines)	Academic experts' network for SSF research - *Too Big To Ignore network*: http://toobigtoignore.net/ an open network of over 400 researchers focused on the specific characteristics of small-scale fisheries, with a secretariat at Memorial University in Newfoundland, administering funding for SSF researchers and hosting meetings on findings, as well as constructing a database and information system on SSF (the Information System for Small-Scale Fisheries—ISSF) *World Forum of Fish Harvesters and Fish Workers (WFF)*. An international organization with about 70 country delegates "that brings together small-scale fisher organization for the establishment and upholding of fundamental human rights, social justice and culture of artisanal / small-scale fish harvesters and fish workers affirming the sea as source of all life and committing themselves to sustain fisheries and aquatic resources for the present and future generations to protect their livelihoods." http://worldfisherforum.org Academic experts' participation and support to the Coral Triangle Initiative (together with

table continued

		• Compensation/alternative livelihoods—research into SSF overcapacity • Technological innovations—supporting market reforms through traceability and certification	multilateral financiers, CSOs, etc.): http://coraltriangleinitiative.org/ Support to Pacific Island countries for development of a region-wide strategy for SSF: http://www.spc.int/coastfish/component/content/article/461-a-new-song-for-coastal-fisheries.html
Civil Society Organization	Local	Capacity building targeted specifically to fisher organizations and associations—often on SSF Guidelines, highlighting the inter-sectoral perspective in governance of small-scale fisheries	*The International* Collective in Support of Fishworkers (ICSF) work in India, China, South Africa and Tanzania: http://www.icsf.net/
		Capacity building for a range of stakeholders in targeted communities to sustainably manage fisheries—fishing associations, community associations, etc.—often on nearshore, benthic fisheries—slowly starting to become connected in networks	*Wildlife Conservation Society's work in East Africa*, focused on community empowerment (or co-management), ecosystem approach to fisheries: https://www.wcs.org/our-work/solutions/oceans-and-fisheries *Blue Ventures' work in Madagascar*: https://blueventures.org/ *Maine Center for Coastal Fisheries* works to secure a diversified fishing future for the communities of Eastern Maine and beyond through connecting the knowledge of fishers,

table continued

		scientists' findings, and policy makers, among other approaches: www.coastalfisheries.org *China Blue Sustainability Institute's work in Hainan* to help bridge local fishers' organizations to global partners and supply chains: http://www.hntsa.org/index.php?c=content&a=show&id=243
	Capacity building for sustainable finance—e.g. working with communities and companies to enhance sustainable value chains, and leverage greater private capital as a result—whereby private capital flows to fishery-scale processing company for more efficient value chain, sourced by sustainable small-scale harvesters who receive a portion of the profits	*Encourage Capital's work on Vibrant Oceans*: http://investinvibrantoceans.org/small-scale-fisheries/ Meloy Fund for Indonesia and the Philippines: *https://www.thegef.org/project/meloy-fund-fund-sustainable-small-scale-fisheries-se-asia-non-grant* SmartFish social enterprise in Mexico: http://voices.nationalgeographic.com/2013/11/01/smartfish-catching-gold-in-the-fish-market/

table continued

Philanthropy	• Local • International	• Science/research • Policy development: governance frameworks, including management plans and MPAs • Capacity building in most aspects • Technological innovations—for market reform at the international level, such as certification or traceability to help increase demand for sustainable seafood	*Locally-Managed Marine Area (LMMA) network* in Melanesia (Fiji, Solomon Islands, Papua New Guinea and Vanuatu) starting in 2000 and now expanded to Indonesia and Madagascar: http://lmmanetwork.org/; philanthropies supported local NGO or university to assist targeted fishing communities to develop rules over a given area/fishery (essentially community-based management), with varying degrees of uptake by communities. In Fiji communities have passed rules that they would like the state to recognize now. Have used learning exchanges between communities to scale the efforts. Some issues have included sustainability of communities' efforts after the exit of philanthropic support, challenges with encroachment by outsiders when efforts translate into more productive fishing grounds, and long timeframes for local partners to build trust with fishing communities and for fishing behavior to change.
Intergovernmental Org.—regional agency	• National • Regional	• Policy development: supporting countries to in development of national governance frameworks, incl. fishery management plans • Policy delivery: supporting countries to administer, monitor and	*West Africa Sub-Regional Fisheries Commission work to support member states* to create national canoe registries, disclose key fisheries information publicly, and to monitor industrial fisheries who overlap with SSF, as well as support learning exchanges between communities who have partnered with national governments to manage nearshore fisheries: http://www.spcsrp.org/en

table continued

		enforce national governance frameworks	*African Union* Policy Framework and Reform Strategy for Fisheries and Aquaculture adopted by heads of state in 2014, with a ten-year action plan (2016—2025) for small-scale fisheries, with a priority on supporting member states to enhance governance, through capacity building for fisher organizations to play a greater role, and through instruments to limit access in SSF, to create marine protected areas and to create user rights.
Intergovernmental Org—financier	• National • Regional • International	• Science/research: biophysical and social (for GEF, less so for other financiers) • Capacity building: all aspects • Policy development: focused on governance frameworks, management plans and MPAs among others • Policy delivery: including support for monitoring and enforcement	*GEF-funded Coastal Fisheries Initiative*: focused in supporting coastal fisheries governance in three geographies (West Africa, Indonesia and Latin America), supporting policy development and delivery (with a focus on monitoring fisheries performance)[19], capacity building—including impact investment: https://www.thegef.org/publications/coastal-fisheries-initiative *World Bank-funded West Africa Regional Fisheries Program*: http://projects.worldbank.org/P106063/west-africa-regional-fisheries-program?lang=en *World Bank-funded Southwest Indian Ocean Fisheries Governance and Shared Growth*

table continued

[19] Including tools such as the fisheries performance indicators developed by Anderson et al. (2015) http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0122809; a focus on governance for example utilizing the Coastal Governance Index: https://www.oceanprosperityroadmap.org/wp-content/uploads/2015/05/EIU_CGIndex_WEB-revised-June-4.pdf; or Conservation International's Ocean Health Index: http://www.conservation.org/projects/pages/ocean-health-index.aspx?gclid=CNPLh9vYtdECFUo7gQoduC4D0Q

		• Compensation/Alternative Livelihoods: in the case of the World Bank, for alternatives to fishing where resources overexploited	*Project:* http://projects.worldbank.org/P132123/south-west-indian-ocean-fisheries-governance-shared-growth?lang=en Focused broadly on supporting dialogue between the state and fishers on governance, including support for policy development and delivery (e.g. governance frameworks including development of fisheries management plans, and administration at the level of the state, including vessel registration), as well as capacity building of the state for fisheries monitoring (e.g. collection of socio-economic statistics), and also on capacity building of communities and CSOs along targeted value chains, as partners or interlocutors with the state in reform across a larger spatial scale.
Intergovernmental Technical Agency (FAO)	• Local • National • Regional • International	• Science/Research: notably supporting social science on SSF • Bridging support: working across organizations • Policy development: supporting SSF guidelines development and now	*Supporting states to implement the SSF Guidelines*, as well as providing fora for CSOs and others to support implementation, for example hosting a global meeting in October 2016 on "exploring the human rights-based approach in the context of implementation and monitoring of the SSF Guidelines"[20] *Facilitating discussion of tenure and rights-based approaches in SSF*, such as the recent workshop in Uganda entitled "advancing a

table continued

[20] See: http://www.fao.org/fishery/meetings/en, accessed on January 10, 2017.

	implementation, working with states on governance frameworks, as well as labor and well-being standards, etc. • Alternative livelihoods to fishing	global work program for rights-based approaches for fisheries": http://www.fao.org/3/a-bl142e.pdf

APPENDIX VI. APPROACH TO ESTIMATE ACTIVE AID TO OCEAN FISHERIES IN 2015

Philanthropies

Information on philanthropic giving to ocean fisheries was obtained from the Foundation Directory Online Database at: fconline.foundationcenter.org. The search parameters were as follows:

Search type. Search Grants

Year authorized. 2013-2015

Search terms: Ocean OR Oceanscape OR Coastal OR Marine OR Fisheries OR Fishery OR Fish OR Fishing OR Coral Reef

Philanthropies searched.

- Bloomberg Philanthropies
- Gordon and Betty Moore Foundation
- The David and Lucile Packard Foundation
- The John D. and Catherine T. MacArthur Foundation
- The Oak Foundation
- The Pew Charitable Trusts
- The Rockefeller Foundation
- Waitt Foundation
- Walton Family Foundation, Ind.
- The Keith Campbell Foundation for the Environment, Inc.
- The Marisla Foundation
- Robertson Foundation
- The Leona M. and Harry B. Helmsley Charitable Trust
- The Summit Foundation
- The Lazar Foundation
- Meyer Memorial Trust
- 444S Foundation
- Alfred P. Sloan Foundation
- Environment Now Foundation
- Firedoll Foundation
- International Community Foundation
- Lighthouse Foundation
- Marine Ventures Foundation, Inc.
- The Skoll Foundation
- Turner Foundation
- Margaret A. Cargill Foundation
- National Fish and Wildlife Foundation
- The Paul G. Allen Family Foundation
- The Schmidt Family Foundation

Steps.

From the search results, the "objective" cell was reviewed for each entry, and results with text that could be clearly identified as not pertaining to ocean fisheries and supporting ecosystems (e.g. marine spatial planning) were eliminated.

- Grants that were for operating costs or general support were not included.

Government aid agencies

Four government aid agencies to date have been included in the database: Australia's Department of Foreign Affairs and Trade (formerly AusAID), the European Union's Directorate General for Development (DG DevCo), New Zealand's aid agency (NZAID) and the United States' aid agency (USAID).

Australia (DFAT). The Australia Government website for "Aid budget and statistical information" (see: http://dfat.gov.au/aid/aid-budgets-statistics/Pages/default.aspx) was accessed and the general "Fisheries and Agriculture" amounts extracted, with information "ground-truthed" with staff from the Department. Monetary amounts were converted from $AUS to $US based on December 31, 2012 Treasury rates (.9640: $1) https://www.fiscal.treasury.gov/fsreports/rpt/treasRptRateExch/1212.pdf.

European Union (DG DevCo). The European Union website was accessed (see: https://ec.europa.eu/europeaid/sites/devco/files/publication-fisheries-and-aquaculture-european-development-cooperation-state-of-play-2015_en.pdf), together with information provided directly by staff in the department. In the case of one project entitled "DEVFISH II," no duration was given. As this project had the same start date as another similar project entitled "SCICOFish 4" where the duration was available, the same duration was assumed for DEVFISH II. Currency was converted from Euro to $USD based on December 31, 2012 Treasury rates (.7590: $1) https://www.fiscal.treasury.gov/fsreports/rpt/treasRptRateExch/1212.pdf. Subsequently, the EuropeAid Advanced Search Engine (see http://ec.europa.eu/europeaid/search/site_en) was used with the search terms: "Ocean OR Oceanscape OR Coastal OR Marine OR Fisheries OR Fishery OR Fish OR Fishing OR Coral Reef OR Seascape," with projects assessed to be related to fisheries added to the database (with "EU contracted amount" used for the project "amount" in the database). The currency was converted to $US following the same procedure above.

New Zealand (NZAID). Information was obtained from a review of the country program aid documents (see https://www.mfat.govt.nz/en/aid-and-development/our-approach-to-aid/where-our-funding-goes/aid-activity-reporting/), with projects related to fishers added to the database. Currency was converted from New Zealand dollar to $US based on December 31, 2012 Treasury rates (1.2160: $1) https://www.fiscal.treasury.gov/fsreports/rpt/treasRptRateExch/1212.pdf.

United States (USAID). Information was obtained from a search of the USAID Foreign Aid Explorer database (see http://explorer.usaid.gov/). Under "obligations," the "purpose" was searched for: bio-diversity, fishery development, fishery education/training, fishery research, fishery services, fishing policy and administrative management. Using excel, the "find" tool was used to search for the following terms:

"Ocean OR Oceanscape OR Coastal OR Marine OR Fisheries OR Fishery OR Fish OR Fishing OR Coral Reef OR Coral." Entries that did not contain one of the search terms were removed. From these results, the "activity name" field was reviewed, and selections that did not pertain to fisheries or ocean conservation were removed. Additional programs were included based on information provided in the

survey of practitioners. Of note, the "current amount" given in the website was used for the amount included in the database (though likely to reflect the amount disbursed to date).

Regional development banks

Three regional development banks have been included in the database to date: the African Development Bank (AfDB), the Asian Development Bank (ADB) and the Inter-American Development Bank (IADB).

African Development Bank (AfDB). The website of the AfDB's projects was accessed (see http://www.afdb.org/en/projects-and-operations/project-portfolio/) and the following search terms used: Ocean OR Oceanscape OR Coastal OR Marine OR Fisheries OR Fishery OR Fish OR Fishing OR Coral Reef (searched individually in engine). The start date was recorded in the database based on "approval date" given on the website. The total amount of the project was included in the database (including other listed government or co-financing associated with the project). Currency was converted from Euros to $US based on December 31, 2012 Treasury rates (.7590: $1) https://www.fiscal.treasury.gov/fsreports/rpt/treasRptRateExch/1212.pdf.

Asian Development Bank (ADB). The website of ADB's projects was accessed (see: **https://www.adb.org/projects/search?keywords=Ocean+OR+Oceanscape+OR+Coastal+OR+Marine+OR+Fisheries+OR+Fishery+OR+Fish+OR+Fishing+OR+Coral+Reef**). The terms searched were: Ocean OR Oceanscape OR Coastal OR Marine OR Fisheries OR Fishery OR Fish OR Fishing OR Coral Reef. The project name was reviewed to assess if the project was related to fisheries, and added to the database. Projects funded by the GEF but implemented by ADB were not included in the database, to avoid double-counting with the results from the GEF search.

Inter-American Development Bank (IADB). The website of IADB's projects was accessed (see: http://www.iadb.org/en/projects/project-details,1301.html?Country=&Sector=&Status=&query=fish) and terms searched were: Fishery OR Fisheries. Additional searches will be completed shortly with the remaining search terms used for the other regional development banks.

Multilateral agencies

Two multilateral agencies have been included in the database to date: the Global Environment Facility (GEF) and the World Bank.

The Global Environment Facility (GEF). The website of GEF's projects was accessed (see: https://www.thegef.org/projects), and projects under the "International Waters" and "Biodiversity" focal areas were searched, using the following terms: Ocean OR Oceanscape OR Coastal OR Marine OR Fisheries OR Fishery OR Fish OR Fishing OR Coral Reef OR Seascape. Projects authorized prior to 2009 or closing prior to 2015 were not included, and projects with the "Latest Timeline Status" of "Completed," "Cancelled," "Concept Proposed," "Received by GEF Secretariat" or Blank were deleted. Results were further narrowed based on a review of the "Description of the grant," with those projects assessed not to be related to fisheries or ocean conservation eliminated. Similarly, all projects in land-locked countries were eliminated.

The World Bank. The website of the World Bank's projects was accessed (see: http://projects.worldbank.org/?lang=en), and searched using the following terms: Ocean OR Oceanscape OR Marine OR Fisheries OR Fishery OR Fish OR Fishing OR Coral Reef. Projects approved prior to 2008 were not included, nor were projects in landlocked countries. Projects that closed prior to 2015 were

also not included for this snapshot. The "Project Development Objective" and in some cases the full "Project Appraisal Document" were reviewed, with those projects assessed not to be related to fisheries eliminated. In some cases, projects contained only a specific component targeted to fisheries, and as such the amount of financing for only that component was included in the database. Projects were compared with the results of the GEF search to eliminate any duplicates, where GEF grants were implemented by the World Bank.

APPENDIX VII. SYNTHESIS OF SSF PROGRAMS OF SELECTED INTERNATIONAL CSOS

As an example of the growing range of support to SSF provided by international CSOs, typically with goals focused on conservation, the relevant programs of 8 organizations are described below: Blue Ventures, Conservation International, Environmental Defense Fund, Environmental Justice Foundation, Rare Conservation, The Nature Conservancy, Wildlife Conservation Society and World Wildlife Fund—though this certainly does not constitute an exhaustive list.

Organization	Overall Programmes	Where SSF is embedded	Type of Interventions and Approach to Supporting SSF	Main countries where SSF programming implemented	Sample project(s)
Blue Ventures	Community Conservation, Rebuilding Fisheries, Blue Forests, Aquaculture, Community Health, Education	Rebuilding Fisheries	The organization works to build capacity of fishing communities to develop policy instruments to manage the resources, often in the form of management plans that create some characteristics of property rights, and connect to seafood purchasers to increase local economic benefits.[21] "We empower coastal communities to manage their own resources, developing rights-based fisheries management plans aiming to sustain local fisheries and safeguard marine biodiversity ... Our models work by demonstrating that fisheries management can yield meaningful economic benefits for communities and seafood buyers, in realistic timescales." –Blue Ventures Factsheet[22]	Madagascar, Tanzania, Kenya, Mozambique, Comoros, Belize	*Temporary octopus fishery closures in Madagascar:* Closely involved in the development and implementation of the short-term octopus fishery closure model. 250+ closures along coastline, inspired new fisheries policy in Madagascar, working with local women's associations to involve women in octopus fishing and fishery management[i].

table continued

[21] See: https://bjyv3zhj902bwxa8106gk8x5-wpengine.netdna-ssl.com/wp-content/uploads/2015/10/BV-Rebuilding-Fisheries-Factsheet-2015.pdf

[22] Ibid.

Conservation International	Climate, Energy & Mining, Field Projects, Food, Forests, Fresh Water, Funding Conservation, Gender and Conservation, Global Stability, Hotspots, Innovating with Business, Livelihoods, The Ocean, Partnering with Communities, Science and Innovation, Seascapes, Wildlife Trade and Trafficking, Working with Governments	Seascapes, The Ocean	The organization focuses on science and research, capacity building, and policy design and delivery at both local and national levels (e.g. in "seascapes"). Instruments supported have often included marine protected areas. Support for policy delivery includes advising local governments on "best practices," and in many cases increasing surveillance and activities to combat illegal, unregulated and unreported fishing. "No fishery has the same set of challenges, so CI creates tools and partnerships to identify and address the unique ecological, social and economic needs and barriers for each fishery in which we work. We focus on coastal fisheries across nine countries to empower ocean-dependent communities to create the sustainable fisheries and aquaculture that they need to thrive." - Conservation.org[23]	Current initiatives are being implemented in nine countries and numerous seascapes, including the Abrolhos Seascape in Brazil, Bird's Head Seascape in Indonesia, the Eastern Tropical Pacific Seascape in Costa Rica, Panama, Colombia and Ecuador, and the Sulu-Sulawesi Seascape in the Philippines, Malaysia and Indonesia.[24]	*Supporting Smallholder Fishing in Brazil:* In 2000, supported six communities to create Corumbau Marine Extractive Reserve, an 89,500-hectare protected area that bans industrial and destructive fishing, made up of "no-take zones" and extractive areas. Up to 300% increase since 2000 in some commercially important fish species[25]

table continued

[23] See: http://www.conservation.org/How/Pages/Transforming-wild-fisheries-and-fish-farming.aspx

[24] See: http://www.conservation.org/How/Pages/Transforming-wild-fisheries-and-fish-farming.aspx

[25] See: http://www.conservation.org/projects/Pages/Supporting-Smallholder-Fishing-in-Brazil.aspx

Environmental Defense Fund	Climate and Energy, Oceans, Ecosystems, Health	Oceans (region-specific programs), Fisheries Solution Center	In fisheries broadly, the organization supports science and research (e.g. tools to assess data-limited fisheries), and policy design and delivery in 12 targeted countries, typically to enhance the property rights characteristics of access. The organization is currently developing specific strategies for SSF. "By changing the policies and practices of 12 nations, we can get 70% of the world's catch under managed rights, tipping the entire system toward sustainability.... By giving fishermen long-term and secure rights, we make sustainability a priority."—Edf.org[26]	United States, Spain, Sweden, United Kingdom, Mexico, Cuba, Belize	*Belize:* Rights-based fishery management project began in 2011, where fishermen collaborate on self-enforcement, submitted catch data, etc. Fishermen report their catches have gone up, and illegal fishing has dropped 60%. Thousands of Belizean fisherman asked for a nationwide system of rights-based management, and in June of 2016, the government implemented the program nationwide.[27]
Environmental Justice Foundation	Oceans, Climate, Commodities, Pesticides	Oceans	The organization provides capacity building to fishing communities in targeted areas to design and delivery policies for co-management, notably to combat IUU fishing (e.g. community	Sierra Leone, Cambodia, Thailand, Vietnam, Bangladesh, Guatemala,	*Oysters for alternative livelihoods:* Working to develop sustainable oyster farms for vulnerable coastal

table continued

[26] See: https://www.edf.org/oceans/how-turn-around-overfishing-crisis

[27] See: https://www.edf.org/oceans/fishing-rights-help-curb-overfishing-belize

			surveillance) and create marine protected areas among others, as well as support for alternative livelihoods to fishing. "We create the momentum to change government policies and business practices. We leverage market forces and drive consumer activism. We give local communities - many among the poorest and most vulnerable on our planet - the tools and support to help them protect their marine environment and bring the issues that affect them locally to global attention. We expose the criminal operators on our seas and oceans who are devastating fish stocks, wiping out wildlife species, damaging fragile ecosystems and driving human rights abuses and slavery in the seafood sector."-Ejfoundation.org[28]	Honduras, Brazil, Ecuador	communities (especially women), in Sierra Leone and the greater region *Addressing destructive artisanal fishing practices in Sierra Leone:* Working with Sherbro River area to share info on destructive fishing practices and strategies to remove illegal fishing from communities[29]
Rare	Coastal fisheries, Clean fresh water, Agriculture, Innovation (sustainable markets and innovative	Coastal fisheries	The organization provides capacity building to local leaders (Rare Fellows) to help fishing communities design and deliver policy instruments for management of coastal sedentary fisheries, typically in the form of	Brazil, Mozambique, Indonesia, the Philippines, Micronesia	*Sustainable fishing in the Philippines*: Partnered with 37 local municipalities to implement community coastal

[28] See: http://ejfoundation.org/campaign/Oceans

[29] See: http://ejfoundation.org/campaigns/oceans/item/protecting-marine-environment-and-biodiversity#5

table continued

finance, campaigning for conservation, solution search)	territorial use rights in fishing (TURFs) and “no-take” reserves. More specifically, the organization supports fellows to implement “Pride campaigns” aimed at inspiring communities to take pride in local species and ecosystems while introducing new fisheries management measures. Much of the support is carried out through the Fish Forever Program started in 2006, in collaboration with the Environmental Defense Fund and the University of California at Santa Barbara.[30] "Rare believes that the adoption of rights-based fishery management systems will result in transformative impact for both people and nature. Our innovative coastal fisheries resource management solution marries managed access of fisheries with marine reserves. By leveraging our proven community mobilization and behavior change expertise at local and national levels, and through private sector partnerships that strengthen the economic and financial incentives for	fisheries campaigns. At the Philippines” 2015 Para El MAR Awards, 8 of 12 finalists and the grand winner for best MPAs were assisted by Rare. 25 conservation leaders from local government and NGOs graduated from Rare’s Local Leadership Program.[31] *Fish Forever (Overall):* As of 9/28/16: 13 TURFs in operation. 2,332,752 hectares of protected waters in proposed TURFs. 66,129 hectares of protected waters in proposed Reserves. 56,220 fishers and 359,819 community members engaged by Fish Forever. 62 partners working to

table continued

[30] See: http://www.rare.org/sites/default/files/2016%20rare%20fisheries%202-pager.pdf

[31] See: https://www.rare.org/Indonesia

			behavior change, Rare is uniquely positioned to enable sustained adoption and replication of our solution." –Rare.org		implement Fish Forever. 6 transferable tools and toolkits developed to disseminate Fish Forever approach. 5 legislations Fish Forever has submitted comments on. 4 markets pilots underway.[32]
The Nature Conservancy	Lands, Climate, Oceans, Water, Cities	Oceans	The organization provides capacity building to communities and local governments for the design and delivery of policy instruments to manage SSF, often area-based instruments such as MPAs or TURFs. "Our fisheries work is based on a proven track record of partnering with fishermen and the fishing industry in collaborative projects that use science, technology and policy to advocate for access rights to fishing grounds for local fishermen and links their fishing to markets that value sustainable products. We believe that by engaging	Indonesia, China, Peru, Chile, United States	*Rebuilding Chilean Fisheries Through Smart Management:* TNC and partners documented 20-year journey of the TURF model that was implemented in Chile. Resulting report intended to inform future efforts for artisanal fishing management.[34] *Challenge Initiatives*—e.g. the Caribbean,

table continued

[32] See: https://www.rare.org/Philippines

[34] See: https://www.nature.org/ourinitiatives/habitats/oceanscoasts/howwework/rebuilding-chilean-fisheries-through-smart-management.xml

			with fishermen, seafood companies, communities and policymakers in collaborative projects worldwide we can ensure that fishermen do not have to choose between either making a living today or ensuring that their livelihoods last far into the future— they can do both— have a sustainable business while protecting and restoring fish habitat."—Nature.org[33]		Micronesia, where governments have pledged to create MPAs covering a minimum percentage of the waters under their jurisdiction, often including SSF[35]
Wildlife Conservation Society	Terrestrial and marine conservation initiatives are divided into three groups: Wildlife, Wild Places, Solutions	Wild Places: Oceans, Solutions: Oceans and Fisheries	Capacity building for fishing communities and associations, to design and deliver policy instruments for fisheries management, as well supporting local science and research (e.g. data collection), and in some cases alternative livelihoods to fishing.[36] "To address modern challenges such as climate change, commercial exploitation and new access to markets, we provide specific interventions where existing or traditional management regimes are recognized as inadequate or no longer exist. We conduct and train	United States, Belize, Cuba, Nicaragua, Argentina, Chile, Equatorial Guinea, Gabon, the Congo, Kenya, Madagascar, Bangladesh, Myanmar, Indonesia, Papua New Guinea, Fiji, the Solomon Islands, New Caledonia, Vanuatu	*Indonesia*: Working with communities and gov't authorities to develop science-based, community-supported network of MPAs. Using a WCS-developed strategy to engage communities and stakeholders in a consultation process to develop an integrated protected-area network and meet community

table continued

[33] See: https://www.nature.org/ourinitiatives/habitats/oceanscoasts/howwework/marine-conservation-inspiring-stories-sustainable-fisheries-1.xml

[35] See for example: http://www.micronesiachallenge.org/

[36] See: WCS Coastal Fisheries December 2014_Final.pdf

			communities and governments in fisheries management techniques such as catch per unit effort analysis, fish and fishery data collection, marine protected area design, spatial and gear controls, enforcement measures, socioeconomic and gender assessments, and where appropriate alternative livelihoods. Finally, we take a demand driven approach to conservation through which our priorities are defined largely by the needs of the communities and countries where we work."-Wildlife Conservation Society Coastal Fisheries Summary[37]		needs. Helping to facilitate a participatory process to develop management plans and build institutional capacity. In N. Sulawesi, working with 31 communities to build local capacity for locally managed MPAs and develop a collaborative management framework.[38]
WWF	Forests, Oceans, Wildlife, Food, Climate & Energy, Freshwater	Oceans	The organization focuses on capacity building for both fishing communities and governments at local and national levels, through its decentralized network of national/regional offices. "In our priority regions, WWF focuses on what we define as community-based management—an approach that empowers communities to take charge of ocean resources in a way that	Madagascar, Turkey, Mozambique, Mediterranean, South Africa, Solomon Islands, Philippines, Pakistan, Chile, Belize, and more	*Making Tourism work for Nature (Turkey):* Helped create marine protected area, worked with community members to support the development of sustainable tourism industry. Connected

table continued

[37] See: WCS Coastal Fisheries December 2014_Final.pdf

[38] See: WCS Coastal Fisheries December 2014_Final.pdf

	safeguards their supply, well into the future. This approach is also at the heart of our work with people who make a living from small-scale commercial or subsistence aquaculture." –Wwf.panda.org[39]	individuals from Albania, Croatia, Algeria and Turkey to share learned lessons[40]

[39] http://wwf.panda.org/what_we_do/how_we_work/our_global_goals/oceans/solutions/sustainable_fisheries/

[40] https://wwf.exposure.co/turkey

APPENDIX VIII. ANALYSIS OF THE OAK FOUNDATION'S INVESTMENTS AND CONTRIBUTIONS TO MARINE CONSERVATION IN ALASKA AND BELIZE

Introduction

The purpose of this evaluation is to address specific questions raised by the Oak Foundation in relation to their experiences supporting small-scale fisheries and marine conservation in the Arctic and Mesoamerican regions (MAR). These two regions offer an opportunity to evaluate Oak's success in building local capacity because of Oak's long-term engagement and investment in both locations. Further, the very different social-ecological and geographic contexts of the two regions offers opportunities to compare Oak's experiences and identify strategies that could be viable at different scales and locations. Overviews of the Arctic and Mesoamerican programs are provided below (parts 2 and 3), including analysis of a sample of grants from each program against their program goals. Finally, both programs are reviewed for their capacity building impact along multiple dimensions including: different types of knowledge capacity, capacity to engage in public processes, enforcement, organization and leadership, financial, and legal capacity. In the conclusion, observations are offered on the most successful elements of both programs and the unique support Oak can offer in support of small-scale fisheries and sustainable ocean governance as they scale their work up and move to new geographies.

Mesoamerican Reef program overview

Nearly 20 years ago, the Oak Foundation made a unique long-term commitment to support marine conservation efforts along the Mesoamerican Reef (MAR). The nearly 700-mile-long reef system connects the Yucatan peninsula of Mexico, Belize, Guatemala and Honduras; forming the second largest barrier reef in the World. Belize's coastline encompasses 80% of the MAR system, including the Belize Barrier Reef, designated a UNESCO World Heritage Site in 1996. In addition to its grand size, the MAR supports a vast array of marine life and is therefore also a key component of local livelihoods, economies, and food security in the region.

In 1997, on the 25th Anniversary of World Environment Day the heads of state of the four countries signed the Tulum Declaration, pledging to expand the network of parks through an ecosystem wide approach to management in the MAR. Oak's entrance to the region coincided with this political climate and interest in protected areas and became a central vision for Oak's MAR program. While the four countries hosted over 60 MPAs at the start of Oak's work, the protected areas network was identified as lacking overall management capacity and coherency—while the maps were drawn up designating MPAs the management structures were not yet in place (Imani Fairweather, personal comment). Oak's investment served as a compliment to several large-scale projects and foundations supporting MPAs at the time[41], to strategically capitalize on existing commitments and political will for marine conservation (Imani Fairweather, personal comment). To do so, Oak's efforts in the MAR focused on enhancing MPA management capacity and connectivity and organizations ability to co-manage marine reserves. Over the course of 20 years Oak committed USD 46 million to nearly 200 projects, primarily focusing on supporting organizations in Belize.

[41] GEF / EC funded projects such as MBRS and CZMAI.

Sample of grants. For this analysis, a subset of 12 grants were provided for review from Oak's wider MAR grant portfolio (see Table A1). Analysis of the sampled grants included a review of grant applications, project reports and end of grant reports. In addition to the grant documents, the Oak MAR 2007-2012 Strategic Plan, and 2011 assessment of the strategic plan were also reviewed for further context and insights into the program aims, history and accomplishments. A summary of the samples projects, including the types of organizations funded, the investments, geographic and temporal trends are summarized below followed by analysis of program goals and key outcomes.

Organizations funded. The 12 grants reviewed were awarded to 8 different organizations (see Table A1)—Oak continued to work with many of their grantees over the course of several grants and follow-up projects. This suggests overall satisfaction and willingness to continue working together on the part of both Oak and the grantees. The types of organizations funded in the project sample included:

- International Environmental Nongovernmental Organizations (Environmental Defense Fund, Wildlife Conservation Society, Oceana)
- National and regional ENGOs (Comunidad y Biodiversidad, Centro de Ecología Marina de Utila)
- Academic institutions (University of Belize)[42]
- Fishers organizations (Belize Federation of Fishers)

Within this sample most grant resources from the projects sampled were invested in international ENGO's (60%), followed by academic institutions (25%), local/regional ENGO's (14%), and fisher organizations (1%) (see Figure A7). It's notable that Oak directly funded two different Belizean organizations—demonstrating investment in building Belize's long-term local capacity. Oak invested significantly in the University of Belize. Graduates from the University's natural resource management program will hopefully continue to contribute to protecting the MAR and local livelihoods in the MAR and wider Caribbean region well into to the future. It would be desirable to check back in five years what some of the alumni of this program are doing, and how it relates to Belizean conservation efforts. It's also notable that Oak directly funded the Belizean Federation of Fishers—this is the first time Oak directly funded a local fisher's organization and could be a valuable precursor towards future engagement with other national or global fisher federations like the WFF (World Forum of Fish harvesters and Fish workers). Most resources in the sample however, were channeled to international ENGO's—yet in the overall MAR portfolio, Oak provided significant funding to a range of Belizean based NGOs which are outside the scope of this report.

[42] Other academic institutions funded include Duke University, Earth and MAR leadership program

Figure A7 Sample of MAR grants

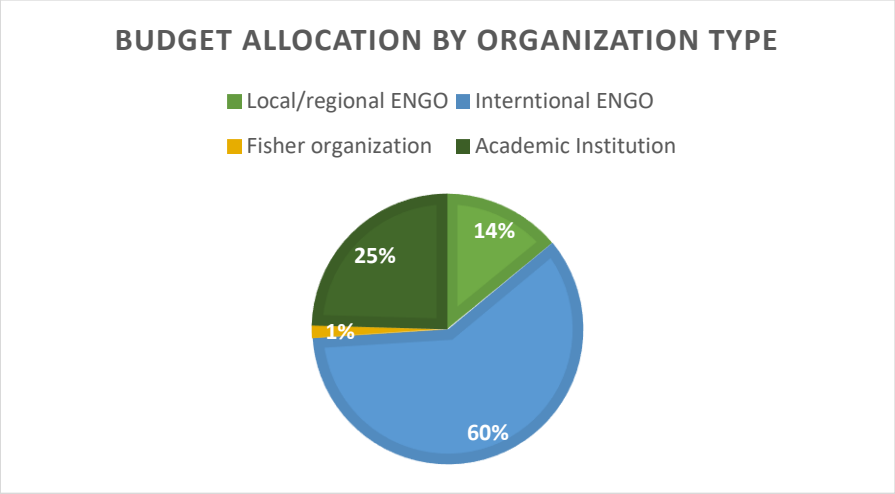


Table A1 Subset of Oak MAR Grants Reviewed

Project name	Partner organization	Start date	End Date	No. Months	Total funding
Campaign for Belizean Fisheries	Oceana Inc	2009	2010	11	200,000
Revision of Belize Fisheries Act	Wildlife Conservation Society (WCS)	2009	2011	24	179,957
Mesoamerican Reef MAR Sustainable Fisheries Initiative in Belize	Environmental Defense Inc (EDF)	2009	2011	35	615,912
Developing National Research and Monitoring Capacity for the Management of Belize's PAs and NR	University of Belize (UB)	2009	2016	77	1,522,843
Restoring the natural capital of coral reefs for sustainable fisheries in Mexican Caribbean waters	Comunidad y Biodiversidad A.C. (COBI)	2011	2013	26	220,000
Campaign to Ban Offshore Drilling in Belize	Oceana Inc	2011	2014	36	837,225
Belize Federation of Fishers - FISH FOREVER (no relationship with Rare) Working Towards Sustainability	Penobscot East Resource Center (PERC)	2011	2014	28	150,000

table continued

Sustainable Fisheries and Effective Management of Marine Protected Areas in Belize: Leveraging Field Success for National Solutions	Wildlife Conservation Society (WCS)	2012	2015	38	1,415,000
Developing Integrated Solutions for Sustainable Fisheries Management in the Honduran Carribean	Centro de Ecología Marina de Utila (CEM)	2013	2016	35	350,000
Establishing a Network of Fish Refuges in Quintana Roo, Mexico through Multisector Collaboration	Comunidad y Biodiversidad A.C. (COBI)	2013	2016	35	300,000
Capacity Building for Sustainable Resource Use, Fishery Alternatives and Technical Support for Members of the Belize Federation of Fishers	Belize Federation of Fishers (BFF)	2014	2016	23	89,000
Sustainable Fisheries and Effective Management of Marine Protected Areas in Belize: Leveraging Field Success for National Solutions	Wildlife Conservation Society (WCS)	2015	2018		322,530

Investments, geography and timeline. The subset of 12 grants reviewed here represent a total grantmaking investment of $6,202,467 in the MAR—90% of which went to organizations working directly in Belize while the remaining 10% went to projects in Mexico and Honduras. In the wider context of Oak's MAR program, the subset of 12 projects reviewed here represent roughly 13.5% of Oak's total earmarked investment in the MAR. The subset of grants spanned the period from 2009-2018, with individual projects lasting an average of 33.5 months.

Overall analysis of MAR strategy. The guiding logic behind the MAR strategic focus is to strengthen the existing extensive network of MPAs to protect habitats and key ecological processes along the Mesoamerican reef and replenish fish stocks. Oak's strategy document designates MPAs as scientifically sound and effective tools for safeguarding critical habitats and improving system resilience to the benefit of resource dependent communities (CEA report 2006). Oak decided to restrict the scope of their approach in the region to focus on MPAs given the larger complimentary investments occurring at the time. The 2011 MAR program evaluation found these three strategies to be either effective or very effective overall.

In addition, the program evaluation found that Oak invested in a range of other activities (termed strategy deviations). All the MAR program goals are focused on MPAs and do not directly include goals related to fisheries management, community resilience, livelihoods, education and awareness, or threats outside of MPAs. Therefore, while Oak's investments in the MAR generally supports their strategic goals (as outlined below), it is clear that many other interventions were prioritized, funded, and succeeded. While a

focus on strengthening MPAs was effective, this should not be pursued in isolation from other strategies—such as supporting local fishers' organizations, improving sustainable fishing practices, market interventions, outreach communication and knowledge exchanges. Therefore, when taking the lessons learned from the MAR to scale and other geographies, its suggested that Oak take a wider focus on the linkages between fisher organizations, sustainable fishing communities and livelihoods and market interventions to complement their work with MPAs. Oak's work in the MAR region demonstrates they can effectively invest in organizations working on a wide range of activities, helping to create a complementary donor and project environment while strengthening MPA networks.

North Pacific/Arctic Marine Conservation Program overview

Renowned for its unique biodiversity, rich fisheries, and maritime oriented indigenous culture, the North Pacific marine environment is another of Oak's strategic areas for marine conservation. Oak's strategy in the region is based in the application of ecosystem-based management tools to build social-ecological resilience and promote sustainable use and conservation of marine and coastal ecosystems (NA marine strategy report 2007). Engaging rural and indigenous communities as essential actors in sustainable marine stewardship is explicitly part of Oak's strategy in the region. Marine resources play an important role in indigenous food security, considered a natural right, where maintaining access to resources aligns with an ethic of respect and protection for ecosystems (IC Council Alaska Report 2015). The Oak program works with indigenous peoples to align their wealth of knowledge, practices and traditional rights with scientific planning and marine policy in the region. Since initiating work in the region in 2007, Oak has invested $17,708,478 through 57 grants.

Sample of grants. For this analysis, a subset of 9 grants were provided by Oak and reviewed from Oak's wider North Pacific/Artic grant portfolio (see Table A3). Analysis of the sampled grants included a review of grant applications, project reports and end of grant reports. Project documents were reviewed for the alignment with program goals and a set of key capacity building themes identified by Oak. A summary of the types of organizations funded, the investments, geographic and temporal trends are provided below followed by analysis of program goals and results from key investments.

Organizations funded. The 9 grants reviewed were awarded to 8 different organizations based in the region. Oak consistently invested in local organizations, rather than international organizations with regional office—demonstrating a commitment to working locally. The types of organizations funded included:

- Local ENGOs (Alaska Marine Conservation Council)
- Local trusts (Ecotrust, Alaska Sustainable Fisheries Trust)
- Indigenous People's Organizations IPOs (Alaska Eskimo Whaling Commission, Eskimo Walrus Commission, Native American Rights Fund)
- Local Producer Organizations (Yukon Drainage Fisheries Association, Alaska Longline Fishermen's Association)
- Legal Support (Crag Law Center, Native American Rights Fund)

The majority of grant resources reviewed were invested in local ENGO's (28%), followed by indigenous people's organizations (27%), local financial trusts (26%), local producer organizations (12%), and legal organizations (7%) (see Figure A8). The sample of grants reviewed here indicates Oak supported a range of different types of organizations with a good balance of investments across the different types.

Figure A8 Sample of Arctic Program Grants

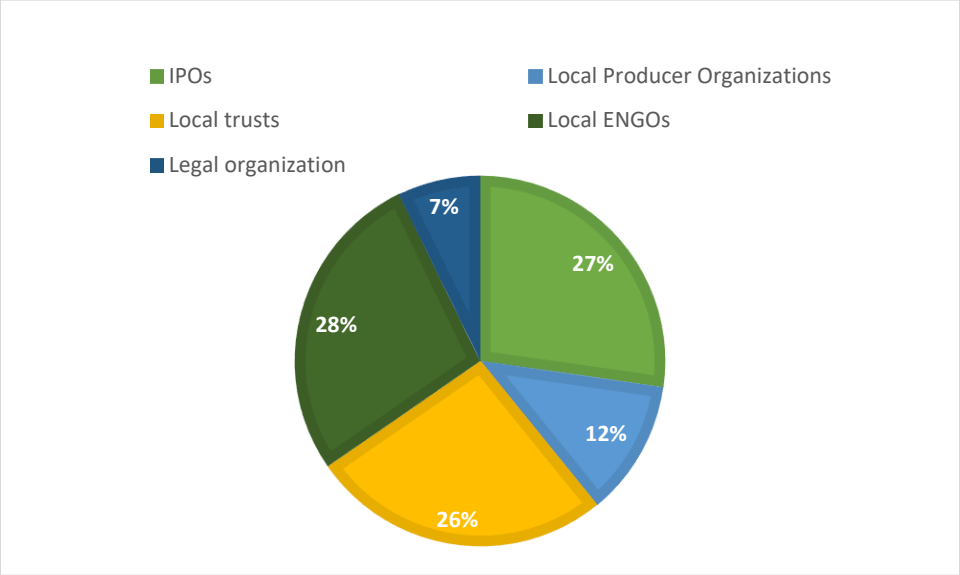


Table A2: Subset of Oak Arctic Grants Reviewed

Location	Project Name	Partner Organization	Start Date	End Date	No. Months	Total Funding	Organization Type
Bering Sea, Bristol Bay	Preparing the Eskimo Walrus Commission for the New Arctic	Kawerak, Inc./Eskimo Walrus Commission (EWC)	2011	2013	24	70,000	IPOs
Northern Bering Sea	Partnerships for Community-based Marine Conservation Solutions	Alaska Marine Conservation Council (AMCC)	2011	2014	36	600,664	Local ENGOs
Bering Sea	Legal Support for the Bering Sea Elders Advisory Group	Native American Rights Fund (NARF)	2011	2014	36	104,782	IPOs
Bering Sea	Reducing Salmon Bycatch in the Bering Sea Pollock Fishery - Renewal	Yukon River Drainage Fisheries Association	2012	2013	16	50,000	Local Producer Organizations

Gulf of Alaska	Sustainable Fisheries/Sustainable Communities: Building the Network	Alaska Longline Fishermen's Association (ALFA)	2012	2015	36	210,000	Local Producer Organizations
Gulf of Alaska	Capital, Capacity and Communication: Building a strong foundation for the Alaska Sustainable Fisheries Trust	Alaska Sustainable Fisheries Trust (ASFT)	2012	2015	36	250,000	Local trusts
Beaufort Sea, Chukchi Sea	Strategic Support for the Alaska Eskimo Whaling Commission	Crag Law Center	2012	2016	48	158,220	Legal organization
USA	Strengthening Accountability in the US Community Fisheries Network	Ecotrust	2014	2017	36	325,000	Local trusts
USA	Mitigation of Off Shore Oil and Gas Development in the Chukchi and Beaufort Seas	Alaska Eskimo Whaling Commission (AEWC)	2010	2012	23	422,721	IPOs

Summary of investments, geography and timeline. The subset of 9 grants reviewed here represent a total of $2,191,387 earmarked for the Arctic region—focused primarily on the Bering Sea, Gulf of Alaska, Chukchi Sea, and Bristol Bay. In the wider context of Oak's Arctic program, the subset of 9 projects reviewed here represent roughly 12% of Oak's total financial investment in the region. The subset of grants spanned the period from 2011-2017, with individual projects lasting an average of 32 months.

Qualitative assessment of the North Pacific/Arctic Program

Overall analysis of Arctic strategy. The central rationale for the Arctic program is to apply the principles of integrated, ecosystem-based spatial planning to build socio-ecological resilience in the region. While MPAs were included as a strategy to protect the Arctic environment from encroaching industrialization, MPAs were complemented by the inclusion of integrated approaches as well as an emphasis on building resilient fishing communities—in contrast the more singular focus on MPAs in the MAR strategy.

Based on the subset of projects reviewed here, the grants successfully supported the goals of abating industrialization and building resilient communities while implementing marine spatial planning and

integrated management was not a central focus of most grant activities in those that were analyzed. Many of the Alaska grant investments focused on reducing overfishing, protecting the marine environment for subsistence harvest, improving ocean governance, community-based stewardship and capacity building. Investments directly supported communities and indigenous peoples' organizations, enabling them to contribute and participate in critical decision-making processes to protect rights, indigenous land, and marine resources. Oak's Arctic strategy was successful at investing in the capacity of local organizations to shape sustainable ocean governance and use in the region. While the Arctic region is ecologically and socially unique, Oak's three-fold strategic approach and demonstrated investment in local institutions in the region would likely be successful in different geographies as well.

Qualitative analysis of key themes in Oak Foundation MAR and North Pacific/Arctic programs

Oak Foundation MAR and Arctic portfolios were evaluated against a set of key capacity building themes identified by Oak including some of those highlighted in this assessment. Qualitative analysis focused on Oak's collective contributions to different types of capacity building: knowledge, financial, ability to engage in public processes, enforcement, organizational, leadership, and legal capacity. All grant documents were reviewed and seven interviews were conducted with selected grantees to identify lessons learned and effective strategies from Oak's investments in the two regions. Illustrative and attributed statements from the interviews are provided in boxes throughout the text.

Knowledge capacity building. Oak's programs in the MAR and Arctic directly enhanced knowledge capacity among organizations, resource managers, government actors, and communities. Knowledge capacity was enhanced along multiple dimensions including intergenerational, local and traditional ecological, scientific and bridging/knowledge exchanges. Oak's work demonstrates commitment to enhancing scientific knowledge and evidence-based management in marine conservation through the participation of local organizations and resource users—not just traditional academic institutions. Their work facilitating knowledge exchanges for local producer organizations in the MAR region are notable and were regarded as highly influential for participants.

Overall, Oak's work demonstrates the importance of supporting multiple types of knowledge—enhancing intersectional knowledge capacity and connectivity on key conservation, institutional and livelihoods issues. Oak investments brought together practitioners, governments, local producers and academic institutions—enhancing the potential for integrated and complimentary knowledge and the impact of knowledge exchanges across regions. Interview participants stressed that Oak created a complimentary environment among grantees, offering opportunities to share and enhance knowledge and efficacy on key issues.

Intergenerational knowledge capacity. While fishing is often described as a graying activity, Oak's work in the Arctic strengthened the capacity for intergenerational knowledge exchanges. Concerted research efforts identified major barriers young people face to enter traditional fisheries and remain in the fleet. Efforts to retain fishing quota for the next generation encourage knowledge transfer and livelihood retention in communities. Educational outreach activities focused on sharing information on marine habitats and livelihoods with local schools—exposing youth to the diversity and importance of social and ecological marine resources.

- AMCC- Funded a multi-year "Graying of the Fleet" research project that focuses on barriers to entry and solutions to sustained local fisheries participation in the vital fishing regions of Kodiak Island and Bristol Bay.
- ALFA- Collaborated with school teachers to develop and teach lesson plans on benthic habitat to pre-school, grade school, Native education program and high schools students. Bathymetry lesson fostered understanding and appreciation for the marine environment surrounding Sitka, and provided students with an appreciation for seafloor complexity and the role of that complexity in fish population distribution.
- ASFT- Encouraged inter-generational transfer of quota and stewardship practices. The Local Fish Fund provides a direct means of transmission of quota and fishing knowledge to the next generation of local fishermen.

Traditional and Local Ecological Knowledge. Oak grantees were able to elevate the role of TEK/LEK into policy arenas, co-management agreements, and scientific communities through their work in both Alaska and Belize. Oak projects often worked to incorporate existing TEK/LEK into science and policy spaces and institutionalize their incorporation into management plans and law.

- AMCC- Able to elevate and incorporate TEK into bottom trawl co-management agreements, combining LEK and scientific data.
- AEWC- Continued the negotiation of the Open Water Season Conflict Avoidance Agreement (CAA); mitigation measures incorporated into the CAA are developed through a collaborative annual process that brings industry representatives together with the Whaling Captains to develop measures that meet the needs of both the hunters and operators, while protecting the whales and habitat. CAA integrates peer reviewed science and TEK, to better understand bowhead whale biology, and to identify impacts and to provide the basis for mitigation.
- NARF- Established co-management agreement and working group between the bottom trawl industry and indigenous peoples of the Bering Sea Elders Group.

Over the course of the bathymetric mapping project, 35 vessels acquired software to record and display depth information that transforms poorly mapped areas into vivid detail. This information now covers 160 miles of coast and has been integrated into a new dataset that incorporates both fleet and NOAA data. 65 fishermen, and the Alaska Department of Fish and Game, are now using bathymetric information compiled by ALFA to improve fishing and fisheries management– Linda Behnken, ALFA

- COBI- Identified fishing spawning aggregations by integrating TEK and scientific data. This TEK was used in the creation of fishing refugia to protect spawning grounds and sustain local fisheries.

Scientific knowledge capacity. Many grantees conducted high quality scientific research producing knew knowledge on relevant issues for marine management and policy. It is also notable that grantees efforts to enhance scientific knowledge often involved the participation of local students, managers and fishermen in the process. Along with increasing capacity to collect scientific data, Oak grantees also invested in making data publicly available and streamlining data management. Oak's work demonstrates the importance and potential to produce high quality scientific research with direct lines into integrative and adaptive management plans.

> University of Belize created a database to house data in one place from the coral reef monitoring network, sea turtle monitoring, fish spawning aggregation, etc. UB provides database support, created and houses a national database where organizations can input their data directly, so data is widely available in one central location. The database project also feeds into the indicators for the National Biodiversity Monitoring Program (NBMP). The database creates a mechanism to pull all these monitoring efforts together into national plans and priorities in Belize. — Dr. Leandra Ricketts, University of Belize

- ALFA- Fishermen participated in bathymetric mapping project by collecting data and now have access to improved maps to inform fishing behavior. Maps are now used by fishermen in the area and Alaska Department of Fish and Game.
- University of Belize- Provide a database support for national monitoring efforts across Belize through national networks of organizations involved in monitoring.
- University of Belize- The Universities' institute leads the majority of monitoring for the Turneffe Atoll Marine Reserve (TAMR) providing data on ecosystem health of coral reefs, seagrass and mangroves, fish spawning aggregations, coral bleaching, sea turtle populations, commercial species abundance and climate data. This includes the training and assistance of students in data collection and monitoring. All site managers also collect data for the parks they manage feeding into the Healthy Reefs Initiative.

> A fundamental part of the UB mission is to create local capacity in Belize. In other countries, scientists might be a dime a dozen and building this basic capacity might to not need to be a core of an institutions mission. In Belize, there are not enough Belizean scientists to do the work. While many foreign researchers conduct high-quality work in Belize, the only people who can integrate the scientific results into policy are local people. UB's work serves to coalesce science and policy work at the national level by building local capacity—Dr. Elma Kay, University of Belize

- CEM- Their research defined the spatiotemporal connectivity of ecologically or commercially important fish resources including: lobster, conch, yellowtail snapper and parrotfish to support the development of management plans and the design and placement of marine reserves. Produced detailed habitat maps for the entire Honduran shore, the first of their kind. Combined with genetic analyses and biophysical models, together these research outputs contributed to understanding of the spatiotemporal connectivity of key fish species. Further, scientific outputs feed into the placement of marine reserves through an iterative process with fishers.

Knowledge bridging and exchanges. Several Oak funded projects included strategic knowledge exchanges between fishing communities and organizations in various locations. These direct exchanges appeared to be especially effective at engaging fishermen and influencing their practices, as opposed to attempting to use passive teaching techniques and inaccessible scientific reports to reach fishermen.

> Initial support from Oak went towards building the Fisheries Conservation Network (FCN). Bringing fishermen together allows them to develop the tools to address conservation issues they care about and their viability as small-boat fishermen. Building the network has allowed fishermen to secure other grants that utilizes the FCN in fisheries research. Initial support gave the organization the jump start they needed to interest fishers in joining the network, by providing the technology and tools as well as stipends to increase participation. In this way, the benefits of joining FCN became clear — Linda Behnken, ALFA

- Belizean Federation of Fishers- Oak funding supported knowledge exchanges between cooperatives in Belize and Mexico. As a result, Belizean fishers learned a more sustainable fishing methodology for the lobster fishery whereby a "lazo" is used as opposed to the hook and stick.
- Ecotrust- Supporting member of the Community Fisheries Network (CFN) which connects community-based commercial fishermen and fishing organizations across 13 states in the US to facilitate collaboration, a sense of solidarity, and envision solutions to shared challenges. Ecotrust supports CFN with implementing tools and practices of bycatch reduction, electronic monitoring, and traceability.
- ALFA- Helped build the Fisheries Conservation Network (FCN) where fishermen come together and engage in research and conservation initiatives that they deem important.

Financial capacity. Oak grantees demonstrated enhanced financial capacity through the duration of their projects. For many projects, Oak was an early investor allowing organizations to initiate projects and leverage Oak's financial support to secure additional and matching funds. It's apparent that Oak was understands the importance of supporting organizations even in their early stages, which makes them unusual in the funder landscape where foundations make "safer" investments and avoid nascent organizations. Oak often required grantees to attain matching funds to prevent narrow financial dependency on Oak.

- PERC- Supported the initial work and formation of the Belizean Federation of Fishers with Oak funding.

- ALFA- During grant period, awarded close to $1 million for projects that were initially launched with Oak Foundation support. New investors included: Central Bering Sea Fishermen's Association, the British Broadcasting Corporation, the National Fish and Wildlife Foundation, the Sitka Sound Science Center, the Sitka Charitable Trust and the City of Sitka.

> From a basic organizational perspective, Oak funds enabled the AEWC to put in place a solid financial structure: managed by a CPA, establish an annual budget, implement annual auditing, etc. Financial capacity was put in place partly with funds and also due to Anne Henshaw's direct involvement and insistence, which was a huge benefit to the organization. A lack of financial capacity is a problem for many small organizations--receiving funds and mismanaging them because they don't know how to. Oak and Anne helped put AEWC on its feet in terms of financial management. That greatly boosted the profile of AEWC. —Attorney Jessica Lefevre, AEWC

- AEWC- Oak funding and requirements enabled them to put in place a solid financial structure and procedures.
- ASFT- Developed the trusts financial capacity and business model around the Local Fish Fund
- AMCC- Diversified their financial resources through oak support. Oak funded AMCC for over 15 years, but they also simultaneously encouraged them to diversify.
- University of Belize- Oak funding supported the Calabash Caye Field Station (CCFS) through matching funds. Very quickly the station was managed to profitability with a reported profit margin of BZ $84,828.00. Most importantly, the Belizean government has absorbed the cost for the Natural Resources Management program and the training program established through Oak funding.

> Oak support helped UB develop their long-term financing strategy and viability of their training programs that will persist after Oak funding ends. Oak helped UB hire consultants to devise business sustainability plans for their pogroms with positive results. Stakeholder surveys revealed that the National Training Program for PA Management (NTPPAM) is sustainable because protected areas capacity is in demand. There will be ongoing need for protected areas training in the region, and UB is positioned to fill this niche, offering the training and services that organizations and the government needs in protected areas management—Dr. Elma Kay, University of Belize

Capacity to engage with public processes. Oak grantees demonstrated enhanced capacity to engage in public processes around marine conservation, fisheries legislation and policy formation. Many grantees participated alongside other organizations and networks, strengthening and amplifying their capacity to engage and affect public processes by working together around key areas of concern. This was an extremely successful form of capacity building Oak was able to support among a wide range of its grantees in both regions. It's also clear from grantees feedback that this capacity, once established, continues to benefit the organizations once they learn the right avenues, partners, contacts and strategies to participate in public processes.

- AEWC- Formed the Arctic Marine Mammal Coalition (AMMC). The AMMC provides a coordinated regional voice for the marine mammal hunter groups of the Arctic on U.S.

regulatory actions related to arctic shipping. The coalition provides an opportunity in the subsistence community to explore structured regional decision-making and action.

- Yukon River Drainage Association- Successfully worked to influence the set of alternatives and the analysis to support the reduction of chum salmon bycatch in the industrial pollock fishery. The North Pacific Fishery Management Council continues to move forward on chum salmon bycatch measures through the influence of the Yukon River Drainage Association.
- NARF- Successfully negotiated with the bottom trawl industry in the Bering Sea to restrict fishing areas and footprint to minimize impact on indigenous subsistence resources such as walrus.
- AMCC- Develop political approach to enable long-term protection for the Northern Bering Sea. AMCC continued to work with the Elders Group, regional leadership, NARF, Trustees for Alaska attorneys, and attorneys to explore potential policy solutions for the Northern Bering Sea. A viable legal/political means for achieving long-term protection was identified.
- AMCC- Participated directly in the reauthorization process for the Magnuson Stevens Act; submitting comments on draft legislation, lobbying Congressional representatives and building relationships with key Congressional staff.
- ALFA- Testified at Senate sub-committee on oceans, fisheries and natural resources. Invited to give presentations on the results of action research at NMFS annual National Cooperative Research meeting.
- Ecotrust- Supports and works with several overlapping fisheries networks (CFN, FCC, and MFCN) members to draft policy objectives and new policy language. Ecotrust aids other policy-focused networks as they work to strengthen policies to ensure healthy fishing communities and marine resources.
- WCS- contributed to reform of Fisheries Act and other fisheries regulations in Belize (such as recommendation on take of sharks, size of lobster, max/min sizes for black grouper). The Fisheries Act in place dated back to the 1940s and was out of alignment with current conditions and wider policies and international commitments (like the FAO guidelines). WCS undertook the huge task of reforming the act through a nationwide consultation which fed into drafting the new legislation which was completed in 2011.

> Oak supported the ongoing collection of both fisheries dependent and fisheries independent monitoring efforts in Belize. From this rich data set, WCS was able to spearhead several areas of data-driven policy reform at the national level, including legislation on the protection of parrotfish and surgeon fish—important herbivores for reef health—protection of fish spawning aggregation sites, and the Nassau grouper—Janet Gibson, WCS

- Oceana- continued work to ban gillnet fishing in Belize. Succeeded in convincing government to test a partial gill-net ban in Southern Belize.
- PERC/BFF- The Belizean Federation of Fishers is increasingly on the Department of Fisheries (DoF) radar, the DoF attends some of their meetings as they build a relationship and communicate around key issues.

Enforcement. Through direct work with MPA managers and government, Oak grantees enhanced enforcement capacity at key sites, especially in the MAR region. This included the development of enforcement protocols, training, and technologies to support proper reserve enforcement. Grantees provided concrete evidence of increased enforcement patrols in reserves with high compliance rates. The

prohibitive costs of monitoring and enforcement continues to be an issue in marine enforcement (e.g. boat up keep and fuel). Oak's investments in cost-effective enforcement procedures and technologies should enhance enforcement capacity through increased efficiency.

- WCS - Implemented new enforcement guidelines and strengthened overall compliance in the two reserves, including more efficient demarcation of management zone boundaries, improved night patrols, and close monitoring of patrol effectiveness in the Glover's Reef Marine Reserve and South Water Caye Marine Reserve in conjunction with local staff.
- WCS - supported the development and implementation of monitoring and enforcement technologies such as SMART software. SMART was utilized by the reserve patrols, and the use of conservation drones was also piloted. WCS will be provided the Fisheries Department with two drones in June 2014, along with the necessary training in their use and maintenance. This new technology should help make on-the-ground patrols more strategic, thus ensuring fuel use is more efficient and effective.

> WCS one of the organizations testing, adapting and applying SMART technology in marine systems. While SMART technology was developed and utilized in terrestrial conservation in Africa, WCS's work in Belize was the first to adapt and apply it to marine settings. The software improves the efficiency, transparency, reporting and record keeping for monitoring and enforcement efforts. WCS trained the Belizean Fisheries department and co-management partners in SMART technology and it is now widely used in Belize and increasingly used in marine settings in other countries—Janet Gibson, WCS

Organizational capacity building. Oak grants supported organizations work to develop and clarify their mission, strategic plans and overall structure. Often, funding basic organizational capacity building is challenging and unattractive to funders, but Oak consistently demonstrated commitment to building strong, sustainable organizations. Oak invests in organizations in early stages of development and supports them as they grow and formalize their mission and basic structure—as in the case of the BSEG in the Arctic and the Belizean Federation of Fishers in Mesoamerica. Oak made a large investment in the University of Belize to develop in country training for PA management—now recognized as a national leader in biodiversity and natural resource management research and training in the MAR region and the first of its kind. Other organizations, such as CEM, were integral in providing basic organizational capacity and systems for departments within the national government.

- WCS- Oak support helped WCS expand its internal capacity and presence in Belize and become a key player in the conservation landscape of donors.

> When WCS first started work with Oak they only had two staff. They expanded to more than 10 staff within a decade, which in turn strengthened and expanded their programs significantly. Oak was very supportive of WCS's work, and they gradually secured larger grants. Through their enhanced financial ability, they brought in consultants that strengthened WCS's science program, awareness building, and socioeconomic work, allowing WCS to expand into areas that were not necessarily initially their strength. —Janet Gibson, WCS

- EWC- Through a facilitator guided retreat the commission agreed on a new three-year strategic "vision navigation" plan to improve stewardship of the Pacific walrus and help support the physical and social well-being of EWC communities with cultural and historical ties to a walrus. The retreat also enabled EWC members to identify/revise priorities and objectives with preliminary timelines for key projects.
- University of Belize- Funding supported the development and implementation of UB's two-year pilot phase of the National Training Program for PA Management (NTPPAM). A total of eight courses were offered including: Financial Management I & II, Conservation Finance, Advanced Conservation Finance, Research and Monitoring I & II, Protected Area Management Effectiveness and Protected Area Management Planning. In addition, through partnership with Ya'axche, three ranger-training courses were offered under the program. A total of 85 participants from 23 different organizations including (10) NGOs, (8) CBOs, and (5) government departments received training, of which 40% were involved in marine conservation.

> UB Learned how to direct their trainings to build sustainable institutional memory for Belizean organizations with lasting impact. They learned that by concentrating training efforts on fewer organizations they can build the capacity of teams and help build effective organizations—rather than training the greatest possible number of individuals whom may leave and take this training with them. Building teams and organizations—rather than individuals—is a better strategy to look at the bigger picture and is a key lesson UB learned through Oak funding—Dr. Elma Kay, University of Belize

- CEM- Developed the Fishermen Digital Registration System, which is now the government of Honduras official registration system. The systems licenses both fishermen and vessels—creating a responsible fishing traceability system for vessels and fishing products in the country.
- NARF- The Bering Sea Elders (BSEG) were able to build their basic organizational structure and establish financial management footing and legal support through their own culturally appropriate process. Rather than deal with cultural and technological barriers presented by remote meetings, Oak funded initial and annual meetings (summits) of the BSEG—bringing 40 elders from 40 communities together to envision their organizations mission, pass by-laws, elect leaders and discuss key policy issues affecting indigenous communities.

> Oak's willingness to help organizations that aren't already 5013c demonstrates they get the importance of true grass-roots building up and organizing. If you are already a non-profit you already have legal support, bank accounts, etc. It requires a lot of effort to get something off the ground, and BSEG have been able to with Oak's support. Oak support has allowed BSEG to decide what their organization is going to look at, and be successful and excited about it. They have been able to grow at a sustainable rate—not so fast that they lose their purpose. Oak and NARF support to BSEG is empowering local people to make their own decisions, led by them, rather than imposing a model and timeline on them. —Attorney Erin Dougherty, Native American Rights Fund

Leadership capacity building/professional development. Grantees could enhance their leadership capacity through Oak support by attending trainings and formal courses.

- AMCC- Executive Director completed 2 years in the University of Alaska- Anchorage MBA program. The program provided a significant opportunity for education related to a variety of facets of non-profit functioning, entrepreneurship, and leadership development we well as networking opportunities within the University and with business leaders in Alaska.
- University of Belize- Oak funding in project phase II lead to the creation of National Research Institute which offers professional development training to the wider Caribbean region. They have already had three graduating cohorts and the program has become a flagship in the region.

Legal capacity building. Oak grantees worked to amend legislation and create legal basis for sound fisheries laws and regulations. Oak funding helped organizations hire attorneys and consultants and support both ongoing and new legal avenues in support of sustainable ocean use.

> EDF was able to use existing elements of the Belizean fisheries law to move rights-based fishing forward, creating a functional legal precedent, but long-term they need a stronger legal foundation with explicit specifications for managed access. EDF, along with a group of other partners (WCS, TASA) are working to pass the revised fisheries act, securing a strong legal basis for rights-based fisheries—Larry Epstein, EDF

- NARF- Worked on a legal strategy with the Bering Sea Elders Group to defend traditional hunting grounds from extractive industry through use and interpretation of the Marine Mammals Protection Act.
- Yukon River Drainage Fisheries Association- Effectively worked to reduce salmon bycatch through a combination of legislation and legal action.
- EDF- Laid the legal foundation for managed access (rights based fisheries) in Belize.
- AEWC- Oak provided stable funding for ongoing legal work with local indigenous communities and the oil and gas industry.

Conclusions

The Oak Foundation's work in the Arctic and Mesoamerican regions demonstrates their commitment and understanding of the complex challenges, dynamics, and stakeholders involved in attainting sustainable ocean governance in support of small-scale fisheries and marine conservation broadly. The results from this review indicate that Oak is a unique funder in the donor landscape. Oak understands the different time-scales required for policy reform and behavioral change, the importance of building bottom-up organizations, and the at times challenging cultural and political context of building organizations capacity to support key marine issues. Their work addresses a range of ocean governance issues, including building sustainable fishing communities and supporting local livelihoods, protecting oceans and coastal communities from exploitative extractive industries, and the role of science in informing monitoring, evaluation, and policies. Oak supports coalitions of grantees and organizations around key issues, creating platforms for

> Oak funding supplemented the ongoing legal work already established at AEWC advocating for indigenous communities' subsistence rights and ability to negotiate access with the oil and gas industry. Attorney Jessica Lefevre facilitated this work for decades without consistent funding. Oak funding gave the program and project financial security and amplified their capacity by allowing them to hire another attorney for the ongoing legal work in support of indigenous communities—Attorney Jessica Lefevre, AEWC

organizations to work together—achieving more than they could in isolation. These collaborations can have multiplying effects, enabling institutional learning and partnerships beyond the scope of any individual Oak grant. Furthermore, Oak encourages organizations to build strong operational and financial structures with lasting effects, therefore even as Oak phases out funding in both regions, organizations are in a better position than they started.

Moving to new locations and scales, Oak should continue working to create collaborative environments among grantees and coalitions around key issues. We recommend that they continue working directly with fisher organizations and trusts, engaging fishers in scientific data collection and monitoring, and all other aspects related to strengthening organizational capacity and better institutional understanding of their actions and their effects. Altogether, Oak's experience in Belize and Alaska shows this to be a promising approach towards constructively assisting key members of civil society to continue pursuing their mission long after Oak's support has ended.

APPENDIX IX. OVERVIEW OF THE WORKSHOP

On February 7 and 8, 2017, we hosted a global workshop at Duke University of over 60 experts and practitioners to share experiences and suggest recommendations for future directions of support to SSF governance, based on an early draft of this document as a discussion paper. Participants included representatives from academia, fisher associations, international non-governmental organizations, regional agencies, philanthropies, research agencies, FAO and the World Bank among others. Discussions from small groups and the plenary provided insights captured in the recommendations. The agenda for the workshop is provided below, as are the full matrix of recommendations proposed by the participants.

Final agenda: workshop to share experiences of support to small-scale fisheries

February 7 and 8, 2017

21c Museum Hotel http://www.21cmuseumhotels.com/durham/

Durham, North Carolina; USA

Objectives:

- Exchange information of experiences in support of small-scale fisheries (SSF) governance
- Grow the field of research and practice on SSF governance
- Propose key recommendations for expanded external support[43] to SSF governance

February 7: Day One

09:00—09:05 *Opening and Welcome*: Dr. Jeff Vincent, Interim Dean of the Nicholas School of the Environment at Duke University

09:05—09:10 *Setting the stage*: Leonardo Lacerda, Director of Environment, the Oak Foundation.

09:10—10:00 Summary of Duke's background research on SSF governance: Prof. Xavier Basurto, Duke University

10:00—10:30 *Questions and Answers:* moderated by Ms. Lena Westlund, facilitator

10:30—11:00 Morning break

11:00—12:30 Update of ongoing global efforts to support SSF governance

- Overview of the FAO SSF Guidelines: Ms. Nicole Franz, FAO
- Report back from the October 2016 workshop exploring the human rights-based approach to implementing the SSF Guidelines: Mr. Sebastian Matthew, ICSF
- Overview, lessons, and direction of the Too Big To Ignore Network (TBTI): Dr. Ratana Chuenpagdee, Memorial University of Newfoundland
- Moderator: Ms. Lena Westlund, facilitator

[43] External support to SSF governance here refers to a full range of support: financing, in-kind contributions, knowledge and research, etc.

12:30—14:00 Lunch

14:00—15:30 Small group discussions on key topics in SSF governance

15:30—16:00 Afternoon break

16:00—18:00 Plenary discussion from small group discussions: moderated by Ms. Lena Westlund, facilitator

February 8: Day Two

08:30—10:00 Reactions and Voices from Fishers' associations

- Panel with Fishers' associations
- Moderator: Ms. Lena Westlund, facilitator.

10:00—10:30 Morning break

10:30—13:00 Discussion on lessons learned in external support of SSF, and recommendations for the future: moderated by Ms. Lena Westlund, facilitator.

Group Photo from the Workshop

List of Participants

Name	Organization
Kate Barnes	MacArthur Foundation
Adam Baske	International Pole and Line Foundation
Xavier Basurto	Duke University
Linda Behnken	Alaska Longline Fishermen's Association
Abby Bennett	Duke University
Stephen Box	Rare
Jesus Camacho	Mexican Federation of Fishing Cooperatives
Lisa Campbell	Duke University
Ratana Chuenpagdee	Memorial University
Philippa Cohen	WorldFish Center
Richard Cudney	Packard Foundation
Kama Dean	Walton Family Foundation
Daniel Dunn	Duke University
Matt Elliott	California Environmental Associates
Larry Epstein	Environmental Defense Fund
Imani Fairweather-Morrison	Oak Foundation
Elena Finkbeiner	Stanford University
Nicole Franz	United Nations Food and Agriculture Organization
Chuck Fox	Oceans 5
Nico Guiterrez	United Nations Food and Agriculture Organization
Han Han	China Blue Sustainability Institute
Elizabeth Havice	University of North Carolina at Chapel Hill
Anne Henshaw	Oak Foundation

table continued

Miguel Jorge	World Bank
Kay Jowers	Duke University
Laure Katz	Conservation International
Leonardo Lacerda	Oak Foundation
Mitchell Lay	Caribbean Network of Fisherfolk Organizations
Xinyan Lin	Oak Foundation
Editrudith Lukanga	World Forum of Fish Harvesters and Fishworkers
Vishwanie Maharaj	World Wildlife Fund
Sebastian Matthew	International Collective in Support of Fishworkers
Bonnie McCay	Rutgers University
Caleb McClennen	Wildlife Conservation Society
Brian McNitt	Cargill Foundation
Leah Meth	Packard Foundation
Rebecca Metzner	United Nations Food and Agriculture Organization
Mark Michelin	California Environmental Associates
Grant Murray	Duke University
Kristian Parker	Oak Foundation
Jason Patlis	Wildlife Conservation Society
Robert Pomeroy	University of Connecticut
Carlos Saavedra	Summit Foundation
Marty Smith	Duke University
David Toole	Duke University
Amadou Toure	West Africa Sub-Regional Fisheries Commission
John Virdin	Duke University

table continued

Amy Hudson Weaver	Niparaja
Lena Westlund	United Nations Food and Agriculture Organization
Dan Whittle	Environmental Defense Fund
Steven Worth	United Nations Food and Agriculture Organization
Guifang Xue	Shanghai Jiao Tong University
Tracy Yun	China Blue Sustainability Institute

Working group recommendation(s)

Recommendation (and to whom):	Purpose and expected outputs:	Type of activity:	Cross-cutting issues or links to other topics?	Geographic focus, or by sub-sector/theme?	Key players and partnerships?
Build capacity of countries to implement the SSF Guidelines in a coordinated manner	Increase uptake by governments of the SSF Guidelines—incorporation into law and on the ground	Support process where countries can agree on minimum set of indicators Support fisher organizations and governments so they can work together to deliver SDGs Building milestones to celebrate capacity development towards achieving SDGs (e.g. June conference on SDG 14, COFI 2018) Building partnership mechanisms that can keep legitimacy and support uptake of SSF Guidelines (governments, foundations, fisher orgs, academia) with a link to COFI, possibly with a Secretariat, a website—serving nature, governments, fisher organizations Building capacity/supporting regional bodies Building capacities supporting global fisher organizations Raise awareness, support translation in different languages Monitoring an important aspect to take into account	-	-	Partnership: governments, fisher orgs, academia, foundations Existing networks (e.g. TBTI tracking of SSF Guidelines implementation in ISSF)—identify gaps

table continued

Recommendation (and to whom):	Purpose and expected outputs:	Type of activity:	Cross-cutting issues or links to other topics?	Geographic focus, or by sub-sector/theme?	Key players and partnerships?
Promote fisher organization at national and regional levels to strengthen their capacities to participate in fisheries management					NGOs, scientists
Conduct a diagnostic of fisher organizations at national and regional level to identify gaps and opportunities for capacity development. This should also include needs of NGOs or other relevant actors at national level.					
Develop financial mechanisms for SSF to promote long term financing (focus on capacity building and research)					
Invest in collaborative research and to promote collaboration involving scientist, fishers, governments to identify needs of research and opportunities and strategies to use					
NOTE: Research should be focused on identifying areas of mutual interest/outcomes that are mutually beneficial					

table continued

Recommendation (and to whom):	Purpose and expected outputs:	Type of activity:	Cross-cutting issues or links to other topics?	Geographic focus, or by sub-sector/theme?	Key players and partnerships?
Building capacity and leadership for sustainable fisheries	Empower network of fishers with political influence	Assessment based community development (identifying assets and skills) Building capacity of fishers to be their own advocates Forster collaborative research Building partnerships Invest in leadership/next generation Provide technical and legal expertise Develop tool kit, communication of success stories Connection to networks to build political capacities	Conservation, social equity, rural development, health, food security	Fishing communities—including inland fisheries	SSF organizations, research partnerships, government at all levels, funders, impact investors
	Getting SSF embedded in national planning frameworks, not only fisheries-sector specific (which links to funding and CSO involvement)	Bottom-up: empower fishing communities Provide new opportunities for communities to express themselves, not only in relation to fisheries issues but also other relevant issues Collect lessons learns on successful fisher networks—prepare a guide Capacity development Develop specific tools for effective advocacy by fisher organizations, learning from experience of other		Global theory of change	Partnership with tech, social media Existing fisher organizations with new ones Funder Partnership Planning Ministries as connectors to bring together various relevant public institutions

table continued

	sector social movements (study and pilots) Partnership with Tech industry and media and NGOs to develop creative tools to empower communities Capacity development for governments: pilots/experiences from FAO to develop model law/draft for others to use Create the argument for small-scale fisheries, from the community and the larger community—related to the SDGs (Study and communication products) Rolf of funders: funding and providing pressure and motivation in the process. Public funders have influence at the international level → SSF funding cooperation to provide pressure and motivation	

table continued

Recommendation (and to whom):	Purpose and expected outputs:	Type of activity:	Cross-cutting issues or links to other topics?	Geographic focus, or by sub-sector/theme?	Key players and partnerships?
	Increase visibility and understanding of gender roles/power dynamics along the SSF value chains Increase capacity in leadership of women in SSF Create new partnerships across gender issues in SSF	Support new research in gender roles Communicate results back to the community Support various levels of the value chain Support women organizations in SSF communities Support for exchanges in convening of women's leaders Facilitate new partner collaborations Ask existing partners about their values and policies on gender equity	Gender is a cross-cutting issue, conservation	Global—but context specific	NGOs, existing women organizations in fishing communities, research institutions, funders
Conduct research project on value chains in SSF + develop tool kit related to value chain analysis in SSF	What are the features of different fisheries, markets, government system facilitate equitable benefit sharing, including the ability to generate/capture value by SSF?	Develop database of SSF cases, augment existing database with value chain cases Start with database that Anderson's have developed (on harvest, post-harvest—coding case studies) FPI database as starting point for value chain mapping Develop tool kit/dynamic tool with list of possible actions (innovative format, open source platform tool, crowd source funding possibility)—phase 2: apply the tool to selected fisheries Work with practitioners to identify needs along the entire value chain	CCA, design of rights based systems, tenure systems, food sovereignty vs food security Social equity, capacity building	Global Opportunistic	FPI data base developers, NGOs, funders Fishers, their organizations, supply chain actors, donors, NGOs

table continued

Recommendation (and to whom):	Purpose and expected outputs:	Type of activity:	Cross-cutting issues or links to other topics?	Geographic focus, or by sub-sector/theme?	Key players and partnerships?
Funders require social development to be considered from the outset, Challenges are appreciated as part of complex and dynamic systems	Social development is considered as part of SSF, not an add-on to sustainability Ensure that social development activities address locally identified priorities, considering best evidence of likely impacts Change to be monitored in a continuous way	All funded activities in SSF	Institutional collaboration, gender equity, supply chain, food security,		Funders Additional partners with expertise in social development
Where small-and industrial fisheries overlap clearly distinguish the two through zones Get rid of unreporting in SSF through enhanced data systems using ICT largely on cell networks Promoting states to develop and adopt IUU NPOAs States need to fund SSF leadership training programs and invest more broadly in SSF management Regional organizations supporting management plans for shared or regional SSF (e.g. small pelagics in West Africa)	reduce conflict - information for better management and efficiency in SSF	- transparency to understand where the industrial fleets are - public disclosure of licenses - tracking though satellite monitoring systems - Pull together pilots on this (e.g. Indonesia, Solomons, Belize) - Support state fisheries agencies to work with fishers to adopt these systems at the national level	China West Africa Caribbean Mexico		

table continued

Recommendation (and to whom):	Purpose and expected outputs:	Type of activity:	Cross-cutting issues or links to other topics?	Geographic focus, or by sub-sector/theme?	Key players and partnerships?
FAO develops repository on SSF tenure and governance	To recognize, legitimize and strengthen and help shape SSF in terms of their tenure and governance rights To provide data to empower SSF To improve visibility and influence of SSF vis-à-vis national development plans	Global scan of how space is partitioned among various fisheries, including in existing legal structures (see also group 2) Research on what existing SSF practices, customs, laws are that determine their tenure—requires participation by SSF and their representatives, collecting also SSF knowledge and stories for communication with policy makers and other influential actors Legal analysis	Integrating different kinds of knowledge in decision-making Climate change and resilience SDGs	Global, coastal and inland Prioritize for food security and poverty eradication/SSF involvement in biodiversity conservation	FAO Global fisheries watch TBTI Donors SSF organizations

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