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Environmental stewardship by small-scale fisheries

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Abstract

Small-scale fisheries, including fishers and fishworkers as well as their communities and organizations, are effective contributors to safeguarding aquatic resources and environments. The key role played by small-scale fisheries is well recognized in the Code of Conduct for Responsible Fisheries and in the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines). Such stewardship contributes importantly to the United Nations 2030 Agenda for Sustainable Development, to achieving the Sustainable Development Goals and to implementing the Global Biodiversity Framework. This publication highlights stewardship by small-scale fisheries, with a focus on real-world examples, thanks to the active participation of many small-scale fishing communities and organizations in sharing their experiences (see also https://ssf-stewardship.net). Four main themes are explored: (i) Key motivations and influences on stewardship practices. For small-scale fishers, stewardship is expressed as both a perspective and a practice, a way of engaging with the natural world and the local environment, with values, relationships, culture and spiritual aspects motivating stewardship action, along with securing sustainable livelihoods and community well-being. (ii) Six types of stewardship in small-scale fisheries: maintaining, restoring and improving local habitat and ecosystems; improving fishing practices and post-harvest practices; engaging in fishery management for sustainable use; stewardship of specific aquatic areas; stewardship of particular aquatic species (such as endangered species); and stewardship through outreach and advocacy. (iii) Supporting and/or enabling activities underlying stewardship. These build capacity for or motivate direct stewardship, creating an enabling environment based on recognizing and reinforcing secure tenure, rights and access; knowledge development; building community and organizational capacity; and education and communications. (iv) Lessons learned, good practices and ingredients for success in stewardship, which include attention to values and ethics; local leadership and responsibility; diverse knowledge and perspectives; cohesion and trust in the community and organization; empowerment and capacity to participate in decision-making and management; appropriate partnerships and external support; and supportive government policy and legislation. Overall, it is clear that support for fishing communities and organizations in their environmental stewardship is a valuable contributor to a sustainable future, as they lead the way in restoring local environments and stewarding resources.

Preface

This publication has been produced in support of implementing the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines). The aim is to highlight stewardship by small-scale fisheries, including key motivations and influences on stewardship practices, the various types of stewardship in small-scale fisheries, the crucial supporting and/or enabling activities underlying stewardship, and the lessons learned, good practices and ingredients for success in stewardship.

The publication was made possible thanks to the involvement of the International Planning Committee for Food Sovereignty Working Group on Fisheries, the World Forum of Fisher Peoples, the World Forum of Fish Harvesters & Fish Workers, and the International Collective in Support of Fishworkers. These organizations supported a process to engage with many small scale fishers, fishworkers, fishing communities and organizations, who, along with some civil society organizations with a principal mandate to work with small-scale fisheries, generously shared their experiences with environmental conservation and stewardship. The stewardship experiences are brought into the publication, as much as possible in the fishers' own voices, linked to analysis of stewardship motivations, approaches and factors of success.

This publication is complemented by the SSF Stewardship website (https://ssf-stewardship.net), which provides a wider range of stewardship experiences, with a web page for each of the participating fisher organizations and fishing communities, as well as an interactive global map showcasing the diversity of stewardship locations. The website provides a vehicle for small-scale fisher organizations and fishing communities to explore similar and different concerns and experiences, and for governments and others to better understand the wide range of SSF stewardship activities.

This publication was prepared during the International Year of Artisanal Fisheries and Aquaculture (2022), a year that also marked the achievement of the landmark biodiversity agreement, the Kunming-Montreal Global Biodiversity Framework (GBF). With small-scale fisheries found around the world, and interacting with many inland and marine ecosystems, SSF stewardship contributes significantly to maintaining and improving the state of biodiversity, helping to realize the goals of the GBF. Accordingly, this provides a timely opportunity, on a global basis, to highlight and facilitate the environmental conservation and stewardship practices of small-scale fishers and fishing communities.

The material covered here aspires to be useful to a diverse audience: to small-scale fisher organizations and fishing communities that wish to effectively engage in stewardship, to countries around the world, including government administrations and similar institutions dealing with fisheries and/or environmental conservation, to funding bodies, which can use this information to reinforce their support for fishery-related stewardship activities, and to other audiences, including civil society and the public. For all of these, the results of SSF stewardship contribute to healthier marine and inland aquatic systems supporting sustainable livelihoods, reinforcing the crucial role of local and community-based stewardship, and highlighting the need to enable or improve both practical and policy-level support.

Acknowledgements

This publication is the result of a collaboration between the Food and Agriculture Organization of the United Nations (FAO), Saint Mary's University (Canada) and the Community Conservation Research Network (www.communityconservation.net). It draws on many stewardship examples provided through the active engagement of small-scale fishers, fishworkers, fisher organizations, fishing communities and fishery support organizations from around the world. Much gratitude goes to all the participants for sharing their stories, experiences, knowledge and perspectives. The engagement was supported greatly by two organizations that act as global networks and coalitions of fisher and fishworker associations, the World Forum of Fisher Peoples and the World Forum of Fish Harvesters & Fish Workers, as well as the major support organization, the International Collective in Support of Fishworkers, and the International Planning Committee for Food Sovereignty Working Group on Fisheries, a global platform supporting alliance and coordination of fisher organizations. Outreach and awareness-raising for this initiative, especially relating to participation by small-scale fisher organizations and fishing communities, were facilitated greatly by these organizations. The effort of many individuals who supported the engagement process by providing information to fisher organizations and communities is also very much appreciated. We thank the Saint Mary's University Research Ethics Board for support in ensuring a proper process to receive and report on the contributions of small-scale fisher organizations and fishing communities.

Lena Westlund and Nicole Franz of FAO provided superb support throughout this work, both logistical and in terms of content. We are grateful as well to Vera Agostini for helpful intellectual contributions and to Larissa Sweeney for her extensive assistance in preparing the publication. We thank Maria Giannini for excellent editing of the text, José Luis Castilla Civit for the attractive publishing layout and Manuela Marazzi for the illustrations, adding greatly to the document, as well as Romina Toscano for her helpful administrative support. The work was funded under the project "Creating an enabling environment for securing sustainable small-scale fisheries", funded by the Swedish International Development Cooperation Agency, and its support is gratefully acknowledged.

Executive summary

Small-scale fisheries (SSF), including small-scale fishers and fishworkers as well as their communities and organizations, are among the world's most effective contributors to safeguarding aquatic resources and environments. Living near, and relying on, freshwater and marine aquatic species and environments, small-scale fisheries are at the heart of environmental conservation and stewardship – of caring for and sustainably using aquatic environments, managing fisheries for sustainable use, protecting and restoring local ecosystems, and working with others for these goals.

The key role played by SSF organizations and fishing communities is well recognized in the Code of Conduct for Responsible Fisheries and in the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines), which notes that "States should recognize the role of small-scale fishing communities and Indigenous Peoples to restore, conserve, protect and co-manage local aquatic and coastal ecosystems" (paragraph 5.5).

This publication highlights the stewardship work of small-scale fisher organizations and fishing communities around the world, showcasing the variety of ways in which stewardship leads to positive environmental and livelihood outcomes. The content includes examinations of key motivations and influences on stewardship practices, the various types of stewardship in small-scale fisheries, the crucial supporting and/or enabling activities underlying stewardship, the lessons learned, good practices and ingredients for success in stewardship, and how policymakers and others can support those stewardship activities. This all draws on real-world examples of small scale fisheries stewardship, thanks to the active participation of many small-scale fishing communities and organizations in sharing their experiences (see also the SSF Stewardship website https://ssf-stewardship.net).

The environmental stewardship role of small-scale fisheries is essential to producing healthier fisheries, safeguarding natural resources, conserving biodiversity, ensuring that ecosystems are maintained and restored, and sustaining livelihoods. The diverse benefits of stewardship also include benefits, such as capacity development; poverty and vulnerability reduction; employment and decent work; food security; post-harvest and value chain benefits; improved local engagement and empowerment; a greater role in decision-making and management; reduction of harmful practices; and improved monitoring and assessment. Furthermore, stewardship can improve responses to threats of climate change, and contribute importantly to the United Nations 2030 Agenda for Sustainable Development, to achieving the Sustainable Development Goals and to implementing the Global Biodiversity Framework.

This publication is organized around four main themes and summarized as follows.

The key motivations and influences on stewardship practices. For small-scale fishers, stewardship is expressed as both a perspective and a practice, a way of engaging with the natural world and the local environment. Values, relationships, culture and spiritual aspects are essential as motivations to take stewardship action along with securing sustainable livelihoods and community well-being. Related motivations include: (i) ensuring resource access, fishing rights and tenure; (ii) countering environmental damage and climate change; and (iii) helping small-scale fisheries to contribute to meeting legal, regulatory and international commitments.

The six types of stewardship in small-scale fisheries. Stewardship appears in six major forms, including activities within fisheries (e.g. sustainable use/harvesting, fishery management, post harvest activities) and other activities (e.g. physical initiatives to restore ecosystems, such as corals, mangroves and beaches). The forms of stewardship identified are:

- maintaining, restoring and improving local habitat and ecosystems;
- improving fishing practices and post-harvest practices;
- engaging in fishery management for sustainable use;
- stewardship of specific aquatic areas;
- stewardship of particular aquatic species (such as endangered species); and
- stewardship through outreach and advocacy.

The supporting and/or enabling activities underlying stewardship. Supporting and/or enabling practices can be crucial for success in stewardship. Such practices build capacity for or motivate direct stewardship activities, and indeed, stewardship efforts generally must be accompanied by these measures to create the "enabling environment". This goes beyond stewardship, in being crucial more broadly for involvement of fishers (and communities generally) in fishery decision-making. Specific supporting and/or enabling practices can include recognizing and reinforcing secure tenure, rights and access; knowledge development; building community and organizational capacity; and education and communications.

Supporting and/or enabling practices often relate to government support, both in policy and in practice, and includes financial support and infrastructure.

The lessons learned, good practices and ingredients for success in stewardship. A set of "good practices" or "ingredients for success" in environmental stewardship have been identified across direct stewardship (through physical, management, planning and advocacy activities) and in enabling and supporting activities. Good practices collectively involve paying attention to local, social, economic, cultural, ecological and biophysical factors, as well as current realities of capacity, institutions, policy and legal frameworks, and governance. Seven specific areas of good practices are as follows:

Values and ethics. The success of SSF stewardship depends largely on the underlying values, goals and motivations of society. These vary with the culture, history and economy surrounding fisheries. Fishers stress that successful stewardship requires following underlying values to ensure the fishery is maintained for future generations.

Local leadership and responsibility. Small-scale fisher organizations and fishing communities, in assessing what has made environmental stewardship successful and what aspects would be important to sustain the benefits into the future, placed local leadership as a crucial factor of success.

Diverse knowledge and perspectives. Fishers highlight the importance of knowledge as a factor of success in stewardship – consistent with its recognized importance to effective fishery management and policy. The use of all sources of such knowledge is needed for effective conservation, including traditional ecological knowledge, Indigenous knowledge, fisher knowledge and "local knowledge".

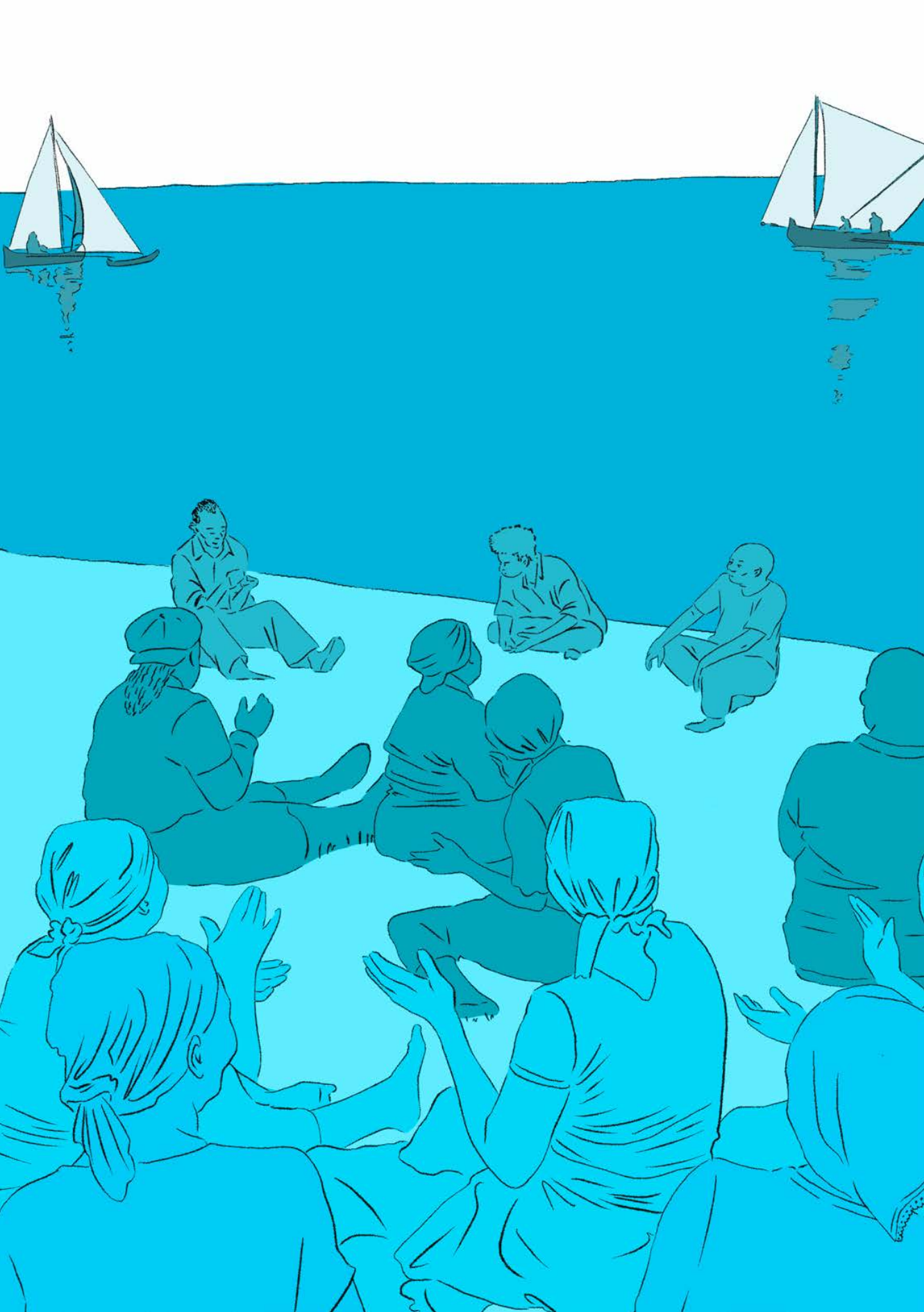
Cohesion and trust in the community and organization. TThe nature or structure of the community or organization plays an important role in the success of stewardship. This includes the nature of the institutions involved (e.g. levels of participation, leadership), the nature and local history of engagement, the social fabric (e.g. social cohesion) and the social structure (e.g. role of women, inclusiveness). Fishing communities have significant potential to draw on their own institutional arrangements.

Empowerment and capacity to participate in decision-making and management. Empowerment provides the capacity to seek out and implement local solutions to safeguard environments and livelihoods, to take leadership in building knowledge and to facilitate better community engagement in broader stewardship initiatives, e.g. carried out jointly by small-scale fisheries together with governments, local non-governmental organizations and scientists.

Appropriate partnerships and external support. While the stewardship role of small scale fisheries does not always require government support, there are situations in which suitable practical, financial and policy support can effectively support stewardship. However, government support must be compatible with the values and goals of fishers, and care is needed that governmental conservation actions are not detrimental to small-scale fishers.

Supportive government policy and legislation. Small-scale fisheries often indicate problems in obtaining government support for stewardship efforts, such as financial support, resources and infrastructure, or lack of recognition or reinforcement of fishers' rights, tenure and access. Positive government support for fisher stewardship can come through policy measures that extend beyond the fishery to include a strong connection with sustainable economies and communities, or that help in enabling fishery organizations and communities to better engage with scientific agencies and governmental institutions.

It is truly inspiring to see what small-scale fishing communities and organizations are achieving in their remarkable stewardship efforts, and, though more subtly, in what is done routinely as part of the life of fishing communities. Support for these fishing communities and organizations in their environmental stewardship is clearly a valuable contributor to a sustainable future, as they lead the way in restoring local environments and stewarding resources.



1. Introduction

Small-scale fisheries (SSF) – small-scale fishers and fishworkers, together with their fishing communities and fisher organizations – are among the world's most effective contributors to the conservation of aquatic resources and environments.[1] Based on proximity to and close interaction with freshwater and marine aquatic species and environments, this aspect of small-scale fisheries is at the heart of environmental conservation and stewardship.

The wide range of activities that constitute "SSF stewardship" involves caring for and sustainably using the aquatic environment, managing fisheries for sustainable use, protecting and restoring local ecosystems, and working with others towards these goals. These actions support ecosystem well-being, health and livelihoods of fishing communities, a sustainable local economy, and local and regional food security in diverse ecosystems around the world. Stewardship is carried out by women and men in both subsistence and commercial small-scale fisheries and across all levels of the value chain, including those who fish, those active in the pre- and post- harvest sectors, and those responsible for unpaid supporting tasks, such as household and family care, and related activities, such as repairing fishing gear and maintaining landing sites.

The importance of SSF stewardship, and the key role played by SSF organizations and fishing communities, has been highlighted in key global agreements produced through the Food and Agriculture Organization of the United Nations (FAO) for many years. In 1995, the Code of Conduct for Responsible Fisheries noted: [2]

> **5.15. States should facilitate, train and support small-scale fishing communities to participate in and take responsibility for, taking into consideration their legitimate tenure rights and systems, the management of the resources on which they depend for their well-being and that are traditionally used for their livelihoods.**

Subsequently, the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication, commonly known as the Small-Scale Fisheries Guidelines or "SSF Guidelines" (FAO, 2015),[3] as part of its fundamental guidance on the future of these fisheries, notes (paragraph 5.5) that "States should recognize the role of small-scale fishing

[1] There is no universal definition of small-scale fisheries, but such fisheries tend to operate on or close to shore – whether gathering along the shoreline, or fishing from shore, or fishing from relatively small boats near the shore. They tend "to be strongly anchored in local communities, reflecting often historic links to adjacent fishery resources, traditions and values, and supporting social cohesion" (FAO, 2015). Notably, "small-scale fisheries employ more than 90 percent of the world's capture fishers and fishworkers, about half of whom are women", and these fisheries "contribute about half of global fish catches" rising to two-thirds of fish "destined for direct human consumption" (FAO, 2015; FAO, Duke University and WorldFish, 2023).

[2] FAO (1995) notes that: "This Code sets out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due respect for the ecosystem and biodiversity. The Code recognizes the nutritional, economic, social, environmental and cultural importance of fisheries and the interests of all those concerned with the fishery sector." (https://www.fao.org/fishery/en/publications/56346)

[3] FAO notes that "The SSF Guidelines are aimed at all actors striving to secure sustainable small-scale fisheries... More than 4 000 voices from fishers, fishworkers and others in over 120 countries have described how they would want to make livelihoods along the small-scale fisheries value chain sustainable for people and the planet. Their recommendations have been summarized into a concise set of principles, namely the SSF Guidelines. ... The final text of the SSF Guidelines was negotiated... in 2014, confirming a strong commitment from both governments and civil society to bring about positive change in small-scale fisheries." For more information, see https://www.fao.org/voluntary-guidelines-small-scale-fisheries/en.

communities and Indigenous Peoples to restore, conserve, protect and co-manage local aquatic and coastal ecosystems."

Notably, these lines focus on both recognizing and supporting SSF stewardship. The aim here is to contribute to these goals by highlighting and supporting the stewardship work of small-scale fisher organizations and fishing communities around the world, showcasing the diverse forms of this SSF stewardship – the variety of ways in which stewardship leads to positive environmental and livelihood outcomes, and how fishers, fishworkers and fishing communities can best embrace their role of responsible environmental stewardship.

Within these pages, the richness and diversity of stewardship can be seen through real-world examples of stewardship, in most cases provided directly by small-scale fisher organizations and fishing communities.[4] A fundamental aspect here is consideration of the diverse voices of fishers, across geography, gender and social characteristics, describing environmental conservation and stewardship experiences often led by fishing communities and local fishing organizations. Many of the stewardship activities lie within the fishery, while others involve more broadly protecting, restoring and improving local ecosystems. Multiple parts of the fishery value chain are engaged – harvesting, processing, marketing, and other areas – though there is a particular emphasis on the first of these. Figure 1 illustrates some of the many possibilities.

This publication has been possible thanks to the deep engagement by many small-scale fishers, fishworkers, fishing communities and their organizations. Following an open and widely publicized invitation, many communities and organizations (as well as some civil society organizations with a principal mandate to work with fishing communities and fisher organizations) generously shared their experiences with environmental conservation and stewardship. This engagement was supported by the International Planning Committee for Food Sovereignty Working Group on Fisheries, the World Forum of Fisher Peoples, the World Forum of Fish Harvesters & Fish Workers, and the International Collective in Support of Fishworkers. This also builds on other work carried out on fishery and community conservation and stewardship.[5]

The stewardship experiences of small-scale fisher organizations and fishing communities are relayed here as much as possible in the fishers' own voices. A wider range of these experiences may be found on the SSF Stewardship website (https://ssf-stewardship.net), where a web page is devoted to each of the participating small-scale fisher organizations and fishing communities. There is also an interactive global map providing a visual sense of the diversity of stewardship locations. The website showcases many varied experiences and provides a vehicle for small-scale fisher organizations and fishing communities to explore similar and different challenges, interests, concerns and experiences and for governments and others to be inspired by the wide range of SSF stewardship activities.

This publication was prepared during the International Year of Artisanal Fisheries and Aquaculture (2022), a year that also marked the achievement of the landmark biodiversity agreement, the Kunming-Montreal Global Biodiversity Framework (GBF) (CBD, 2023). With small-scale fisheries found around the world, and interacting with many inland and marine ecosystems, SSF stewardship

[4] Additional examples are from the Community Conservation Research Network, a global initiative on community conservation (www.communityconservation.net), and from Hicks (2020), research that was carried out within the framework of the SSF Stewardship Initiative.

[5] A variety of past work on small-scale fisheries and on stewardship has been drawn upon, e.g. the links of fisheries and biodiversity conservation (e.g. Garcia, Rice and Charles, 2014); how these links work in small-scale fisheries and fishing communities (e.g. Berkes, 2004, 2009, 2021; Charles, 2017); the forms and profile of local marine stewardship (e.g. Bennett *et al*., 2018, 2022; Gasalla and de Castro, 2016); and re-Indigenizing conservation (e.g. No'kmaq *et al*., 2021). Many examples of stewardship are described, most provided directly by small-scale fisher organizations and fishing communities, with others from the global Community Conservation Research Network (www.communityconservation.net) and from Hicks (2020), research that was carried out within the framework of the SSF Stewardship Initiative. The stewardship role of SSF has been examined also in the Too Big to Ignore small-scale fisheries network, where it is noted that "Small-scale fishing communities are, and can be, active partners and leaders in the stewardship and conservation of aquatic and marine resources." (http://toobigtoignore.net/research-cluster/ssf-stewardship)

contributes significantly to maintaining and improving the state of biodiversity, helping to realize the goals of the GBF. Accordingly, this provides a timely opportunity, on a global basis, to highlight and facilitate the environmental conservation and stewardship practices of small-scale fishers and fishing communities.

A key goal here is to provide the reader with practical information, and examples, to illustrate SSF stewardship through the perspectives shared by small-scale fishers and fishing organizations about how small-scale fisheries are protecting and caring for the environment – through various types of stewardship activities – to meet the many goals being pursued through stewardship and drawing on some "good practices" in SSF stewardship. Three additional goals are to build knowledge and capacity, to support policy development, and to facilitate greater recognition of the role of SSF stewardship within national and international decision-making bodies. All of this can help small-scale fisheries in meeting responsibilities for improving ecological and human resilience, in achieving the targets of the Global Biodiversity Framework and the Sustainable Development Goals, and in building adaptive capacity that supports preparedness and response to the impacts of global climate change.

The material covered here aspires to be useful to a diverse audience: to small-scale fisher organizations and fishing communities that wish to effectively engage in stewardship, to countries around the world, including government administrations and similar institutions dealing with fisheries and/or environmental conservation, to funding bodies of all types, which can use this information to reinforce their support for fishery-related stewardship activities, and to other audiences, including civil society and the public. For all of these, the results of SSF stewardship contribute to healthier marine and inland aquatic systems supporting sustainable livelihoods, reinforcing the crucial role of local and community-based stewardship, and highlighting the need to enable or improve both practical and policy-level support.

Following this introductory chapter, the four main chapters each explore one of the main aspects of SSF stewardship:

i) The key motivations and influences on stewardship practices.
ii) The six types of stewardship in small-scale fisheries.
iii) The supporting and/or enabling activities underlying stewardship.
iv) The lessons learned, good practices and ingredients for success in stewardship.

Chapter 2 focuses on the fundamental nature of stewardship – what underlies stewardship activity, what motivates it, and the key factors affecting stewardship practices. The importance of values, relationships, culture and spiritual aspects is highlighted as major motivations to take stewardship action along with securing sustainable livelihoods and community well-being. Concerns are examined around: (i) ensuring resource access, fishing rights and tenure; (ii) countering impacts of environmental damage and climate change; and (iii) emphasizing stewardship as a means for small-scale fisheries to contribute to meeting legal, regulatory and international commitments. Finally, the chapter discusses the importance of leadership, participation, and recognizing and working towards enactment of universal human rights such as gender equality.

Chapter 3 discusses the many different activities that can be considered forms of stewardship, including protecting or restoring parts of the environment or fishery resources (e.g. through physical activities such as mangrove restoration); sustainable use/harvesting of aquatic species (e.g. through better post-harvest practices, better fishery management or stewardship of aquatic areas); and efforts to conserve non-fishery aquatic species such as endangered species. For each of the forms of stewardship, a short explanation is given of what it involves, why it is important and how it is carried

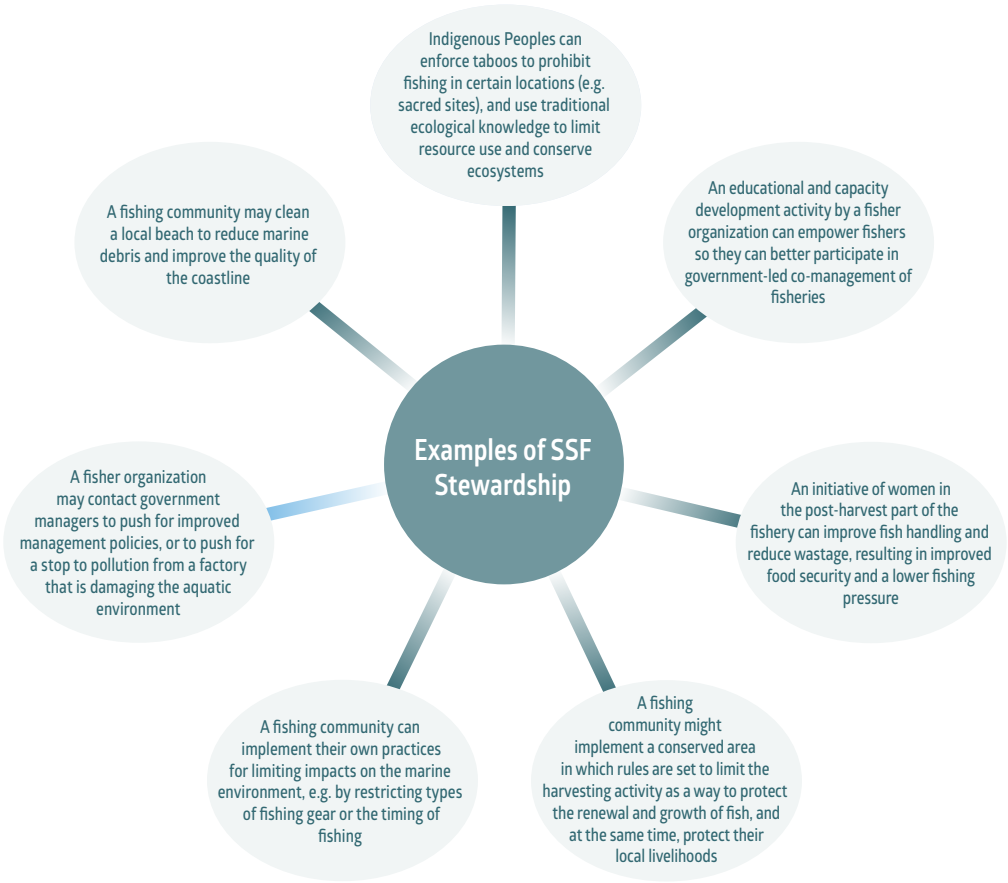
out. Real-world examples are given, largely provided directly by fisher organizations and fishing communities based on their own experiences.

Chapter 4 complements the preceding chapter with a focus on the "supporting" and/or "enabling" activities leading to successful stewardship. These build capacity for or motivate direct stewardship activities, and indeed, stewardship efforts generally must be accompanied by some combination of these measures to create the "enabling environment". These measures are not just about stewardship but are crucial more broadly for involvement of fishers (and communities generally) in fishery decision-making. Such measures can relate to ensuring secure tenure, rights and access; knowledge development; community/organizational capacity; education and communications, as well as additional enabling activities discussed in the chapter, alongside real-world examples.

Chapter 5 reviews the goals being pursued by small-scale fishing communities and fisher organizations in their stewardship activities and discusses the levels of success achieved in meeting these goals. This includes the "lessons learned" reported by SSF organizations and fishing communities, leading to identifying a series of good practices or "ingredients for success" that can be helpful to small-scale fishers in their stewardship efforts, as well as helpful to governments and other policymakers in seeking ways to improve their support for SSF stewardship.

Chapter 6 provides a brief closing discussion, highlighting the path forward for small-scale fishing communities and fisher organizations in their environmental stewardship initiatives.

Figure 1



Source: Authors´ own elaboration.

2. The nature of SSF stewardship

Underlying the specific activities undertaken as environmental stewardship by small-scale fishers, fishworkers, fishing communities and fisher organizations, there are some fundamental elements that are related to living with and caring for the aquatic world. Key among these are underlying values, ethics, relationships, cultural and spiritual aspects, including a sense of responsibility to care for natural systems on behalf of future generations. Also of crucial importance are concerns over the well-being of the fishery (fisheries sustainability), fisher livelihoods (livelihood sustainability) and fishing communities. These aspects all interact with recognition of fundamental human rights, such as gender equality and empowerment. For each topic in this section, brief examples and/or quotes from participants are provided to illustrate the ideas being described. However, it is also recognized that the examples chosen cannot fully convey the wide diversity in approaches to these themes.

2.1. Values, relationships, culture and spiritual aspects

Small-scale fishing communities typically have strong links between humans and nature, and between the community and the local ecosystem – a "conservation ethic" – which then appears as active and regular involvement in stewardship activities. Many ethical, values-based and spiritual aspects underlying stewardship are based fundamentally on that close relationship with the natural environment.

Fishing, in coastal communities around the world and practised over many generations, has created among fishers "a deep connection to the ocean and their communities. This connection is often expressed in a strong ethic of care for the marine environment" (Graham, Charles and Bull, 2006). Small-scale fishing communities and fisher organizations highlight the importance of a sense of moral/ethical responsibility or civic duty to care for natural systems and a sense of responsibility to future generations. This is reflected in practices of stewardship, and in many cases, local management of fisheries and coastal areas.

The ethics and values underlying stewardship are reflected among fishers individually and in their organizations, but also at a community level. Indeed, there is a fundamental connection between a community and its local environment, a connection rooted in values that may be cultural, spiritual and economic. Stewardship is often based in a belief system and values relating to being in and part of nature, respecting and caring for the natural world. As Graham, Charles and Bull (2006) note, in small-scale fisheries:

> ...the marine ecosystem holds an importance far beyond just providing fish for human consumption. The ocean holds many other values for people (and other species), which are intrinsically important in their own right.

While this is certainly based on the closeness of coastal communities to the water, with people spending much of their lives at sea or by the shoreline, there is nevertheless great diversity in the specific realities of small-scale fisheries (see box on *People, nature and diversity*).

People, nature and diversity

Stewardship is supported by the attributes of small-scale fisheries noted above, including a fundamental connection with the local environment rooted in values, ethics and culture, a sense of moral responsibility to care for natural systems and a sense of responsibility to future generations. This outlook seems common to many societies around the world and is seen in many fishery and community contexts, notably being found in many Indigenous societies, as well as in many philosophies and world religions (e.g. Attfield, 2016). There is often a personal and/or cultural element involved; stewardship aligns with people's core values, to be in nature and care for it. As Makino (2016) notes, stewardship is "dependent on how the local culture interacts with the ecosystem service uses", so it is "reflecting the local way of living in harmony with the coastal ecosystems."

Connections with nature may have developed since time immemorial, in the case of Indigenous Peoples, or over centuries for other societies, but may have been deeply affected by more modern events, such as colonization. How history has shaped connections with nature can affect many forms of stewardship, from involvement of fishers nationally and internationally to local aspects of stewardship. It is important, in considering stewardship by small-scale fishers, to be mindful of both historical and current practices together with societal impacts that affect them.

It is common among small-scale fishers that fishing is not seen as being about controlling or exploiting nature, nor of maximizing output, but rather about providing food and livelihoods while also safeguarding the well-being of the fish and of marine life and marine ecosystems more broadly.

Consequently, small-scale fishers and fishing communities around the world are showing how people can work effectively together to conserve, manage and improve local environments and build sustainable local economies in coastal and inland areas. More attention could be paid to these successes in various settings, such as national and international public affairs, news and online media and academia/research communities.

"Keep taking care of nature because nature keeps taking care of us. Whatever the situation, whenever we live, and wherever we are..."

"Women are an important element both in community leadership and in implementation. [Many of] our members are women..."

R. Nurhadi, All Indonesian Fishermen Association (HNSI), Indonesia
Source: Nourhadi 2022.

2.2. Livelihoods and community well-being

In addition to values, relationships, culture and spiritual aspects, stewardship is motivated by a recognition that the quality of life among fishers, fishworkers and fishing communities depends on a healthy environment together with economic stability and social well-being. Specifically, stewardship by SSF communities and fisher organizations is often closely linked to sustaining livelihoods (individually and collectively) and to securing and improving the well-being of communities into the future.[6] It has been noted that SSF stewardship:

[6] See, for example, Borrini-Feyerabend *et al*. (2010); Berkes (2021); Charles (2021); Govan *et al*. (2008).

...is about the present and the future. It is about making a living and supporting the community now, while also maintaining healthy resources and marine ecosystems so future generations can also benefit."... "The desire to secure the long-term survival of inshore fisheries and coastal communities is part of what fosters a sense of resource stewardship. (Graham, Charles and Bull, 2006, p. 131)

> "Environmental conservation for the organization is how to use the resources in the environment to sustain them for transfer to the next generation to use."
>
> H. Kumara, National Fisheries Solidarity Movement (NAFSO), Sri Lanka
> *Source*: Kumara (2022).

Stewardship involves environmental aspects, primarily the health of fish stocks and local ecosystems, and other aspects of ecological and resource well-being (biodiversity conservation, protecting endangered species and habitats). However, since resources and livelihoods are intrinsically linked, in parallel, stewardship also supports the goals of human well-being, particularly of fishers, fishworkers and communities protecting and enhancing the sustainability of local livelihoods, income generation, poverty reduction, nutrition and food security.

The fact is that a community in harmony with its environment can better meet fundamental needs, produce food and earn a living by using the local environment while at the same time protecting the environment from negative human impacts. Given the chance and support, fishers and their communities can resolve many environmental and livelihood challenges in ways that make a difference locally, a reality that explains why much of the world's progress in conservation is occurring at the local level. That said, there are external forces or threats that extend beyond the scope of fishing and local stewardship, such as climate change, introduced species and external polluters affecting fishery ecosystems. Yet, even when these challenges are outside the ability of fishers and communities to resolve, stewardship initiatives can help improve visibility and voice and help provide some degree of protection.

Stewardship to enhance livelihoods can come in various forms, including efforts to combat negative or harmful behaviour (destructive fishing practices, habitat degradation), educational materials to increase awareness of environmental issues, campaigns to obtain recognition or certification for sustainability (an "ecolabel" indicating sustainable harvesting, for instance), and income from payments for stewardship activities by external organizations, such as environmental non-governmental organizations (NGOs).

> "...the community and fisher groups understand the importance of conservation, both in terms of the resource itself and the environment in which these resources live. That the environment is well maintained will ensure the sustainability of the resources they use, and some of them feel they have to take responsibility for it."
>
> Khalis, Berkat Kuitta Onus Cooperative, Indonesia
> *Source*: Khalis (2022).

> "Because the local fishing profession has to rely on natural resources, if [these] are not preserved, the fishing profession cannot survive. It is therefore necessary to ensure that there is a balance between use and conservation."
>
> S. Jahmoudor, Federation of Thai Fisherfolk Association
> *Source*: Jahmudor (2022).

2.3. Facing the future, climate change and environmental hazards

Stewardship, closely linked with the ideas of sustainability, focuses on caring for the environment and the future. This implies the need to consider rights and governance, major threats such as climate change, poverty and food insecurity, impacts of environmental damage, and regulatory and statutory requirements. Brief descriptions follow of these considerations, including pertinent examples and illustrations.

Secure access enables stewardship. Stewardship supports long-term sustainable livelihoods, but the long-term perspective requires security for fishers to engage in those livelihoods. Accordingly, stewardship must take place in conjunction with efforts to secure resource access, fishing rights and tenure and to build resilience, all of which enhance community well-being.[7] Indeed, "Secure access to resources is a prerequisite for livelihood security and development", given that "people are more likely to invest in their own future when they are confident that they will continue to be able to draw on the resources they need for their livelihoods" (FAO, 2013). As a result, improving recognition of tenure and access rights over resources and spaces can enhance the capability to carry out stewardship and the success of such efforts. Conversely, SSF stewardship activity can itself provide an impetus for improving tenure and access for small-scale fishers, fishworkers and fishing communities.

Canada: Indigenous Nuu-chah-nulth Nation

The stewardship role of small-scale fishers is demonstrated clearly within the Nuu-chah-nulth territory on the west coast of Vancouver Island, in the Canadian province of British Columbia. The Nuu-chah-nulth people have been living for thousands of years on land that includes coastal ecosystems and watersheds, with a society, economy and culture that are deeply connected to their natural resources. The Nuu-chah-nulth make their societal decisions about fishing based on Uu a thluk, which is translated as "taking care of".

There are multiple Nuu-chah-nulth communities in the territory, and for these communities, salmon fishing is of great importance culturally, with the Nuu-chah-nulth now building their capabilities to utilize a broad range of marine resources and developing suitable management plans to benefit their communities and to ensure sustainability. The Nuu-chah-nulth approach, as for many other Indigenous Peoples, is based on traditional management incorporating the holistic principles underlying ecosystem-based and integrated management.

The resulting stewardship efforts are accompanied by higher-level policy and legal initiatives, including court cases (over) traditional resource access rights, so that Nuu-chah-nulth communities can achieve their long-term livelihood potential. A combination of long-standing cultural values, traditional stewardship practices, rights over local resources and a crucial need for sustainable livelihoods leads to practical conservation efforts (e.g. fishery management plans), as well as coordinated high-level policy engagement by the Nuu-chah-nulth communities.

Foxcroft, Hall and Cowan. Community Conservation Research Network.

Source: Foxcroft, Hall and Cowan (2016).

[7] For example, see Armitage, Berkes and Charles (2017); Berkes (2021); Charles (2013, 2021); Jentoft (2000); Pinkerton (2009); and Weeratunge *et al*. (2014).

Pursuing climate and environmental resilience motivates stewardship. Stewardship is an essential component of building resilience for fisheries and communities to deal with rapidly increasing frequency and intensity of many types of shocks and stressor changes and new risks, including increased exposure to hazards, disasters, and the range of shocks and stressors that are already happening and those bound to arise.

Stewardship in small-scale fisheries and fishing communities builds environmental resilience by reducing declines in the quality of the environment caused by external factors, such as industrial pollution and coastal development. Such stewardship may involve local efforts to restore damaged habitats and ecosystems, as well as efforts to influence government and other players to reduce damaging activities so that widespread prevention and recovery from large-scale environmental damage can take place.

> "The coast is marked by very strong pressure from tourism, which increases the number of inhabitants, while the treatment capacities are insufficient... There is also pollution linked to agriculture (green algae) and episodes of toxic algae blooms in summer. This is linked to an estuary dam, which has changed the circulation of water and species such as eels."
>
> *Source*: Le Sann (2022).

Pursuit of climate resilience also motivates stewardship initiatives, which can be key ingredients in preparing for and dealing with a range of climate change impacts. Two specific tasks are: (i) reducing disaster risks and adapting to climate change (e.g. to prevent damage by storm surges); and (ii) recovering from the impacts of disasters or climate change (e.g. rebuilding habitat). Stewardship provides mechanisms to simultaneously help communities adapt to climate change and build resilience while also safeguarding and improving livelihoods by reducing poverty and improving food security. This type of place-based, integrated approach is one way in which small-scale fishers are preparing for and addressing the *nexus* of climate and poverty (Charles, Kalikoski and Macnaughton, 2019).

Climate change and the Iconi Fishers Cooperative in the Comoros

The Iconi Fishers Cooperative in the Comoros engages in a combination of activities to care for the local environment while also addressing climate change impacts and working to improve livelihoods. As related by Ismail Mahamoudou, Secretary General of the cooperative, this has included promoting practices that prevent the removal of coral and sand, constructing new infrastructure to protect the cooperative's landing site from storm surges, working to improve fishing practices, protecting sea turtles, and organizing municipal waste collection to reduce the impact of household waste on sensitive reef ecosystems.

Ismail Mahamoudou, Iconi Fishers Cooperative (2022)

Source: Mahamoudou (2022).

Climate change and the Association of Cochabamba Fishers in the Plurinational State of Bolivia

In the Plurinational State of Bolivia's Amazon region, the impacts of climate change are increasing on the Ichilo River, as noted by Omar Ortuño, of the Association of Cochabamba Fishers:

> One of the big things is climate change, which I observe has been affecting us a great deal... There are extended, long very hot dry seasons, and then when it rains, it rains a lot, and with force, it sweeps a lot of mud down from the banks and the water becomes very turbid, and this starts to kill the small fish...While we have a lot of measures that we can take to contribute to protection, there are these other big problems, like climate change that I don't know how we will be able to solve.

Mr Ortuño noted that climate concerns are parallel to their work to improve fishing practices by raising awareness around harmful practices and coordinating with different levels of government to improve regulation. This included creating and implementing a ban on fishing for "blanquillo" (a local scavenger catfish species) since wild game was used as bait in its harvesting, a practice the association recognized as harmful to the local forests and aquatic ecosystems.

Orellana, O. O. 2022. Asociación de Pescadores Cochabama (ASPECO).

Source: Orellana (2022).

Climate change and the Thailand Sustainable Development Foundation

The "Thailand Sustainable Development Foundation (SDF) ...works to create a sustainable future for resource-dependent communities and vulnerable natural ecosystems across Thailand, by promoting and supporting the participation of resource-dependent communities in the management of natural resources, disaster risk reduction and adaptation to climate change. ...The strength of the community makes it possible to better cope with the threats of both natural and policy-borne threats. Communities have more access to information and protect their rights than in the past. ... Government agencies have begun to put gender dimensions and climate change adaptation issues into national plans and policies."

Source: Prasertcharoensuk (2022)

Stewardship can help meet legal, regulatory and policy imperatives. Legal/regulatory requirements (or standards) and governmental policy requirements may be met through appropriate stewardship actions, thus supporting sustainable livelihoods and community well-being. This could relate to implementing ecosystem-based management and the ecosystem approach to fisheries, participating in fishery co-management, or developing and managing community-based fisheries. There could also be governmental regulatory and statutory requirements based on meeting international agreements, e.g. FAO agreements and those established through the Convention on Biological Diversity, requiring, for example, the implementation of a certain number of marine protected areas or other effective area-based conservation measures that would be relevant for SSF stewardship.

"Caring for the environment is important in order to guarantee the reproduction sites of marine species so that their habitat does not suffer any change or damage."

"[Since we] attach particular importance to the conservation and protection of biodiversity... we actively participate in research work with scientists, and we have set up partnership actions with environmental NGOs. We have also developed modern and innovative tools for the protection of sensitive species."

B. Wendling, SATHOAN Producers' Organization, France
Source: Wendling (2022).

2.4. Leadership and partnerships in stewardship

Stewardship within a particular small-scale fishing community or fisher organization may be led by, and/or involve, a range of participants, such as leaders of the organization or community, a particular community group or certain members of the organization, or broad participation from the full organization or community. There may be potential involvement from the various parts of the fishery and community in general (e.g. fishing, processing, fish selling or trading, and pre-harvest support services such as net making).

Stewardship may be initiated and primarily led locally by the fishery organization or the community itself, or it may take place in connection with a larger-scale fishery organization or at a broader subnational, national or regional level. Furthermore, there can often be collaboration between the SSF organization/community and others, or participation of the SSF organization/community in broader activities since small-scale fishing communities and organizations report that their stewardship work is carried out, at least in part, by a range of partners.

Such partners can include other fisher organizations or communities and/or a combination of government, NGOs, international donors or agencies, community groups and fisheries organizations locally, or in the private sector. In fact, there may be shared leadership across several of these, or different entities may have initiated or led different elements. Evidence from the SSF stewardship project indicates that NGOs, civil society organizations and similar organizations are partners in most cases; there are also situations where a broad network of organizations and communities is involved.

Governments are also frequent partners with small-scale fishing communities and organizations. When stewardship is carried out in a partnership between the fisher organization or community and the government, it is known as co-management (sharing of decision-making) or community-based management (with the community or fisher organization having a high level of decision-making responsibility), as noted earlier. While these terms are often associated with fishery management, they can be applied equally to stewardship activities.

In cases where the SSF organization or community participates in broader activities (e.g. at a national or subnational jurisdiction rather than the local area of the community or organization), management activities will be typically led by governments, donor agencies, NGOs or other bodies. The fishing community or fisher organization may be among many involved in a specific broad-scale environmental stewardship project (e.g. habitat restoration or spatial management), led by the government or other body. Alternatively, the organization or community may play a supporting role in an initiative focused on networking activities, such as planning/coordination meetings, perhaps with one or two specific people serving as representatives of the organization or community, possibly within a network of other organizations or communities.

Within stewardship activities, there is the important matter of empowerment and how it can change over time. For example, some initiatives are designed to start with leadership by an NGO, with a degree of community or fisher organization involvement, and then to evolve over time so that the fisher organization or community takes on increasing leadership and responsibility for the stewardship activity.

The Democratic Republic of the Congo: awareness-raising and lakeshore habitat restoration

The Lake Tanganyika Fishers Collective (Collectif des Pêcheurs du Lac Tanganyika, or COPETANG) connects small-scale fishers in Lake Tanganyika, the Congo River and the many rivers scattered across the Tanganyika province. Between climate change and large-scale environmental degradation, negative impacts have been noticed in the lake, specifically the disappearance of certain fish species. Ensuring the lake fishery is sustainable is crucial to maintaining local livelihoods and supporting good nutrition, guaranteeing food security.

COPETANG has engaged in conservation activities by raising awareness on negative environmental impacts in the surrounding communities, using media to hold awareness sessions and hosting workshops and conferences. It has also organized activities to strengthen ecosystem resilience, such as riparian planting along the shores of Lake Tanganyika and the surrounding rivers.

These initiatives have led to increased awareness of environmental issues and the importance of the fishery to the local people, as well as to a better understanding of the interconnection between community members and nature. As Kapalay Kabemba Jean Pierre, a COPETANG member and community fisher, has said, "When the environment is well protected, it generates benefits for food security, poverty reduction and above all the fight against climate change."

Source: Jean Pierre (2022)

2.5. Gender and stewardship

Advancing towards gender equality is an essential principle to uphold and ensure both within and alongside small-scale fisheries and stewardship activities. Gender equality is a fundamental human right, and working towards its realization is a core societal value recognized in international law through, for example, the United Nations Universal Declaration of Human Rights (1948), the Convention on the Elimination of All Forms of Discrimination against Women (1979), and as Sustainable Development Goal 5 (Achieve gender equality and empower all women and girls). Working towards and promoting gender equality in stewardship and small-scale fisheries is important not only because women and girls are already leaders in conservation and should be supported even more in these roles, but also because of its intrinsic value of improving fairness and contributing to global human well-being.[8]

Gender and gender inequality are not specifically about women or women's issues and roles, but are about the values, rules and relationships existing among all people. Gender interacts with other dimensions of identity, including class, age, ethnicity, race, caste, religion and sexual orientation – the idea of intersectionality. Observing gender and intersectionality enables us to understand how unequal social position, access, agency and vulnerability continue to significantly influence the roles

[8] For example, see Lawless *et al*. (2021); and Tallis and Lubchenco (2014).

that people may occupy in fisheries and acknowledge what barriers need to be addressed in order to advance towards greater equality (FAO, 2022a).

In the face of these persistent inequalities, it is important to recognize the role of women not only in stewardship, as shown strongly here, but also in management and decision-making, and overall, in the fishing community or fisher organization. Many hold roles within the fishery, for example, participating in some aspect of fishing or post-harvest, as a fisher or fishworker, in processing or marketing, and holding roles and responsibilities at the household level. The roles taken on by women in stewardship, as in other activities, may be as leaders, such as elders, as advocates for local rights or initiators in community mobilization, or as participants, to varying extents, in activities such as teaching, training, capacity development, technical support, and data collection and monitoring.

While women's roles in small-scale fisheries are diverse and essential not only to stewardship but also to food security, livelihoods and local economies, they are also greatly under-recognized and undervalued. Globally, women make up an estimated 40 percent of fishers (FAO, Duke University and WorldFish, 2023), including 18 percent of people directly involved in fishing activities and 50 percent of people involved in pre- and post-harvest activities.

Despite significant global progress, gender inequality continues to prevail in many dimensions of daily life, as women in the fisheries sector are often at risk of gender-based violence, continue to occupy a much larger share of informal, lowest paid, least stable and least skilled positions, are frequently excluded from decision-making and leadership positions, have limited access to physical and capital resources, receive fewer benefits and have fewer rights and privileges in the sector, and have more limited control over markets and value chain interactions (FAO, 2022b).

Thus, a key challenge is finding a way to better address inequality as part of and together with supporting stewardship. Women and girls should be supported in their existing leadership roles and contributions to governance and environmental stewardship through new opportunities to increase their available choices and ability to act on them (empowerment and agency). This should also recognize and endeavour to reduce the unequal burden and barriers that they face not only in achieving stewardship goals but also more broadly in society. To this end, action towards gender equality in small-scale fisheries links closely with Sustainable Development Goal 5 and to global policy instruments, such as the 2020 FAO Gender Strategy and the SSF Guidelines.

Thailand: Khon Khlan Sub-district Folk Fisheries Association

"In the beginning, the women were involved in information making, coordinating with local people and government agencies, managing food when patrolling and preventing illegal fishing. At present, due to the increasing number of fishing boats, the concept of developing a value-added seafood project has emerged. Women play a role in integrating food processing and standardizing blue-brand (sustainability certified) fisheries."

Source: Chumpholwong (2022)

Ghana: Tsokomey – Development Action Association

Located in the Ga South Municipal Assembly of the greater Accra region of Ghana, this rural women's organization (Noyaa Kpee in the Ga language) is "a loose federation of grassroots organizations" formed by local women's groups, reflecting "growing self-confidence and organizational maturity" and emerging out of an FAO initiative (Freedom from Hunger) for building organizational development and capacity. The Development Action Association (DAA) is a member of the Farmers Organisation Network in Ghana, which is a member of the Network of Farmers' and Agricultural Producers' Organizations of West Africa (ROPPA). The DAA is now involved in a variety of development initiatives in 70 rural communities across Greater Accra and the Central, Eastern, Volta and Oti Regions. DAA has implemented several development projects, including the construction of a nursery and primary school, as well as arranged capacity development in financial management and rural women's empowerment.

Source: Sasu (2022).

India: Odisha

"The Samudram Women's Federation (SWF) began in 1993 with 250 female members, as a response to conservation and livelihood challenges faced by the small-scale fishers. The SWF now has more than 5,800 members in 160 groups spread over 50 villages along the coast of Odisha. It is both a state level federation of women fish workers and a social enterprise. A key factor to its success... has been its joint focus on biodiversity conservation and community enterprise for poverty reduction."

"Conservation is multidimensional and holistic, encompassing species, humans, environment and the whole biosphere" – Samudram's view on biodiversity conservation.

"The SWF fosters a holistic approach to conservation that is sensitive to local livelihoods and strives to achieve a balance between ecological conservation and social/economic goals. The presence of many complementary factors – economic, environmental, social and cultural – enables the Odisha fishing community to take up conservation and environmental stewardship."

Source: Zachariah-Chaligne (2015).

3. SSF stewardship activities

Building upon the previous chapter and its discussion of the underlying goals of stewardship, this chapter discusses some of the many different activities that can be considered forms of stewardship. These involve actively protecting or restoring parts of the environment or fishery resources, especially by protecting, restoring or improving local habitat and ecosystems, and promoting sustainable use and harvesting of aquatic species, such as managing fishing activity, supervising aquatic areas and protecting endangered species.

The forms of stewardship in small-scale fisheries can be grouped under six categories:

- Maintaining, restoring and improving local habitat and ecosystems;
- Improving fishing practices and post-harvest practices;
- Engaging in fishery management for sustainable use;
- Stewardship of specific aquatic areas;
- Stewardship of particular aquatic species; and
- Stewardship through outreach and advocacy.

The forms of stewardship are discussed in detail below. For each, a short explanation is given of what that form of stewardship involves, why it is important and how it is carried out. The real-world examples are provided directly by fisher organizations and fishing communities based on their own practical experiences. The fisher examples are complemented with others obtained from various sources. Together, all the examples illustrate how each activity arises in real-world situations.

At this point, a few comments should be made on three of the above types of stewardship: fishery management, stewardship of specific aquatic areas, and stewardship through outreach and advocacy.

Fishery management is itself a vast topic, one that takes place in most fisheries of the world. Not all aspects of fishery management can be considered environmental stewardship, for example, management aimed solely to reduce conflict among the different sectors of a fishery. Overall, fishery management is a crucial contributor to stewardship, and accordingly, is considered here among the direct forms of stewardship, as will be discussed in greater detail.

In a similar manner, stewardship (or management) of aquatic areas could be viewed by some as a matter of establishing governmental "marine protected areas"; and while fishers may contribute to stewardship through involvement in that activity, there are many other ways in which fishers and fishing communities can take care of specific aquatic areas, as outlined below.

Finally, stewardship through outreach and advocacy – including efforts to change the practices, regulations or policies of governments, or to stop an activity that threatens fishery ecosystems – is considered here as a form of stewardship even though it does not involve physical activities such as planting mangroves or developing a plan for managing a fishery or an aquatic area. It can be, however, a crucial endeavour for fisher organizations and fishing communities to protect their local environment, and as such, constitutes a stewardship activity.

Examples of stewardship experiences in the categories described above, provided by SSF organizations and communities, are shown in the box *Experiences with stewardship*. Many of the examples are discussed further in this chapter.

Experiences with stewardship

- Promoting sustainable harvests of endangered crayfish in an artificial reservoir
- Protecting indigenous river and lake fisheries
- Improving monitoring and reducing harmful bycatch of a riverine catfish fishery
- Sustainable harvesting while conserving mangrove forests
- Promoting the sustainability of octopus fisheries
- Sustainably managing fisheries led by producer cooperatives
- Protecting the marine environment through habitat protection/restoration
- Using capture data for local management of marine areas
- Creating a community-based subsistence fishing area
- Organizing clean-ups, solid waste collection and public education campaigns
- Initiating bans on illegal fishing
- Managing seaweeds in traditional areas – as a carbon sink, an income source

3.1. Maintaining, restoring and improving local habitat and ecosystems

What is involved?

Actions include protecting biodiversity and marine/coastal/inland habitat, such as cleaning beaches, replanting mangroves or restoring stream beds. Indeed, this includes any form of actively protecting or restoring spaces or species in the ocean or freshwater, dealing with, for example, fish spawning or nursery areas, coastal mangroves and coral reefs, stream habitat, riverbanks and lakeshores, and wetlands. Also included are activities that build protection from or restore areas impacted by climate change, such as flooding, coastal erosion or saltwater incursion. Small-scale fisher organizations and fishing communities may already be empowered or authorized to undertake the necessary stewardship measures, or they may need to gain that authority. This is especially crucial in situations where habitats and resources are severely degraded.

Why is it done?

Inland and coastal areas are crucial habitats for aquatic life, including those used as resources, and for all aquatic species. Small-scale fishers and their organizations are immersed in and aware of local environmental conditions and changes through their daily interactions with aquatic habitats. As a result, they are often the first to notice how changes in habitat may impact resource availability and abundance. Protecting, restoring and maintaining habitat can ensure sustainable sources of food and livelihoods, while efforts to rebuild degraded fish stocks and enhance the productivity of inland, coastal and nearshore habitat will directly benefit the fishery, fishers, communities, and the local environment more generally.

How is it done?

Rehabilitation, or restoration, efforts to reverse damage to natural systems and restore productivity and ecosystem function can be accomplished: (i) by preventing an activity, such as destructive coastal development or destructive fishing that has negative impact on the aquatic species, e.g. through protection and/or enhancement of sensitive habitat; or (ii) by direct intervention to reverse the damage, e.g. species enhancement, habitat restoration or removal of marine debris. Fishers and fisher organizations, recognizing the importance of ensuring the reproductive capacity of the fish, may also implement fishery measures to protect spawning and juvenile fish, such as identifying and protecting (from fishing activity) locations where reproduction takes place and habitats where juvenile fish mature. These activities may require additional capacity in terms of personnel and funding. While some stewardship is carried out entirely by small-scale fisher organizations and fishing communities, there are often external partnerships involved to provide the needed capacity and resources.

The following examples from Cambodia, Ghana and Sri Lanka provide brief illustrations of "how it is done" in terms of SSF initiatives relating to maintaining, restoring and improving local habitat and ecosystems. The focus on maintaining or restoring mangroves reflects a key consideration in many tropical areas where mangroves are at the heart of local ecosystems and fisheries, providing protection against erosion, supporting biodiversity, and offering nursery habitat and other essential ecosystem services. These examples also show how such activities can be combined with other efforts, such as education, capacity development and fishery management.

Oyster harvesters of the Densu Estuary in Ghana

People in the Densu Delta community are settlers who migrated from the Volta region. Fishing occurs in the Densu River and the sea. Men fish while women collect oysters and other shellfish from mangroves, as well as process, store and distribute a variety of fish (e.g. anchovies, shrimps, sardinella, small tilapia, and shellfish such as oysters and crabs) to different markets in Ghana.

Locally, there is a Densu Oyster Pickers Association group in the Densu Estuary made up of women who harvest oysters and other shellfish in the mangrove estuary. The harvesters noticed that local mangroves were overharvested and depleted, which affected the growth of oysters and shellfish, and because catches were low, they started to work on mangrove restoration. This was then supplemented by installing natural barriers to protect against riverbank erosion.

Most recently, the women harvesters have been actively seeking to secure tenure and access rights in the estuary for the area where stewardship activity and oyster harvesting take place. They also implemented a seasonal closure to protect the health of the fishery, a successful management measure improving the harvest. Other activities include community clean-up exercises, capacity development and co-management training. As a result, almost 15 acres of mangroves have been replanted, oyster populations have recovered, and fishing is now being done sustainably.

Frances Agbeshie, who is active in the initiative and has been collecting oysters since childhood, says "I have learned how to plant mangroves, and how to take care of oysters, and put them in the river to rebuild it (protecting the banks). Now we have children, so we are looking to sustainability and making sure we have a supply of oysters that will continue for future generations and be available."

Source: Sasu (2022).

Cambodia: Koh Sralao

"The Koh Sralao community has worked together to safeguard their natural environment. They have become aware of the importance of conserving the mangrove forests that form a critical link to their livelihood. For example, annual mangrove replanting became a community tradition in the late 1990s. The area is known for its mangroves, which span 23,750 hectares in a protected area and features an ecotourism site set up near the Peam Krasop community."

Source: Asif, Horlings and Marschke (2021, p. 76).

Sri Lanka: Conservation of mangroves and coral reefs, National Fisheries Solidarity Movement

The National Fisheries Solidarity Movement (NAFSO) is a membership-based fisheries organization focused on small-scale fishing in Sri Lanka. The community of Negombo has experienced environmental degradation through the conversion of mangrove forests to aquaculture farms and the destruction of coral reefs from bottom trawling. The loss of these ecosystems has destroyed many fish nurseries and spawning grounds, putting fish populations at risk. Recognizing the importance of the ecosystems to their livelihoods, NAFSO and community members have implemented a number of conservation measures over the past two decades. Herman Kumara notes:

> **In 1997, we began to study and compile records of the destruction of mangroves. NAFSO began media work, advocated the necessity of protection with the government authorities, took legal actions, conducted mangrove replanting campaigns, and education programs with the communities. Community organization members attended the sessions and engaged with the material, then collectively approached the politicians to seek support. Community leaders found some ways to prevent the destruction and protect the grounds, both coral and mangroves. Women were engaged in the learning process as well as community mobilizations for tree planting and protection. Youth were the main group we worked with in the conservation programs.**
>
> **We experienced the recovery of the ecosystem in coastal areas once we began to replant the mangroves. The regenerative capacity of the ecosystem was experienced, and we expect the fish catch will be increased both in the lagoon and in coastal fisheries. We expect sustainable livelihoods will be supported through the healing of the ecosystem, and due to increased community-level awareness of the need to protect these environments.**

Source: Kumara (2022).

3.2. Improving fishing practices and post-harvest practices

What is involved?

There are many reasons to improve fishing and post-harvest practices. For example, a prominent goal of better practices is to increase the quality and therefore the value of landed harvests, and subsequently of the marketed products, such as through better handling of aquatic harvests. On its own, this may not necessarily lead to stewardship outcomes, such as greater sustainability of fishery resources and well-being of ecosystems. However, many efforts to improve fishing and post-harvest

practices can be forms of stewardship if they reduce negative impacts on fish habitats, ecosystems and resources.

Why is it done?

Improving fishing practices and post-harvest practices can produce positive stewardship benefits that can help to maintain or improve ecosystem health and the security of livelihoods and of food production. Such actions may directly increase available fishery resources (e.g. through healthier ecosystems) or may allow for improvements in livelihoods and food security without increasing harvests (e.g. by reducing waste).

How is it done?

Stewardship that focuses on improving fishing practices and post-harvest practices can seek to: (i) reduce the negative impacts of fishing activity (e.g. stopping the use of fishing gear or methods that harm an aquatic habitat, such as poisons and explosives); and (ii) reduce waste and improve quality in the post-harvest handling of aquatic products. There are many forms of reducing fishing impacts, such as the work of the Association of Cochabamba Fishers on the Ichilo River, in the Plurinational State of Bolivia, as the fishers advocated to improve the regulatory framework of the fishery for "blanquillo" (a local scavenger catfish species) in order to eliminate the use of (endangered) wild animals as bait and to reduce environmental contamination from water pollution near communities through the use of chicken/beef waste as bait. Along similar lines, improvements to post-harvest practices to achieve environmental benefits can include measures concerning firewood use and mangrove restoration.

The following examples from Tunisia and Turkey provide brief illustrations of "how it is done" for SSF stewardship initiatives that focus on improving fishing practices and post-harvest practices. These examples serve to protect aquatic biodiversity by reducing fishing for endangered species in one case and addressing the negative impacts of an invasive species in the other. They also demonstrate the role of community-based monitoring in stewardship, and how markets and innovation can support both stewardship and improved livelihoods.

Tunisia: Managing invasive species – blue crab. Fishers Association for Development and the Environment

Improving post-harvest practices may not focus on handling of fish, but rather on markets. The Fishers Association for Development and the Environment (Association le Pêcheur pour le Developement et l'Environnement) is focused on the protection of marine resources and the development of the fishing sector while contributing to the social development of fishers. The organization aims to contribute to an environmental ethic and acts as an important bridge between national and international organizations. In Medenine, near the Mediterranean Sea, fishers faced problems because of the introduction of the invasive blue crab, which were first found in the area in 2014. The foreign crab destroyed fishing nets and preyed on other important species, impacting the local ecosystem and causing challenges for local fishers. Instead of trying to eliminate the new species, the association took a novel approach, deciding to market the blue crab, which has since led to a productive and successful new local fishery. By creating this new market, it has contributed positively to more secure and sustainable fisher livelihoods.

Imen Bouzoumita, Association le pêcheur pour le developement et l'environnement

Source: Bouzoumita (2022).

Turkey: Gökova Bay Fishery Cooperatives

The Gökova Bay Fishery Cooperatives sought to improve overall fishing practices in the bay by preventing or reducing illegal fishing methods, which not only deplete marine living resources and harm underwater habitats but also present a risk to endangered species. A community-based marine ranger programme began in 2012 to coordinate daily community-led patrols, putting small scale fishers at the forefront of monitoring compliance in fishing activities.

Source: Ünal (2022).

3.3. Engaging in fishery management for sustainable use

What is involved?

As mentioned earlier, fishery management is a vast topic, one that is almost universal. Not every aspect of fishery management can be considered environmental stewardship, for example, management aimed solely at reducing conflict among the different sectors of a fishery. However, the many forms of managing fishing activity, to limit human impacts on fishery ecosystems and resources, are indeed stewardship activities. These management actions help to ensure the health and sustainability of fishery resources, but also to meet human needs in terms of sustained livelihoods and food production. Such management includes decisions about how and when to fish, the types of fishing allowed, developing and applying management measures to limit overall fishing pressure, limiting the size of catch, and regulating how it is caught, all supported by scientific and/or traditional and local knowledge and practices. Stewardship through improving fishing practices and post-harvest practices, as outlined above, can be a form of fishery management, but it can also occur independently of management per se.

Overall, fishery management has been assessed by fishers as the most prominent form of stewardship. For fishing communities and fisher organizations to engage in the various aspects of fishery management, it is crucial to have security of tenure (see "Ensuring secure tenure, rights and access" in Section 4), whether engagement is in the form of self-management or co-management, as will shortly be discussed.

Why is it done?

Fishery management has been an accepted practice for centuries, wherever and whenever it has been realized that unregulated fishing can destroy fishery resources and ecosystems. The fundamental reason for managing fisheries is to ensure sustainability for the future, i.e. to ensure "sustainable use" of fishery resources. Although other goals of management exist, such as avoiding conflict among resource users and ensuring a fair distribution of benefits, the sustainability goal is the most important because small-scale fisher organizations and fishing communities see environmental stewardship as essential for sustainable use of resources and to protect the environment, thereby maintaining their livelihoods. Fisheries management plans, typically developed each fishing season, are inherently based on the goals of stewardship: To achieve long-term fishery objectives, the plans take into account biological, economic and social considerations besides meeting legal and regulatory conservation requirements.

How is it done?

This usually involves using a diverse set of management methods, such as the following:

- Management tools focused on biological considerations, leading to technical and technological measures, such as (i) limiting the allowable mesh size in fishing nets or the hook size in hook and-line fisheries, setting a minimum allowable fish size and reducing the catches of juveniles; (ii) limiting the location of fishing, e.g. by closing spawning areas; and (iii) limiting when fishing can occur (e.g. closed periods) to reduce bycatch and avoid overfishing local stocks or spawning aggregations.
- Effort controls to restrict the amount of fishing or the effectiveness of each day of fishing, notably by limiting access to the fishery (e.g. number of boats); capacity of each vessel or the amount of fishing per fisher (e.g. number of traps); and the number of fishing days (e.g. days at sea).
- Catch controls focus on limiting how much is caught, i.e. the output from the fishery. This can include the total catch, community quotas, or limits on catch within a fishing season, such as catch limits per fishing trip or per day of fishing.

Small-scale fisher organizations and fishing communities can carry out some of these management measures by themselves (e.g. through delegation of responsibilities and/or authority to fisher organizations or communities), or they can participate in government-led fishery co-management. In the latter, willing governments share power and responsibility with fisher organizations or fishing communities (partial delegation of responsibilities and authority), so there is joint decision-making over local resources and local environments on which fishers depend. The components of fishery management in which fishers and communities are involved will depend on the choices of the government. For example, there may be shared management of harvest planning, fishery monitoring and knowledge production, and enforcement and compliance measures, among others. SSF stewardship can arise in any of these shared management functions, but particularly in management measures involving fish stocks and ecosystem health, such as developing fishery management plans or conservation measures.[9]

The following examples from Canada, Mexico and Thailand provide brief illustrations of "how it is done" for SSF initiatives relating to fishery management for sustainable use. The examples highlight capacity development and supportive networking among community-level organizations, as well as the value and key role of rights and recognition in supporting fisher-led management and stewardship efforts.

Thailand: Federation of Thai Fisherfolk Association

The Federation of Thai Fisherfolk Association is an umbrella group that is involved in capacity development, supported by training programmes of the Sustainable Development Foundation Thailand. The association aims to achieve sustainable fisheries livelihoods through fishery management interventions, such as organizing registration of fisher status, engaging in co management, and advocating to change the fisheries law to abolish destructive types of gear.

"The Federation of Thai Fisherfolk Association (FTFA) represents coastal fishing community groups (with both male and female members) in 19 provinces and in 55 organizations. It was formed and registered in 2009, with the following objectives:

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[9] For more on co-management of the components of fisheries management, see Puley and Charles (2022). For detailed exploration of the assessment of co-management effectiveness, see Pomeroy *et al*. (2022).

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- To conserve, restore and manage marine and coastal resources including freshwater fisheries resources in a balanced and sustainable manner,
- To restore and develop good wisdom, traditions, arts and culture of local fishing communities,
- To promote and support community rights, specifically the right of local fishers to participate in the management, maintenance and exploitation of natural resources and the environment with the public and private sectors, and
- To promote cooperation of local fishers in carrying out economic activities for self-sufficiency.

Sama ae Jahmudor, Federation of Thai Fisher folk Association

Source: Jahmudor (2022).

Mexico: Punta Allen, Quintana Roo

In the fishing community of Punta Allen, fishery management takes a community-based, co management approach and uses territorial user rights to provide the owners of each campo (individual fishing area) with exclusive fishing rights:

"The rights-based system has eliminated the race to fish since each fisher has exclusive access to lobsters in their fishing ground. This has also allowed fishers to develop a unique harvesting method highly suitable to the area and the resource."

"In each 'campo', fishers deploy artificial shelters, from which spiny lobsters are harvested by free diving using a small hand-held net, which allows females with eggs and undersized individuals to be [returned to the sea] ... There are 41 campo owners, and each owner has exclusive fishing rights within their fishing ground. These rights are supported by internal working rules of the Cooperative and are respected amongst the fishers. The individual fishing grounds where artificial shelters have been introduced are located in twenty-five (25) major fishing areas... characterized by different habitat and bottom types, and environmental parameters e.g. salinity and temperature."

Source: Seijo and Headley (2021, p. 96–99).

Canada: Indigenous involvement in stewardship – the Beaufort Sea

"A 1984 comprehensive land settlement agreement (treaty) between Canada and the Inuvialuit established a co-management regime for limited aspects of fish and marine mammal resource management, and gave the Inuvialuit rights to subsistence fisheries and existing commercial fisheries but no preference for new commercial fisheries. The Fisheries Joint Management Committee (the fisheries co-management body), the Canada Department of Fisheries and Oceans, the Inuvialuit Regional Corporation and the Inuvialuit Game Council have developed an integrated fisheries management framework agreement for the review and assessment of any proposed commercial fisheries within the Canadian Beaufort Sea."

Source: Ayles, Porta and Clarke (2016, p. 246).

3.4. Stewardship of specific aquatic areas

What is involved?

Developing and implementing measures for managing the uses of specific aquatic areas, generally applying not only to fisheries but also to other uses, helps to maintain or restore ecosystems and protect biodiversity while also enhancing the sustainability and security of livelihoods and food production. This form of stewardship typically uses measures often referred to as area-based management tools and falls within the broader theme of area-based management for both fisheries and environmental management. There are many ways in which fishers and fishing communities take care of specific aquatic areas. Stewardship of aquatic areas includes safeguarding sacred sites, establishing and managing a closed area or a protected area, and implementing other ecosystem conservation measures, typically through ecosystem-based management.

Why is it done?

Small-scale fisheries usually operate in a limited spatial aquatic area, set perhaps by proximity to the fishing community or the range of fishing boats, or by traditional limits relative to neighbouring fishing communities. In whatever manner that area of ocean or inland water is set, the fishers, fishworkers and fishing communities have a strong stake in assuring the sustainability of fishery resources and the health of the ecosystem within the area. As a result, stewardship of aquatic areas is a well-established approach to ensuring the health of aquatic environments and biodiversity.

How is it done?

Involvement of small-scale fishing communities and organizations in the management of specific well-delineated spatial areas of the ocean and other waterbodies can be usefully grouped into cases that are governmental and those that are informal, community-based or fisher led.

- For official (governmental) areas, particularly marine protected areas, it is increasingly common to have small-scale fishers involved in stewardship, given the clear evidence of success in conservation efforts when fishers and others are involved in creating and managing the areas. Indeed, there is abundant evidence of detrimental impacts on conservation, as well as on small-scale fishers themselves, when they have been excluded from involvement or even from access to fishing in aquatic protected areas.[10]
- For more informal, community-based or fisher-led areas, such as locally managed marine areas (LMMAs) and Indigenous and community conserved areas (ICCAs), small-scale fishers are often not only involved but are actually in leadership positions for stewardship. Decision-making for such areas may lie in the hands of the fishers or the fishing community collectively. Many examples of such areas are available, and increasingly national and international policymakers are seeing the value of expanding such areas globally.
- The new approach of "other effective area-based conservation measures" (OECMs) is an important development in the stewardship of aquatic areas. Consider an area of the ocean or other waterbody that is typically already in place to meet certain conservation or management goals. This could be designated by a government (but not as an official marine protected area) or it may have been developed by a local community or fisher organization (such as the well-established locally managed marine areas). In either case, if that area meets certain specified biodiversity conservation goals, then it could be internationally recognized as an OECM if desired by the corresponding government and, where applicable, the local

[10] See, for example, Charles *et al*. (2016) and Westlund *et al*. (2017).

community or fishers (and thus counts towards international conservation and biodiversity targets, such as Target 3 of the Global Biodiversity Framework).

The following examples from Ecuador and Indonesia provide brief illustrations of "how it is done" for SSF initiatives relating to stewardship of aquatic areas. The examples demonstrate how stewardship activities are often interconnected and can grow and expand from a simple beginning to multifaceted, long-term endeavours that involve various dimensions of livelihoods and conservation. The examples also show the foundational role that traditional and local knowledge can play in forming stewardship practices.

Ecuador: Association of Artisanal Fishers, Shellfish and Allied Costa Rica, Costa Rica Island

As reported by Franklin Cruz, a local fisher, the Association of Artisanal Fishers, Shellfish and Allied Costa Rica was originally formed in the 1970s and 1980s with the goal of protecting mangroves (where fishing and oyster/crab harvesting take place) from being cut for shrimp pond aquaculture. Since 2000, it has protected and managed 460 hectares of mangroves, also including reforestation. Indeed, in the words of Franklin Cruz, "The Isla Costa Rica community was the first to have custody of mangrove concessions in El Oro, and the second in the country." The organization is active in managing aquatic areas, with activities described as follows.

"We make a rotating monthly calendar to reduce fishing pressure in certain areas, to ensure that species in these areas are able to regenerate and that the fishery remains productive. Additionally, the community conserves marine species through a self-imposed 40-day ban. It runs from February 15 to March 25. This time of year was chosen since most of our products are exported to Peru, and at that time prices are very low. The community thinks that instead of selling their products at reduced prices, it is better to allow the areas to rest, then they can sell the product at a better price while ensuring the area is not overfished. This ban has been in place since 2019."

This spatial management activity is accompanied by many other stewardship initiatives, including (i) physical activity ("Mangrove restoration is being carried out on beaches although now almost everything is reforested. As for species, there used to be hatcheries to promote species regeneration. These are currently not active, but locals plan to resume this activity."); (ii) managing fisheries ("Implementing local management controls and fishery monitoring"); and (iii) monitoring ("There are dedicated personnel who monitor the concessions every day. They are in charge of checking when collection takes place and ensuring that the species harvested are the correct size for sale").

With respect to outreach, Franklin Cruz notes that "Our organization is part of a UOPAO, which is a union of artisanal fishing organizations of El Oro (Ecuador). The union is in charge of coordinating with the authorities that correspond to each issue being faced. For example, if there is an issue of security at sea, they coordinate with the navy; if it is logging, they coordinate with the Ministry of the Environment."

Franklin Cruz Ramirez, Association of Artisanal Fishers, Shellfish and Allied Costa Rica
Source: Cruz, R. (2022).

Indonesia: Haruku village, Maluku Province

"In the island, an Indigenous practice of coastal resource protection, called sasi laut, has been used for hundreds of years. Sasi laut is a form of traditional institution regulating the management of coastal resources based on the knowledge, norms and value systems of the Indigenous Peoples of Maluku. This system regulates the rights and obligations of the Indigenous Peoples in utilising and protecting coastal resources."

As defined by Harkes and Novaczek (2000, pp. 1–3), *sasi laut* "...prohibits the use of destructive and intensive gear (poisonous plants and chemicals, explosives, small mesh lift-nets), but also defines seasonal rules of entry, harvest and activities allowed in specific parts of the sea. The regulations are guarded and enforced by an institution known as the kewang, which functions as a local police force. Their legitimacy, as well as that of the sasi institution itself, is based on adat, or customary law..."

"Recently, sasi laut has been developed by expanding the objects of conservation, including mangrove ecosystems, the Gosong bird (*Eulipoa wallacei*, or Moluccan scrubfowl), turtles and other coastal resources. In addition, sasi laut is supporting marine tourism through a sasi laut festival in Haruku Village."

Source: Mony and Satria (2021, pp. 83–86).

3.5. Stewardship of particular aquatic species

What is involved?

This form of stewardship involves activities with the primary goal of protecting species that require special conservation and protection action, such as those designated as endangered species. These species – e.g. iconic species such as manatees, whale sharks, turtles, seals, dolphins, sharks and seahorses – may or may not be targeted by small-scale fisheries. This stewardship often relates to supporting local livelihoods that are involved in tourism, such as whale watching or conducting tours to see turtles nesting on beaches.

Why is it done?

Conservation of species is a concern internationally, e.g. under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Biological Diversity (CBD), reflected also in the new Global Biodiversity Framework adopted by countries of the world within the CBD process. Supporting this imperative for biodiversity conservation, thousands of local stewardship actions in the aquatic realm are carried out every day in small-scale fisheries. These actions go beyond fishery conservation per se, reflecting the values and ethics of fishers as well as their deep connection with nature.

How is it done?

While harvesting aquatic species for their livelihoods, small-scale fisher organizations and fishing communities also work to protect species, whether targeted by fishers or not. These actions may involve fishing communities helping protect species around them, such as turtles nesting on community beaches in Costa Rica or adjustments to fishing patterns to avoid negative impacts on species in need of protection, as is the case with fishers in Canada shifting their activity to avoid North Atlantic right whales.

The following examples from Costa Rica and the Islamic Republic of Iran provide brief illustrations of "how it is done" for SSF initiatives relating to stewardship of particular aquatic species, in both cases through providing protection to marine turtles. These examples reflect the importance of local communities leading stewardship activities and using a wide range of activities, such as education, research, monitoring, physical clean-ups and the development of ecotourism.

The Islamic Republic of Iran: Qeshm Island

The communities on Qeshm Island in southern Iran (Islamic Republic of) have been actively engaged in sea turtle conservation through education, beach patrols and tagging, collecting, transferring and guarding the species' eggs:

"Local residents of Qeshm Island voluntarily participate in conservation programmes such as sea turtle (Hawksbill) conservation. In Shibderaz Village, in collaboration with the village council and Qeshm Free Zone Organization, around 25 km of the south coast has been declared a turtle breeding and hatchery area."

This coastal stewardship is complemented by inland initiatives to maintain and restore natural and human-made features of the environment, including sacred fig trees and sacred "tela" wells.

Source: Ghayoumi and Charles (2021, pp. 120–123).

Costa Rica: Ostional Integral Development Association

The association aims "...to protect Ostional beach and to provide benefits and incentives to the local community to protect the turtles" with a mission "...to manage and achieve the sustainable use of this resource and to gain community support through its participation in the conservation process, including strategies such as planning, research, protection, control, ecotourism and environmental education..." As part of the community conservation arrangement, the community of Ostional takes a variety of conservation measures, "the most important of which was the creation of a monitoring and surveillance group to prevent looting of eggs on the beach, the removal from the beach of breeding pigs which eat the eggs, the clearing of coastal vegetation, the removal of natural debris that would prevent the entry of turtles onto the beach...".

Source: Orrego and Rodríguez (2018, p. 71).

3.6. Stewardship through outreach and advocacy

What is involved?

Outreach involves using processes of education and communications, as already discussed, to influence public opinion and external decision-makers. It also includes forms of networking and coalition-building through engaging beyond the community or fisher organization per se. Advocacy seeks to influence decisions relating to a specific issue or concern, such as efforts to change practices, regulations or governmental policies, to stop an activity that threatens fishery ecosystems, or to safeguard fishing rights and resource access that underlie stewardship practices. As noted earlier, outreach and advocacy are considered forms of stewardship even though they do not involve physical

activities, such as planting mangroves or developing a plan for managing a fishery or an aquatic area, since they can represent crucial engagement of fisher organizations and fishing communities to protect their local environment.

Why is it done?

Occasionally, outreach and advocacy by small-scale fisher organizations and fishing communities are needed to support stewardship initiatives or to provide crucial enabling conditions, for example, through efforts to secure rights and access. Such outreach and advocacy can build broad support, and government support, for fisher stewardship, thus having an indirect benefit to stewardship and conservation outcomes and making outreach and advocacy itself an important enabling activity. Advocacy can also be oriented directly to a particular environmental concern, such as stopping an activity in aquatic areas that threatens the health of fish stocks and fishery ecosystems (e.g. impacts of industrial activity in a coastal bay).

How is it done?

Outreach is largely a matter of relationship-building, which includes, for example, building collaborations and partnerships with other related bodies such as NGOs or community groups so as to more effectively meet stewardship goals (e.g. establishing protected areas or protecting endangered species) and those of the fishers more broadly. This can involve various forms of linking and networking, participating in joint bodies and institutions, and scaling up from a local area to a larger region. Developing relationships or partnerships with external organizations, often with funding attached, can have both positive and negative effects, with possibly different effects on different players in the SSF community or organization. Positive effects may come from mutually beneficial partnerships in which the SSF organization or community is empowered to pursue its goals and to participate in its own way. Negative impacts could arise if compromises are made relating to the goals being pursued and the methods involved, to the extent that the goals of the organization or community are not being met and membership support is lost.

Advocacy uses many different tactics, often aimed at policy-related decisions. This can involve (i) engaging with formal and social media to generate attention for issues raised by the SSF community or organization; (ii) engaging with politicians and policymakers at multiple levels, from local to national; and (iii) building alliances and coalitions to better carry out advocacy efforts. Such alliances may involve those beyond the fishery, e.g. others in the community who depend economically and socially on maintaining local fishery access. Advocacy measures include organizing protest actions to mobilize public support or expressing concerns and priorities to the government within a structured meeting or workshop format.

The following examples from India and Indonesia highlight the different approaches and strategies for "how it is done" in terms of outreach and advocacy as forms of SSF stewardship. In one case, engaging in protests provides the means to counter external forces affecting the fishery, such as illegal aquaculture farms, while in the other, it is possible to engage with government to develop new or improved policy ideas.

India: Chilika Lagoon

In Chilika Lagoon, policy changes to support aquaculture combined with the opening of a new sea mouth to the Bay of Bengal impacted biophysical processes, which affected the livelihoods of fishers who relied on the lagoon. Faced with poverty, the fishers came together to protest, resulting in the government closing illegal aquaculture farms.

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"Fishers use a well-known metaphor which best explains the level of their response to these challenges and initiatives: 'For the poor, when hunger becomes unbearable, movement and protest becomes our last resort'. This suggests that social and political struggles and movements are the ultimate options for the fishers when social, economic, political and environmental problems become rampant. Fishers realise that when everything seems to be going against them and nothing really works in their favour, coming together to protest the acts of the external forces becomes an obligation."

Source: Nayak (2021, p. 118).

Indonesia: Lobster conservation with All Indonesian Fishermen Association

Himpunan Nelayan Seluruh Indonesia (HNSI) – the All Indonesian Fishermen Association – is a major non-governmental organization representing fishers in Indonesia. The organization recognizes that a healthy environment is crucial to the community and to the livelihoods and welfare of fishers. Recently, the lobster fishery has been facing sustainability challenges resulting from the export of lobster seeds (larvae) to international markets, threatening future lobster stocks and the small-scale fishers who rely on them. As part of its regular work to engage in fisheries and marine environmental conservation policies with the parliament and the Ministry of Marine Affairs and Fisheries of Indonesia, the HNSI has responded to concerns over lobster conservation by working on developing and disseminating policies and rules to address the overharvesting of lobster seeds, acknowledging that effective government policy forms the basis of law and environmental protection rules.

Source: Nurhadi (2022).

3.7. Diversity of activities within stewardship

Small-scale fisher organizations and fishing communities involved in stewardship may have experience with many of the six types of stewardship mentioned above – and SSF stewardship may involve a variety of simultaneous activities given that they are inextricably linked. This will depend on the capacity and arrangements made with the government and other fishery authorities, as well as interactions among stewardship activities within a given context.

Notably, environmental protection can be intertwined with sustainable use of resources. For example, if there is a need to improve the sustainability of mangrove-based fisheries to produce improved economic benefit to fishers and communities, physical activity such as mangrove restoration (planting mangrove seedlings, for example) may not be sufficient on its own, but there could be synergies if combined with complementary fishery management activities, such as putting limits on resource harvesting and making improvements to value-added processing.

The fact that SSF communities and organizations use a diversity of stewardship activities simultaneously shows that stewardship is inherently integrative and can build on the collaborative nature of small-scale fisher communities and organizations themselves and the realities of real-world settings. Indeed, stewardship can also take place together with other activities that may not themselves reflect stewardship as such since it is crucial to address multiple, often overlapping, issues at once.

"Because the sea is like a bank that is the food source for local fishers, if the resources are reduced, the food source and income of the fishers are decreased too. For this reason, it has been established for local fishing groups to monitor and prevent illegal fishing, … including resourcing activities such as setting up community aquatic animal sanctuaries, making fish houses for habitats for marine animals in the conservation area, and rules for the use and care of resources. It's run by the community committee that is responsible for the supervision and monitor illegal fishing."

Mrs D. Chumpholwong, fisher and member of the Khon Khlan Sub-district Folk Fisheries Association, Thailand

Source: Chumpholwong (2022).

The mix of stewardship activities is often undertaken within the context of locally led community-based management and conservation. While not appropriate in all situations, this approach can be effective if it serves to empower communities to set rules and develop plans for resource use, consequently producing greater acceptance of and compliance with conservation measures. Usefully, this also can serve to support sustainable development through more direct use of local knowledge and community understanding of local ecosystems, and draw on community mechanisms for resolving conflicts over the use of aquatic space and fishery resources as well.

The following examples from a coastal estuary in South Africa and a small island community in Thailand illustrate how diverse stewardship approaches fit together in an integrated manner. This can involve everything from replanting coral reefs to developing tourism as a way to diversify livelihoods to engaging in multistakeholder processes for managing traditional land use practices.

Thailand: Koh Pitak and its integrated stewardship activities

The island community of Koh Pitak off the coast of Thailand, with its 43 households, is involved in a variety of resource-based livelihood activities, including fishing and coconut production; this resource use is accompanied by significant community stewardship initiatives to protect the island's resources, such as the replanting of coral reefs. Additionally, the community is diversifying its livelihoods through tourism development, which includes a programme that provides homestays and produces souvenirs. This initiative supports both environmental stewardship and livelihood security, as it reduces (or avoids increases in) pressure on the environment and resources. In Koh Pitak, the combination of stewardship together with innovative, culturally appropriate economic development is aided by the local culture and community beliefs, which produce effective participation in decision-making, community sharing of natural resources and a sense of equity (e.g. reflected in the startup of a community market to sell food at a fair price).

Source: Emphandhu and Dearden (2021, pp. 70–73; see also p. 9).

South Africa: Olifants Estuary

In South Africa, multistakeholder discussions over the future of the Olifants Estuary and its resources led to a development plan, including "...a decision to establish a community conservation area (CCA) at the mouth of the estuary that would be co-managed with local community members. While progress has been slow to formalize the CCA, significant progress

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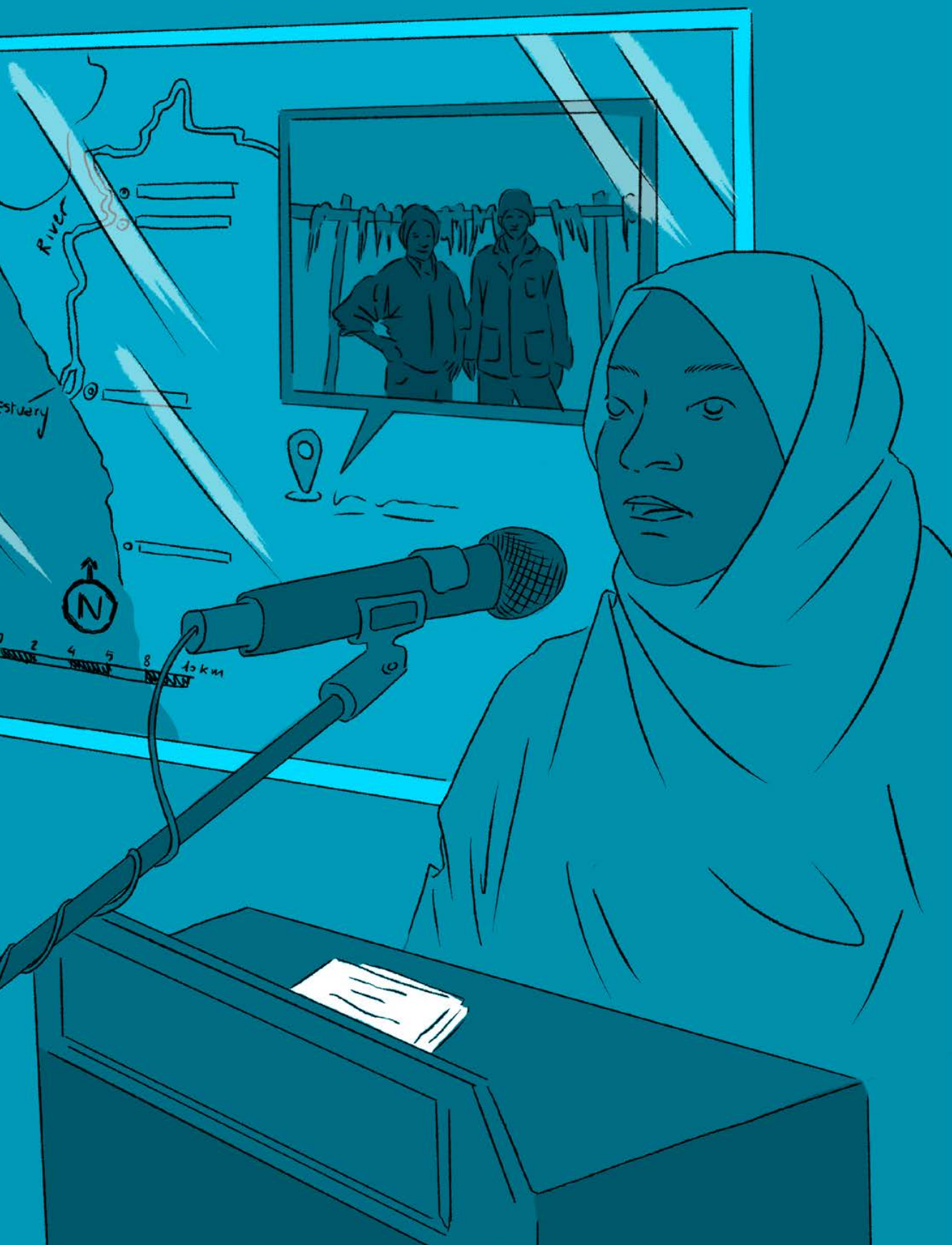
has been made in bringing different groups together, including representatives of the land claimants, fishers, conservation authorities and other estuary stakeholders, to discuss and define the boundaries of the CCA, seek agreement on traditional land use practices on land adjacent to the protected area (i.e. grazing of sheep on the salt marshes during periods of drought) and to develop maps demarcating the area."

Source: Sowman (2021, p. 113).


River
estuary
N
0 2 4 6 8 10 km

4. Activities supporting and enabling stewardship

The stewardship activities described in the previous chapter directly lead to environmental and resource management benefits. As noted, such stewardship activities can include physical activities such as mangrove restoration, initiatives to improve fishing and post-harvest practices, actions to implement fishery management, stewardship of aquatic areas, conservation of non-fishery aquatic species such as endangered species, and programmes of outreach and advocacy. These stewardship efforts generally must be accompanied by some combination of supporting and enabling measures, which together create a suitable environment for successful stewardship efforts. In fact, these measures are not exclusive to supporting stewardship, but may be seen as crucial in the involvement of fishers (and communities generally) in fishery decision-making, e.g. in co-management systems. The various supporting and enabling activities that can foster effective stewardship may be considered within four main areas, as follows, with additional supporting/enabling measures described later in this chapter:

- Ensuring secure tenure, rights and access
- Knowledge development
- Building community and organizational capacity
- Education and communications

Each of these areas is addressed within the chapter together with additional enabling activities. As with the direct forms of stewardship, the four supporting and enabling activities relating to stewardship in small-scale fisheries are examined in detail below along with real-world examples. As a prelude, the box below provides specific examples from SSF organizations and communities of activities that support or enable stewardship. Many of these are discussed further in this chapter.

Experiences with supporting/enabling activities relating to stewardship

- Media work, including radio and television interviews
- Legal work, and lodging of complaints to relevant official bodies
- Educational work leading to “a sense of ownership and a commitment to the activity”
- Forming coalitions and new forums to coordinate management and restoration efforts
- Conducting a study to better understand the carrying capacity of livelihood alternatives
- Linking traditional knowledge and science in community-managed fisheries
- Community-based monitoring of marine protected areas
- Marine guard training, integrating knowledge and practices on topics such as protected area patrolling, boat safety, biodiversity assessments and public awareness-raising strategies
- Increasing capacity to makes decisions about illegal removal of coral and sand

4.1. Ensuring secure tenure, rights and access

What is involved?

Tenure in fisheries reflects established rights to fish and to adjacent land. This may be viewed individually (for each individual harvester) or collectively (e.g. for a fishing community as a whole), and may occur for specific fishing grounds or locations, or for specific species. Tenure may be based on inherent rights (notably for Indigenous Peoples) or may be based on social or economic factors in certain commercial fishery settings. In small-scale fisheries, tenure and access rights are often intertwined with a human rights-based approach.

Why is it done?

Small-scale fisheries face many challenges – there are risks, dangers and uncertainties involved in fishing, and throughout the fishery system it is a basic challenge to make a decent livelihood. In addition, there are often unfortunate threats to the very ability to take part in the fishery, i.e. threats to fishing rights and challenges to accessing aquatic spaces for fishing and land for post-harvest activities. The threats might come from government actions or from encroachment of the land and aquatic space for other uses, such as industrial fishing, aquaculture, non-renewable resource extraction, and tourism or coastal development. Faced with such threats, ensuring secure fishing rights together with access to the fish, the sea and the land is a key condition not only for those in small-scale fisheries to maintain sustainable livelihoods, as noted in the SSF Guidelines, but also to facilitate effective engagement in stewardship to take care of the environment.

How is it done?

While the SSF Guidelines are clear on the importance of tenure, rights and access in small-scale fisheries, obtaining and safeguarding these is often challenging. There is no simple solution. In some cases, legal mechanisms such as lawsuits may be used, while in others direct action through protest, lobbying and advocacy may be required, for example, by promoting alternative paths such as community-based management. Sometimes this can be supported by efforts to document the collective attachment of the community to the fishing grounds or fishery resources and to work with supportive partners to maintain or increase access and clarify recognition of rights. There may also be a synergy, a complementarity, between protecting rights and engaging in stewardship; the latter may build support for recognition of rights.

The examples below, from South Africa and the United States of America, illustrate "how it is done" for activities aiming to ensure secure tenure, rights and access in support of SSF stewardship. In South Africa, the approach of legal action was used to defend the rights of fishers to be consulted in advance of development approvals. In the United States of America, development of an intertribal council (involving 32 Indigenous Peoples, 15 in the United States and 17 in Canada) provided a vehicle to assist in the review of the United States-Canada Columbia River Treaty concerning the decline of salmon in the Columbia River Basin and the impacts of a hydroelectric dam project.

South Africa: Langebaan Lagoon

"In early June 2021 we worked with several NGOs to submit comments on the EIA [Environmental Impact Assessment]. We highlighted our concerns for the lagoon and for our livelihoods. We complained that they did not take our tenure rights into consideration. We held a protest action on World Oceans Day on the 8th of June and used this to mobilize public support. We

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held radio and Television interviews. Together with an NGO, Green Connections, we got an environmental lawyer to assist us and analyse the EIA. She then submitted a complaint to the Environmental Authority stating that the EIA process failed to take our knowledge into consideration as it failed to conduct proper studies of the impact of the noise and increased temperature on the fish that we depend on for our livelihoods. The Authority suspended the EIA on the grounds that they did not take this impact on the ecosystem and on our livelihoods into consideration.

This highlights the importance of fisher knowledge of local marine ecosystems and community mobilisation in protecting biodiversity. It has not improved local biodiversity specifically, but has protected local ecosystems and the action has definitely increased support from the local community who now take pride in the idea of protecting the lagoon from destructive developments such as oil and gas production.

Women have been at the forefront of this struggle to protect our lagoon and our rights. Both myself and the leader from the neighbouring fisher community of Saldanha who led the struggle are women. In addition, the two youth who received training in advocacy specifically for this project from the NGO were both young women. Although our fisher group is dominated by men, our youth group is dominated by women. Women play the leading role in leadership in our organization, in managing the administration for the fishermen and in advocating politically for the fishers' rights.

The action has highlighted the link between SSF fisher livelihoods and biodiversity protection, the link between the right to participate in decision-making and protecting biodiversity. It has also highlighted the need to assess projects for their impact on carbon emissions. Although SA [South Africa] needs electricity we do not want it to come from gas (fossil fuel). This action strengthened our fisher community's identity and cohesion and ownership over the lagoon."

Mrs S. Smith (Chairperson) and Mr N. Dowries (Deputy), fishers and members of the Langebaan Lagoon Traditional Fisher Community

Source: Smith and Dowries (2022).

United States of America: Columbia River Inter-Tribal Fish Commission

"The Columbia River system is the lifeblood of all the tribes and First Nations found along its entire length. Since time immemorial, the water, salmon, game, roots, and berries of our homeland—the sacred first foods—have sustained our health, spirit, and cultures". (p. 23)

"Human impacts on the Columbia basin have dramatically altered the entire ecosystem since the signing of the treaties. Increased human population, dam construction, unregulated harvest, and substantial habitat modifications drastically reduced salmon populations." (p. 23)

"Armed with court rulings that reaffirmed their right to fish and manage the fishery resource, the four Columbia River treaty tribes united forces to address the significant decline of salmon returns. Together, they formed the Columbia River Inter-Tribal Fish Commission (CRITFC) in 1977 to coordinate their management activities and restoration efforts. Since then, these tribes have become leaders in accomplishing their stated goal to 'put fish back in the rivers and protect the watersheds where fish live.' They participate in interstate agreements and international treaties controlling salmon harvest and water management." (p. 25)

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> "A key element of this traditional wisdom is the view that people are a part of the ecosystem (e.g. deep tribal connection to first foods). Changes to the ecosystem also affect humans. People are not outside of the ecosystem, nor does the ecosystem exist solely for human use. Humans would all be better off if they viewed themselves as a part of the ecosystem. If more people realized this, there would be much better decisions where the environment is concerned." (pp. 32–33)
>
> *Source*: Lumley *et al.* (2016).

4.2. Knowledge development

What is involved?

Ensuring the availability of traditional/local fishery and ecological knowledge and skills, as well as appropriate scientific data, is a key element in addressing environmental and conservation challenges through stewardship initiatives. Knowledge is needed, and can be developed, in many parts of the fishery system including on fish stocks and fishery ecosystems, on the nature of the fishing activities themselves and on management functions such as enforcement and compliance. This can and should draw on fisher, community and traditional knowledge, as well as approaches to bring these forms of knowledge together, e.g. linking Indigenous and non-Indigenous forms of knowledge and science.

Why is it done?

Support for stewardship through building and utilizing knowledge – including traditional and local knowledge, research activity and monitoring – is seen by small-scale fisher and fishworker organizations, and women and men throughout fishing communities, as one of the most crucial supporting and enabling measures. Not only does knowledge provide the basis for wise stewardship decision-making, but the recognition of fisher knowledge is in itself empowering, reflecting the fundamental importance of fishers and fishing communities being involved in knowledge recognition and knowledge building.[11]

How is it done?

Knowledge building can take place within a community, for example, when elders pass along their wisdom to youth. It can also occur through partnerships, such as community science processes (Charles *et al*., 2020) in which the community engages in partnerships with external research institutions or government agencies to build the knowledge base. A particular aspect of knowledge development lies in monitoring: keeping track, over time, of such fishery aspects as the state of the fish (e.g. through fish stock assessment, assessing the state of fish stocks and trends over time); fishing activity and catches, environmental conditions in aquatic habitats and ecosystems (e.g. biodiversity, aquatic habitats, fishery ecosystems and climate); effectiveness and support for management measures; and keeping track of activities that impact the environment (e.g. tourism, coastal development), which potentially interacts with conservation and stewardship. The issues to be discussed and resolved when building knowledge may include the types of information to be collected, the methods to be used for data collection and analysis, and who owns and controls the resulting information (e.g. in cases of collaborative research partnerships).[12]

[11] For example, see Charles *et al*. (2020); Cowie *et al*. (2020); Puley and Charles (2022).
[12] See Charles *et al*. (2020); Cowie *et al*. (2020).

The following examples from France, Indonesia and Turkey provide some diverse illustrations of "how it is done" for knowledge-building activities in support of SSF stewardship. This ranges from a focus on traditional knowledge and practices (e.g. *sasi laut* in Indonesia) through to involvement in research work with scientists and partnership programmes with environmental NGOs (in the France example). The high level of community engagement is notable, involving fishers and fishworkers directly together with local fishing cooperatives (Indonesia, Turkey) and coastal communities.

Turkey: Gökova Bay Fishery Cooperatives

"A participatory marine resource management model engages a wide range of stakeholders … in monitoring, evaluation, and program design. … local fishers have a high level of ownership and are drivers of the management process. To build the capacity of local communities to enforce and monitor designated [zones], the organization provides marine guard training that integrates a combination of theoretical knowledge and practical training. Training topics range from protected area patrolling to boat safety and from marine biodiversity assessments to public awareness-raising strategies. Men and women from NGOs, fishery cooperatives, and universities attend the meetings and support the project. Local fishing cooperatives choose trainees for the program, selecting experienced fishers with the most knowledge of fishing grounds and also the types of illegal activities to monitor for."

Source: V. Ünal (2022).

France: SATHOAN Producers' Organization (Organisation de Producteurs SATHOAN)

Based in Sète, France, SATHOAN Producers' Organization has about 60 small vessels that fish for bluefin tuna. The organization falls under the collective brand Thon Rouge de Ligne, Pêche Artisanale, ecocertified by "peche durable" (sustainable fishing) and the Marine Stewardship Council. Bertrand Wendling, SATHOAN's General Director, notes that "as part of our two ecolabels, we attach particular importance to the conservation and protection of biodiversity. Thus we actively participate in research work with scientists and we have set up partnership programs with environmental NGOs. We have also developed modern and innovative tools for the protection of sensitive species." It is considered "important to know the catch rates with the help of scientists, and also to develop tools to reduce… unwanted catches. This involves training and awareness actions, as well as data collection, scientific research and partnerships with private or public environmental management companies." Bertrand highlights that "local fishers have an increased sense of responsibility and guardianship to the resource, and an interest in maintaining the fishery in a sustainable manner."

Source: Wendling (2022).

Indonesia: Berkat Kuitta Onus Cooperative

Khalis Dwi, fisheries organization member, Yayasan Alam Indonesia Lestari (LINI), notes:

"The cooperative, established at the end of 2019, is the first legal entity of Bajo Tribe Fishers to be established in Banggai Regency. Cooperative members consist of fishers of all ages, both young and old.

The people of Popisi Village, both members of the cooperative, fishers from other groups, as well as the village government, have collaborated to manage the marine area, by recording catch data and limiting fishing time at the fishing location of octopus, the main marine commodity utilized by fishers in this cooperative, to ensure the sustainability of resources and the catch. ...community involvement in fisheries management is getting better after the joint regulation of community-based marine area management plans has been validated and supported by policy stakeholders.

Data collection on octopus has been carried out by fisher groups here since 2017. The data obtained have been analyzed and have been provided to policy makers at both local and national levels, so that they can be used as recommendations for octopus fishery management. Women have an important role to play. The wife of an octopus collector measures the biological data of the octopus and records the octopus data every day on an ongoing basis.

The concept of environmental preservation and maintenance was initially seen as something uncommon by the village community. ...However, after collectively collecting data on the catch of octopus, the community and fisher groups understand the importance of conservation, both in terms of the resource itself and the environment in which these resources live. That the environment is well maintained will ensure the sustainability of the resources they use, and some of them feel they have to take responsibility for it. The fishing community depends on fisheries resources and wants fisheries activities locally to continue. This is related to their sense of responsibility to future generations. In addition, the economic benefits factor is also one of the main motivations for carrying out environmental management in a sustainable manner."

Source: Khalis (2022).

Indonesia: Haruku village, Maluku Province

"Haruku village is a coastal community that uses sasi laut, a local knowledge and culture-based practice of coastal resource conservation. ...through the cooperation of multiple stakeholders, the sasi laut system has strengthened, helping local fishing communities to consider global issues related to conservation practices."

Source: Mony and Satria (2021, p. 83).

4.3. Building community and organizational capacity

What is involved?

Building capacity to engage in stewardship activities within small-scale fisher organizations and fishing communities usually involves finding suitable resources and funding, engaging in suitable partnerships, developing suitable organizational structures to encourage widespread participation, and providing training on the details of carrying out stewardship activities.

Why is it done?

Small-scale fisher/fishworker organizations and fishing communities are crucial to the present and future of sustainable fisheries and healthy fishery ecosystems, and they often have long-standing experience with stewardship, such as safeguarding sacred sites and managing community-run protected areas. However, in some circumstances, there may be a need to directly build or enhance stewardship capacity of the community or organization to support fishery management, conservation and stewardship for sustainable use of natural resources. Indeed, effective SSF organizations are necessary to facilitate the participation of fishers and fishworkers in a wide range of management, knowledge building, and other processes or institutions within the fishery.

How is it done?

Building capacity could include, for example, developing the capability of fisher organizations and fishing communities to carry out local ecosystem restoration projects (e.g. mangrove replanting), participating in scientific research and monitoring, and working on developing and implementing fishery co-management plans. More fundamentally, there may be a need for capacity on how to engage with government, NGOs and others. While some capacity development may be required for a community or organization as a whole, in other cases it may be needed specifically for certain sub-units, the leadership or specialized personnel. Capacity can also involve seeking out and supporting leadership in stewardship initiatives, developing decision-making frameworks within stewardship projects, developing engagement processes within the fisher organization or fishing community, and finding mechanisms and funding to maintain activities over time.

The following examples from the Comoros and Saint Vincent and the Grenadines help illustrate "how it is done" in building organizational and institutional capacity to support SSF stewardship. While both of these examples involve fishery cooperatives and both are successful in their capacity development goals, the cooperatives occur at different organizational scales, one involving a small coastal town in the Comoros, the other a national effort in Saint Vincent and the Grenadines (and, indeed, a broader multinational regional initiative).

The Comoros: Iconi Fishers Cooperative

In Iconi, a coastal town of 10 000 on Grande Comore (the main island), an estimated 40 percent of the population is involved (directly or indirectly) in fishing; 70 percent of fishers are young

(16–30 years old) and with high involvement of women in marketing fish. In the past, fishers perceived a decline in fish populations and associated that with habitat degradation (from coral harvesting, sand extraction, and use of destructive fishing practices, including dynamite, poison and mosquito net fishing). The main island was also experiencing an issue with

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household waste disposal; as there was no collection service, the dumping of waste in coastal areas and landing sites was a common occurrence.

Since 2017, fishers from eight island communities have organized to protect and reduce the impacts to reef habitat through scheduled "cleaning days". The communities have educated fishers against destructive fishing practices, and with a garbage truck donated by France, communities now collect trash, keeping the coasts and landing sites clean.

Through the efforts of the Iconi Fishers Cooperative...

"The coastal environment now has a much better chance of recovery now that it has protection. The community has gained an understanding of their relationship with nature and has an interest in preserving it. Outcomes: (1) The community has increased capacity to makes decisions about what to do for anyone apprehended for removal of corals and sand. (2) Coral collection has been 100 percent stopped. (3) There has been a significant (90 percent) reduction in sand harvesting."

In this example, the communities cite the key role of government support: "Governments must support local initiatives so that the efforts made by the communities bear fruit." Reflecting on this experience, Ismail Mahamoudou, Secretary General of the cooperative, notes that the cooperative has also helped fishers achieve better fuel prices, as fuel is bought through group purchases and then resold to individual fishers. With this success, fishers have clearly recognized that the cooperative is working in their interests by protecting and improving their livelihoods.

Ismail Mahamoudou, Iconi Fishers Cooperative

Source: Mahamoudou (2022).

The Saint Vincent and the Grenadines National Fisherfolk Co-operative Limited (SVGNFO): Improving fisherfolk engagement and capacity to participate in ecosystem stewardship

"There are a number of challenges that hinder the engagement of fishers and their organizations in the sustainable management of fisheries in the [Caribbean] region including fisherfolk having insufficient capacity and knowledge of ecosystem stewardship practices for fisheries sustainability. In an effort to address these challenges, the StewardFish project [worked] within seven CRFM Member States by empowering fisherfolk throughout fisheries value chains to engage in resource management, decision-making processes and sustainable livelihoods with strengthened institutional support at all levels."

Some achievements of the initiative include:

- "Given the importance of the fisheries to fisherfolk livelihoods, it was decided that in order to mainstream good management practices, there was a need to have an electronic registry of Fisherfolk Organization members, develop a stakeholder engagement strategy to increase membership, and provide training in business and fisheries resource management."
- "One of the proudest achievements would be the development of a stakeholder engagement strategy which will assist the SVGNFO to communicate with the various stakeholders in the Fisheries Industry..."

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- "A regional code of conduct for Caribbean Fisheries … developed by the Caribbean Network for Fisherfolk Organizations …. recognizes fishers as ecosystem stewards and as important actors in the blue economy and advocates for blue justice. The code sets out principles and standards of behaviour to ensure the well-being of fisherfolk through sustainable use, management, and development of both marine and freshwater living aquatic resources in the Caribbean which is considered to be ecosystem stewardship."

"Work in the region is ongoing to improve capacity of fisheries state agencies and fisherfolk organizations to implement the ecosystem approach to fisheries. Continued stewardship is highly dependent on strong fisherfolk organizations and fisheries state agencies and success will be influenced by appropriate governance and financing frameworks. Financial capability and suitable infrastructure were the hardest to overcome … and addressing these items will be critical in continuing success."

Source: Harry (2022).

4.4. Education and communications

What is involved?

Environmental stewardship of oceans and inland waters by small-scale fishers can be supported through education and communications, whether carried out locally or through involvement in relevant government projects. Education and communications inform members of a fisher organization or fishing community of the necessity and practice of stewardship. Equally, both are relevant in informing policymakers and others of organization or community interests served by their involvement in carrying out stewardship activities or participating in broader activities.

Why is it done?

Education and communications "internally" within the community or organization help build interest and support among members for stewardship measures and keep members informed of the progress with stewardship activities. Education and communications can also be aimed more widely – "externally" (e.g. to the general public) – to build public and political support for the community or organization and its actions to improve environmental health and supporting livelihoods, community well-being and other goals.

How is it done?

Internal education and communications within the community or organization can be viewed as a two way process. As noted, they help build interest and support for stewardship and provide updates on progress with stewardship, but in the other direction, communication from members to the community or organization provides feedback on the level of satisfaction with stewardship activities and ideas for adjustments. External education and communications can be oriented to inform the general public, but may also aim to influence policymakers, funding agencies and others, building political and funding support for the stewardship work of the community or organization and its goals, e.g. environmental health, livelihoods and community well-being.

The following examples from Ecuador and Uganda help illustrate "how it is done" by engaging in education and communications to support SSF stewardship. These examples show the role of

education and communications in contributing to broader stewardship initiatives and societal benefits broadly – building support, involving women, securing livelihoods and enabling better resource management measures.

Ecuador: Don Goyo Mangrove Community Participatory Management Board

JUMAPACOM is a Community Participatory Management Board located in the Gulf of Guayaquil, and encompassing several islands. Ancestral community-based management received official legal recognition in 2000 when a mangrove concession from the government was approved. The concession territory now covers 10 869 hectares of mangrove forests on several islands, and since 2017, JUMAPACOM also manages Manglares Don Goyo (a Ramsar-designated wetland), which overlaps with the concession area. Don Goyo now is the integration of six small fisheries associations (about 250 artisanal fishers and crab collectors).

Regarding education and communications, including the importance of these towards the empowerment of women:

"We found it was beneficial to first recommend a local conversation followed by an invitation to the locals to visit the nearby community of Bellavista to talk about their experience with fishery stewardship. Then, when local needs and interests were clear, an invitation to ... talk with the technicians was shared. Through this process, locals were able to gain a better understanding and become involved in project planning from the beginning, which enhanced a sense of ownership and a commitment to the activity...

The integration of women is a main preoccupation for the technical assistance, as macho culture is quite strong. The integration in schools and the visits by foreign volunteers helped to persuade many women to more integration and to higher education. A woman in Cerrito succeeded to the presidency of the Cerrito de los Morreños community and another one to the presidency of the Asociación de Cangrejeros y Pescadores Artesanales Cristo Rey."

Federico P. Koelle D., Don Goyo Mangrove Community Participatory Management Board
Source: Koelle D. (2022).

Uganda: Lake Albert and Lake Victoria

The Uganda Fisheries and Fish Conservation Association (UFFCA) aims to mobilize and organize communities engaged in small-scale fish harvesting, processing and marketing for sustainable fisheries and development. Around Lake Albert and Lake Victoria, many of the fishing areas are severely polluted, heavily overfished and ecologically degraded. As a result, fish stocks have significantly declined, threatening the livelihoods of small-scale fishers. As the UFFCA's Seremos Kamuturaki notes, this "resulted in alarming levels of poverty and food/nutritional insecurity and increasing joblessness."

Facing these challenges, the UFFCA undertook an education and information dissemination programme on "the long-term benefits of environment conservation – resource conservation and management, e.g. against destructive fishing methods and gear, environmental protection." This was an important factor in building interest and support among fisherfolk for stewardship measures – recognizing that "more secure, less vulnerable fisherfolk have more incentives to participate in saving fish stocks and therefore make more effective and motivated fishery managers."

Seremos Kamuturaki, Uganda Fisheries and Fish Conservation Association
Source: Kamuturaki (2022).

4.5. Other supporting and enabling activities

The enabling environment for stewardship involves not only the four supporting and enabling activities discussed above, but also many other specific activities that small-scale fisher organizations and fishing communities need to carry out regardless of the specific form of stewardship. In fact, the supporting or enabling activities listed here are ones that fisher organizations and fishing communities will need to engage in, beyond stewardship per se, to support whatever activities are being carried out (membership and health programmes, for example).

The following, adapted directly from the *Community Fisheries Management Handbook* (see below), are some supporting activities that fishing communities and fisher organizations can perform, potentially within partnerships. These are presented in the order, roughly, in which they may arise during the process of considering, planning and implementing stewardship.

Community visioning: A collective, shared dream or aspiration for the future that can be expressed in words or drawings is often developed through dialogue and facilitation within the organization or community and is based on underlying values. This vision can determine the direction of all sorts of goals, including stewardship efforts.

Setting management/conservation objectives: The objectives, or goals, being pursued arise out of the values and vision, but represent more specific, reflecting priorities for the organization or community. The objectives may be in many forms – economic, social, cultural, ecological, etc. – and be set in a participatory manner or by the leadership.

Developing or influencing policy: A fisher organization will likely have its own policies – the agreed-upon ways in which the organization operates – and a fishing community may also have theirs. Developing these internal policies is important, but equally, there may be a need to participate in, or seek to influence, broader governmental policy, which governs implementation of the various rules and legislation in the fishery and coastal areas broadly. Therefore, there are many different ways of looking at policy: developing it internally, possibly participating externally, and lobbying or pursuing advocacy to change policy if it is not suitable for the organization or community. Key elements in this process are to identify and analyse how the existing policy is or is not working and to develop and evaluate policy alternatives that can be put forward (or lobbied for).

Setting acceptable rules: Rules are essential for determining the way stewardship, or resource use, is done, to meet management/conservation objectives and fit within the policy framework. Importantly, the acceptability of those rules ensures that compliance is high, and that the management or stewardship programme is widely supported. Typically, setting acceptable rules is done in a participatory manner, whether involving all participants, e.g. in a community meeting, or through a process of interaction between the community/organization leadership and the government.

Enforcement: It is a fact of life, not just in fisheries but everywhere, that even the most widely accepted rules encounter rule-breakers. Once rules have been developed and followed by a community or organization, there is a strong desire to penalize those who break them. This is especially the case when stewardship initiatives are involved, as rule-breaking can threaten the success of that stewardship. Enforcement can take place in a variety of ways in small-scale fisheries, sometimes by the community or the organization itself, or otherwise by the government.

Managing conflict: Conflicts can arise (i) entirely within an organization or community (e.g. based on different priorities or disagreements over allocations of resources); or (ii) between a given organization or community and others (whether involving other parts of the fishery, or those engaged

in other economic or advocacy activities, or governmental and regulatory bodies). Whatever the case, conflict management is an important process. There are various approaches for dealing with conflict, which can differ depending on whether the conflict is internal or external. For example, in cases of external conflict with government or with competing economic interests, a common strategy is to forge alliances with those with common objectives, such as other fisher groups and community groups.

Livelihoods and economic development: Stewardship can play an important role in sustaining livelihoods and the well-being of communities. This occurs by maintaining or rebuilding the health of ecosystems and the environment around fisheries and the corresponding species, and by managing the fish supply, the fisheries themselves and the relevant aquatic areas. To safeguard and sustain livelihoods, such stewardship measures are supported by many related steps, such as improving product quality, market development and measures to keep wealth in the community. Many of these steps go beyond fishing per se and demand attention to the "bigger picture" around the fishery and the fishing community. The SSF Guidelines provide excellent ideas for this endeavour.

Evaluation and reflection: Evaluation is the process by which objectives can be assessed as time passes to see whether they are being achieved or advanced. Reflection is related to evaluation, but it is a deeper activity that typically looks back to understand what can be learned from previous efforts, to meet objectives, and to carry out stewardship activities, etc.

Further details on each of the above activities that support stewardship are contained in the *Community Fisheries Management Handbook*, a freely available online sourcebook (Graham, Charles and Bull, 2006), which also covers many other activities involved in small-scale fisheries stewardship, and for that matter, relating to most endeavours of fisher organizations and fishing communities.[13]

[13] The handbook is available at https://www.communityconservation.net/wp-content/uploads/2016/07/CommunityFisheriesManagementHandbook.pdf

5. Outcomes and successes of stewardship

Stewardship activity is seen by small-scale fishing communities and fisher organizations as having diverse benefits. As discussed, an often-noted benefit of stewardship is the achievement of healthier fisheries and more sustainable livelihoods through sustainable use of ecosystems and fish stocks. Other benefits include capacity development; poverty and vulnerability reduction; employment and decent work; food security; benefits to the post-harvest sector of the fishery, including value chains and trade; local engagement, participation and empowerment; achievement of a greater role in decision-making and management; reduction of harmful practices; and improved monitoring, data collection, assessment and traceability. A further benefit of stewardship relates to responses to threats of climate change – maintaining or improving environmental conditions, such as the state of mangroves along a coast, can play a large role in disaster risk reduction, i.e. reducing the potential damage caused by natural hazards, such as extreme weather events like hurricanes and cyclones and associated flooding.

The success of stewardship will depend on the extent to which small-scale fishing communities and fisher organizations identify and ultimately achieve the combination of benefits they are seeking. This in turn depends on the choices of stewardship approaches and the presence of suitable enabling and supporting conditions. Small-scale fishing communities and fisher organizations have noted widely varying levels of success in their specific stewardship initiatives, from largely unsuccessful to almost entirely successful, with every outcome in-between, averaging somewhat more than 50 percent success. Furthermore, whatever the level of overall success, every stewardship experience was reported to be somewhat incomplete or facing challenges. In other words, stewardship efforts are typically best seen as ongoing over time.

However, there do seem to be some good practices or ingredients of successful stewardship that are widely occurring and that can be studied. These are not only helpful to small-scale fishers, but also can help inform governments and other policymakers on key areas to improve their support for small-scale fisheries stewardship, both on-the-ground, in terms of capacity and resources, and in terms of legislation and policy. Good practices apply to direct stewardship through physical, management, planning and advocacy activities, as well as enabling and supporting activities, such as knowledge and capacity development, education, and efforts to protect or expand local rights and tenure. There are implications for the financing of environmental protection and restoration measures and for other forms of SSF stewardship as well.

The lessons learned reported by many SSF organizations and fishing communities reflect several major messages, described in the following sections, each reflecting "good practices" for SSF stewardship.[14]

5.1. Values and ethics

The success of SSF stewardship depends largely on the underlying values, goals and motivations of society, both broadly and specifically of the fishing community or fisher organization. Such aims vary widely, depending on the culture, history and economy surrounding fisheries. Interestingly,

[14] These are compatible with good practices and lessons learned reported elsewhere, e.g. with respect to fisheries co-management effectiveness (Pomeroy *et al*., 2022) and local community roles within environmental conservation (Charles, 2021).

there is evidence that stewardship initiatives motivated by moral aspects, relating to a feeling of responsibility to future generations, may have relatively high success rates. Indeed, fishers stress that successful stewardship requires following underlying values to ensure the fishery is maintained for future generations and caring for nature in order to benefit from it.

Perspectives on success

"The sea as a source of livelihood must be maintained and preserved so that it is sustainable for future generations." – M. Syahrul, Bengkulu, Indonesia

"Conservation ... maintains a balance in the chain of marine life. Thus, healthy marine life is beneficial for all humans." – R. Nurhadi, Indonesia

"Keep the spirit and continue to prevent destructive fishing gear for the sustainability of our generations of children and grandchildren. The role of a woman is to be involved in directly participating and determining her opinion." – B. Laksana, South Kalimantan, Indonesia

"Fight to continue conserving the species that feed our families." – R. can Perera, Yucatan, Mexico

"If the fishery environment is conserved it will benefit the society... Women must be involved because they are among the biggest stakeholders of fisheries in their communities; some are more active than men." – J. Othman Mshenga, the United Republic of Tanzania, Zanzibar

"On the one hand because our fishery is the first fishery in the world to hold this double [environmental] certification, on the other hand because we have to develop a network of scientific partners but also institutional, and finally because we have today many commitments of conservation of biodiversity that is not (yet) applied by any other fishery." – B. Wendling, France

Source: Charles *et al*. (2022).

5.2. Local leadership and responsibility

Small-scale fisher organizations and fishing communities have provided a range of insights on what has made environmental stewardship successful and what aspects would be important to sustain the benefits into the future. Leadership was identified as the top factor of success. This assessment by fishers is in line with the results of Gutiérrez, Hilborn and Defeo (2011), highlighting the importance of leadership for successful fisheries.

Perspectives on success

"Do not be afraid of responsibility and leadership." – R. Sulyandziga, Centre for Support of Indigenous Peoples of the North, the Russian Federation

"Practice humility and good communication... Find space for fun, have patience and recognize progress when you see it. Celebrate why you do the work in the first place; eat fish." – K. Chang, Hawai'i, the United States of America

Source: Charles *et al*. (2022).

5.3. Diverse knowledge and perspectives

Fishers participating in this SSF Stewardship Initiative indicate that knowledge is among the most common factors of success in stewardship. This parallels the well-established importance of knowledge in terms of effective fishery management and policy. It has been noted that "Local

conservation can draw on local knowledge, held by those dependent on and/or living with the environment and who have a strong understanding of local ecosystems", helping to produce more effective conservation (Charles, 2017). This knowledge is variously known as traditional ecological knowledge, Indigenous knowledge, fisher knowledge, or simply "local knowledge." The use of all sources of such knowledge is needed for effective conservation.

Perspectives on success

"Traditional practices and local wisdom in managing marine resources are important lessons..." – C. Paino, Central Sulawesi, Indonesia

"Know how to surround yourself with constructive people, work in close collaboration with scientists and listen to fishermen." – B. Wendling, SATHOAN Producers' Organization, France

"Coastal communities generally and fishers especially were gaining their understanding about what the issues or roots of the problems and how to solve those problems. They are willing to improve the marine ecosystem and work together with other fishermen from different villages." – M. Mutia, Indonesia

"The fishing community previously caught octopuses of all sizes or weights. However, after collecting data on octopuses for one year, fishermen began to understand how important it is to choose size, weight, gender, to catch location, and use of fishing gear. Data collection is used as the main basis for managing coral reefs that have an impact on the sustainability of marine resources and their future income." – C. Paino, Indonesia

Source: Charles *et al*. (2022).

5.4. Cohesion and trust in the community and organization

Another frequent factor of success is the nature or structure of the community or organization. This is also complex, involving multiple components, including the nature of the institutions involved (e.g. levels of participation, leadership), the nature and local history of engagement, the social fabric (e.g. social cohesion) and the inherent social structure (e.g. role of women, inclusiveness). In particular, local communities have significant potential to draw on their own institutional arrangements, as well as community support, for knowledge acquisition, conservation and management. Indeed, recognizing and drawing on strong human institutions within communities can provide a "comparative advantage" for local-level conservation, which can enhance the sustainability of conservation efforts (Charles, 2017).

Perspectives on success

"Build capacity to coordinate and network members, practice humility and good communication, adapt, anticipate and leverage strategic opportunities. ..." – K. Chang, Hawai'i, United States of America

"Strong community organizations are needed which are capable of implementing resource management and supported by appropriate policies." – S. Kamuturaki, Kampala, Uganda

"The community recognizes the Association by being involved in the Association's activities. People in the community see the importance of working and helping each other get strong and engaging in resource rehabilitation activities." – Mrs D. Chumpholwong, Thailand

Source: Charles *et al*. (2022).

5.5. Empowerment and capacity to participate in decision-making and management

Empowerment provides many benefits, including the capacity to seek out and implement local solutions to safeguard environments and livelihoods, to take leadership in building the knowledge needed, and to participate fully in larger-scale initiatives of governments and others. On the one hand, empowerment leads to successful community-led stewardship of local ecosystems by enabling local environmental conservation and thereby local livelihoods and economies. At the same time, empowerment leads to better community engagement in stewardship that may be either broader in scale and/or locally based while involving partnerships with others. Such initiatives may be carried out jointly by fishing communities and organizations, together with governments, local NGOs and scientists, in a manner parallel to that of co-management. This can help build greater acceptance of the need for conservation, producing greater local "buy-in" that can extend to management measures.[15]

Perspectives on success

"Increased capacity and empowerment of fishers to challenge unjust proposals, plans and policies, and participate in planning and decision-making processes." – South Africa: Sowman (2021, p. 114)

"Community involvement, engagement and participatory decision making is very important. Awareness of all groups within the community and outside the community with all stakeholders is also important... Women (as well as some men) are the most important beneficiaries of the initiatives as they are mostly active in the shallow water fishery. They collect shellfish, small fish, octopus, and anchovies by foot, using small-meshed nets. They are part of the community general meeting, they have the women's leadership..." – M. Makame Mohammed, Jongowe, the United Republic of Tanzania, Zanzibar

"An important lesson for strengthening local fishers to jointly use and maintain sustainable resources is the participation process of local fishers in every region. There must be a discussion and common goal setting for all groups to thoroughly understand the information." – Sama ae Jahmudor, Federation of Thai Fisherfolk Association, Thailand

"The unity and participation of the people in the community is an important part of the successful care of resources." – D. Chumpholwong, Khon Khlan Sub-district Folk Fisheries Association, Thailand

"... we have been marginalised and invisible for so long in South Africa. We managed to get our voices heard and say that our livelihoods are linked to the health of the lagoon and are also important. It is significant because this action helped us mobilise many youth in our area who are now eager to take on other actions to protect the lagoon for our traditional fishing community." – S. Smith, South Africa

Source: Charles *et al*. (2022).

5.6. Appropriate partnerships and external support

While the stewardship role of small-scale fisher organizations and fishing communities has taken place for thousands of years, and does not necessarily require government support, there are situations in which such stewardship can be more effective through suitable practical, financial and policy support, whether at local or national levels. These steps can build from successes in certain

[15] For more on this topic, see Charles (2017, 2021).

locations with government support for fisher-led stewardship in terms of ensuring the needed resources and capacity and possibly empowering fishers to take on management authority. At the same time, government support for fisher stewardship must be compatible with the values, objectives and attitudes of those involved and adaptable across the diversity of stewardship roles played by small-scale fishers.[16] To avoid serious harm that might result from making the wrong decisions, governments should also ensure that effects of their conservation actions on small-scale fishers are carefully considered.

Perspectives on success

"Build internal and external partnerships." – R. Sulyandziga, Centre for Support of Indigenous Peoples of the North, the Russian Federation

"Having a network of various parties working with the community to support, strengthen and develop community capabilities." – D. Chumpholwong, Khon Khlan Sub-district Folk Fisheries Association, Thailand

"Adapt, anticipate and leverage strategic opportunities." – K. Chang, Hawai'i, the United States of America

"This initiative is very important for the community in [terms of] livelihood sustainability but needs to be supported when the resources from the community are not able to undertake the initiative. Any concerned party in the SSF should be aware that there are other communities that need support and there should be a mechanism of introducing a special fund for supporting the communities involved in stewardship." – M. Makame Mohammed, the United Republic of Tanzania, Zanzibar

Source: Charles *et al*. (2022).

5.7. Supportive government policy and legislation

Fishers often express concerns over a lack of government support for stewardship efforts. Even worse, some note cases in which policy, legislation or practices are actually contrary to SSF stewardship. There are often problems specifically with obtaining financial support, resources and infrastructure, and an urgent need to recognize and reinforce fishers' rights, tenure and access.

Ensuring positive government support for fisher stewardship initiatives depends on broader aspects of fishery policy, such as openness to fishers being involved in management decision-making (as well as monitoring and fishery research). These aspects can be addressed through improvements to the policy environment to support stewardship by fisher organizations and communities. Here are three possible approaches:[17]

- Policy measures can extend beyond the fishery to include a strong connection with sustainable economies and sustainable communities to maintain the stewardship function fishers and their communities often provide. Notably, it is crucial to have recognition of tenure rights (the long-term right to access and utilize resources) within policy for post-harvest workers, both for tenure over aquatic spaces and fishery resources and for tenure of land. For example, systems of collective community rights assigned at a local level support the community nature of environmental solutions by providing secure access to resources and mechanisms for the community to take part in the management of those resources.

[16] See, for example, Béné, Macfadyen and Allison (2007); Berkes (2004, 2021).
[17] For details, see Charles (2013, 2017, 2023).

- Government policy can help in building skills of small-scale fisher organizations and fishing communities, so they can better organize and engage with scientific agencies and governmental institutions that are also involved in environmental stewardship and management of aquatic resources. For example, a crucial aspect is to support fishers in having time and resources to engage in stewardship while also maintaining their livelihoods in fishing.
- Government policy can support "scaling-up" from initiatives of small-scale fishers to large-scale conservation, as well as "scaling down" to make large-scale efforts applicable to the local level. In some cases, local-level stewardship has produced conditions in which new national or subnational management arrangements have been able to emerge, such as in Chile (Gelcich *et al*., 2010), where local conservation efforts of fishers, working with scientists, led to a model of community-level marine protected areas that eventually entered national legislation and management systems. Similarly, the model of locally managed marine areas has expanded globally, reflecting an important illustration of scaling-up. Furthermore, linking together local fisher stewardship initiatives can be relevant at a national scale, e.g. by enabling larger-scale ecosystem health activities, so local-level efforts can support higher-level goals.

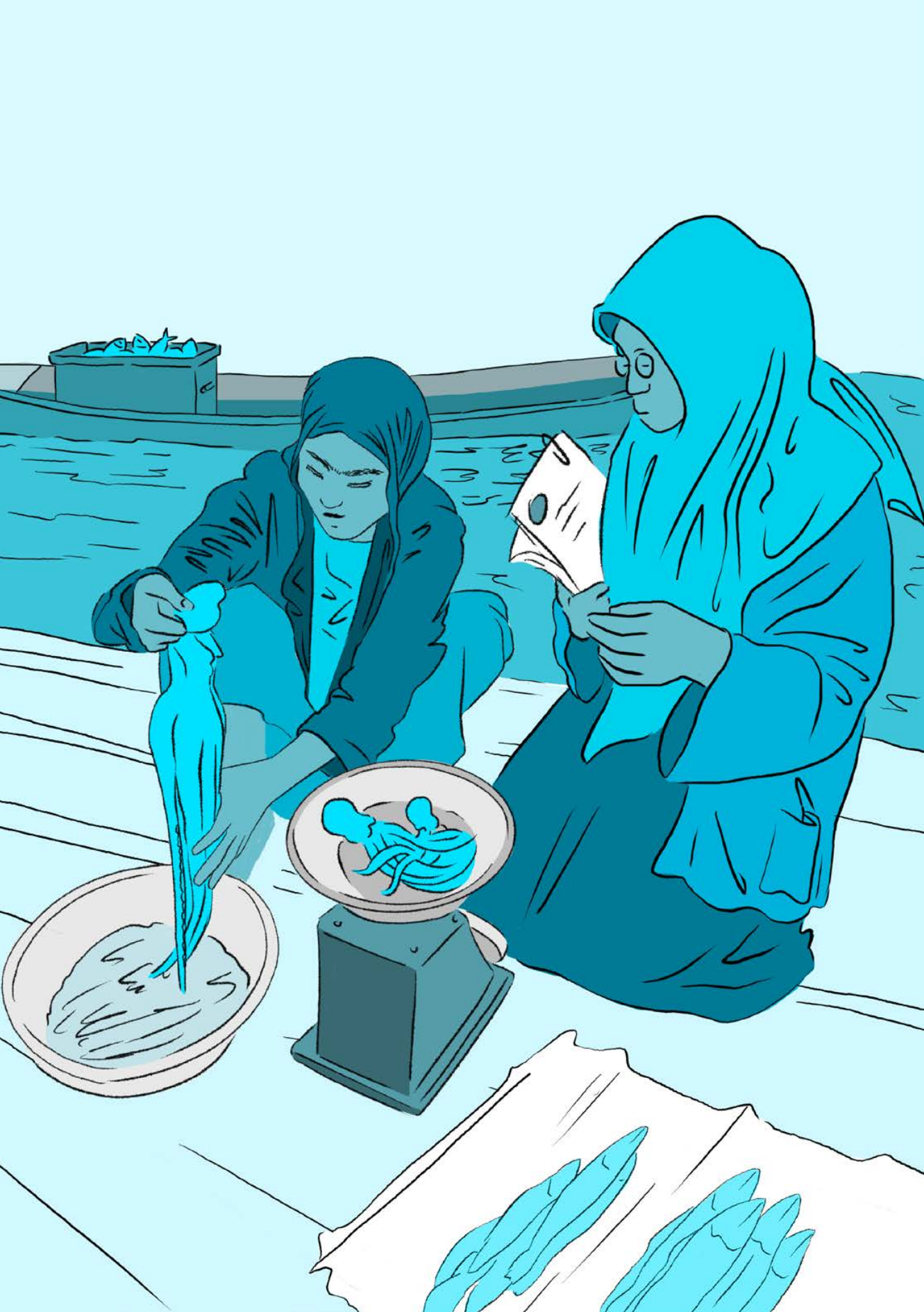
Perspectives on success

"... the state's empowerment of artisanal fishers with resource rights served as a critical turning point toward more socially just policies with transformative impacts on previously degraded mangrove landscapes." – Ecuador: Beitl et al., 2019, p. 123

"Ongoing meetings to raise voices to government agencies and the public about the goals and identities of local fishers." – Sama ae Jahmudor, Federation of Thai Fisherfolk Association

"We continue working on conservation, but the government's support is necessary to be able to stop illegal fishing." – R. can Perera, Mexico

Source: Charles *et al*. (2022).



6. The path forward for small-scale fisheries stewardship

In small-scale fisheries around the world, fishing communities and organizations are actively involved in a wide range of environmental conservation and stewardship activities. This has been strongly demonstrated through the many stewardship experiences generously shared by small-scale fisher organizations and fishing communities, both here and in the SSF Stewardship website (https://ssf-stewardship.net). Together, those experiences expand the global understanding of SSF stewardship, providing valuable ideas for fishing communities and fisher organizations and for policymakers, educators, NGOs and others.

The environmental stewardship role of small-scale fisheries is essential to safeguarding natural resources, local livelihoods and the well-being of local fishing communities, as well as contributing greatly to biodiversity conservation and to ensuring that aquatic (and coastal) ecosystems are maintained and restored. Superficially, stewardship initiatives in small-scale fisheries may seem "small" or "local", but when thousands of these initiatives, around the world, are considered together, the results are profound – benefiting the environment and the economy broadly. This reinforces the message of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) by highlighting the role of small-scale fisheries in responsible fishing and the responsibility of governments to offer them support. Indeed, given its widespread nature, SSF stewardship contributes importantly to the United Nations 2030 Agenda for Sustainable Development, to achieving the Sustainable Development Goals and to implementing the Global Biodiversity Framework.

The preceding four chapters discussed four main aspects of SSF stewardship:

(i) The key motivations and influences on stewardship practices.
(ii) The six types of stewardship in small-scale fisheries.
(iii) The supporting and/or enabling activities underlying stewardship.
(iv) The lessons learned, good practices and ingredients for success in stewardship.

First, as highlighted in Chapter 2, it is evident that, for small-scale fishers, stewardship is expressed as both a perspective and a practice, a way of engaging with the natural world and the local environment. As S.A. Jahmudor puts it, on behalf of the Federation of Thai Fisherfolk Association (Jahmudor, 2022):

> **Our life and survival depend very much on an abundant and rich biodiversity ecosystem. … Small-scale fishers see it as our responsibility to protect and conserve coastal resources in our community as well as networking among coastal communities to collectively look after coastal resources.**

Second, stewardship appears in six major forms (Chapter 3), including activities within fisheries, such as community-based or co-management measures to ensure sustainable use of resources and ecosystems, as well as activities not specifically relating to fisheries, such as ecosystem restoration, beach clean-ups and efforts to conserve specific species, among other activities. A wide diversity of stewardship has been highlighted, across many political, economic and social contexts and in a broad range of fisheries and ecosystems. For example, in some cases, there are positive, supportive

relationships with government, while in other cases, efforts are undertaken by small-scale fishers to engage government and advocate for recognition of their rights to fish and to participate in conserving the resources on which their livelihoods depend.

Third, a set of key supporting or enabling practices can be crucial for success in stewardship (Chapter 4). These can include suitable government support, both in policy and in practice (e.g. financial support, resources and infrastructure), recognition and reinforcement of fishers' rights, tenure and access, and attention to internal conditions to ensure education and communications, engagement and support and the required cohesion and trust.

Fourth, several "good practices" or ingredients for success in environmental stewardship have been identified (Chapter 5). These collectively involve paying attention to local social, economic, cultural, ecological and biophysical factors, as well as current realities of capacity, institutions, policy and legal frameworks, and governance, along with cost implications. The good practices described here are compatible with those reported in other publications, such as FAO's *Guidebook for Evaluating Fisheries Co-management Effectiveness* (Pomeroy *et al*., 2022).

It is truly inspiring to see what small-scale fishing communities and organizations are achieving in their remarkable stewardship efforts, and, though more subtly, in what is done routinely as part of the life of fishing communities. Support for these fishing communities and organizations in their environmental stewardship is clearly a valuable contributor to a sustainable future, as they lead the way in restoring local environments and stewarding resources, contributing to achievement of the Sustainable Development Goals and the Global Biodiversity Framework targets.

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Note: This set of references is divided into two parts: first, those in the main text, and second, those in the boxes – each of these parts being shown in alphabetical order.

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SSF Stewardship Vignettes

SSF Stewardship Initiative:

https://ssf-stewardship.net/interactive-ssf-stewardship-map

The following are brief summaries of the stewardship experiences provided directly by small-scale fisher organizations or fishing communities, or organizations directly supporting small-scale fishers. For further details, please see the website above, where a web page is provided on each experience, directly in the voices of fishers.

Sustainable shellfish harvesting

Morbihan Departmental Fisheries Committee

MORBIHAN, BRITTANY, FRANCE

In Morbihan, each maritime department has a fishery committee that is comprised of all the fishers in that region. The fishery committees are partly responsible for managing the coastal zone along with the larger regional committee. Following a boom and subsequent crash of the shellfish fishery that endangered fragile eelgrass environments, the state created a professional status of fishers through a licensing system. Through this process, the committees could establish a history of the fisher and manage resources by temporarily freezing fishing zones and the rights of fishers through the allocation of "stamps" for each species in each zone. In this arrangement, fishers are integral in the decision-making process. Fishers set the conditions for the allocation of licences, stamps, authorized gear, fishing areas, campaign dates, etc. Once decided among themselves, decisions go through the local commission, followed by the regional commission, and if favourable, deliberations go to the regional Prefect, who will issue a decree validating the provisions adopted, making them applicable to everyone. Women are quite numerous in this activity, representing 20 percent of fishers. As all fishers, they participate in the discussion processes. Although the number of harvesters has dropped since the introduction of permits and licences, those who do harvest now have social protection; they can sell their products legally, manage their resource effectively and play a role in protecting the environment.

Reducing the negative impacts of fisheries for scavenger species in the Upper Amazon

Association of Cochabamba Fishers (Asociación de Pescadores Cochabamba – ASPECO)

PUERTO VILLARROEL, THE PLURINATIONAL STATE OF BOLIVIA

In Puerto Villarroel, a town in the Department of Cochabamba, in the Plurinational State of Bolivia, the fishing industry is comprised of two small-scale fishing organizations (ASPECO and APTIMCO), non-organized fishers engaged in illegal fishing and Indigenous fishers. The fishery is regulated by SEDAG (the Departmental Agricultural and Livestock Service). Conflict emerged between organized and illegal fishers, as the latter fished blanquillo (*Calophysus macropterus*) using animal-carcass-based bait, which caused concerns over sanitation and water pollution and threatened biodiversity, as the bait was often illegally hunted forest animals. Seeing a gradual deterioration of the environment and fearing these practices would tarnish their image, the organized fishers started a dialogue with SEDAG about regulating the practice. Meetings with the involved parties resulted in a verbal agreement in 2011, a written agreement in 2014, and a more formal agreement was put in

place in 2021. Their agreements include the total prohibition of the use of wild animals as bait and regulating the catch volume. Although the formal agreement has only recently been adopted, the fishers are expecting improvements in local water quality and ecosystem health because of reduced pollution. The agreements also led to social benefits, improving (partially) the public image of fishers who are association members (who were initially stigmatized) and maintaining social balance in the community between fisher groups.

Building stewardship consciousness with Indigenous perspectives in schools

Mi'kmaq Confederacy of PEI

CHARLOTTETOWN, PRINCE EDWARD ISLAND, CANADA

The Mi'kmaq Confederacy of PEI (MCPEI) is a Tribal Council that supports two First Nations on Prince Edward Island (PEI) – Lennox Island and Abegweit. As a Tribal Council, MCPEI provides technical advice and assistance around resource-based activities, primarily the fisheries. Both communities have been involved in environmental projects, and one of the communities owns and operates an enhancement fish hatchery. The communities practice *Netujulimk*, the concept of taking only what you need from nature in order to sustain the resource for future generations. Faced with colonization of traditional territories and the destruction of the environment and resources, the organization has been working alongside partners to alleviate some of the issues facing the communities. Recently, the organization reintroduced the Plamu'k na Kitapina'q (Salmon Are Our Friends) programme. Originally developed by the Department of Fisheries and Oceans Canada and delivered by the Atlantic Salmon Federation, the programme is now delivered by Abegweit, where it has been "Indigenized" and includes sustainable resource use and environmental sustainability. Aimed at children, the programme creates stewards of the environment with an understanding and appreciation of the natural world. Randall Angus, who originally envisaged and developed the programme in 1991, is still meeting people, 30 years later, who speak enthusiastically about their experiences and their interest in environmental issues.

Social enterprise and sustainable shellfish harvesting

Bitecma Ltda.

TRONCOS VIEJOS, VILLA ALEMANA, VALPARAÍSO, CHILE

Bitecma Ltda. is a social enterprise involved in small-scale fisheries and the management of benthic resources in Chile. The enterprise contributes its knowledge and experience to development of the country's fishing and aquaculture sector. Bitecma works with communities on capacity development through empowerment and development of leadership in communities. It aims to foster a sense of responsibility for future generations through the design and execution of technical consultancies, studies and research in the field of marine sciences. In Troncos Viejos, benthic resources face pressure from illegal fishing, and one of its shellfish resources, Loco (*Concholepas concholepas*), faces depletion. Knowing that the uncontrolled exploitation will lead to the breakdown of ecosystems and cause irreversible damage to fishing resources, Bitecma has assisted small-scale fisher organizations with community use rights, enabling community members to take care of these management areas while receiving advice from technicians who do fisheries extension work. Although it notes that challenges still exist with illegal fishing, the enterprise has already experienced positive benefits in the community. Benthic resources have started to recover, and there have been improvements in fishing activities and commercialization. Furthermore, most of the fisher organizations are motivated and have requested to manage their local areas.

Coral reef protection and planning

Iconi Fishers Cooperative (Coopérative des Pêcheurs d'Iconi)

MDE, NGAZIDJA, THE COMOROS

In Iconi and the surrounding villages of Raya reef, in the Comoros, there was a problem with some fishers who engaged in harmful fishing practices, including shore and mosquito net fishing along with the use of dynamite and tephrosia, a plant-based toxin. The harmful fishing practices combined with detrimental onshore practices, such as dumping waste into the ocean and sand mining, have produced significant degradation of nearshore environments. Fishers have noted reduced catches and are now having to travel further to sustain their livelihoods. Facing environmental degradation and having concerns with resource management and ensuring the sustainable livelihoods of fishers, the Iconi Fishers Cooperative led outreach and awareness efforts in the community, followed by empowerment sessions for members of the cooperative. Efforts focused on education about the negative impacts of harmful fishing practices, sand mining and dumping waste into the ocean. Physical actions led by the cooperative include regular cleaning sessions of the fishing area, which also involves surrounding villages. The cooperative's endeavours resulted in the community receiving a garbage truck from the diaspora in France to assist with proper waste disposal. Many benefits have been identified, including a complete stop on coral collection and a 90 percent reduction in sand mining. Because of the cooperative's efforts, the community has also increased its capacity in decision-making, and through its educational pursuits has fostered an interest in preserving the environment. Although the cooperative has made great progress, it stresses the need for further government support of the local initiatives to ensure the efforts succeed.

Lakeshore habitat restoration

Lake Tanganyika Fishers Collective (Collectif des Pêcheurs du Lac Tanganyika – COPETANG)

LAKE TANGANYIKA (THE DEMOCRATIC REPUBLIC OF THE CONGO)

The Lake Tanganyika Fishers Collective (COPETANG) is a provincial umbrella organization that connects small-scale fishers in Lake Tanganyika, the Congo River and the many rivers scattered across the Tanganyika province. Between climate change and large-scale environmental degradation, negative impacts have been noticed in the lake, specifically the disappearance of certain fish species. Ensuring the lake fishery is sustainable is crucial to maintaining local livelihoods and supporting good nutrition, guaranteeing food security. COPETANG has engaged in conservation activities by raising awareness on negative environmental impacts in the surrounding communities, using media to hold awareness sessions and hosting workshops and conferences. The collective has also held activities to build ecosystem resilience, such as riparian planting along the shores of Lake Tanganyika and the surrounding rivers. As a result of its initiatives, there is increased awareness of environmental issues and the importance of the fishery among local people. Furthermore, a better understanding of the interconnection between community members and nature has been cultivated. As Kapalay Kabemba Jean Pierre, COPETANG member and community fisher, has said, "When the environment is well protected, it generates benefits for food security, poverty reduction and above all the fight against climate change."

Community-based management of a mangrove reserve

Association of Artisanal Fishers, Shellfish and Allied Costa Rica

COSTA RICA ISLAND, ECUADOR

With the introduction of shrimp farming came the devastation of mangrove estuaries in Costa Rica Island, Ecuador. The previously thriving mangrove forests were converted to shrimp ponds, negatively impacting water quality and the environment. Despite protesting, the community made little progress since it was not recognized legally as an organization. In acknowledging the importance of mangroves to their livelihoods, fishers formalized themselves as a legal organization, the Association of Artisanal Fishers, Shellfish and Allied Costa Rica. With their new legal recognition, the mangrove area became a reserve area enabling the organization to facilitate community-based management, protecting and managing 460 hectares of mangrove forests since 2000. In addition to restoring mangroves, the organization plays a crucial role in actively managing the fisheries and aquatic areas. Initiatives include implementing local management controls through fishery monitoring and efforts to reduce overfishing by reducing fishing pressure and implementing complete bans. The organization has been successful in its restoration efforts by supporting species regeneration and addressing water quality, increasing the overall sustainability of the mangroves. The recognition of the association as a legal organization has allowed the local community to reclaim their rights to manage the local mangrove concessions, increasing their capacity and fostering a unified goal to protect the mangroves and therefore protecting their livelihoods. Conservation remains a central long-term ideal of the association.

Managing eel fisheries for sustainable use in the Kingdom of the Netherlands

netVISwerk

ZWARTEWATERALLEE, ZWOLLE, THE KINGDOM OF THE NETHERLANDS

netVISwerk is an interest group for small coastal and inland fisheries in the Kingdom of the Netherlands and Belgium that is committed to improving conditions for fishers while being more ecologically responsible. Facing unsustainable eel fishing, inland fishers were granted permission to conduct a decentralized eel fishery, using a more ecologically responsible approach. European eels are crucial in maintaining a balanced ecology, yet their numbers have plummeted in recent years, with the International Union for Conservation (IUCN) listing them as critically endangered. The eel fishery typically closes during the silver eel migration, where they head to the Atlantic to spawn; however, under the new decentralized eel management (DAB), fishers can fish year-round but must adhere to a predetermined quota. The DAB also includes efforts to maintain and manage the populations by releasing juvenile glass eels imported from France into the project area. Under the new management plan, eel stocks have improved in the project area while also providing assurance to fishers because the annual turnover can be calculated. Fishers have also experienced social benefits by being involved in surveys and monitoring activities in the project area, which has contributed to improved relationships between the legislator and other stakeholders. After the pilot project proved to be a success, the DAB has been accepted by the Dutch government, and there are now applications in other regions to set up decentralized fishing areas. In terms of gender, the Frisian Association has one woman member, and the wives of the fishers are generally involved in the processing and sale of eels at home.

Coral reef protection and planning

Tam Tien Co-management Community Organisation

TAM TIEN COMMUNE, NUI THANH DISTRICT, QUANG NAM PROVINCE, VIET NAM

In Tam Tien commune, located in the central coasts of Viet Nam, small-scale fisheries are the backbone of the community. The community began seeing a reduction in both the quantity and quality in the catches because of overharvesting, the use of harmful gear, marine pollution, climate change and illegal fishing practices at nearby coral reefs. Following successful co-management in nearby communities, Tam Tien was chosen as the new commune to implement the management scheme to protect and steward marine resources. So far, a coral reef area has been proposed for co-management, and the People's Committee of Nui Thanh district is drafting a management plan for a no-take fishing area along with a series of measures to combat illegal fishing. Proposed measures include raising awareness about illegal fishing, strengthening inspections, and supporting loans for fishers to upgrade or convert to fishing gear that cause less harm. The local women have an important role to contribute and make decisions in the process of participating in project activities, such as planning, resource management, advocacy and promotion of co-management. The success of the project is still largely unknown since it only began in 2021; however, monitoring and assessments are underway to gain a more complete picture of local ecosystems. The community is already experiencing increased cohesion and the development of a stewardship ethic and expects to experience physical benefits, leading to long-term sustainability and improved livelihoods.

Conservation of mangroves and coral reefs in the coastal area

National Fisheries Solidarity Movement (NAFSO)

NEGOMBO, SRI LANKA

The National Fisheries Solidarity Movement (NAFSO) is a membership-based fisheries organization focused on small-scale fishing in Sri Lanka. The community of Negombo has experienced environmental degradation of mangrove forests because of the conversion to aquaculture farms and the destruction of coral reefs from bottom trawling. The loss of these ecosystems has destroyed many fish nurseries, putting fish populations at risk. Recognizing the importance of these ecosystems to their livelihoods, NAFSO and community members have implemented several conservation measures, beginning over two decades ago with studying and compiling records. Some of these measures include mangrove replanting campaigns and education programmes, followed by advocating for law enforcement, and for government agencies to draft and adopt necessary laws to protect both mangrove and coral ecosystems. Because of their efforts, the mangroves have recovered, and community members expect to see increases in fish catch in lagoons and coastal fisheries. In addition, with healthy ecosystems, sustainable livelihoods will be supported through increased income stability and a reduction in poverty, ensuring food security in the community. Women are also playing an active role in the new ecosystems, generating additional income for their families by collecting prawns.

Community-based management of fisheries

Kua'aina Ulu Auamo (KUA)

HAWAI'I, THE UNITED STATES OF AMERICA

In Hawai'i, Kua'aina Ulu Auamo (KUA) is a local initiative that works on community-based fishery issues through its founding network E Alu Pū, called the Lawai'a Pono Hui. Lawai'a Pono Hui is to "fish virtuously; to fish in a Hawaiian way; to fish sensibly and responsibly with respect to each other's needs and in reverence and obligation to the oceans power and life-giving nature to sustain us now and into the future." The Lawai'a Pono Hui created the community-based subsistence fishing area (CBSFA) law, which allows subsistence communities to manage their fisheries using traditional and customary practices. In this agreement, communities co-manage and develop rules working alongside the state by holding various meetings, working groups and focus groups to discuss fishery management and stewardship around Indigenous and traditional knowledge. Once issues or themes emerge, KUA builds capacity with communities to assist with implementation. Communities are beginning to see both cultural and environmental benefits. Culturally, a renewed sense of empowerment and unity has evolved through their stewardship efforts, and ecologically, preliminary analyses regarding biomass and other ecological indicators are positive. Women elders have been leaders in this group, especially around gathering practices (such as limu; seaweed). However, most of the elder leaders have been male. Today, it has become a little more diverse and multigenerational. The organization's ultimate goal is to "restore, protect and bolster Native Hawaiian place-based practice and knowledge, and environment and community self-governance through nearshore marine management."

Habitat enhancement

Pesca National Autonomous Association of Small Fishing Companies (Associazione Nazionale Autonoma Piccole Imprese di Pesca)

ROME, ITALY

The Associazione Nazionale Autonoma Piccole Imprese di Pesca (ANAPI Pesca) is an Italian organization representing both coastal and inland small-scale fishers and processors at national institutions. The organization plays an important role in protecting fishers, acknowledging that conservation and stewardship are important to protect the livelihoods and social status of communities, a vital component in safeguarding the environment for future generations. In Rome, fishers noticed a reduction in commercial marine species along with increased degradation of the marine environment. These impacts have been caused, in part, by top-down management that enforces overly generalized rules not accounting for local contexts and needs and are compounded by illegal fishers. Beginning in 2002, a project was created to help mitigate the negative impacts by adding artificial reefs to the seabed to support the recovery of marine ecosystems while providing critical habitat for fish. Creating fish habitat helps the recovery of local ecosystems and enhances resiliency against illegal fishing, producing a healthy, self-sufficient ecosystem. Benefits have been also evident to fishers, who are now able to travel shorter distances, requiring less fuel and less time to pursue their livelihoods. Overall, the organization has contributed to more secure, sustainable and reliable fishing livelihoods for the local community.

Sustainable octopus fisheries

Jongowe Development Foundation

JONGOWE, TUMBATU, THE UNITED REPUBLIC OF TANZANIA, ZANZIBAR

With the support of the Jongowe Development Foundation, the community of Jongowe conducted rapid assessments on the declining harvests of various fish species and juvenile octopuses. Together, they found that the fishing area had been exhausted. Faced with declining fish catches, a reduction in biodiversity and increased fishing pressure from outsiders, the foundation along with the community initiated an octopus closure to conserve the fishery. The initial idea came from community members who proposed the idea to a team from the Village Council. It is worth noting that people of all ages are involved in decision-making. The Indigenous leadership in the community is divided into strata or cohorts, where men and women have their cohort system called HIRIMU in the leadership and management of community issues. The elders, youths, and men and women have their system of decision-making and report to Baraza (the Council). After the Council approved the project, the technical team of the Fisheries Committee took the lead, receiving backing from the marine conservation organization Blue Ventures, which provided the support needed to implement the project through the Mwambao Coastal Community Network, a non-governmental organization operating in the mainland of the United Republic of Tanzania and Zanzibar (the United Republic of Tanzania). Since implementing the octopus closure in 2016, the environment is returning to a healthy state, and the community is noticing the return of species that had previously disappeared from the area. In the closure area, fish populations have improved, and octopus have increased in both size and quantity. The closure has also reduced illegal fishing and increased the income of fishers, improving the well-being and livelihoods of the community. Livelihoods have been improved through increased economic capacity, purchasing power and ability to pay for contributory social services in education and health, which means access to public services. All of these are the indicators of poverty reduction. Men and women are equitably participating in activities, indicating gender equality.

Managing invasive species – blue crab

Fishers Association for Development and the Environment (Association le Pêcheur pour le Developement et l'Environnement)

MEDENINE, TUNISIA

The Association le Pêcheur pour le Developement et l'Environnement is an organization focused on the protection of marine resources and the development of the fishing sector while contributing to the social development of fishers. The association aims to contribute to an environmental ethic and acts as an important bridge between national and international organizations. In Medenine, Tunisia, situated near the coast of the Mediterranean Sea, fishers faced problems because of the introduction of the invasive blue crab, which were first found in the area in 2014. The foreign crab destroyed fishing nets and preyed on other important species, impacting the local ecosystem and causing challenges for local fishers. Instead of trying to rid the new species, which was the initial action taken against the blue crab, the association worked with the Japanese organization Co-management of Coastal Fisheries in the Gulf of Gabès (COGEPECT) to study the species. The fishers took a novel approach and decided to market the blue crab, which has since led to a productive and successful new local fishery. Creating this new market has contributed positively to more secure and sustainable fisher livelihoods.

Building regional capacity for small-scale fisheries stewardship

St. Vincent and the Grenadines National Fisherfolk Co-operative Limited (SVGNFO)

KINGSTOWN, SAINT VINCENT AND THE GRENADINES

The St. Vincent and the Grenadines National Fisherfolk Co-operative Limited (SVGNFO) is a non-governmental organization that aims to educate and empower fisherfolk for future livelihoods and acts as an umbrella organization to four primary fisherfolk organizations (PFOs). Given the importance of the fisheries as livelihoods, SVGNFO aimed to mainstream good management practices through three key initiatives. The organization created an electronic registry, where membership information was updated for all fisherfolk organization members, developed a stakeholder engagement strategy, and hosted three workshops involving the training of board members related to the economics and sustainability of the fishing industry in Saint Vincent and the Grenadines. The benefits include highlighting the importance of the fisheries to the country, providing fishers with training on sustainable fishing practices, and learning how fishing, fish processing and related sectors can be managed to provide lucrative sources of jobs and incomes. The organization has also expanded the fishers' knowledge base of alternative strategic options for sustaining and growing their fishing businesses instead of increasing fishing effort and catches, as well as increased fishers' resiliency to shocks such as COVID-19. The cooperative has played an essential role in building capacity of PFO leaders, resulting in better relationships and trust between the cooperative and the community. SVGNFO continues to focus on sustainable livelihoods, employment and decent work, capacity development, and government policy and decision-making for the fisheries sector.

Sustainable octopus fisheries in Indonesia

INDONESIA

In Indonesia, the octopus fishery has not been well documented and much remains unknown about the general characteristics. Establishing base data is a critical step in making management and conservation decisions. In regions of Indonesia where the fishery is better known, a need for sustainable practices has been highlighted, as the fishery is crucial to the livelihoods of the surrounding communities. Despite the importance, octopus fisheries face threats from destructive fishing practices, illegal, unreported and unregulated fishing, pollution and tourism, which contribute to reduced resources and negatively impact their habitat. Blue Ventures, a marine conservation organization that supports coastal fishers in remote and rural communities, has helped implement several initiatives across multiple communities to support sustainable octopus fisheries by engaging local organizations in Indonesia. The activities vary between communities and the fishery, and their progress ranges from the beginning stages of collecting data to actively implementing conservation efforts. Reduced resources and damage to habitat motivated the Tubir Octopus Fishers Group to collect census data to establish a sound management plan. The organization aimed to understand if the current catch is sustainable, determine what an appropriate catch level would be, and establish areas of priority for conservation. Similarly, the Octopus Fishers Union has initiated a project after facing destructive fishing practices and a lack of awareness among the coastal communities. Although the Octopus Fishers Union comparably collected ecological data, it also looked at social factors to understand the status of communities and how to improve it. Through capacity development and training, communities have already begun working on ecosystem rehabilitation. Several of the communities have already actively contributed to or created their own management initiatives. For instance, in 2017, the Berkat Kuitta Onus Cooperative initiated data collection of its octopus fishery to provide results to local and national policymakers to optimize the management of the octopus fishery. Taking a different approach to management, the fishing community in Banggai Regency in Uwedikan Village formed its own management team to protect marine areas. The management team

intends to implement a temporary closure but is currently in the process of receiving government recognition. In the villages of Bulutui and Gangga Satu, people have been encouraged to manage their octopus fisheries independently and actively. In attempt to utilize the octopus fishery optimally and sustainably, villages have implemented temporary octopus closures to give species a chance to thrive while also providing an opportunity to restore their habitat. Because of their initiatives, many of the communities have already experienced positive benefits, and for those still in the data collection phase, positive outcomes are expected to come. In all cases, communities are experiencing improvements from their efforts in sustainable resource management, and their individual successes range from the beginning steps of data collection to efforts in habitat restoration and the development of a sustainability ethic among community members. Community efforts are contributing to the sustainability of marine resources and ensuring sustainable livelihoods for future generations.

Lobster conservation

Cooperative Society for Fishery Production–United Fishers of San Felipe (Sociedad Cooperativa de Producción Pesquera Pescadores Unidos de San Felipe)

SAN FELIPE, YUCATÁN, MEXICO

The Cooperative Society for Fishery Production–United Fishers of San Felipe is an organization in Yucatán, Mexico. Founded over 50 years ago, the organization is focused on carrying out sustainable fisheries while promoting a strong and unified community. The organization focuses on the engagement of local communities in natural resource management by incorporating local wisdom in both ecological and cultural contexts. Using local knowledge, the organization helps ensure sustainability in the management of natural resources. It noticed drastic changes in fishery productivity and seasonal variation in fish availability, in part because of illegal fishing, which has negatively affected lobster biomass over the past five years, threatening the sustainability of the fishery and therefore the security of local livelihoods. To address these challenges, in 2010, the organization created artificial reefs to restore habitat for lobsters and other marine species, which has helped rebuild the marine ecosystem. So far, the efforts have led to increased production, contributing to higher incomes and more secure and formal employment for fishers. Illegal fishing continues to be an ongoing challenge the organization is addressing, and it has acknowledged that government support is key in combating it.

Co-management experience and improved fishing practices

Fisher Development Association

PYAPON TOWNSHIP, AYEYARWADY REGION, MYANMAR

In the Ayeyarwady, Delta Region of Myanmar, most of the fishing grounds are leasable fishing grounds and tender areas. Fishers who want to fish in these areas must participate in price competition with the Department of Fisheries-led tender auction system. Because of this practice, the cost of the fishing grounds increases every year; fishers who win in the auction generally harvest fish within one season without doing any conservation to recover the costs. A one-year fishing permit through auction impedes resource conservation in the Delta, as the current system contributes to exploitation since fishers bid for a yearly licence, incentivizing them to maximize their harvest in an attempt to recover their costs.

Meanwhile, the livelihoods of small-scale fishing communities depend on open fishing grounds, which are less productive compared to the fishing areas that operate on a leasing system and are inaccessible to most small-scale fishers. Small-scale fishery communities in the Delta are mostly

located in remote areas with little access to roads, electricity, education and health services, among other things. All family members could be defined as fishers because each of them (wife, children) is involved in fishing and occasionally selling fish to vendors. The precariousness of livelihoods, with only rudimentary fishing gear, pushes many to use illegal fishing methods (poison, electronic fishing, etc.), although there are improvement efforts. Indeed, environmental conservation is critical for the people who rely on natural resources for their livelihoods. Today, communities themselves well understand the ecosystem concept, and resource conservation is now practised under the fishery co-management arrangement.

In 2018, the Freshwater Fishery Law was amended, leading the government to allocate more fishing grounds to small-scale fishers. Following this, the Network Activities Group mobilized fishing communities, hosting workshops, training activities, knowledge mobilization campaigns, and empowering them to form fisher development associations. Following these initiatives, a co-management pilot project was developed to conserve mangrove forests and fish spawning grounds, which led to an increase in fish stocks, a reduction in fishing effort required by the fishers, and a reduction in the use of illegal fishing gear due to community-led patrolling. Based on this success, fishery co-management was added in the 2/2018 Ayeyarwady Region Freshwater Fisheries Law. However, the de facto government has recently abolished Chapter 8 of the 2018 Ayeyarwady Region Freshwater Fisheries Law, creating new difficulties for small-scale fishers both in accessing fishing ground allocations and receiving legal support. The abolishment threatens progress made in conservation and the livelihoods of fishers, as communities will now have a less active role in fisheries management.

The main reason for fishery conservation in Myanmar is to focus on sustainable livelihoods of fishery communities by using natural resources in a wise use manner. Because of conservation measures, fish stocks are increasing; this information has been shared with the Department of Fisheries, seeking greater allocation of fishing grounds to small-scale fisheries (SSF). Currently, access to fishing rights for SSF is limited; however, if resources are improved through a community-led fishery co-management system, the Department of Fisheries may be able to provide communities the fishing grounds they seek.

As a result of a co-management arrangement, fish stocks (mullets) in the Gulf of Martaban (Gulf of Mottama) have increased by 20 times, and the endangered *Hilsa* fish is now rebounding. In the Gulf, anti-conservationist fishing gear involving nets with small mesh size and too long an extent (e.g. nets 2 kilometres long) are illegal and strictly prohibited by community-led patrolling teams. The increase in fish stocks has been a big achievement for SSF and for sustainable livelihoods.

The government contribution for resource conservation is not well funded because its priority is to support production-oriented fisheries. However, in 2018, when the new freshwater fishery law was amended, the government allocated more fishing grounds to small-scale fisheries without their needing to compete in the auction system. This greatly contributed to community-led resource conservation in the Delta. In addition, the department is supporting community-led patrolling in fishery co-management and fishery laws by holding awareness-raising activities in fishery villages.

Social enterprise, addressing traceability and bycatch reduction

INNOVAPESCA CIA. LTDA.

PUERTO AYORA, GALAPAGOS, ECUADOR

In Galapagos, only small-scale fisheries are permitted to fish, which contribute to food security and sustain the local livelihoods of surrounding communities. Increasingly, the tuna fishery has played an important role in maintaining food security and contributing to the Galapagos economy. The leading consensus among management authorities, fishers and non-governmental organizations has been to promote the development of the small-scale tuna fishery to reduce the exploitation of coastal fisheries, improve the socioeconomic status of the fishing sector by diversifying livelihoods, and restore the structure and functionality of marine ecosystems. INNOVAPESCA, a community-based fishing enterprise focused on stewardship, has actively participated in the design and implementation process of a community improvement project for the Galapagos tuna fishery. The enterprise has created action and business plans to improve management and marketing and hopes to launch a project focused on a monitoring and traceability system. Although the plan has not been implemented because of a lack of funding, INNOVAPESCA maintains interest and support, and bases its company on principles of sustainability and social responsibility. So far, the enterprise has been involved in capacity development, and has attracted the attention of authorities, non-governmental organizations and the fishing sector who support the project and its implementation.

Sustainable tuna fishing

SATHOAN Producers' Organization (Organisation de Producteurs SATHOAN)

SÈTE, FRANCE

SATHOAN Producers' Organization, based in Sète, France, has about 60 small vessels that use pole and line and longline fishing techniques to catch bluefin tuna. The organization falls under the collective brand Thon Rouge de Ligne, Pêche Artisanale, which provides strict fishery regulations, and has been ecocertified by both "peche durable" (sustainable fishing) and the MSC (Marine Stewardship Council). SATHOAN is concerned with the sustainable management of stocks and reducing sensitive bycatch. Working alongside scientists, non-governmental organizations and both public and private environmental management companies, the organization has engaged in research, data collection and training and has also cultivated partnerships to understand catch rates of susceptible species caught in the bycatch of longline bluefin tuna fishing. The partnerships with non-governmental organizations and scientists also led to increased knowledge about the species and its habitat. SATHOAN has also helped foster an increased sense of responsibility and guardianship in local fishers, who are now interested in continuing to operate with a sustainability mindset. The organization is also the first fishery to hold both sustainability certifications and being a leader in conservation and preserving biodiversity.

Co-management

Uganda Fisheries and Fish Conservation Association (UFFCA)

LAKE ALBERT AND LAKE VICTORIA, UGANDA

Uganda Fisheries and Fish Conservation Association (UFFCA) aims to mobilize and organize communities engaged in small-scale fish harvesting, processing and marketing for sustainable fisheries and development. Because of increased pressure, fish stocks have declined, and environmental degradation has threatened the livelihoods of small-scale fishers. Landing sites in Murchison Bay near Kampala City have experienced severe pollution, overfishing, and are ecologically degraded. Similarly, around Lake Albert, declining fish stocks caused by encroachment, overfishing and overexploitation has threatened food security and the livelihoods of fishers in the surrounding villages. Population increases combined with free access and entry to the fisheries have exacerbated pressures on fishery resources and have led to increased fishing effort and further environmental degradation. The UFFCA has engaged in education, information dissemination and training activities to generate awareness about the long-term benefits of conservation and sustainable management practices. The organization initiated community mobilization, resource management planning and capacity development, which was followed by the establishment of a co-management system and the subsequent implementation of management measures and livelihood diversification activities. The initiatives have led to the involvement of fishers in the preparation of policies and laws and have devolved power to local governments and community organizations. The fishery has improved, leading to social benefits, including reduced resource conflict and an increase in social cohesion, nutrition and health, and economic gains.

Community-based marine ranger programme

Akyaka, Akçapinar and Sarnıç-Akbük Fishery Cooperatives

GÖKOVA SPECIAL ENVIRONMENTAL PROTECTION AREA (GÖKOVA MARINE PROTECTED AREA), TÜRKIYE

In the Gökova Special Environmental Protection Area, three small-scale fishery cooperatives are active in the protected area: the Akyaka Fishery Cooperative, the Akçapinar Fishery Cooperative and the Sarnıç-Akbük Fishery Cooperative. Facing threats from illegal fishing and a loss of habitat, those who relied on the area experienced reduced incomes and were no longer able to rely on the area for their livelihoods. The fishery cooperatives worked alongside scientists and the non-governmental organization Mediterranean Conservation Society (AKD) to create a marine ranger system, which focused on a participatory marine resource management model. Women from non-governmental organizations, fishery cooperatives and universities attended meetings and supported the project. Today, this management model engages a wide range of stakeholders in monitoring, evaluation and programme design while ensuring fishers are integral to the management process. The fishery cooperatives along with AKD coordinate daily community-led patrols to put a stop to illegal fishing, preventing the depletion of resources and degradation of marine habitats. The marine rangers play a vital role in preventing illegal fishing in the protected area, especially regarding the no-fishing zones. Consequently, their efforts have led to a positive impact on fisher incomes, fostered a sense of connection between the fishers and the fishing areas, and created new employment opportunities for those involved in the ranger programme.

Habitat protection and traditional fisheries by artisanal fishers of the Chebba in Tunisia

Pêcheurs Artisanaux de la Chebba Tunisie

CHEBBA, TUNISIA

In Tunisia, the traditional fishing practice known as "charfia" is a passive fishing technique that uses palm leaves embedded in the seabed to create a channel, funneling fish into a net or trap. Modifications have been made to the traditional materials by replacing palm leaves with nets, turning charfia into a destructive practice and negatively affecting marine ecosystems. The use of nets in place of palm leaves has essentially created a wall along the coast, hindering the passage of fish to the nurseries. As a result of this modification, fishers in the region have experienced increasingly low catches. Facing these impacts, the Tunisian Society for Sustainable Fisheries – an association focused on sustainable capacity development and supporting coordination among fishers and actors in the fisheries sector – has encouraged small-scale fishers to claim their rights to traditional fishing areas. In taking the first steps by making requests to fishing authorities, they were blocked by the administration and ended up having to go to court. Sit-ins were held in front of the trade union centre and supported by industrial fishers and traders of fishery products, raising awareness of the concerns of small-scale fishers. Their efforts have led to improved participation in decision-making and resource management by fishers.

Sustainable octopus fisheries in Mauritius and Rodrigues

Federation of Artisanal Fishers of the Indian Ocean (Fédération des Pêcheurs Artisans de l'Océan Indien – FPAOI)

INDIAN OCEAN REGION

The Federation of Artisanal Fishers of the Indian Ocean (FPAOI) is the professional regional association of artisanal fishers from five Indian Ocean countries; its focus is on advocacy and ensuring that the rights of members are recognized. In Mauritius and Rodrigues, the octopus fishery was exploited by both local and foreign fishers to a point of near collapse. Over the past decade, the catch has drastically declined, causing local fishers to be concerned about their livelihoods and forcing them to demand support in maintaining the octopus stock. In 2014, with support from the Smartfish programme at Commission de L'Océan Indien, local fishing communities carried out a seasonal closure for two months to allow the octopus stock to recover. The communities led the closure, ensuring management measures aligned with their values and knowledge, avoiding a top-down approach. Women were significantly involved because octopus fishing (hand-picking) is carried out mainly by women in Rodrigues. Within two years, the fishers' catch doubled, and they noticed that they were catching bigger octopus, allowing fishers to increase their revenue while also providing an opportunity for the stock to recover. Now, with a better understanding of how closures affect the fishery, the communities implement two closures per year and are actively engaged in monitoring. This example highlights the importance of integrating communities into the decision-making process, ensuring the actions are appropriate and suit local needs.

Spiny lobster conservation

Finistère Fisheries and Marine Breeding Committee (Comité des Pêches et des Elevages Marins du Finistère)

ERGUÉ-GABÉRIC, FINISTÈRE, BRETAGNE, FRANCE

The Comité des Pêches et des Elevages Marins du Finistère (CDPMEM 29) represents all fishers within the department and is responsible for promoting and representing the interests of fishing professionals along with local and departmental authorities. The organization is involved in the sustainable management of resources, and it works in close collaboration with the marine reserve Parc Naturel Marin d'Iroise. The fishers recognize that sustainable management of the environment and resources are vital to their profession and territory, so when spiny lobster populations suffered from overfishing in Iroise, they were quick to act. Professionals set up a cantonment zone, where measures and regulations have been established to enforce minimum catch sizes and good practices. Plans also exist to manage the exploitation of the spiny lobster sustainably once the stock replenishes. Although the main benefit is the recovery of the stock and implementing sustainable fishing measures, establishing partnerships between local fishers, the CDPMEM 29 committee, scientists and the Marine Park has also been important. With their success, the project was recognized nationally and played a large role in the improvements of the stock, enforcing the compulsory tagging of spiny lobsters.

Lobster conservation

All Indonesian Fishermen Association (Himpunan Nelayan Seluruh Indonesia)

JAKARTA, INDONESIA

Himpunan Nelayan Seluruh Indonesia (HNSI) is a non-governmental organization representing 17 million fisher members. Although the organization views conservation as crucial to the livelihoods of fishers and communities, there has been a lack of involvement and knowledge on environmental conservation measures, creating sustainability issues for some of their fisheries. Recently, the lobster fishery has been facing sustainability challenges because of the export of lobster seeds (larvae) to international markets, posing threats to its own stock while also reducing its competition in the market. When fishers receive offers to export lobster seeds, they attempt to maximize their catch to increase their income, threatening future lobster stocks and the small-scale fishers who rely on them. The organization recognizes that a healthy environment is crucial to the community and the fishers' livelihoods and welfare. Part of the work conducted by HNSI involves providing input on fisheries and marine environmental conservation policies to the parliament and the Ministry of Marine Affairs and Fisheries of Indonesia. Faced with this conservation problem, HNSI has been working to develop and disseminate policies and rules to address the overharvesting of lobster seeds, acknowledging that effective government policy forms the basis of law and environmental protection rules.

Sustainable mangroves and oyster harvesting

Tsokomey/Development Action Association

DENSU, GHANA

The Development Action Association is a rural coastal women's organization located in the greater Accra region of Ghana, operating in 70 communities across the country. In the Densu Delta, the community relies on fisheries for their livelihoods, especially mangrove forests where oysters and other shellfish are harvested. Shellfish harvesters here are primarily women who harvest and cook shellfish, selling some, keeping some to feed their families, and contributing to the food security of the community as a whole. This is especially important during times when returns from other fisheries are scarce, the "lean times", when oysters and other shellfish become the main source of protein in local diets. For many poor families, shellfish are the main or only source of protein throughout the year. Unfortunately, the mangroves have experienced deforestation, destroying oyster habitat, affecting their growth, depleting oyster stocks and impacting water quality. A project implemented by the Densu Oyster Pickers Association along with international support aimed to rebuild the oyster estuary by replanting mangroves and provide training to the community. An educational campaign was held for those involved in oyster harvesting by hosting workshops with the University of Cape Coast and by visiting neighbouring countries to learn from their conservation efforts. Following the campaign, the Densu River was restocked with shellfish after seeking permission from traditional leaders and custodians of the Densu Estuary. The community now practices seasonal closures every year during the reproductive period of the oysters, contributing to improved food security and livelihoods through increased harvests and incomes. It has also developed a co-management system for future management efforts that engages all stakeholders. Geared with this knowledge, the community is now better able to sustainably manage the mangroves and local fishery, ensuring sustainability for future generations. Another key element of this initiative was the peer-to-peer learning and knowledge exchange – early in the initiative, community groups visited other restoration efforts in Benin and the Gambia to learn from oyster harvesters there, and now they share their own knowledge and experience with other interested groups and individuals.

Coastal habitat protection and restoration

Tananua Flores Foundation (Yayasan Tananua Flores)

NUSA TENGGARA TIMUR, INDONESIA

The Tananua Flores Foundation, located on Flores Island in eastern Indonesia, focuses on empowering underprivileged groups. Working with as many as 24 villages, Tananua Flores mentors communities to engage in environmental stewardship and encourages communities to maintain environmental sustainability. The local concerns for sustainability are mainly focused on taking care not to destroy *trumbu karang* (coral reefs), ensuring the process of catching fish does not use harmful methods such as bombs or poison/potassium and overfishing is prevented. Impacts from land also pose a threat to ocean sustainability, including pollution from industrial waste and garbage, negative impacts from mining (including sand mining), and unsustainable forestry practices that increase soil erosion and runoff into coastal ecosystems. The efforts vary depending on the concerns of the community and focus on the sustainability of coastal communities through various initiatives, such as identifying the capacity for self-governance, participatory data collection and monitoring, and sustainable management initiatives of fisheries. The organization has engaged in coastal clean-ups, planting trees for soil retention, building erosion-resistant embarkments, and preventing deforestation by enforcing local customary rules. Through Tananua Flores's efforts, more people are aware of the importance of environmental conservation and protection.

Sustainable fisheries

Federation of Thai Fisherfolk Association

KHUAN PRING SUB-DISTRICT, MUANG DISTRICT, TRANG PROVINCE, THAILAND

The Federation of Thai Fisherfolk Association represents coastal fishing community groups across 19 provinces and 55 organizations in Thailand. The organization initially started by coordinating fishing groups in the southern provinces, aiming to expand community rights protection work, conserving and restoring marine and coastal resources, promoting career development, proposing policies related to local fishing communities to support resource recovery, and supporting the livelihoods and well-being of the community itself. When faced with overfishing and a law that permits the use of destructive fishing tools, local fishing groups called for the law to be amended and to abolish the use of destructive fishing gear. Consultations with non-governmental organizations and educational institutions determined that establishing a group of local fishers would help gain access to state information and give them the power to solve the issue. The fishing groups established the Federation of Southern Fisherfolk, which eventually expanded across the country, leading to what is now the Federation of Thai Fisherfolk Association. Confronting the problem of destructive gear, the organization formulated a policy proposal to the government to solve the problem, engaging local fishers and ensuring that the process was suitable in local contexts. The government has since improved the law to abolish destructive fishing gear and now has a policy to involve local fishers, warranting better legal recognition of fishers' rights. In the beginning, women came to discuss the establishment of the association, though in small numbers because the fisher representatives of each province are men. Over the years, women have increasingly represented fishers in driving policy proposals.

Sustainable fisheries

Khon Khlan Sub-district Folk Fisheries Association

KHON KHLAN SUB-DISTRICT, SATUN, THAILAND

In the past, the Khon Khlan coastal community faced declines in marine resources, resulting in lower incomes and reducing food security for fishers dependent on the fishery for their livelihoods. The declines were attributed to illegal fishing using harmful gear and the harvesting of juvenile species. To combat the illegal fishing, local fishers formed a group, the Khon Khlan Sub-district Folk Fisheries Association, to monitor and prevent illegal fishing. Working in collaboration with community leaders who coordinate with government agencies, illegal fishers are arrested, and their boats and gear are seized. In addition to addressing illegal fishing, the organization has been involved in other conservation efforts, including creating marine habitat and sanctuaries, establishing rules for the use and care of resources, and making local rules into local ordinances. Conservation efforts have resulted in increased marine resources, increased fish populations and a greater diversity of species, leading to more stable careers and improved livelihoods. There is no longer illegal fishing, and food security has increased in the community. Fisher groups are now legally recognized and are involved in policymaking, with the villagers playing an important role in caring and protecting resources.

Building stewardship capacity with local organizations

Thailand Sustainable Development Foundation

THAILAND

The Thailand Sustainable Development Foundation is a non-governmental organization in Thailand focusing on creating a sustainable future for resource-dependent communities and protecting vulnerable ecosystems across the country. Recent developments have focused on economic expansion and modular development, creating conflict between the state and the people over the imbalance of power in natural resource management. A lack of attention to social dimensions combined with a lack of participation from communities in the use and maintenance of resources led to rapid degradation of natural resources and increasing social and economic inequality. Faced with these inequalities, local fishing groups unified to form a strong community organization, followed by a network encompassing the whole country. Unifying enabled fishers to actively participate in sustainable resource management both at the local level and at the national level, having an influence on policy. By giving communities a voice and increasing their understanding of the importance of sustainable resource management, their resources will be continually protected and maintained for future generations. The process has also resulted in the government devolving some of its authority and including local people in participatory resource management, empowering communities to take responsibility for their impact on the environment.

Traditional fishers' rights and gaspowership development in Langebaan Lagoon

LANGEBAAN, SALDANHA BAY MUNICIPALITY, WESTERN CAPE, SOUTH AFRICA

In South Africa, the Langebaan Lagoon supports the livelihoods of the surrounding community, including both Indigenous fishers and descendants of freed enslaved people who relied on the lagoon for their survival. When the South African government granted permission to a Turkish company to anchor a gaspowership, a fossil-fuel powered ship that converts gas to electricity, near the entrance of the lagoon, community members mobilized to fight for their rights since they were not informed or consulted as part of the public participation process in the environmental impact assessment (EIA). The community worked with non-governmental organizations to submit comments on the EIA, highlighting their concerns for the lagoon and their livelihoods and noting that their tenure rights were not accounted for. The community also mobilized public support by holding a protest and participating in radio and television interviews. While the fisher group itself is comprised of mainly men fishers, women were at the forefront of the struggle, with women leaders (within the local organizations involved) managing the administration of these organizations and advocating politically for fishers' rights. With the support of the non-governmental organization Green Connections, the community was able to access an environmental lawyer who filed a complaint to the Environmental Authority, noting that the EIA failed to conduct proper studies and take the community's knowledge into consideration. Based on these grounds, the authority suspended the EIA, and in June of 2021, the EIA was withdrawn. Although the company could appeal the decision, the example has highlighted the importance of fisher knowledge of local marine ecosystems and community mobilization in protecting biodiversity. Their efforts have also increased the community's interest in the protection of the lagoon from destructive developments, such as oil and gas production.

Community-managed mangroves

Don Goyo Mangrove Community Participatory Management Board (Junta de Manejo Participativo Comunitario – JUMAPACOM – Manglares Don Goyo)

CERRITO DE LOS MORREÑOS, GUAYAQUIL, ECUADOR

JUMAPACOM is a Community Participatory Management Board located in the Gulf of Guayaquil, and encompassing several islands. Here, ancestral community-based management received official legal recognition in 2000 when a mangrove concession from the government was approved. The concession territory now covers 10 869 hectares of mangrove forests on several islands, and since 2017, JUMAPACOM also manages Manglares Don Goyo (a Ramsar-designated wetland), which overlaps with the concession area. Don Goyo now is the integration of six small fisheries associations (about 250 artisanal fishers and crab collectors). With the communities relying on the fisheries for their livelihoods, there was a need to diversify production to reduce pressure on the overharvested red crab, a species that comprised the main subsistence activity of the community and that is important to the health of the mangroves. With help from Polytechnic University, the community of Guayaquil was able to implement organic shrimp breeding, leading to improvements in local infrastructure, capacity development and a significant increase in production, strengthening both sustainable livelihoods and food security. The success with shrimp farming has shown that further diversification through sustainable organic production is a suitable option along with other advancements, such as using improved fishing gear. In sustainably using mangrove ecosystems, the board notes that the knowledge gathered through monitoring practices and devices is a necessity for future experimenting on other species. Experiments to further diversify the fishery are ongoing with local fish species and mussels, making the community proud to employ sustainable technology. The community's involvement throughout the project has united community members with a common goal of protecting their environment, equipping them with the knowledge and skill set to do so. Promoting gender equality and empowerment of women to engage in leadership roles is also a particular focus in this initiative.

Crayfish conservation

Professional Fishers of Lake Polifytos

LAKE POLIFYTOS, GREECE

In Lake Polifytos in Greece, the spawning of two crayfish *Astacus astacus* and *Astacus leptodactylus* has attracted increased attention from the fisheries industry. Several factors, some of which include anthropogenic activities, diseases, competition with invasive species, eutrophication, pollution and habitat destruction, have put several populations of crayfish species at risk, with some already becoming endangered or extinct. In collaboration with two European universities and the professional fishers' group, a seminar was held on the sustainable fishing and conservation efforts for the two crayfish species. Following the seminar, the fishers' group brought its concerns to local authorities, who applied laws regarding the protection and conservation of the species. Consequently, fishing for crayfish in Lake Polifytos was banned for two years, and the government has funded scientific groups to study both species and the surrounding environment to inform management and support evidence-based decision-making at the local level. Engagement efforts with local fishers have contributed to a better understanding of the impact of environmental changes on the crayfish species and has garnered support for the closure period, helping instil the importance of sustainable management and conservation efforts in maintaining a healthy crayfish population.

Appendix:
Key questions to understand SSF stewardship

Fisher organizations and fishing communities wishing to examine their stewardship experiences or to consider new initiatives, as well as others, such as governments needing to better assess and understand SSF stewardship, may wish to draw on the following questions as a "menu" for compiling information.

Questions relating to stewardship by the SSF organization or community:

- What does stewardship mean to women and men who are involved in fisheries and related activities (pre- and post-harvest, as well as fishing, foot-fishing, processing, marketing, unpaid tasks including household and care work and other types of support)?
- What motivates stewardship activity?
- Is stewardship locally initiated or does it involve participating in broader initiatives?
- How does decision-making work, and who is involved in it?
- How could stewardship be best supported by governments and other external bodies?

Questions relating to a specific stewardship initiative:

- How did the initiative develop? What were the goals?
- Where did it happen? In what geographical areas and in what types of ecosystems?
- What stewardship activities were involved?
- How does the stewardship initiative relate to livelihoods?
- What were the results? What were the expected or unexpected results?
- What does success look like? ("Ingredients for success")
- What were the biological/biodiversity, economic and social benefits?
- What were the challenges to overcome?
- Will the initiative continue into the future? In what way?

Appendix:
The process of compiling SSF stewardship experiences

Reflecting the reality that the best way to understand stewardship by small-scale fishers, fishworkers and fishing communities is to listen directly to their perspectives and priorities, an engagement process was used that led to participation with the focus on three main types of fisher entities:

Questions relating to stewardship by the SSF organization or community:

- coastal and inland small-scale fishing communities (with fishing as a prominent livelihood);
- small-scale fishery organizations (whose members are primarily all fishers and/or fishworkers); and
- economic or professional organizations, associations, cooperatives, etc., in which membership involves small-scale fishers and fishworkers who are represented by these bodies, e.g. in fishery management.

In each of these categories, engagement was welcomed from both Indigenous and non-Indigenous communities and organizations. In addition, a fourth category of participant was permitted, namely organizations not comprised of small-scale fishers and fishworkers, per se, but having as their primary mandate to work with and support small-scale fishery communities and organizations. Experiences of these supporting organizations were also included if they were able to provide information about a specific fisher organization or fishing community.

Locating participants for the survey (recruitment) took place largely through direct contact via email largely using lists provided by FAO, the World Forum of Fisher Peoples, and the International Planning Committee for Food Sovereignty Working Group on Fisheries. Particular attention was paid to seeking contributions from all genders in a gender-inclusive way, as well as from actors engaged in a diversity of roles along fish value chains and different types of fisheries in both coastal and inland settings. In addition, direct contact was made with many others, such as academics and other researchers; while not eligible to participate themselves, they were asked to help identify additional contacts and/or fisher organizations as potential contributors, or in some cases, to facilitate engagement with an eligible community or organization. Finally, there was also considerable publicity for the survey in many periodicals and newsletters, such as the Samudra Report of the International Collective in Support of Fishworkers and FAO's SSF Guidelines Update (https://www.fao.org/voluntary-guidelines-small-scale-fisheries/en).

The engagement process was conducted over the period 2021–2022. Those who chose to participate were able to provide their stewardship experiences in one of three ways: (i) online through the website (https://ssf-stewardship.net); (ii) completing a Word or fillable PDF file; or (iii) working with staff of the SSF stewardship team, if preferred, in order to complete the survey. Whatever the means of participating, it was necessary to agree to a consent form, reflecting an approved Research Ethics Board process.

A key goal was to produce a global set of stewardship experiences from small-scale fishers, so the question of language was a principal concern. While certainly with major limitations, a Google Translate add-in was used on the survey website so participants could view, and complete, the questionnaire in their choice of over a dozen major languages, including all official United Nations languages as well as a variety of others, such as Swahili. Requests from contributors for additional languages not in the core list (e.g. Malagasy) were accommodated as much as possible. Each completed questionnaire accordingly came to the research team in the language of submission. This enabled broader and more grassroots participation than would have been possible otherwise. The challenge with this approach came later, in that submissions had to be then translated into English in a careful step-by-step manner using suitable translation software. To reduce concerns of some content not being translated properly, the research team engaged with those making submissions to clarify any issues as needed.

Another language concern lay in the wording of the questionnaire. While the evidence is that environmental conservation and stewardship is practised widely among small-scale fishers and fishing communities, how this is expressed in words varies from language to language, society to society, and culture to culture. Notably, the word "stewardship" is translated in various ways, though it is meant to have a meaning similar to "environmental conservation" and "taking care of the environment." This point is made because some languages, Portuguese for example, do not seem to have a word for stewardship in the manner it may be understood in English. The overall wording of the survey was adjusted to try to take such matters into account. In addition, considerable effort was made to find comprehensible wording. Despite this, and in common with many surveys, there were trade-offs in the wording.

As highlighted to potential contributors, "The focus is on your fishing organization or fishing community (or one with which you work, in the case of support organizations)." In keeping with this focus, the survey had two main components, covering:

- general aspects of environmental conservation and stewardship for the organization or community, including motivations, types of stewardship carried out, partnerships and related topics; and
- a specific example of environmental conservation/stewardship "that the community or organization has carried out, or participated in, within the past 5 years", one that the participant feels is important, in some way, to the community or organization. It was noted that this can be an example carried out entirely by the community or organization, or one that was led by them with other partners, or one involving a broader stewardship situation in which the community or organization played a part. The survey requested an assessment of the stewardship outcomes and impacts arising from each example. There was also a request for documentation of the example (such as a media article or a website).

The survey also requested individual contact information, information on the organization or community, a set of photos if possible, and any other documentation describing the stewardship example.

Each submission was checked carefully against the eligibility criteria. In cases where a submission arrived that did not fit with the three main types of fisher entities described above, the research team interacted with the submitter to ensure it could be seen as a supporting organization with a primary mandate "to work with and support small-scale fishery communities and organizations." There was some flexibility in allowing, for example, submissions by individuals demonstrating close ties to a community or organization even if a "supporting individual" more than a supporting organization.

Ultimately, 46 submissions formed the project database. Feedback from participants in the survey was very positive, though many (as well as some unable to submit) noted the challenges of responding to a survey and generally carrying out fishery activities during the COVID-19 pandemic. The 46 submissions were largely complete, although for a significant number of survey questions, one or two submissions were excluded because of missing responses. Thus, the exact number of participants used in the analysis varies somewhat from question to question; in almost all cases, it was 44, 45 or 46 though for a small number of questions a lower number applied.

To interpret the results on small-scale fisher stewardship, it is important to have a sense of who contributed to the survey and the nature of the locations, ecosystems, fish stocks and fisheries represented.

Survey participants were asked to list any and all roles they individually play with respect to the corresponding small-scale fishing community or organization. The average number of roles listed was two, with most indicating one or two, and some noting three roles. The prominent roles, as expected, were as a fisher or fishworker (including involvement along the fishery value chain), a member of a fisher organization, or a resident in the fishing community. There were also many participants who indicated being a member of a civil society organization, a non-governmental organization or a support organization. In many cases, this was in addition to being a fisher or member of a fishing community, while in other cases, as noted above, these participants from external to the fishery provide support to the fisher organization or community in completing the survey. Small numbers of participants had additional roles in fisher organizations, local community organizations, research and, in one case, the government. Since the survey focused on communities and organizations, there are no submissions from individuals who may be carrying out stewardship activity on their own, e.g. in their daily practices.

Participants were also asked about the engagement and roles of women in the stewardship initiatives. A total of 87 percent of participants responded to this question; 95 percent of those who responded indicated women are actively involved in the initiative, with roles ranging from participation/implementation, active in fishing, leadership, discussions and decision-making, coordination and mobilization, capacity development, data collection and monitoring, women-led organizations, value-added processing and addressing gender inequality. About 23 percent of responses stressed that women have played a key role in the initiative. Finally, 18 percent of survey participants were women; three of four members of the survey development and implementation/research team were women.

The small-scale fisheries covered in the survey are located in Africa (24 percent), Asia (39 percent), Europe (15 percent), North America (11 percent) and South America (11 percent). The fisheries are marine for 74 percent of the communities and organizations, and inland for 41 percent (with some involving both). For those fisheries represented in the survey, fishing takes place most commonly in coastal ecosystems – notably, nearshore (55 percent), coral (38 percent), estuarine (36 percent), as well as in non-coastal ocean areas (41 percent). Also significant was fishing in freshwater rivers, lakes, reservoirs and wetlands, most commonly riverine ecosystems (33 percent), as well as large and small lakes and wetlands (19 percent each).

In 63 percent of cases, the community or organization engages with multispecies fisheries, while 20 percent have single-species fisheries (the remainder reported a mix of these or no answer). The main species fished by the small-scale communities or organizations participating, in declining order of frequency, are: (i) molluscs – including bivalves and cephalopods, e.g. octopus, clams – 61 percent; (ii) crustaceans – e.g. shrimp, prawn, lobster – 61 percent; (iii) marine small pelagic finfish – e.g. reef fishes, herring, sardines – 46 percent; (iv) marine large pelagic finfish – e.g. tuna/sharks – 37 percent;

(v) marine demersal finfish –e.g. cod/flatfish/grouper – 37 percent; (vi) inland finfish – e.g. carp, perch, catfish, salmonids – 27 percent; and (vii) algae, seaweed and other aquatic plants – 27 percent.

The most common gear for harvesting were lines (51 percent), pots/traps (49 percent), gillnets (49 percent) and beach harvest/gleaning (47 percent), with longlines, diving, beach seine and purse seine also in significant numbers.

Commercial fisheries are relevant to 52 percent of the communities/organizations, subsistence fisheries to 48 percent, and recreational or sport fisheries to 24 percent. For most of those in the communities and organizations (78 percent), fisheries represent the main source of employment (rather than being secondary or supplemental). Of the fishing communities and organizations, 50 percent have individuals engaged in fishing full-time, 39 percent have those who fish seasonally, and 17 percent have at least some occasional fishers. In the post-harvest segment of the fisheries, 62 percent of cases involve catches sold in local markets to community merchants or fishmongers, with a smaller number reporting the catch being exported (22 percent). In many cases, the catches are sold fresh or on ice (38 percent), though small numbers reported the catch being dried, smoked, salted, frozen, fried or processed into fishmeal or paste.

Fishery management measures most often reported (and the percentage of cases with each measure) included restrictions on how fishing gear are used (58 percent), when fishing can take place (56 percent), where fishing can take place (53 percent), including use of various area-based fisheries management measures, e.g. fisheries closures (49 percent) and of permanent marine protected areas (42 percent) – as well as restrictions on the number of fishers allowed in the fishery, e.g. by licensing (47 percent), how much fishing activity (effort) is allowed, e.g. time or amount of gear (44 percent) and how much can be caught in total, e.g. total allowable catches (33 percent).

Small-scale fisheries (SSF), including fishers and fishworkers together with their communities and organizations, are among the world's most effective contributors to safeguarding aquatic resources and environments. Living near to, and relying on, freshwater and marine aquatic species and environments, small-scale fisheries are at the heart of environmental conservation and stewardship – of caring for and sustainably using aquatic environments, managing fisheries for sustainable use, protecting and restoring local ecosystems, and working with others towards these goals. The key role played by SSF organizations and fishing communities is well recognized in the Code of Conduct for Responsible Fisheries and in the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication ('SSF Guidelines') which note that "States should recognize the role of small-scale fishing communities and Indigenous Peoples to restore, conserve, protect and co-manage local aquatic and coastal ecosystems." Thanks to the active participation of many small-scale fishing communities and organizations, this publication draws on real-world examples of small-scale fisheries stewardship to highlight the various forms of stewardship, to outline ingredients of success in that stewardship, and to describe how policymakers and others can support those stewardship activities around the world.

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