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Chapter 7. Towards "good" governance of small fish in food systems

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Key messages

- The combination of governing actors in food systems and supply chains of small fish is relatively successful in providing rural and urban consumers in low-income developing countries with fish to supplement their diets.
- In line with the ecosystem approach to fisheries and the varying nature of the food systems of which they are a part, industrial and small-scale fisheries require different governing approaches, which need to be harmonized with each other.
- Legal pluralism characterizes the governance of many food systems and supply chains of small fish in low- and middle-income countries; more efforts to create effective and legitimate co-management are required.
- The importance of small fish as food for human beings should be prioritized in the regulation of food systems and supply chains of small fish, without compromising environmental sustainability.
- Governing actors must counter the marginalization of vulnerable participants in aquatic food systems, including women marketing fish and small-scale fishers.
- The governance objective of "upgrading" supply chains of small fish creates dangers of putting them out of reach of low-incomepopulations: "affordable fish" then risk becoming "too expensive fish".

7.1 INTRODUCTION

Previous chapters have noted that all sections of aquatic food systems and supply chains of small fish generate governance challenges and opportunities for the food security and nutrition of low-income populations. Challenges follow partly from two features of fish supply chains: the unpredictable supply in any one location, and the perishability of produce (Trienekens, 1999). The latter characteristic affects the quality (loss of nutrient value) and the safety of small fish products (Chapter 2). The former results in variations in supply (gluts or shortages) and can be evened out only through moving fish from one place to the other (within or between countries) or changing the composition of the fish basket (it should be recalled that small fish is a category, not a single species). However, it has also been noted (Chapter 6) that there are important differences in the way harvests of small fish are utilized: some – predominantly industrial – fisheries are geared toward the production of non-food products (fishmeal and fish oil) while other, largely small-scale fisheries, focus mainly on human consumption. Similarly, there are large variations in the way small fish are consumed, which relate to differences in culture, habit and consumer choice, as well as to availability and access (Chapter 3). Complicated as they are, all sections of the fish supply chain are dynamic too: in other words, they change in myriad ways in response to other parts of the food system (HLPE-FSN, 2020). Improvements in preservation,

transportation and communication infrastructures within and between countries finally affect the length, reach and stability of fish chains.

Governance involves the steering of societal trends in directions that are considered collectively desirable (see Box 7.1). The starting point of this technical paper is that governance capacity – broadly defined as the ability to handle the challenges in food systems involving food security and nutrition – is present throughout supply chains of small fish. Such capacity is often informal in nature. The peripheral nature of many supply chains of small fish can add to this. Although nutritionally vulnerable human populations are large in number, their political influence is small; the same is true for many actors in supply chains of small fish. Most of these actors do not stand out or attract attention; their voices do not reach far. Achieving a "radical transformation" (HLPE-FSN, 2020, p. 41) of aquatic food systems to achieve better food security and nutrition may therefore pose greater challenges than in other societal fields: challenges of prioritization and attention. At the same time, this chapter argues that in many instances, governance arrangements in supply chains of small fish work relatively well and constitute a worthwhile starting point for improvement.

BOX 7.1

What is governance?

"Governance is about governing, and governing is predominantly about making decisions" (Peters and Pierre, 2016, p. 1). To this succinct definition, it can be added that governing is not only about making decisions but also about implementing them. Because those in charge of governance are generally not single individuals, but several in number, Kooiman (2003) defines governing as "interactions to solve societal problems or create societal opportunities" (Kooiman, 2003, p. 231). Such interactions can involve governing actors (persons or organizational bodies) at different levels and of different kinds (formal and informal). "Internal governance" that is exercised by "market parties" in the supply chain is distinguished from "external governance", which emerges from within but also from outside the food system.

Notes:

Kooiman, J. 2003. *Governing as governance*. London, Sage Publications.

Peters, B.G. & Pierre, J. 2016. *Comparative governance – rediscovering the functional dimension of governing*. Cambridge, UK, Cambridge University Press.

In discussing the governance of aquatic food extraction, it is important to distinguish industrial fisheries from small-scale ones. The former are frequently international in scale and supply both food and animal feed markets. Their marine stocks are often well-monitored and managed (Hilborn *et al.*, 2022). In some parts of the world, however, industrial fishing in coastal waters threatens not only the sustainability of understudied fish stocks but also the livelihoods of small-scale fishers, processors and traders. Small-scale fisheries predominantly supply territorial markets (Chapter 4).

In addition to the challenges that follow from the features of small fish supply chains, there are others that derive from the nature of governing systems and the knowledge gaps that prevail. Governing systems may impede the flow of nutritious small fish to low-income consumers, such as through the imposition of administrative barriers. Legal pluralism (see Section 7.5) may reduce the coherence and legitimacy of the governance system. Governments and other governing actors within (and beyond) aquatic food systems may prioritize the production and export of high-value species or of fishmeal, rather than domestic food security. Small fish supply chains and their nutritional contributions may be ignored, and important regulatory aspects (such as

food safety) neglected. Where governing activity does occur, it can be insufficient, inconsistent and may overlook the experience and insights of those who work in aquatic food systems and even displacing them.

Knowledge gaps too are plentiful. Previous chapters have pointed out the shortfall of information regarding many parts of aquatic food systems and in particular,supply chains of small fish. This shortfall has two reasons: first, the fact that knowledge infrastructures in developing countries are frequently less advanced than in other parts of the world; second, that aquatic food systems, and specifically, supply chains of small fish, with some exceptions, attract less scientific and policymaking attention than globalized, high-end systems do.

This chapter emphasizes three aspects of governance: the role of informal governing actors in aquatic food systems ; the need for collaboration, or co-management, across governance divides; and the need to take a pragmatic approach towards achieving good governance, that takes the specifc context and capacities into account. Section 7.2 presents relevant insights from the literature. Attention then shifts to governance at national and local levels (Section 7.3), where formal and informal governance efforts go hand in hand. The next topic explored is international governance (Section 7.4). After deliberating briefly on the fragmentation of governance that exists between and within levels and the urgent need for bridging (Section 7.5), attention turns to governance performance (Section 7.6). The latter section highlights not only the successes but also the problems that occur in reference to the six dimensions of food security and nutrition. Section 7.7 reviews governance responsibilities.

7.2 INPUTS FROM GOVERNANCE LITERATURE

A rich body of literature exist on the attributes of governance, food systems, and fisheries and aquaculture. Many sections of aquatic food systems, and specifically, supply chains of small fish have, however, received scant attention. Fisheries scientists have indeed investigated the ecological status of small marine and inland fish species and made recommendations as to the regulation of harvesting activity. There is growing attention from nutritionists for the nutritional qualities of small fish. However, these have not yet been translated into national food-based dietary guidelines in many countries. Social scientists, economists and technologists have to some extent studied the processing and distribution of small fish in different parts of the world and have also made policy suggestions. However, very few of these authors have applied a perspective based on sustainable food systems, and there are still many gaps in knowledge.

The first suggestion made by the governance literature is that, making use of the food system framework (HLPE-FSN, 2020), it is useful to distinguish between domains and levels of governance (Kooiman *et al.*, 2005). The primary domain of governance activity is the fish supply chain: formal and informal governing actors attempt to regulate activities in the supply chain in one way or another, but often based on partial knowledge. The food environment, together with the range of food system drivers, constitutes the second, more indirect domain of governance activity. The third domain is the governing system itself: in a process sometimes called meta-governance (Kooiman, 2003), attention focuses on the goals, institutions, instruments and communication styles that are being applied.

The literature also argues that it is useful to distinguish different levels of governance activity, with the simplest division being between international, national and local governance. At each level, a different set of actors (individuals, organizations) is undertaking regulatory action based on their own assumptions and goals. Although policymakers normally strive to achieve coherence between levels, this is rarely achieved. Because each level of governing activity has its own dynamics, and conflicts readily occur between them, the literature prescribes what is now known as multilevel

governance (Stephenson, 2013): governance activity that is coordinated between different scales and is therefore able to address common goals.

A second suggestion emerging from the literature is that one may distinguish *different categories of actors* (organizations, people) involved – or to be involved – in governance. Having left behind the notion that it is only government that is engaged in governance (Kooiman, 2003), a range of other governing actors is identified. Each category has a different role to play in aquatic food systems and experiences unique challenges and opportunities. The simplest distinction is between governmental bodies, actors internal to the fish supply chain (associations of fishers, processors, traders and consumers), and civil society actors such as NGOs.

A third suggestion refers to the different objectives – and values – that underlie governance activity (Kooiman *et al.*, 2005). It is hardly necessary to mention that food security and nutrition are often only two of many concerns that governments and other governing actors need to deal with. Governing actors often have multiple goals, which require consideration of trade-offs and prioritization. The process of prioritization, and the negotiations that take place between governing actors, can deflect attention toward or away from food security and nutrition. Political interests and power imbalances usually define what becomes a priority and what disappears from the radar. Hard choices often emerge (Kooiman and Jentoft, 2005).

Fourth, governance efforts differ in style and in direction. Formal governance is often hierarchical, or top-down, and overly rigid in nature. Recent authorship, however, emphasizes that governance of sectors characterized by uncertainty are required to be adaptive and participatory (Armitage and Plummer, 2010). Adaptive governance responds to the changes that regularly take place in a food system. It requires attention to the dynamics, which require good monitoring, and focuses on learning.

The fifth and last suggestion concerns the limitations of governance (Jentoft, 2007). Although there are many definitions of what is considered good governance, scholars have drawn attention to the weaknesses that prevail in this approach (Grindle, 2016). It is for this reason that some have preferred to suggest good-enough governance as a more realistic objective. Developing country contexts differ from one another, and their states and civil societies possess varying capacities. "Good enough governance […] suggests that not all governance deficits need to (or can) be tackled at once, and that institution- and capacity-building are products of time" (Grindle, 2007, p.554). In this regard, it is important to recall that the capacity of aquatic food systems to be governed successfully depends not only on the qualities of the governing system in place, but also on the extent to which food systems harbour complex, or even "wicked" problems (Rittel and Webber, 1973; Jentoft and Chuenpagdee, 2009).

7.3 NATIONAL AND LOCAL GOVERNANCE

7.3.1 Formal governing activities

Many government agencies contribute to the workings of aquatic food systems. Departments of fisheries and aquaculture, and departments of health (or however they are termed or embedded in each country) are key players, as they are tasked with governing the stocks of small fish and the contribution they make to human health and nutrition. In his global review of the relationship between fisheries and health policies, Koehn *et al.* (2021) point out that these policies, and these departments, are often poorly interconnected. This is a consequence of the fact that fish is not recognized as a valuable input for food security and nutrition (Chapter 2). Similarly, in Africa, inland fisheries are usually located under the same administrative umbrella as wildlife, tourism or game departments, with as result that priority is not given to their contribution to food security and nutrition. The reason for this administrative separation is difficult to pin down. However,

it appears to be partly historical and mainly inherited from colonial administration (Malasha, 2003; Kolding *et al.*, 2016; Schut, Nooteboom and Kutanegara, forthcoming).

Apart from bureaucratic fragmentation, governmental agencies in lower- and middle-income countries are frequently understaffed and underresourced (Mahon and McConney, 2004). This contributes to their lack of presence in aquatic food systems. In addition, departments of fisheries and aquaculture often concentrate on maximizing high-value fish exports and overlook the relevance of small fish for domestic consumers. Concerned as fisheries officials are with preventing the catch of juveniles under the conventional fisheries management paradigm (Zhou *et al.*, 2019), they strive to eliminate the use of small mesh fishing nets, such as in beach seine operations. In addition, almost all countries have minimum mesh size legislation (Misund, Kolding and Fréon, 2002). The fact that most fish species never grow beyond a small size and cannot be harvested without a small mesh size is overlooked, but needs of course to be addressed taking into account environmental sustainability (see Chapter 6).

Departments of health are active at the consumer end of the fish supply chains. However, they are generally not aware of the relevance of small fish for health (see Section 4.4.1). Food safety also suffers. While seafood exports are monitored to meet the food safety criteria of importing actors (such as the European Union), the same is not true for seafood destined for the domestic market. The application of insecticides and preservatives, such as formalin, is common and detrimental to the health of consumers. Campaigns to eliminate adulteration practices are still rare (however, see Box 7.2). Regional fish markets, which are under the responsibility of local authorities, often suffer from a lack of hygiene and sanitation.

BOX 7.2

Fighting the adulteration of fish

The Food Safety Wing of the Government of Kerala, India, recently initiated a campaign called Operation Matsya to eliminate the sale of spoiled and adulterated fish in the state. This is part of a larger programme (called Pradhan Mantri Matsya Sampada Yojana) undertaken by the Department of Fisheries of the Government of India to address major bottlenecks in the fish supply chain. On 23 April 2022, raids took place at many transportation hubs and major fish distribution centres, with fines being handed out to 53 traders. Large unfit stocks were seized, and samples sent for further laboratory analysis.

The Hindu, Operation Matsya nets a huge haul.
The Hindu, 23 April 2022. Chennai, India.

Other government agencies are responsible for infrastructure, such as roads and markets that indirectly facilitate or hamper the flow of fish from their aquatic origins to low-income consumers. The improvement of transportation infrastructure that has taken place within and between countries has resulted in greater flows of aquatic food. Digital communication facilities have facilitated connections between parties in the supply chain. Ministries of trade and economic affairs promote the export of seafood products and import others if necessary (see Box 7.3).

BOX 7.3
Contrasting governmental import and export strategies

Fisheries is the second-largest source of foreign exchange for Uganda, and Nile perch (*Lates niloticus*) is the largest contributor. To safeguard the productivity of Nile perch fishing, and thus the export sector, the Government has imposed severe restrictions on small-scale fishers and fishing activities that target small species (Lince, 2011; Mpomwenda *et al.*, 2021).

Faced with population growth and stagnating local harvests, the Government of Ghana has over the years been importing increasing amounts of small fish. While these imports have contributed to the development of a new cold chain market in Ghana, conventional fish processors and traders have also blended the flow of imported fish into the regular supply chain (Ahwireng, 2022).

Notes:
Ahwireng, A.K. 2022. *Small pelagic fish for food. Governance and performance of small pelagic fish value chains for food security and nutrition in Ghana*. PhD dissertation University of Amsterdam.
Lince, S. 2011. The Informal Sector in Jinja, Uganda: Implications of Formalization and Regulation. *African Studies Review*, 54(2): 73–93.
Mpomwenda, V., Kristófersson, D.M., Taabu-Munyaho, A., Tómasson, T. & Pétursson, J G. 2021. Fisheries management on Lake Victoria at a crossroads: Assessing fishers' perceptions on future management options in Uganda. *Fisheries Management and Ecology*, 29: 196–211.

7.3.2 Informal governance

Because fishing populations are spread out along lengthy shorelines and consumers are widely dispersed, government agencies in many developing countries often have limited reach and authority. Under these circumstances, informal market actors perform an important role. Social connections underlie the functioning of small fish supply chains; their workings are situated in contexts of shared kinship, ethnicity and other forms of social identity, collegial collaboration and personalized trust.

Gereffi and Fernandez-Stark (2016) argue that vertical integration of global supply chains is realized through at least three types of internal governance: market governance (with price being the main factor), relational governance (based on trust and mutual reliance), or captive governance (with high degrees of monitoring and control by the lead firm). The same categories apply to domestic supply chains of small fish. Box 7.4 provides an example of relational governance from the consumer end of the supply chain. Box 7.5 explains the vital role of fish processors and traders in West Africa.

BOX 7.4
Rural consumers and mobile traders in Indonesia

Rural low-income in Sumenep, Indonesia, prefer small fish prepared in very specific ways. Pindang fish, cooked with certain spices, is most favoured. Fish paste is another product in high demand. Smoked, sun-dried and salted fish are also liked. Mobile traders who carry the preferred kinds of fish at reasonable prices generally do good business, connecting these consumers with larger market hubs. Trust plays a role in such trade relations, and consumers are often provided with credit (Dipananda, 2020).

Note:
Dipananda, K. 2020. Dried, tried, tasted. *Samudra Report*, 83: 26–28.

BOX 7.5

The essential role of fish processors and traders in West Africa

The women fish traders of West Africa invest in fishing fleets, process local and imported catches and channel these to their connections in proximate and distant markets (Hasselberg *et al*., 2020). They therefore make a major contribution to the steering of aquatic food systems for food security and nutrition (Overå, Atter, Amponsah and Kjellevold, 2022). While many of these processors are small-time operators, others handle large quantities of produce every year, availing of storage facilities to benefit from market fluctuations. Their processing technology (smoking of fish), while fuel-inefficient and detrimental to their own health as well as that of their customers (Chapter 5), is time-tested and consistent with available social norms. While government agencies and NGOs have attempted the introduction of more efficient technologies, they have not always taken relevant conditions into consideration. Processors are necessarily reluctant to adopt technology that may be sustainable but not cost-effective or suitable to local conditions.

Gereffi and Fernandez-Stark (2016) also point out that horizontal coordination between supply chain actors (such as fishers, processors or traders) can help them achieve leverage over supply chains. Marketing cooperatives that attempt to break the hold of monopolistic merchants form an example (see Box 7.6).

Notes:

Gereffi, G; & Fernandez-Stark, K. 2016. *Global Value Chain Analysis: A Primer, 2nd Edition*. Retrieved.

Hasselberg, A.E., Aakre, Scholtens, J., Overå, R., Kolding, J., Bank, M.S., Atter, A. et al. 2020. Fish for food and nutrition security in Ghana: challenges and opportunities, *Global Food Security*, 26: 100380. doi.org/10.1016/j.gfs.2020.100380

Overå, R., Atter, A., Amponsah, S. & Kjellevold, M. 2022 Market women's skills, constraints, and agency in supplying affordable, safe high-quality fish in Ghana. *Maritime Studies*, 21: 485–500. doi.org/10.1007/s40152-022-00279-w

BOX 7.6

The South Indian Federation of Fisher Societies (SIFFS) in Kerala, India

The South Indian Federation of Fisher Societies (SIFFS) marketing cooperative was established with the help of NGOs in 1980 and soon became a powerful player in the fisheries of Kerala State. It now has over 100 primary societies at the village level. Its marketing activities were originally aimed at reducing the exploitative hold of fish merchants and to provide fishworkers with a measure of control over the market chain. The success of SIFFS resulted in the Government of Kerala establishing a cooperative marketing body, called Matsyafed, of its own. However, SIFFS continues to play an independent role.

Note: SIFFS. 2022. South Indian Federation of Fishermen Societies. Trivandrum, India. siffs.org

The governance exerted by market actors within small fish supply chains is generally geared towards the facilitation of daily operations and making a living. Customary authorities external to small fish supply chains often play a role in rule-making within these supply chains. Such authorities tend to have deep historical roots and make use of other forms of law that are based in religious, ethnic or other social identities. Being situated close to the supply chain, they are more aware of local priorities. Their dispute-regulation activities are frequently prized. The informal, caste-based village councils of South India, provide a good example of the role such authorities play in supply chain governance (see Box 7.7). Johannes (1978) famously described the

traditional conservation methods of Oceania and their demise. Other authors explore the cultural role of tenure and taboos in the geographical region (Foale *et al.*, 2011; Steenbergen. 2016). Box 7.8 provides another example from West Africa.

BOX 7.7
Informal village councils in South India

The informal village councils (uur panchayat) of the State of Tamil Nadu, India, claim authority over coastal lands and waters, and play an important role in the regulation of local, small-scale fisheries as well as the marketing of small fish for the domestic market. These elected councils regulate the technologies and practices allowed in village waters, prohibiting those considered environmentally and socially harmful (Bavinck and Karunaharan, 2006). They also facilitate the auctioning of small fish among village women who ply regional markets in the surroundings, providing special support to widows. Dispute management is part of their tasks (Bavinck, 2001).

Notes:
Bavinck, M. 2001. *Marine resource management. Conflict and regulation in the fisheries of the Coromandel Coast.* New Delhi, Sage
Bavinck, M. & Karunaharan, K. 2006. A history of nets and bans: restrictions on technical innovation along the Coromandel Coast of India. *Maritime Studies* – MAST, 5(1): 45–59.

BOX 7.8
Chief fishermen and fish queens

The role of chief fishermen and fish queens in the coastal regions of sub-Saharan Africa stands out. Such figures enjoy beach-level support and contribute to the smoothening of supply chains operations, as well as to the resolution of disputes. The fish queens of Ghana, for instance, who are appointed based on age and experience, fix the daily beach landing prices of fish, thereby facilitating transactions between fishers, processors, and traders. Fish traders have similar leaders, so-called market queens, in regional marketplaces. Their authority often derives from precolonial systems of governance (Ahwireng, 2022).

Note:
Ahwireng, A.K. 2022. *Small pelagic fish for food. Governance and performance of small pelagic fish value chains for food security and nutrition in Ghana*. PhD dissertation University of Amsterdam.

7.3.3 Local and national governance (formal and informal)

Formal governance actors, connected largely to governments, play a vital role in certain portions of aquatic food systems . Governments are responsible for the well-being of their citizens, as well as for the sustainability of aquatic resources in their exclusive economic zones – and are therefore expected to contribute to the achievement of international strategies as well as local and national goals. However, governments often do not put sufficient emphasis on the fisheries sector to allow their agencies develop and implement effective policies. It is for this reason that government agencies in such countries often lean on a range of informal actors for the governance of supply chains of small fish. Certain conditions in these food systems, however, require special attention, as they are beyond the reach of the informal sector. Thus, governments are essential for formulating a coherent policy framework and for the linkage between departments at different levels. Frequently, they are also the initiators of collaboration with informal governing actors.

Customary authorities, as well as their modern counterparts such as cooperatives and other types of associations (see Section 7.3.2), share characteristics that give them an advantage over governments in the regulation of supply chains of small fish:

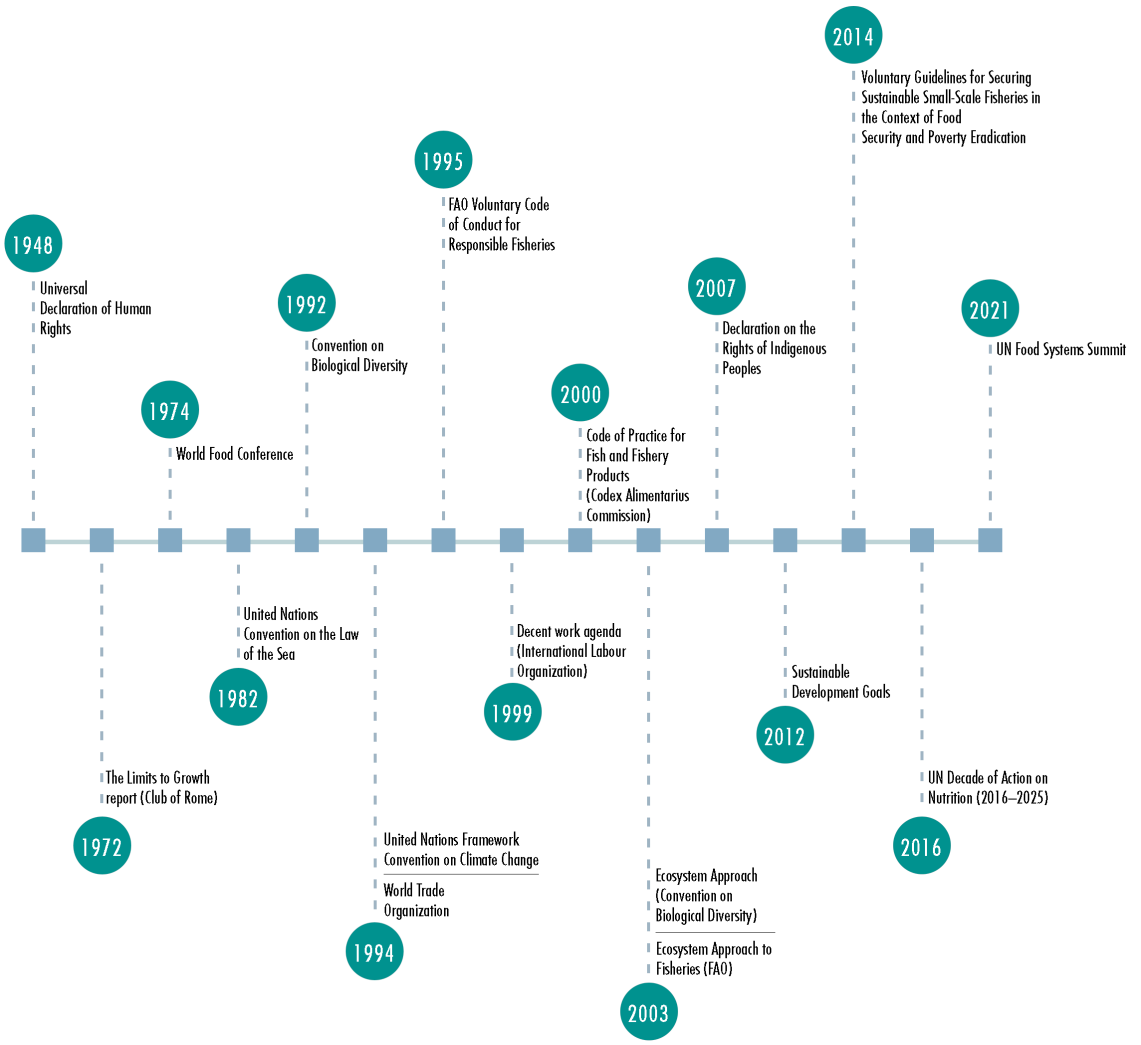
- Customary authorities and professional associations are physically proximate to the operations of the supply chains of small fish, and highly aware not only of its workings but also of the needs of the people involved.
- They respond more quickly to emerging problems than formal government, with its time-consuming procedures.
- Customary authorities often base their regulations and dispute solving activities on consensus and forms of social control, rather than on written rules, resulting in more effective implementation.
- Where there is a higher mistrust of formal government, they often enjoy higher legitimacy than government agencies.

However, there are disadvantages to customary authorities too. One of the most obvious ones is that they generally operate on local scales and possess less ability to address pressing issues at international or national levels. This is one reason to plead for co-management that brings together formal and informal forms of governance (see Section 7.5).

7.4 INTERNATIONAL GOVERNANCE

Many of the goals, activities and accomplishments of international governance have a bearing on the performance of aquatic food systems. The actors are multiple, the objectives manifold, and the styles varied. Separately and in combination, referring to and building upon one another, they influence the governance taking place on national as well as local levels. At the same time, national and local governance priorities obviously influence the direction of international efforts. This section reflects on international governance activities that have a bearing on aquatic food systems, distinguishing several topical concerns. Figure 7.1 provides a timeline of significant events. International NGOs are pinpointed where relevant. The section ends with a discussion of how the structure of international markets affects aquatic food systems.

FIGURE 7.1
Timeline of relevant international events and documents



7.4.1 Topic: the generation of economic wealth

The World Trade Organization (WTO), established in 1994, has formulated its overriding purpose as: "to help trade flow as freely as possible — so long as there are no undesirable side-effects — because this is important for economic development and well-being" (WTO, 2023). Its efforts have assisted in making aquatic food – including small fish – the most-traded agricultural product in the world (FAO, 2009), with substantial flows moving from developing countries to developed countries (Watson *et al.*, 2017). Small fish are no exception. The Doha Round of the WTO concentrates on the issue of harmful subsidies, which play a role in promoting unsustainable fisheries.

The World Bank too focuses on economic optimization, such as of fisheries and aquaculture. Its report titled *The Sunken Billions* points out that the sector is generally undervalued and – if provided with better governance – could make a far larger economic contribution than it does today (World Bank, 2017). Its wealth-based approach is argued to be "the only way to reverse the decline in fish resources and to ensure that potential social and economic benefits from their exploitation are fully realized" (Cunningham *et al.*, 2009, p. 285).

7.4.2 Topic: environmental conservation

The United Nations Convention on the Law of the Sea (UNCLOS), adopted and signed in 1982, provides a comprehensive framework of rights and responsibilities over the marine environment and the conservation of its living resources, expanding the rights and duties of coastal states to an exclusive economic zone 200 nautical miles wide. The FAO Voluntary Code of Conduct for Responsible Fisheries (CCRF) of 1995 has defined the term "responsible fisheries" in relation to "the effective conservation, management and development of living aquatic resources, with due respect for the ecosystem and biodiversity" (FAO, 1995, p. 1).

FAO is the prime custodian of international fisheries policy. Concerns of environmental conservation dominate many other international arenas that impinge, directly or indirectly, on aquatic food systems. The Convention on Biological Diversity (CBD) of 1992, and the United Nations Framework Convention on Climate Change (UNFCCC) of 1994 stand out in this regard, as does Sustainable Development Goal (SDG) 14.

The CBD introduced and promoted the "ecosystem approach" (EA) as a guiding principle for sustainable use and conservation of biodiversity; this was later adapted to fisheries by the ecosystem approach to fisheries (EAF) (FAO, 2003). While intergovernmental organizations have played a conspicuous role in promoting sustainable use, international NGOs too have contributed strongly to the effort. Their interventions to reduce illegal, unreported and unregulated fishing, promote marine protected areas, and introduce certification programmes have strong influence on the field.

7.4.3 Topic: social justice and human rights

Concerns of social justice permeate the SDGs, starting with the goals on poverty and hunger (SDGs 1 and 2) and continuing to gender equality (SDG 5), societal inequalities (SDG 10) and peace, justice and strong institutions (SDG 16). Even SDG 14, which is devoted to "life below water", makes a connection to support small-scale fisheries (SDG Target 14.b), which deserve better access to resources and markets. This recommendation is relevant to the topical concern of this technical paper, which highlights the role of small-scale fishers, processors and traders in the provision of food security and nutrition. The SDGs find a foundation in the Universal Declaration of Human Rights (1948) and other international agreements.

The CCRF too expresses attention for inequality, such as between developing and developed countries (Article 5). It argues for the protection of small-scale fisheries and the rights of fishers and fishworkers to a secure and just livelihood (Article 6.18). The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) that followed up on the CCRF and were adopted in 2014 are particularly relevant for small-scale fishers in developing countries, but also for marginalized post-harvest actors, many of whom are women (Chapter 4 of this publication).

The international attention given to social justice has been translated into what has become known as the human rights, or well-being, approach in fisheries (Béné, Hersoug and Allison, 2010; Allison *et al.*, 2012; UNSDG, 2003). This approach takes the spectrum of human needs – food, housing, safety, etc. – as the starting point for governance activity and argues fiercely against the wealth-based approach mentioned above. International NGOs, such as the International Collective in Support of Fishworkers (ICSF), have played a vital role in the development of the human rights perspective in fisheries.

7.4.4 Topic: food security and nutrition

The concept of food security and nutrition developed through several decades of international deliberation, starting at the World Food Conference in 1974 and proceeding through several other milestone events to the current UN Decade of Action on Nutrition (2016-2025). In the process, it has become defined as "a multi-dimensional phenomenon" (FAO, 2003, p. 25), and one with close connections to human health. SDG 2 (zero hunger) and SDG 3 (health and wellbeing) encapsulate these concerns. The HLPE-FSN points to the need "for strengthening and consolidating conceptual thinking" and advocates for the sustainable food system framework as an analytical and policy device (HLPE-FSN, 2020, p. xiv).

The Codex Alimentarius Commission established by FAO and WHO in 1963 has generated a comprehensive set of safety standards for human foods, including a Code of Practice for Fish and Fishery Products (2020) and a system for Hazard Analysis and Critical Control Points (HACCP). The CCRF too considers post-harvest activities and trade. While endorsing the precepts of WTO (as delineated above), it argues that: "States should adopt appropriate measures to ensure the right of consumers to safe, wholesome, and unadulterated fish and fishery products" (Article 11.1.1), thereby making a connection with the concerns of health and food safety (see Chapter 3). The SSF Guidelines are even more explicit: they refer directly to the requirements of food security and nutrition and the underlying issues of poverty.

Comments on international governance

The burgeoning international field displays countless connections with the concerns of this technical paper. Aquatic food systems have become a nascent focal point, subject to contrary currents and approaches. This becomes apparent in the diversity of topics and agencies presented above.

The ambitions that exist at the international level for achieving a transformation in food systems are singularly high. This puts pressure on governance actors at national and local levels. At the same time, intergovernmental agencies are limited in their ambitions by the priorities voiced by individual nation states.

By including respect of cultures in its set of guiding principles, the SSF Guidelines illustrate another debate between governing actors at international and national levels. According to this guiding principle, "existing forms of organization, traditional and local knowledge, and practices of small-scale fishing communities, including indigenous peoples and ethnic minorities" are to be recognized and respected (FAO, 2015, p. 2). This statement – which is endorsed in other international agreements – provides a cautionary reflection on the imposition of international agendas on local realities (Jentoft and Bavinck, 2019).

7.5 BRIDGING GAPS AND IMPROVING COHERENCE

While formal and informal governing actors in aquatic food systems are aware of their mutual existence and collaborate in a variety of ways, there is a need for more systematic bridging. This is, however, complicated by the impact of legal pluralism in many aquatic food systems. Legal pluralism, or the coexistence in any one field of "multiple normative communities" (Berman, 2016, p. 1157) is a regular phenomenon in most postcolonial as well as other countries. Legal pluralism implies that people participating in aquatic food systems and supply chains of small fish and their governance are influenced and motivated by different sets of norms that derive from other sources and authorities (Benda-Beckmann, 2001). These result in: (1) asymmetry between values, institutions and actions; and (2) asymmetry in terms of power (Jentoft and Bavinck, 2014). Such asymmetries are not always easily bridged.

Bridging needs to take place between governance efforts at different levels (from international to local) as well as between governance parties at any one level.

The former includes the mainstreaming of international guidelines into national policy and implementation practice. This often requires time and effort, such as lobbying of local parties that are interested in advancing certain policy goals.

Co-management, sometimes referred to as multilevel partnerships, is suggested as a productive way forward at the national level (HLPE-FSN, 2020), which may also apply to aquatic food systems. It involves the establishment of platforms whereby governing parties meet and discuss the resolution of problems pertaining to aquatic food systems and any specificities relating to supply chains of small fish. The availability of legal pluralism implies that such meetings are not necessarily trouble-free; however, they require the development of trust and mutual respect, and an equal say in decision-making. Co-management structures for different sections of aquatic food systems are required. Such structures have already materialized in many lower- and middle-income countries for marine and inland fisheries (FAO, 2022; Cohen *et al.,* 2021; Pomeroy and Rivera-Guieb, 2006). Having carried out a review of literature published in the period 1996 to 2020, Cohen *et al*. (2021) associate co-management in fisheries with positive trends across various social, ecological and governance indicators. However, these authors point out that there is still very little evidence of co-management's impact on the field of food security and nutrition (cf. Béné *et al*., 2016). Territorial markets (see Chapter 4) are obvious candidates for co-management, gathering local authorities and representatives of the market user groups.

For co-management to work, all parties should be interested in long-term cooperation – after all, as Pomeroy and Berkes (1998) summarize their argument, "it takes two to tango". Collaboration between parties that are mutually ill at ease, or with a skewed power balance, is not easy to establish, and there are many examples of failing or deficient co-management. Box 7.9 provides an example whereby the Ugandan Government sought to establish collaboration the easy way, by incorporating informal market actors in the governmental system. This move seems to have improved government tax returns; however, it produced negative effects for the vendors operating there. Box 7.10 contains an example of community-based fisheries management in Bangladesh, which has contributed to an improvement of food security and nutrition.

BOX 7.9

The open-air market formalization scheme in Uganda

"Under the [open air market] formalization scheme the individual awarded a contract to manage an open-air market is explicitly responsible for delivering taxes and dues to municipal councils and higher levels of government. This move is subtle but important, since it changes the primary goals and functions of open-air markets. Markets managed by informal vendors' associations and cooperative strategies like those used in the toninyira mukange markets were geared toward hedging risks for vendors in an unpredictable market by means of controlled overpricing, shared profits, and collective reinvestment to facilitate individual gain through group stability. Under the new formalized system individual profit and the flow of resources away from the market in the form of taxes and fees have become central organizing principles. This significantly alters the conditions under which vendors operate and has disrupted the political economy under which informal market vendors had developed workable livelihood strategies" (Lince, 2011, 79–80).

Note:
Lince, S. 2011. The Informal Sector in Jinja, Uganda: Implications of Formalization and Regulation. *African Studies Review*, 54(2): 73–93.

BOX 7.10
Community-based fisheries management in Bangladesh

In many of Bangladesh's inland waterbodies, community-based fisheries management (CBFM) replaced a profit-driven licensing system by transferring regulatory jurisdiction over fisheries management to community-based organizations, with support from NGOs and relevant government departments. These NGOs were particularly important in providing community-based organizations with legal support and scientific recommendations for regulatory development at the community level. The new CBFM has improved fisheries productivity and increased access for subsistence fishers, a particularly vulnerable demographic. It also improved fishers' food security– subsistence fishers ate more fish and micronutrient intake from fish increased over time for all fishers. While small fish were the most important fish in terms of total micronutrient contribution (iron, calcium, zinc and iodine), increasing intake of cultured carp (*Cyprinus carpio*) and tilapia (*Oreochromis* spp.) was responsible for increasing intake of micronutrients and protein from fish over time. Questions remain about the long-term resilience and impact of CBFM once NGO support ends. (A. Pounds, personal communication).

A cautionary note is to be made. Under conditions of legal pluralism, it is unlikely that governance structures for aquatic food systems will ever reach an optimum. Instead, such structures will probably remain in flux, responding to changes occurring in small fish supply chains and driving factors, as well as to the limitations experienced by governing actors. Under such conditions, a very gradual approach towards good governance that acknowledges and gradually addresses governance challenges in a dynamic context is the more realistic ambition.

7.6 GOVERNANCE OUTCOMES FOR FOOD SECURITY AND NUTRITION

The six dimensions of food security and nutrition constitute outcomes and criteria for the success of any aquatic food system are impacted, first, by the workings of small fish supply chains, and second, by trends that drive food systems externally. This section considers the extent to which governing systems have shaped aquatic food systems, and more specifically, supply chains of small fish in ways that maximize outcomes in terms of each of the dimensions of food security and nutrition, as well as where their shortcomings lie.

7.6.1 Dimension 1 – Availability of small fish

Preceding chapters have noted that small fish of many species are in abundance in the high seas, coastal waters and inland waters of many countries, and that while global fisheries' yield may be reduced through imperfect harvesting practices or other factors, it can often be expanded. A significant proportion of small fish catches is, however, considered forage food and destined for animal husbandry and aquaculture. The choice to channel small fish towards animal feed rather than human food affects its availability within supply chains of small fish for human consumption at a global level.

Although several food systems handle very large quantities of small fish, human population growth and climate change are likely spoilers to future food security and nutrition (see Section 7.6.6 below). In addition to making better use of available wild stocks of small fish and redirecting small fish from non-food to food purposes, governing actors may therefore investigate other potential sources, such as the

diversification of aquaculture or fish stocking in small water bodies. The contribution of aquaculture to the stock of small fish for human food is, however, mixed.[1]

Other conditions that affect the availability of small fish are:

- The losses that occur throughout supply chains (starting with handling on board and continuing throughout processing and storage) and the wastage that results from discarding practices.
- Unevenness in the geographic distribution of small fish to market outlets in the proximity of low-income consumers, thereby resulting in its physical non-availability in some areas. Such non-availability may be local or may also apply to entire regions or countries.

Governing action can in principle be directed to remedy both conditions, thereby increasing the total available stock of small fish and evening out its geographical availability.

7.6.2 Dimension 2 – Accessibility of small fish

It was pointed out in Chapter 4 that small fish, while available in the larger market economy, is not always on hand in the territorial markets that low-income consumers visit. This affects its accessibility in a physical sense. However, accessibility also depends on social and economic conditions, such as price in relation to income levels.

Current research suggests that in many low- and middle-income countries, a mixed basket of small fish is usually available for prices affordable to those living at or below poverty levels. The mixed nature of this basket is caused by the fact that different combinations of species may fit into this price category – while certain species may predominate, these too are subject to price variations. The mixed nature of the basket also derives from the various origins of small fish: from wild, domestic catches (inland and marine), from imports, and sometimes from aquaculture. While consumers act upon their taste preferences (Chapter 3), their wants may not always be affordable.

However – as was pointed out in Chapter 3 of this publication – low-income populations are heterogeneous in nature, and different groupings (ethnic, religious, geographical and professional) may enjoy different levels of access to the varieties of small fish they prefer. The precise condition thereof depends on context: to which governance structures should be sensitive.

It should be noted that some policy choices have large consequences for the financial accessibility of small fish. Thus, if more of the small fish currently channelled for fishmeal and fishmeal production become directed to human food, prices may decline. On the other hand, increased efforts to improve the quality of small fish on the market (see Section 7.6.3) may, however, drive prices beyond the reach of people living in poverty. Such dilemmas and hard choices result in a need for policy trade-offs that are usually decided at a country level.

7.6.3 Dimension 3 – Sufficient utilization and quality

Chapter 2 pointed out that the nutrient content of small fish is still insufficiently recognized. While governments and research organizations are now discovering and paying attention to their nutritious qualities, most long-time consumers of small fish hardly need to be convinced of their worth. Food preferences are an item of culture, and generally transmitted from one generation to another.

However, it is also true that not all consumers are knowledgeable about the nutritional value of small fish (see Chapter 2, as much food composition data on small fish is lacking), and some cultures are averse to its inclusion in the diet. It is here

[1] While Asia has a long history of cultivating small fish for domestic consumption, aquaculture in other parts of the world tends to focus on high-value species with feed requirements that include fishmeal and fish oil (deriving largely from the reduction of small fish, which is thus not available for human consumption).

that governance may have a role to play, communicating information on nutritional relevance and providing support to product development.

It was pointed out above that the quality and safety of small fish products is sometimes a concern. This follows from the perishability of fish and the application of chemicals to extend its shelf life. Scientific studies have demonstrated how contemporary harvesting, processing and trading practices affect the nutritional value and the safety of small fish (Chapter 2). Governing actors at various levels may therefore act to improve such conditions, while keeping a watchful eye so that interventions do not result in excessive price increases. Consumers too require greater sensitivity, not only to the health implications of their diets, but also environmental and social implications.

7.6.4 Dimension 4 – Stability

The stability of supply and accessibility of small fish throughout the year is of obvious importance for households living in poverty that depend on such fish for their nutrition. Wild catches of small fish may originate from different regions throughout the year, which has implications for the composition of the basket of small fish available in any location. Research suggests that the market actors driving small fish supply chains are successful in realizing a steady volume of small fish at affordable prices (see, for example, Subramanian *et al.*, 2022). To do so, however, they must source a variety of species from different geographical and business settings. External governing actors may focus on enlarging the opportunities to do so, reducing obstacles such as adverse trade regulations, and improving infrastructural facilities such as roads and markets. As women play important roles particularly in fish supply chains, there is a need to ensure them with stable supplies.

7.6.5 Dimension 5 – Agency

Previous chapters have pointed out the numerous actors – individuals and organizations – that populate and structure aquatic food systems across the globe. These actors link up and ensure the steady flow of fish from diverse origins to the places where consumers live. Constituting a range of what this technical paper calls internal governors, they adjust the workings of supply chains according to changing circumstances, thereby ensuring its continued performance. The rapid adjustment of fish supply chain actors to the effects of COVID-19 lockdowns is a case in point (Bassett *et al.*, 2021).

Although big firms and powerful traders also play a role in small fish supply chains, many actors belong to the informal sector and are small-scale. Images of crowded beaches, roads and marketplaces demonstrate their numbers. Preceding chapters of this technical paper have indicated the variety of economic niches they occupy and the ways in which these interlink to form a functioning whole, or food system.

It is clear, however, that small fishers, processors, traders and producers possess limited resources and suffer important vulnerabilities. Governments and other governing actors should recognize, first, that while participants in supply chains of small fish generally do a very good job, they face many smaller and bigger obstacles. Second, some of these participants are more vulnerable than others. Women actors suffer specific disadvantages, resulting from cultural discrimination and the neglect of safety and well-being concerns. Depending on context, ethnic or religious minorities, migrants and disabled people too are sometimes in a weak position.

7.6.6 Dimension 6 – Sustainability

Chapter 6 has pointed out the range of challenges affecting the environmental, economic and social sustainability of supply chains of small fish, which relate partly to the condition of oceanic and other aquatic environments, and to the state of small fish stocks. The governing thereof stretches beyond small fish supply chains to include global challenges of climate change, biodiversity loss and pollution. These make up the

agenda of SDG 14. Other SDGs cover a spectrum of concerns, such as poverty, hunger and equality, that present sustainability challenges to governing actors at various levels. Whether the sustainability of food systems, such as those pertaining to small fish, is realized into the future depends on the extent to which the foundations thereof are laid now. The following concerns stand out:

- Improved global care for small fish stocks and the health of their aquatic environments;
- Sustainable harvesting patterns adapted and aligned with the productivity of ecological systems;
- The anchoring of aquatic food systems and the role of small fish in both health and food security policies, as well as in fisheries and broader agricultural systems' policies;
- Care for those who are playing core roles in supply chains of small fish;
- Better understanding of who the main consumers of small fish are (especially people living in poverty, vulnerable and indigenous groups) and ensuring their sustainable access to small fish; and
- Introduction and maintenance of institutional structures to promote the availability, accessibility, quality and stability of supply chains of small fish.

7.7 CONCLUSIONS

This chapter has discussed the governing of aquatic food systems and supply chains of small fish as they operate in many parts of the developing world. It has pointed out that the contribution small fish make to food security and nutrition in low- and middle-income countries is insufficiently acknowledged. It has also noted the remarkable capacity of actors, in many aquatic food systems to provide stable food security and nutrition benefits to large rural and urban populations. This testifies to the quality of informal governing actors, who play a major role throughout supply chains of small fish. Still, there are many ways in which supply chains of small fish can be improved upon and expanded. Addressing these weaknesses, identifying new opportunities, and finding new approaches for the long-term sustainability of these food systems depends in large measure on the agency of the people that are involved. It is for this reason that the chapter has chosen to emphasize that their knowledge and insights are an important resource.

REFERENCES (Chapter 7)

Allison, E. & Badjeck, M.C. 2004. *Fisheries Co-Management in Inland Waters: A Review of International Experience, Sustainable Fisheries Livelihoods Programme (SLFP)*. Rome, FAO.

Allison, E.H., Ratner, B.D., Åsgård, B., Willmann, R., Pomeroy, R. & Kurien, J. 2012. Rights-based fisheries governance: from fishing rights to human rights. *Fish and Fisheries*, 13: 14–29. doi.org/10.1111/j.1467-2979.2011.00405.x

Armitage, D. & Plummer, R. 2010. *Adaptive Capacity and Environmental Governance*. Berlin/Heidelberg, Germany, Springer.

Bassett, H.R., Lau, J., Giordano, C., Suri, S.K., Advani, S. & Sharan, S. 2021. Preliminary lessons from Covid-19 disruptions of small-scale fishery supply chains. *World Development*, 143: 105473. doi.org/10.1016/j.worlddev.2021.105473

von Benda-Beckmann, F. 2001. Who is afraid of legal pluralism? *Journal of Legal Pluralism*, 47: 37–83.

Béné, C., Hersoug, B. & Allison, E.H. 2010. "Not by rent alone": analysing the pro-poor functions of small-scale fisheries in developing countries. *Development Policy Review*, 28: 325–358.

Béné, C., Arthur, R., Norbury, H., Allison, E.H., Beveridge, M., Bush, S., Campling, L. *et al.* 2016. Contribution of Fisheries and Aquaculture to Food Security and Poverty Reduction: Assessing the Current Evidence. *World Development*, 79: 177–196. doi.org/10.1016/j.worlddev.2015.11.007

Berman, P.S. 2016. The evolution of global legal pluralism. In: R. Cotterrell & M. Del Mar, eds. *Authority in Transnational Legal Theory: Theorising Across Disciplines* (pp. 151–190). Cheltenham, UK, Edward Elgar Publishing.

Cohen, P.J., Roscher, M., Wathsala Fernando, A., Freed, S., Garces, L., Jayakody, S., Khan, F. *et al.* 2021. *Characteristics and performance of fisheries co-management in Asia - Synthesis of knowledge and case studies: Bangladesh, Cambodia, Philippines and Sri Lanka*. Bangkok, FAO. doi.org/10.4060/cb3840en

Cunningham, S., Neiland, A.E., Arbuckle, M. & Bostock, T. 2009. Wealth-based fisheries management: using fisheries wealth to orchestrate sound fisheries policy in practice, *Marine Resource Economics*, 24(3): 271–287.

FAO. 1995. *Code of Conduct for Responsible Fisheries.* Rome, FAO. 41 p.

FAO. 2009. *Responsible fish trade*. FAO Technical Guidelines for Responsible Fisheries. No. 11. Rome, FAO. 23p.

FAO (Food and Agriculture Organization of the United Nations). 2015. *Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication*. Rome. fao.org/3/i4356en/I4356EN.pdf

FAO. 2022. *The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation*. Rome, FAO. https://doi.org/10.4060/cc0461en

Farmery, A.K., Allison, E.H., Andrew, N.L., Troell, M., Voyer, M., Campbell, B., Eriksson, H. *et al.* 2021 Blind Spots in Visions of a "Blue Economy" Could Undermine the Ocean's Contribution to Eliminating Hunger and Malnutrition. *One Earth*, 4(1): 28–38.

Foale, S., Cohen, P., Januchowski-Hartley, S., Wenger, A. & Macintyre, M. 2011. Tenure and taboos: origins and implications for fisheries in the Pacific. *Fish and Fisheries*, 12(4): 357–369. doi.org/10.1111/j.1467-2979.2010.00395.x

Gereffi, G; & Fernandez-Stark, K. 2016. *Global Value Chain Analysis: A Primer, 2nd Edition*. Retrieved

Grindle, M.S. 2007. Good enough governance revisited. *Development Policy Review*, 25(5): 553–574.

Grindle, M.S. 2016. Good governance, R.I.P.: a critique and an alternative. *Governance*, 30(1): 17–22.

Hilborn, R., Buratti, C.C., Díaz Acuña, E., Hively, D., Kolding, J., Kurota, H., Baker, N. *et al.* 2022. Recent trends in abundance and fishing pressure of agency-assessed small pelagic fish stocks. *Fish and Fisheries*, 23: 1313–1331. doi.org/10.1111/faf.12690

HLPE-FSN (High Level Panel of Experts on Food Security and Nutrition). 2020. *Food security and nutrition: building a global narrative towards 2030. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security*. Rome, FAO.

Jentoft, S. 2007. Limits of governability: Institutional implications for fisheries and coastal governance. *Marine Policy*, 31: 360–370.

Jentoft, S. & Bavinck, M. 2014. Interactive governance for sustainable fisheries: dealing with legal pluralism. *Current Opinion in Environmental Sustainability*, 11: 71–77.

Jentoft, S. & Bavinck, M. 2019. Reconciling human rights and customary law – legal pluralism in the governance of small-scale fisheries. *Journal of Legal Pluralism and Unofficial Law*, 51(3): 271–291.

Jentoft, S. & Chuenpagdee, R. 2009. Fisheries and coastal governance as a wicked problem, *Marine Policy*, 33(4): 553–560.

Johannes, R.E. 1978. Traditional Marine Conservation Methods in Oceania and their Demise. *Annual Review of Ecology and Systematics*, 9: 349–364.

Koehn, J.Z., Allison, E.H., Villeda, K., Chen, Z., Nixon, M., Crigler, E., Zhao, L. *et al.* 2022. Fishing for health: Do the world's national policies for fisheries and aquaculture align with those for nutrition? *Fish and Fisheries*, 23: 125–142. doi.org/10.1111/faf.12603

Kolding, J., van Zwieten, P.A.M., Marttin, F. & Poulain, F. 2016. *Fisheries in the Drylands of Sub-Saharan Africa – "Fish come with the rains". Building resilience for fisheries-dependent livelihoods to enhance food security and nutrition in the drylands*. FAO Fisheries and Aquaculture Circular, FIPI/FIRF/C1118, 52 pp. Rome, FAO.

Kolding, J., van Zwieten, P.A.M and Mosepele, K. 2016. "Where there is water there is fish" – Small-scale inland fisheries in Africa: dynamics and importance. Chapter 18 In Tvedt, T. & Oestigaard, T. (eds.). *A History of Water,* Series 3, Volume 3. Water and Food: From hunter-gatherers to global production in Africa. I.B. Tauris, London.

Kooiman, J. 2003. *Governing as governance*. London, Sage Publications.

Kooiman, J. & Jentoft, S. 2005. Hard Choices and Values. In: J. Kooiman, S. Jentoft, R. Pullin, & M. Bavinck, eds. *Fish for Life: Interactive Governance for Fisheries* (pp. 285 –300). Amsterdam, Amsterdam University Press.

Kooiman, J., Bavinck, M., Jentoft, S. & Pullin, R., eds. 2005. *Fish for Life – interactive governance for fisheries*. MARE Publication Series. Amsterdam, Amsterdam University Press.

Mahon, R. & McConney, P. 2004. Managing the managers: improving the structure and operation of small fisheries departments, especially in SIDS. *Ocean & Coastal Management*, 37(9-10): 529–535. doi.org/10.1016/j.ocecoaman.2004.09.001.

Malasha, I. 2003. The emergence of colonial and post-colonial fisheries regulations: the case of Zambia and Zimbabwe. In: E. Jul-Larsen, J. Kolding, R. Overå, J. Raakjær Nielsen & and P.A.M. van Zwieten, eds. *Management, Co-management or No-management? Major dilemmas in southern African freshwater fisheries* (pp. 253–266). Rome, FAO.

Misund, O.A., Kolding, J. & Fréon, P. 2002. Fish capture devices in industrial and artisanal fisheries and their influence on management. In: P.J.B. Hart & J.D. Reynolds, eds. *Handbook of Fish Biology and Fisheries* (pp. 13–36). Vol. II. London, Blackwell Science.

Pomeroy, R.S. & Berkes, F. 1997. Two to tango: The role of government in fisheries co-management, *Marine Policy*, 21(5): 465–480.

Pomeroy, R.S. & Rivera-Guieb, R. 2006. *Fishery co-management: a practical handbook*. Wallingford, UK, CABI Publishing.

Rittel, H.W.J. & Webber, M.M. 1973. Dilemmas in a general theory of planning. *Policy Sciences*, 4: 155–169.

Schut, T., Nooteboom, G. & Kutanegara, P.M. Forthcoming. Policy Blind Spots And The Contested Nature Of Small, Low-Cost Fish Consumption In Indonesia. *Development and Change.*

Steenbergen, D.J. 2016. Strategic Customary Village Leadership in the Context of Marine Conservation and Development in Southeast Maluku, Indonesia. *Human Ecology*, 44(3): 311–327.

Stephenson, P. 2013. Twenty years of multi-level governance: 'Where Does It Come From? What Is It? Where Is It Going?'. *Journal of European Public Policy*, 20(6): 817–837.

Subramanian, K., Bavinck, M., Scholtens, J., Hapke, H.M. & Jyotishi, A. 2022. How Seafood Wholesale Markets Matter for Urban Food Security: Evidence from Chennai, India. *European Journal of Development Research*, 12: 1-23.

Thiao, D. & Bunting, S.W. 2022. *Socio-economic and biological impacts of the fish-based feed industry for sub-Saharan Africa*. FAO Fisheries and Aquaculture Circular No. 1236. Rome, FAO, Penang, Malaysia, Worldfish and University of Greenwich, Natural Resources Institute. doi.org/10.4060/cb7990en

Trienekens, J.H. 1999. *Management of Processes in Chains: A Research Framework*. Wageningen, Kingdom of the Netherlands, Wageningen University. Thesis.

UNSDG (United Nations Sustainable Development Group). 2003. *The Human Rights Based Approach to Development Cooperation Towards a Common Understanding Among UN Agencies*. New York, USA, UNSDG.

Watson, R., Nichols, R., Lam, V.W.Y. & Sumaila, U.R. 2017. Global seafood trade flows and developing economies: Insights from linking trade and production. *Marine Policy*, 82: 41–49. doi.org/10.1016/j.marpol.2017.04.017

World Bank. 2017. *The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries*. Environment and Sustainable Development series. Washington, D.C., World Bank.

World Trade Organization. 2023. https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact1_e.htm (retrieved: May 7, 2023)

Zhou, S., Kolding, J., Garcia, S., Plank, M., Bundy, A., Charles, A., Hansen, C. *et al.* 2019. Balanced harvest: concept, policies, evidence, and management implications. *Reviews in Fish Biology and Fisheries*, 29: 711–733. doi.org/10.1007/s11160-019-09568