

## Chapter 10

# Conclusion

Fishing has great potential to boost growth, employment and food security for a number of LDCs with inland and coastal fish resources. Fishing improves export competitiveness and contributes to efforts to diversify, provided that the supply-side and demand-side constraints facing the sector in LDCs are effectively addressed. Of the top 16 producers of inland waters captures in 2003–2012, six were LDCs, namely Myanmar, Bangladesh, Cambodia, Uganda, the United Republic of Tanzania and the Democratic Republic of the Congo, in declining order by capture size (FAO, 2016). Myanmar was also among the top 10 producers of marine captures in the same period. Despite this potential, the share of LDCs in global fishery exports remains negligible, while other developing countries have substantially increased their share in such exports since the 1980s.

Sustainably tapping the potential role of the fishery sector in the socioeconomic development of LDCs requires effectively addressing supply-side and demand-side constraints. In particular, it requires LDCs and their development partners to view the fishery sector from economic, social and environmental perspectives. In this regard, the full and effective implementation of the 2030 Agenda for Sustainable Development, in particular Sustainable Development Goal 14, should be given particular significance. LDCs have preferential market access in major fish-importing markets, such as the European Union. However, they are unable to capitalize on this market access due to the fact that international standards, in particular those related to food quality and safety, including sanitary and phytosanitary standards, are not always met. These standards are the most significant barrier undermining the realization of the export potential of the fishery sector in LDCs. If international standards are harmonized and simplified, and national and regional standards are aligned with internationally agreed standards, and if LDCs receive robust targeted technical and financial support to build their capabilities to meet the standards, there is considerable scope for many LDCs to become successful exporters of fishery products.

The fishing industry has become increasingly globalized. Non-LDC developing countries have become the largest exporters, with China and Viet Nam among the top exporting countries, and developing countries as a group accounting for about two thirds of exports. Moreover, as in manufacturing, fishing is increasingly subject to fragmentation of production, with non-LDC developing countries, such as China in particular, importing raw fish and re-exporting after processing. A confluence of factors have contributed to the growth of trade in fresh and processed fish, including the following: advances in transportation, handling and storage technologies that can manage the perishability of fish; rising demand in developed countries; the need to rebuild depleted fish stocks in developed country waters; the abundance of fish resources in many tropical or subtropical regions; and the competitive advantage provided by low-cost labour in this labour-intensive industry. The share of LDCs in world exports is low but is growing rapidly, and could accelerate with improved management.

As in other industries, fisheries in LDCs are mostly informal and less organized, and raising productivity is required for international competitiveness. Fishing faces the additional imperative of maintaining resource sustainability (World Bank and FAO, 2009). Controlling overfishing is a major problem for countries and particularly daunting for LDC fishery administrations with limited administrative capacities and funding. This study has examined how LDCs have faced this dual challenge of boosting productivity and sustainability.

The capacity of LDCs to monitor and fully benefit from fishing licence agreements is severely limited. This is linked to deficient human resources-related, institutional and regulatory capacities in LDCs in negotiating the terms and conditions of agreements with countries dominating the fishing industry. In most instances, the amount of fees received by some LDCs and small island developing States from fishing agreements is too low to contribute to the socioeconomic development of these countries, when compared with the market value of fish. In addition, the extent of fishing and the types or species that are captured by major fleets under fishing agreements are not fully known or documented. These problems show the need to build the capacities of LDCs and small island developing States to negotiate the terms and conditions of fishing agreements, including fees, in order for such agreements to promote their sustainable development objectives.

Furthermore, trade and production-distorting fishery subsidies negatively affect the trade and development potential of fishery sectors in LDCs. In this context, the LDC Group has submitted to WTO its position regarding fishery subsidies disciplines (WTO, 2016). While LDCs are exempt from subsidy-reduction commitments contained in the WTO Agreement on Agriculture, their capacity to provide export or production-distorting fishery subsidies is limited due to financial constraints. LDCs are directly affected by the incentives created by cost-reducing subsidies, particularly those granted to large-scale industrial fishing. Hugely subsidized fishery exports from developed and more advanced developing countries distort markets for fishery exports from LDCs, rendering them uncompetitive. Lucrative subsidies have also led to overcapacity and overfishing, undermining food security and development prospects in LDCs. Therefore, it is in the interest of LDCs to discipline fishery subsidies through multilateral trade agreements. Such efforts should focus on subsidies that are granted to fishing vessels or fishing activities, which negatively impact fish stocks that are overfished; provided to vessels or operators engaged in IUU fishing, with prohibitions also applying to illegal trans-shipment at sea; and related to capital and operational costs, which contribute to overcapacity and overfishing.

The six LDCs examined in this study differ in the nature and level of development of their fishing industries, as shown in table 21.

**Table 21. Fish production, markets and key constraints, selected countries**

Country	Production source	Largest export market	Potential growth areas	Key constraints
<b>Bangladesh</b>	Marine: 588 988 tons Freshwater: 2 821 266 tons Aquaculture: 1 859 808 tons	European Union (\$341.8 million)	Increase exports by linking artisanal fishers to global value chains Market diversification within and outside region	Basic infrastructure, including landing and transportation Harmful fishing practices Linking small-scale fisheries to market segments
<b>Cambodia</b>	Marine: 111 468 tons Freshwater: 528 000 tons Aquaculture: 90 000 tons	China (\$507,098)	Aquaculture Market diversification outside region	Basic infrastructure, including landing and transportation Harmful fishing practices IUU fishing Processing capacity Meeting international standards
<b>Comoros</b>	Informal industry: Catches are small and not reliably recorded	None Fees received from fishing licence agreements with the European Union	Marine catches and onshore processing of fish caught under international agreements	Basic infrastructure Meeting international standards Institutional oversight of industry Balancing receipt of fees in licence agreements with fish stock captured
<b>Mozambique</b>	Marine: 222,101 tons Freshwater: Approximately 68,215 tons Aquaculture: 721 tons	European Union (\$38.0 million)	Aquaculture (freshwater: 2 million tons; marine: 800,000 tons) Market diversification	Basic infrastructure Meeting international standards in aquaculture Institutional and regulatory framework Access to credit for artisanal fishers
<b>Myanmar</b>	Marine: Approximately 2,854,200 tons Freshwater: Approximately 1,463,120 tons Aquaculture: 999,630 tons	China (\$169.7 million)	Aquaculture (many wild-catch areas at risk of overfishing) Market diversification outside region	Basic infrastructure, especially energy Meeting private or industry standards in major markets Overfishing and environmental risks Lack of research and development institutions with a focus on fisheries
<b>Uganda</b>	Marine: None Freshwater: 517,312 tons Aquaculture: 117,000 tons	European Union (\$77.2 million)	Aquaculture Market diversification outside region	Basic infrastructure, especially transport and energy) Meeting international standards in aquaculture Overfishing and management of fish stocks on lakes that are shared resources

The Comoros mostly has maritime capture fisheries, Uganda has access to freshwater fish in Lake Victoria and other lakes and Bangladesh, Cambodia, Mozambique and Myanmar have both maritime and inland fisheries. All of these countries feature both industrial and artisanal fishing, yet the relative significance of the two categories differs. Bangladesh, Mozambique and Uganda have well developed or emerging, dynamic domestic industrial fishing sectors that are certified to export to the European Union. Cambodia has emerged as an exporter to Japan and the United States following reforms since 2000, but does not yet fully comply with European Union norms. Bangladesh, Cambodia, Mozambique and Uganda have begun aquaculture production. Domestic fishing in the Comoros is overwhelmingly artisanal, with industrial fishing carried out by foreign vessels.

Some broad policy recommendations applicable to all six countries are provided in the following section.

## Overall recommendations

Fishing requires a favourable policy and institutional environment to prosper. Following periods of civil war, Mozambique, Uganda and Cambodia all saw improvements in their fishing industries. Similarly, improved political stability in the Comoros is propitious for upgrading domestic fishing. The lifting of sanctions on exports from Myanmar provides a boost for the national fishing sector. Beyond basic political and macroeconomic stability, productivity and competitiveness in exports depend on a developmental state that invests in infrastructure and assists the private sector rather than predated on it.

A general principle of industrial policy, applicable to the fishing industry as elsewhere, is that countries should be proactive in assisting the private sector but focus on areas in which they have comparative advantage (Stiglitz et al., 2013). Governments should accurately assess current capabilities and weaknesses and attempt to provide assistance that will enable progressive upgrading into higher technology sectors. Moreover, Governments should focus attention on providing public goods and leave investment in commercial activities to the private sector, as to do otherwise invites costly failures.

In particular, Governments should view fishery sectors from economic, social and environmental perspectives, as fisheries provide employment, export opportunities and incomes in several LDCs, yet face the challenges of environmental degradation, including water pollution and overfishing. Policies should balance income and employment growth with environmental sustainability in the fishing industry. There is a complex relationship between productivity and sustainability. Under some conditions, improving the efficiency of domestic industry may be complementary to sustainable resource use,

including the increasing capture of fish when stocks are not in danger of overexploitation; increasing domestic capture at the expense of foreign fishing; and increased value added through reduced losses, improved use of by-catches and greater local processing and aquaculture. However, overfishing is a significant problem in many LDCs, as addressed in this study.

Given the common resource nature of fishing, regulatory oversight is essential. Government fishing agencies should monitor fish stocks, control overfishing, conduct research, provide technical assistance in quality control and invest in infrastructure, yet there is often a lack of financial resources and technical expertise to do so. Regional and international cooperation is crucial in many of these areas, in particular the monitoring of fish stocks and oversight of fishing rights. International institutions and non-governmental organizations have an important role to play in many of the areas discussed in the following sections. Similarly, enhanced public–private cooperation is conducive to solving problems. For example, in the late 1990s and the 2000s, cooperation between various stakeholders and donors played a key part in overcoming European Union bans on fish from Bangladesh, Mozambique and Uganda. For some purposes, policy should differentiate between artisanal and industrial fishing, and for the latter, between domestic and foreign vessels. Improved governance of the sector, however, benefits both small and larger fishing operations.

## Providing infrastructure

Public and private investments in basic and specialized infrastructure are required for fishery sectors to reduce costs and enhance competitiveness. Governments should generally provide basic infrastructure, and specialized facilities may be developed mostly by the private sector. Transport and electric power infrastructure is lacking in many LDCs. Poor-quality roads increase transport times, pushing up costs. Electricity is critical, as the cold chain cannot function without reliable power. Governments, donors and industrial fishing companies should work together to upgrade fishing-specific infrastructure, such as landing sites and cold chains, since the adequacy of landing sites affects the ability to satisfy sanitary norms and inadequate cold-storage facilities constrain exports and processing operations. In the Comoros, for example, there are no common refrigeration facilities, one of the reasons for the lack of domestic industrial fishing. The poor quality and high cost of electricity in turn discourages investment in cold storage.

## Improving capacities of Governments

In many LDCs, fishing agencies are underfunded, understaffed and lack adequate technical knowledge. Donors can assist with funding, institutional design and technical assistance. The designation of revenues received from fishing agreements to enhancing domestic policy agencies is a positive development. In the Comoros and Mozambique, nearly half of European Union financial contributions are earmarked to government capacity-building. Local authorities should develop capacity to collect data on the level of fish stocks, production and exports, possibly through partnerships with international organizations, in order to benchmark industry trends for policy purposes. Of the countries profiled in this study, there are reasonably reliable data on production and exports in Bangladesh and Uganda, and these two countries are among the few LDCs, including Mozambique and Myanmar, with approval to export to the European Union.

## Attaining certification for access to developed country markets

Developed countries have established increasingly stringent public and private standards on imports of produce from developing countries, including fish. European Union standards are the most important and most demanding, and require the establishment of a local competent authority to provide oversight of the domestic application of HACCP standards. Only 12 LDCs, including Bangladesh, Mozambique, Myanmar and Uganda, meet European Union norms and have access to European Union markets. Private standards are more restrictive, and few LDCs are able to sell directly to large global retailers, instead selling to wholesale markets to which access is easier, although prices are lower.

Close coordination between local governments and donors and international organizations, as well as between the private and public sectors, is necessary to meet European Union norms, as illustrated by the experiences of Bangladesh, Mozambique and Uganda. These countries have faced intermittent European Union bans, from which they have emerged stronger, with assistance from donors. Meeting European Union norms can be a stimulus to upgrading. Bangladesh and Uganda have overcome and ultimately benefited from European Union bans, while other countries, such as Benin, have not yet fully done so (Houssa and Verpoorten, 2013); the difference can partly be explained by the relative sizes of the countries, as well as the quality of national institutions, combined with the willingness of public and private stakeholders to cooperate. Countries that meet European Union standards can usually also meet the less stringent requirements in other importing countries, such as Japan and the United States.

In the 1980s, FAO assisted the Government of Bangladesh in developing inspection schemes, laws and standards governing the capture and conservation of fish. The European Union played a similar role during the European Union ban on fishery exports from Uganda in 1997–2000. The provision of chemical inspection laboratories is a key requisite for ensuring fish quality. In Bangladesh, Mozambique and Uganda, Governments, together with external donors, invested in laboratory upgrades and employee training to overcome European Union bans. Similarly, the Government of Uganda, together with donors, financed inspection laboratories to overcome a European Union ban. Private firms should also upgrade plant

sanitary facilities, train employees and conduct audits of their facilities. International organizations and donors can inform and assist firms about regulations and technologies. The need to harmonize international standards not only between and among major importing countries but also between public and private standards has become ever more urgent. Finally, solutions should be found to align national and regional standards with internationally agreed standards, either in the context of WTO or through the Codex Alimentarius Commission.

## Monitoring and regulating domestic fishing

Both industrial and artisanal fishing contribute to the depletion of fish stocks, but there are some differences in their management. In both segments, better knowledge of the state of fish stocks is the starting point. The monitoring of fish stocks and surveillance of fishing require resources and capacities lacking in most LDCs. Without good knowledge of local fish stocks, many LDCs are unable to prevent illegal fishing. Domestic governments can oversee fishing close to landing sites, but are generally unable to monitor foreign vessels operating offshore. Global assistance, in particular from the European Union, can play an essential role in maritime fishing, and regional cooperation can be critical in inland fishing. Developing aquaculture sectors can contribute in the long term to easing the pressure on natural fish stocks in many LDCs, although meeting import requirements is complex and challenging.

The control of industrial fishing requires the assertion of sovereignty over national fishing waters, as Namibia has done successfully (Organization for Economic Cooperation and Development, 2012). Prior to independence in 1990, fishing in Namibian waters by foreign vessels under agreements was not well monitored and often illegal. The main fish stocks, hake in particular, were depleted, and fishing yields dropped dramatically. The Government implemented a policy with a focus on rebuilding fish stocks, and quotas were established and carefully monitored and controlled. Authorities prioritized human resources development, development of a regulatory framework and dialogue with stakeholders.

Controlling artisanal fishing is more difficult, both politically and socially, given the sector's role in subsistence employment and income. Governments in most LDCs have legislation protecting against industrial trawling activity, yet laws regulating fishing practices and equipment for artisanal fisheries are also required.

Regional agreements are important for common resources, for example the transboundary Mekong River and Nile perch in Lake Victoria, shared by Kenya, Uganda and the United Republic of Tanzania. Regional collaboration is also necessary to obtain information and formalize the often large amounts of unrecorded cross-border trade in fish products.

Most attempts to control overfishing in LDCs have had little success or have not been fully implemented. For example, the assigning of private property rights through a commercial lot system worsened the situation in Cambodia. Bangladesh, Cambodia and Uganda have recently initiated projects involving the formation of local fishing communities as a means towards controlling overfishing, namely village surveillance communities in Bangladesh, co-management communes in Cambodia and beach management units in Uganda. The goal is to inform the community and local leaders about harmful practices and authorize the local community itself to monitor the fishing practices of its members.

## Transitioning from artisanal to industrial fishing

Transitioning from artisanal to industrial fishing requires the accumulation of human and physical capital. In LDCs with long fishing traditions, such as Cambodia, Mozambique and Myanmar, there are numerous skilled artisanal fishers, but limited or little knowledge of modern fishing and processing technology. In the Comoros, traditional fishing using wood canoes has evolved into artisanal fishing using small, motorized fiberglass boats. Increasing the number and size of motorized boats can boost both productivity and sustainability by enabling them to travel further offshore to where fishing stocks are less threatened, but requires skilled personnel to operate them and investment in building boats. Investment in boats, landing facilities and processing factories, as well as testing laboratories, by domestic entrepreneurs depends on the availability of credit or access to finance. However, financial systems in LDCs are generally relatively unsophisticated and lack the tools to safely generate sufficient credit, and banks may be averse to lending to small artisanal businesses. Artisanal fishers obtain the lowest margins among all stakeholders in typical distribution chains in LDCs, and their ability to repay loans is a source of concern. The development of appropriate credit facilities, along with mechanisms that ensure the repayment of credits, is a problem faced by economic policymakers in LDC. Adequately funded and staffed fishing schools, along with technical assistance from donors, can help raise skill levels.

## Moving up the value chain: Processing and aquaculture

LDCs perform little processing. Bangladesh, Mozambique, Myanmar and Uganda are partial exceptions. Uganda banned exports of unprocessed fish to spur domestic processing, but such measures are unlikely to suffice to attract investment in higher value added activities such as canning, and may be counterproductive if they dissuade exports. With regard to canning and freezing, non-LDC developing countries have an advantage in economies of scale and better know-how and logistics. As LDCs improve their business climates and transition towards industrial fishing, foreign and domestic investment is likely to increase.

Aquaculture, as are capture fisheries, may be either small and artisanal or industrial. Industrial aquaculture is currently beyond the reach of most LDCs. Some LDCs, however, including Bangladesh, Mozambique, Myanmar and Uganda, have been successful in boosting small-scale aquaculture to aid food security and incomes in rural communities. Industrial-scale aquaculture is likely to require foreign participation, given the capital and level of technology and organization involved.

Growth in aquaculture may be facilitated by investment in research institutes, as in Bangladesh and Uganda. Bangladesh is now the world's sixth largest aquaculture producer. The Bangladesh Fisheries Research Institute has successfully developed and disseminated genetically modified strains of fish to suit the local ecology, while simultaneously training small-scale farmers in best practices. The Government of Uganda recently established an aquaculture research institute in a joint-venture partnership with China, and efforts are underway to replicate a model similar to that of the Bangladesh Fisheries Research Institute.

## Selling fishing rights to foreign countries

A number of LDCs receive foreign exchange earnings by leasing out maritime fishing rights, notably to the European Union and Japan. Advantages to LDCs include fees and technical assistance in exchange for fishing rights and disadvantages include the fact that fish are often not processed locally and that the monitoring of compliance with fishing limits is difficult. Agreements with foreign fleets should be carefully negotiated to ensure that the home country receives adequate benefits. The European Union agreement with the Comoros appears fair to both parties, with the Comoros receiving revenues of more than 10 per cent of the value of the fishing rights, along with substantial technical assistance and assistance in monitoring fishing stocks. However, the extent of fishing and the types of fish captured by foreign fleets are not known and it is difficult to precisely determine the advantages to the Comoros. The situation in Mozambique is more complicated, as there are also non-European Union fleets. Furthermore, foreign fleets put pressure on fish stocks in waters demarcated for artisanal fishers, while export earnings from licence agreements are low relative to actual export incomes earned by enterprises. The effective regulation of foreign vessels and the transparency of agreements is indispensable to the sustainable development of the sector. Agreements should also provide incentives for local landing and processing, where economically efficient to do so.

## Improving capacities of LDCs to negotiate and monitor fishing licence agreements

The capacity of LDCs to effectively negotiate and monitor the implementation of fishing licence agreements is low, and LDCs are unable to make full and effective use of their fish resources with regard to fees from such agreements. It is critical to build the capacities of LDCs and small island developing States to negotiate the terms and conditions of fishing agreements, in order that fees received through such agreements contribute to their socioeconomic development. Developed countries should also support LDCs and small island developing States in entering into transparent fishing licence agreements that guarantee fairness with regard to fees based on the market value of fish and take into account the species caught by fishing fleets from countries that dominate the fishing industry.

## Priority actions

The following actions are recommended as the highest priorities in order to attain certification to export to developed countries and boost income and employment in fishing in LDCs. A general theme is the need for the various stakeholders to work together.

1. Institutional capacity-building. LDCs should seek assistance from development partners to develop the capacity of Governments to monitor and regulate fishing sectors. They should also establish technical agencies and fishing-related research and development institutions, not only to meet market requirements but also to ensure sustainable fishing
2. Infrastructure provision, as follows:
  - (a) Electricity. The fishing sector, as many others, cannot function without reliable electric power. Governments should resolve the problem of power outages and excessively costly electricity supply
  - (b) Cold storage. Joint investments by the public and private sectors and donors should target the cold chain, which is crucial due to the perishability of fish
  - (c) Chemical inspection laboratories. For example, in Bangladesh and Uganda, the creation of laboratories for testing fish was a key step in obtaining European Union certification
3. Regional cooperation. Several countries share fishing stocks, in both marine and inland waters. Monitoring, control and surveillance should be coordinated, as carried out increasingly successfully in Kenya, Uganda and the United Republic of Tanzania. Regional organizations such as ASEAN and the Indian Ocean Tuna Commission can play a catalytic role in enforcing international and regional rules and regulations, as well as in controlling IUU fishing
4. Aquaculture. LDCs should endeavour to develop their aquaculture sectors as a method of horizontal diversification and a means to generate employment, domestic consumption (food security) and exports, while contributing to the improved management and sustainability of natural fish stocks in the long term. In the short term, the emergence and expansion

of aquaculture depends on, among others, natural stock levels and the availability of improved varieties or species of fish seeds and fish feeds

5. Community-based approaches. Such approaches to fishing conservation, such as the beach management units in Uganda, should be further explored. Such organizations are best placed to balance the use of fisheries as a source of employment with the need to protect fish stocks
6. Fishing agreements. Donors, non-governmental organizations and LDC Governments should ensure that fishing agreements with developed country fishing fleets are transparent and include fair fees and provisions for capacity-building for local governments and fishers. Such agreements should reflect or take into account the prevailing market value of the fish captured. It is important to build the human, institutional and regulatory capacities of LDCs and small island developing States to negotiate, implement and monitor fishing agreements
7. Fish subsidies. Concrete actions should be taken to discipline production and export-distorting fishery subsidies, as well as subsidies that contribute to overfishing and IUU fishing activities, while ensuring the exemption of LDCs from any reduction commitments that are not consistent with the level of their socioeconomic development
8. Harmonization of standards. There is a need to harmonize national and regional food standards, including private and public standards, and realign them with internationally agreed standards.