



AN OVERVIEW OF THE STATE OF THE GLOBAL FISHERIES WITH AN EMPHASIS ON EASTERN-SOUTHERN AFRICA AND THE INDIAN OCEAN REGION

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An overview of the state of the global fisheries with an emphasis on Eastern-Southern Africa and the Indian Ocean region as of 2018

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Global Fish Production

In 2018, **global fish production was estimated at 179 million tonnes, with a total first-sale value of USD 401 billion**, of which 82 million tonnes [46%], valued at USD 250 billion, came from aquaculture production². Total fish production has seen significant increases in all the continents in the last few decades, except for some ups and downs in Europe and the Americas, mainly due to fluctuations in catches of anchoveta). In contrast, it has almost doubled during the last 20 years in Africa and Asia. **As a result, global capture fisheries production in 2018 reached a record 97 million tonnes (with a first-sale value of USD 151 billion), an increase of 5.4 % from the previous three years' average**. The growth was mainly driven by marine capture fisheries, where production increased from 81.2 million tonnes in 2017 to 84.4 million in 2018. Asia, including China, is the world's largest fish producer, with 59 % of the global production, followed by the Americas (14 %), Europe (10 %), **Africa (7 %)**, and Oceania (1 %).

Indian Ocean

In the Indian Ocean, catches have been increasing steadily since the 1980s, particularly in area 57, the Eastern Indian Ocean, with small pelagic, large pelagic (tunas and billfish), and shrimps driving most of the increase. **The Eastern Indian Ocean shows a steady increase in catches, reaching an all-time high of 7 million tonnes in 2017. In the Western Indian Ocean, total landings increased to 5.3 million tonnes**. However, recent assessments have shown that the main wild shrimp stocks fished in the South-West Indian Ocean, the primary source of export revenue, continue overfishing, prompting the countries concerned to introduce more stringent management measures. **The 2017 assessment estimated that 66.7 % of the assessed stocks in the Western Indian Ocean were fished within biologically sustainable levels, while 33.3 % were at biologically unsustainable levels**.

Fish Consumption

Of the total, 156 million tonnes were used for human consumption, equivalent to an estimated annual supply of 20.5 kg per capita. The remaining 22 million tonnes were destined for non-food uses, mainly to produce fishmeal and fish oil. A growing share of fishmeal and fish oil, estimated at 25–35 %, is made from fish processing by-products, often discarded or used as direct feed, silage, or fertilisers. Other aquatic organisms, including seaweeds and aquatic plants, are the subject of promising experimentation and pilot projects for use in medicine, cosmetics, water treatment, the food industry, and biofuels. **Global food fish consumption increased at an average annual rate of 3.1 % from 1961 to 2017, a rate almost twice that of yearly world population growth (1.6 %) for the same period** and higher than that of all other animal protein

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² Indicatively the global average landing price of captured and farmed fisheries was US\$ 1,56 per kilo and US\$ 3.10 per kilo live-weight respectively. Over the years, catches of major marine species have registered marked variations and fluctuations, among the top-producing countries. Catches of anchoveta made it once again the top species at more than 7.0 million tonnes in 2018. Alaska pollock ranked second with 3.4 million tonnes, while skipjack tuna was third at 3.2 million tonnes.

foods (meat, dairy, milk, etc.), which increased by 2.1 % per year. As a result, per capita food fish consumption grew from 9.0 kg (live weight equivalent) in 1961 to 20.5 kg in 2018, by about 1.5 % per year.

Per caput Fish Consumption

In developed countries, apparent fish per capita consumption increased **from 17.4 kg in 1961 to 26.4 kg in 2007 and gradually declined after reaching 24.4 kg in 2017**. In developing countries, fish consumption significantly increased **from 5.2 kg per capita in 1961 to 19.4 kg in 2017, at an average annual rate of 2.4 %**. Among these, the least developed countries (LDCs) increased their consumption **from 6.1 kg in 1961 to 12.6 kg in 2017, at an average annual rate of 1.3 %**. This rate has increased significantly in the last 20 years, reaching 2.9 % yearly, because of expanding fish production and imports. In low-income food-deficit countries (LIFDCs), mainly in Sub-Saharan Africa, fish consumption increased **from 4.0 kg in 1961 to 9.3 kg in 2017, at a stable annual rate of about 1.5 %**. However, fish consumption in Africa is projected to decline to 6.8 kg by 2025 if appropriate measures are not taken promptly. In 2017, fish consumption accounted for 17 % of the global population's intake of animal proteins and 7 % of all proteins consumed. **Globally, fish provided more than 3.3 billion people with 20 % of their average per capita intake of animal proteins, reaching 50 % or more in some coastal and island countries.**

Fish Trade

Fish and fishery products are the most traded food commodities in the world. **In 2018, 67 million tonnes, or 38 % of total fisheries and aquaculture production, were traded internationally**. In addition, 221 States and territories reported some fish trading activity, exposing about 78 % of fish and fishery products to competition from international trade. **Following a sharp decline in 2015, trade recovered between 2016 and 2018 with an average annual growth rate of 7 % and 5 % in value terms**. Overall, from 1976 to 2018, the value of global fish exports increased from USD 7.8 billion to a peak of USD 164 billion, at an annual growth rate of 8 % in nominal terms and 4 % in real terms (adjusted for inflation). Over the same period, global exports in terms of quantity increased at **an annual growth rate of 3 %, from 17.3 million tonnes**. Exports of fish and fish products represent about 11 % of the export value of agricultural products (excluding forest products). Between 1976 and 2018, developing countries increased their share of international fish trade **from 38 % to 54 % of global export value and 34 % to 60 % of total volumes**. In 2018, the European Union was the largest fish-importing market (34 % in terms of value), followed by the United States of America (14 %) and Japan (9 %). While developed countries still dominate the markets of fish imports, the weight of developing countries as consumers has been steadily increasing. Urbanisation and expansion of the fish-consuming middle class have fuelled demand growth in developing/emerging markets, outpacing developed nations. In 2018, imports of fish and fish products from developing countries represented 31 % of the global total by value and 49 % in quantity, compared with 12 % and 19 %, respectively, in 1976. **Africa is a net importer in volume terms but a net exporter in value**. African fish imports, mainly affordable small pelagic and farmed tilapia, represent an essential source of nutrition, especially for populations that are otherwise dependent on a narrow range of staple foods.

Inland Fish Production

In 2018, catches from inland fisheries were at their highest at 12.0 million tonnes. Asia has accounted for two-thirds of global inland production since the mid-2000s. **Inland catches are also crucial for food security in Africa, which accounts for 25 % of global inland catches**, while the combined catches for Europe and the Americas account for 9 %.

Aquaculture Production

In 2018, **world aquaculture fish production reached 82.1 million tonnes³**. Aquaculture fish production was dominated by finfish (54.3 million tonnes: 47 million tonnes from inland aquaculture and 7.3 million tonnes from marine and coastal aquaculture), molluscs, mainly bivalves (17.7 million tonnes), and crustaceans (9.4 million tonnes). The contribution of world aquaculture to global fish production reached 46.0 % in 2018, up from 25.7 % in 2000. At the regional level, **aquaculture accounted for 17.9 % of total fish production in Africa**, 17.0 % in Europe, 15.7 % in the Americas, and 12.7 % in Oceania. The share of aquaculture in Asian fish production, including China, reached 36.6 %. Inland aquaculture produced most farmed fish (51.3 million tonnes, or 62.5 % of the world's total), mainly freshwater, compared with 57.7 % in 2000. The share of finfish production decreased gradually from 97.2 % in 2000 to 91.5 % (47 million tonnes) in 2018, while production of other species groups increased, mainly through freshwater crustacean farming in Asia, including shrimps, crayfish, and crabs.

Fishing Labour

In 2018, an estimated 59.51 million people were engaged (on a full-time, part-time, or occasional basis) in the fisheries sector, capture fisheries (39.0 million people), and aquaculture (20.5 million people), a slight increase from 2016. Women accounted for 14 % of the total, with 19 % in aquaculture and 12 % in capture fisheries. Most of those engaged in primary production are in developing countries, and most are small-scale, artisanal fishers and aquaculture workers. **The highest numbers of workers are in Asia (85 %), followed by Africa (9 %), the Americas (4 %), and Europe and Oceania (1 % each)**. When post-harvest operations data are included, one in two workers in the sector is a woman.

Fishing Assets

In 2018, the total number of fishing vessels, from small undecked and non-motorised boats to large industrial vessels, was estimated at 4.56 million, a 2.8 % decrease from 2016. Between 2013 and 2018, China's fleet was reduced by almost 20 %, from 1 071 000 vessels to 864 000 vessels. Despite declining vessels, Asia still had the largest fishing fleet, estimated at 3.1 million, or 68 % of the total, in 2018. **Africa's vessels represented 20 % of the global fleet**, while America had a 10 % share. The fleet size in Europe represented about 2 % of the worldwide fleet, despite the significance of fishing in the region. The global total of motorised vessels remained steady at 2.86 million, or 63 % of the total fleet. This stability masks regional trends, including decreases since 2000 in Europe and 2013 in China due to reducing fleet sizes. **Asia had almost 75 % (2.1 million vessels) of the reported motorised fleet in 2018, followed by Africa with 280 000 motorised vessels. The most significant number of non-motorised vessels was in**

³ The figure does not include 32.4 million tonnes of aquatic algae and 26,000 tonnes of ornamental seashells and pearls, bringing the total to all time high of 114.5 million tonnes.

Asia (947 000), followed by Africa (just over 643 000), with smaller numbers in Latin America and the Caribbean, Oceania, North America, and Europe.

About 82 % of the world's motorised fishing vessels (2.35 million) were in the LOA class of less than 12 m, most of which were undecked. On the other hand, only about 3 % of all motorised fishing vessels were 24 m and larger (roughly more than 100 GRT), and the proportion of these large boats was highest in Oceania, Europe, and North America. FAO estimated about 67,800 fishing vessels with LOA of at least 24 m worldwide. At the same time, the fleet statistics by size classification are underreported by some countries having the most extensive fleets.

State of Marine Fisheries Resources

Based on FAO's long-term monitoring of assessed marine fish stocks, marine fishery resources have declined. **The proportion of fish stocks within biologically sustainable levels decreased from 90 % in 1974 to 65.8 % in 2017, with 59.6 % classified as** maximally sustainably fished stocks and 6.2 % underfished stocks. **During the same period, the percentage of stocks fished at biologically unsustainable levels increased from 10 % to 34.2 %.** This rising trend warrants further effort and concrete actions to combat overfishing⁴ and unethical fishing practices. It also highlights an urgent need to operationalise informed policies and management measures considering the socio-ecological realities of specific fisheries. **A recent study has estimated that rebuilding overfished stocks to the biomass that enables them to deliver MSY could increase fisheries production by 16.5 million tonnes and annual rent by US\$32 billion⁵ while improving marine biodiversity and ecosystems.** It also indicated that the global fishing capacity needs to be cut by 36–43% from the 2008 level, resulting in the loss of employment of 12–15 million fishers and costing US\$96–358 billion for buybacks. However, this study has been overturned by other more realistic reform strategies and projections.

Prospects and Challenges for fisheries reforms

Many of the world's fish stocks are depleted due to overexploitation, land-based and marine pollution, biodiversity degradation, and climate change. The 2002 World Summit on Sustainable Development (WSSD) targets maintaining or restoring fish stocks to maximum sustainable yield (MSY) by 2015. However, these indicators show that the overall conditions of global fisheries are declining, long-term benefits are being compromised, and pressures on fisheries are increasing despite fisheries policy and management actions being taken by coastal States. Moreover, the short and long terms economics of fishery reforms have hindered the rebuilding of fish stocks. Thus, there is a pressing need to integrate rebuilding plans into national political and economic decision-making. As a result, it is most unlikely that Sustainable Development Goal 14, mainly the target 14.4 – End overfishing and marine fisheries by 2020, will be achieved. To do so will require more time and:

- i) *Stronger political will and commitments, especially at the national level*

⁴ Overfishing: stock abundance fished to below the level that can produce maximum sustainable yield (MSY) – not only causes negative impacts on biodiversity and ecosystem functioning, but also reduces fish production, which subsequently leads to negative social and economic consequences. Generally, well-managed fisheries have seen decreases in average fishing pressure and increases in average stock biomass to maintain biologically sustainable levels and reverse is the case for poorly managed fisheries.

⁵ Ye Y et al – FAO 2012 Rebuilding global fisheries: The World Summit Goal, costs, and benefits.

- ii) Enhanced institutional and governance capacity, technology transfer, and capacity building in science-based best management practices;*
- iii) Controlling fishing capacity and intensity at levels that do not impair resource productivity;*
- iv) Transformation of consumers' perceptions through market mechanisms and education;*
- v) strengthening the global monitoring system to provide transparent and timely information to the public.*

The United Nations General Assembly has declared 2022 the International Year of Artisanal Fisheries and Aquaculture (IYAFA 2022). FAO is the lead agency for celebrating the year in collaboration with other relevant organisations and bodies of the United Nations system. It is a recognition of the millions of small-scale fishers, fish farmers, and fish workers who provide healthy and nutritious food to billions of people and contribute to the improvement of the livelihoods and well-being of millions of people living mostly in developing countries and the need of sustainable, integrated, and responsible management to support healthy aquatic ecosystems.

Political Economy of capture fisheries

Marine fisheries are biologically renewable resources that can be continuously exploited at a certain level without adverse effects on the stock. Beyond that point, putting more boats and nets in the water will not increase the catch; the opposite will likely occur if stocks become depleted. Economically, the consequences of over-exploitation involve the misuse of limited capital resources and the dissipation of resource rents available to society. Socially, the consequences include reduced employment opportunities, lowered incomes, and a likely reduction in the supply of fish to local consumers. A central problem of fisheries management is the absence of property rights limiting access to the resource. The free movement of people into fishing is possible because of the lack of property rights governing access to the resource. Fish is an open-access resource, freely available to anyone who can catch them. Easy entry into fishing is made possible by the relatively low capital requirements to purchase a small used boat and simple fishing gear.

Open Access and Informal Economy

In many tropical developing countries, the fisheries sector has always been seen as a safety net or an employer of last resort, absorbing surplus labour from other sectors of the national economy. The problem is that, as pressures on the resource increase, fishing becomes a competitive scramble that often leads to over-exploitation and the concentration of fishing power into the hands of relatively few people. As a result, official fish stock estimates are inaccurate /unreliable and misleading. As guides to policy, these estimates are dangerous as they encourage a continued emphasis on production-oriented development/expansionist programmes. These programmes threaten to increase overinvestments and overfishing without adequate resource management capacity.

Moreover, overly optimistic assessments of resource potentials mask the fact that governments must pay greater attention to resource management if development efforts are biologically sustainable. The reality is that marine and inland fisheries resources in the EA-SA-IO region are unevenly exploited. Generally, shallow near-shore fisheries, especially those close to major population centres (and hence markets), are heavily exploited and offer limited potential for expanded harvests. Areas with the potential for increased production are probably in deeper

waters or sparsely populated areas, where local markets have limited capacity to absorb the increased supply. Harvesting these resources for the urban markets will be possible only by improving the basic socio-economic infrastructures and market logistics.

Misguided policy

The political economy objectives such as poverty reduction, food security, export earnings and wealth creation are nicely suited to fisheries policy, where competition over scarce resources becomes part of the globalisation recipes. Thus, formulating fisheries policy is a balancing act among competing goals - resource management and development expansion. The national fisheries agency is responsible for both management and development activities. However, from the perspectives of the available human and financial capacities, the emphasis is primarily on administration development activities that aim to increase production.

Before the mid-1960s, small-scale fishers were the only ones exploiting fisheries in developing countries worldwide, most of whom used sail or paddle-powered boats and simple fishing gear. Most fishers in the EA-SA-IO region still fit this rudimentary description (about 80% of all fishing boats are non-motorised). However, technological evolution has transformed the fishing industry into a dualistic one over the past decades, where small-scale producers have been progressively marginalised by introducing large-scale, capital-intensive fishing units such as long liners, trawlers, and purse seiners.

Rebuilding small-scale fisheries

Adopting a holistic and integrated approach to rebuilding fisheries is critical against international hard and soft commitments, domestic needs, and competing social, biological, and economic goals. Rehabilitation of depleted fisheries and maintaining sustainable fish stocks is the central objective of fisheries management. Besides fishing practices, several external anthropogenic and environmental stressors - confounding factors - such as land-based and marine pollution, climate change pathways, and extreme weather events interact with the fisheries ecosystems and fish production. Moreover, these must be taken into consideration to ensure effective fishery reforms. Coveted by strong political will, the economics of Rebuilding⁶ small-scale subsistence and artisanal Fisheries entails an interdisciplinary analysis and discussion of critical economic, social, and institutional issues associated with formulating and operationalising fisheries reforms strategies and plans. These targets are like those concerned with fisheries management. However, specific fishery reforms or rehabilitation factors are complex and sensitive from the political economy perspective. For example, in several cases, there is a disconnect or lack of trust between the regulators and the fishing communities when a stock collapse undermines collaborative efforts for credible and effective fisheries rebuilding.

Lack of reliable or adequate fisheries data.

According to the FAO, the catch data in developing countries are underestimated by at least 30 %. This fact was also highlighted by a global catch re-assessment study undertaken by the Ocean

⁶ A distinction can be drawn between fish stock rebuilding and rebuilding fisheries; the former is focussed exclusively on the species and its habitat [bio-ecological aspects], while the latter would extend to the fishery value chains and consider the human dimension as well, thus necessitating a socio-economic component to rebuilding.

Around Us British-Columbia University Ocean Around Us. The post-harvest physical and economic losses in developing countries small-scale fisheries, particularly in Sub-Saharan Africa, vary between 40% and 70 %. There is room for intelligent fisheries reforms without creating additional hardship for fisher and fish worker communities. Overfishing can be partly resolved by improving fish and fishery product value chains and market development and supporting alternative sustainable livelihoods at the grassroots level. The global average economic rent value per tonne of fish harvested is estimated at US\$ 625 per tonne, dissipating due to policy and management failures. On top of it, developed economies provide subsidies of US\$ 40 billion per year to their industrial fishing fleets.

Informed policymaking and management decision

Fisheries rebuilding should be based on a sound analysis of various rebuilding options' biological and economic impacts and risks and the clear and transparent communication of the associated uncertainty. Therefore, multi-stakeholder consultation and participation are essential in formulating and implementing fishery rehabilitation strategies and plans. The information and detail required to develop robust rebuilding plans should be identified. Experience learnings and good practices on socio-ecological and policy challenges from similar initiatives and expected outcomes of the contemplated reform plan must be shared with key stakeholders. The implications of the lack of critical fisheries and socio-economic data; the potential impacts of IUU fishing, including institutional overfishing, i.e., non-application of existing harvest rules and post-harvest physical and economic losses, as well as the inadequacy of the operational capacities of the fisheries management agencies must be examined. In other words, close collaboration among stakeholders and government authorities is necessary to successfully rebuild fisheries and ensure the best available information is utilised cautiously. As a result, all participants in fishery rebuilding are effectively involved, and the economic benefits are shared equitably.

Status of the EA-SA-IO Marine Fisheries

The African continent has outperformed several global economic indicators over the past decade but is still plagued by endemic poverty and food insecurity. The public health and economic impacts of the COVID-19 pandemic have exacerbated the situation. Africa has abundant fish resources in its oceans, lakes, rivers, floodplains, and fish farms but accounts for approximately 5% of the global fish trade. ***Africa produced nearly 12 million tonnes of fish 2017, representing 7 % of the worldwide catch of 173 million tonnes.*** This figure comprises 3.0 million tonnes from inland fisheries, 2.2 million tonnes from aquaculture and 6.7 million tonnes from marine capture fisheries. Over the same period, the African continent contributed about 3.4 % to the total value of global fish imports of US\$ 146.3 billion) and 4.6 % to the total value of global fish export of US\$ 156.5 billion ⁷. ***The fisheries sector, both inland and marine, is considered the bedrock of Africa's Blue Economy owing to its significant contribution to sustaining the livelihoods and well-being of the local communities - the poorest of the poor - and the populations at large.*** Despite its potential development, science, policy, and governance have neglected this primary industry. The Blue Economy will disrupt business as

⁷ FAO. 2020. *The State of World Fisheries and Aquaculture 2020. Sustainability in action.* Rome.

usual. It is not doing the same things but doing things differently. Will the fisheries sector be a victim of the Blue Economy or benefits from it. It seems the grass is always greener elsewhere!

By value, Africa was an exporter during 1985–2010 but a net importer since 2011 in quantity terms, reflecting the lower unit value of imports, mainly for small pelagic species. Regional Fish Trade in Africa is constrained by inadequate market and trade infrastructures and insufficient policy and regulatory frameworks. It is aggravated by high transport costs, complex and unaligned trade rules, and imperfect market information. In 2011 the value of the pan-African fish trade was **US\$24 billion, equivalent to 1.26% gross domestic product of all African countries**. The fisheries sector **employs 12.3 million, accounting for 2% of Africa's population between 15 and 64 years old, of whom 27% are women**. The cost of illegal and unregulated fishing in Africa is estimated to be over US\$1 billion annually. In 2014, the per-capita fish on the continent was about 9.7 kg, which is relatively low compared to the global average of 18.9 kg per year. It will decline to 6.8 kg by 2030 if appropriate policy and management measures are implemented to halt overfishing and unsustainable fishing practices exacerbated by environmental degradation, including climate change.

Nearly 100% of the inland and 90% of the marine fisheries resources of the African continent are harnessed by small-scale fishing. The region's two largest inland fisheries are Lake Victoria and Lake Tanganyika. The small-scale fisheries across the African continent are open-access and poorly managed. **The rate of pre-and post-harvest losses in small-scale fisheries is around 40 and 70%, owing to the predominance of poorly regulated open access and informal economy.** The catch of the industrial fisheries in the SWIO basin consists of high-value species such as tuna, shrimp, and lobster, harnessed by multinational enterprises through various fishing licensing arrangements with those coastal states. About 90 % of the marine fish stocks are globally harvested inside the Exclusive Economic Zones of the coastal states. So far, there is no indication of an equitable sharing of value-added and economic opportunities between the coastal states and the foreign fishery enterprises.

Types of Fisheries

Wild fish stocks are public goods, and governments are responsible for managing them sustainably. The fisheries resources can be differentiated into two broad groups: the demersal or sedentary species and pelagic or migratory resources. In the region, marine fisheries are categorised into small-scale and large-scale or industrial sub-sector. In contrast, semi-industrial or extended artisanal fishing is squeezed between the two and considered a continuum within the small-scale environment. The cut-off between small-scale and industrial fishing is often based on policy or management decisions rather than techno-economic factors. The industrial fishing and processing businesses, owned mainly by multinational enterprises, are capital-intensive and export-oriented. About 80 % of the industrial fisheries in the WIO are associated with migratory tuna resources and are predominantly an extension of the EU purse seine fishery and canned tuna value chain.

Resource Misallocation

Economic inequalities are creeping into these small-scale fisheries. Most artisanal fishers are fishing labour. The bulk of the fishing assets is owned by a few fish traders and outside investors/financiers with no direct and long-term interest in sustainable fisheries. The fishers do not earn a

fair income and are pushed to overfishing and unethical fishing practices to benefit the shadow investors. The economic rent or surplus profit from the industry can be a significant revenue stream for governments to fund socio-economic infrastructure, and services in local communities are dissipated. It is left to few hegemony, either hoarded or divested in other economic sectors while leaving the fishing community behind. The above is a textbook example of poor management or misallocation of resources due to policy and governance failures. Besides the lack of essential social overhead capital in the coastal rural areas, the traditional fishing assets and supply-chain logistics are inadequate to capture the value-added from the offshore fisheries – “*the paradox of poverty amid plenty*”. Alternative sustainable livelihood opportunities are also scarce in coastal areas. The fishers and fish workers are trapped in an existential threat which is the cause of the growing disconnect between the local communities and the Governments. The scarcity of sustainability-smart professionals and awareness among the citizens contributes enormously to the existing policy-action trap in the fisheries sector.

Integration and Way Forward

Effective Policies and Governance

Developing intelligent solutions for sustainable marine fisheries and ecosystems requires an integrated and iterative management approach. The sector embeds several international maritime environmental and fisheries conventions⁸ that provide general institutional guidelines for marine fisheries resources and ecosystem conservation management. The FAO Code of Conduct for responsible fisheries 1995 and its associated International Plan of Actions have integrated the Multilateral Environmental Agreements to push for an ecosystem-based management approach in the fisheries. The Integrated Coastal Zone Management concept and the Voluntary Guidelines for Small-Scale Sustainable fisheries further enhance the idea. The developing countries are not short of good fisheries policies but adequate human, technical and financial capacities to implement them effectively.

Diversity and Complexity of the Fisheries Sector

The fisheries sector is highly complex, diverse, and dynamic, and its generalisation does not make sense. It consists of several segments, such as wild and farmed fisheries, small-scale and large-scale fishing, and recreational and ornamental fisheries, complementing and competing in many ways. The sector also shares the common aquatic space with other industries/stakeholders, and it is crucial to understand these socio-ecological interactions. Besides overfishing and unsustainable fishing practices, marine fisheries ecosystems such as coral reef areas, coastal mangrove forests, seagrass meadows, estuaries, and wetlands are also under the threat of land-based and marine pollution and environmental stressors, including climate change and extreme weather events. Over the past decades, marine fisheries management has focused on fisheries resources and environmental conservation management, i.e., the bio-ecological aspects, while overlooking the socio-economic dimension of the fisheries. So, it is time to rethink sustainable fisheries management with human well-being and social equity. Effective regional cooperation

⁸ Including the United Nations Convention of Law of the Sea 1982 which is an overarching and comprehensive instrument for ocean governance; the Multilateral Environment Agreements (Climate Change, Biodiversity, Deforestation & Desertification, and Wetland Management); UN Code of Conduct for Responsible fisheries that includes several international Plans of Action to combat IUU fishing, Port States Measure Agreement and SSF Voluntary Guidelines etc., UN Fish Stocks Agreement 1995...

and collaboration are essential for the sustainable management of shared fish stocks – Straddling and migratory fish resources - and national fisheries of regional interest in market and trade, capacity building and sharing of scientific knowledge, information and best practices capacity building. The FAO and the regional fisheries organisations curated a wealth of scientific and fisheries information accessible for goal-oriented research and development.

Development Potential

The management of small-scale fisheries in the developing countries of the Southern Hemisphere is seen through the lens of the industrial fisheries in the Northern Hemisphere. For instance, the theory of Maximum Sustainable Yield is not feasible in multi-species and multi-gear fisheries in the Tropical and Sub-Tropical regions of the world. Scientific knowledge and adequate fisheries data are scarce, but the local traditional and empirical information has not made its way through the formal fisheries management system. The small-scale fisheries are still considered a social sector that is predominantly open access and informal. In 2000, the sub-sector came under the international community's spotlight for its significant contribution to poverty reduction and food security but not because of its development potential as a sustainable growth engine. Due to the foregone economic benefits from this misguided policy, the regional fisheries are considered a “non-performing asset” by the “sunken billions”. The sustainable rehabilitation and modernisation of small-scale fisheries and other primary industries are strategically essential to Transforming Africa 2063. However, the bio-economic interactions between the small-scale and industrial fisheries are still not adequately documented to inform national fisheries policies from the coastal states' outlook.

Non-food / Hedonic Activities

The economic significance of non-food activities or hedonic value associated with marine fisheries resources and ecosystems should not be underestimated. These include recreational fisheries, ornamental fish value chains, and cultural and eco-tourism in the marine protected areas. They provide a suite of sustainable alternative livelihood opportunities for the fisher households, which is not fully explored. The expansion of the *Marine Protected Areas* has not gained traction in most developing countries as the economics of the mechanism is not well understood from the perspectives of the fishing communities. Most likely, marine protected areas must be revisited because most were created in a silo focusing on biodiversity conservation. At the same time, the looming threat of ocean warning was not considered. Moreover, the conservation strategy must be sorted out whether the emphasis is on a little of everything /a panache of the diverse species or the core species. A Local Sustainable Livelihood Approach (SLA) or circular economy can contribute significantly to economic opportunities by creating positive linkages between small-scale fisheries and other local industries such as recreational fisheries, cultural and eco-tourism, and environmental stewardship.

Sustainable Growth and Shared Prosperity

The capture fisheries are often studied as fishing operations only, whereas the upstream and downstream activities are accounted for in other industries such as “manufacturing” or “commerce”. As a rule of thumb, the value-added and job creation coefficient in the sub-sector is

approximately 2.5⁹, i.e., every US\$ spent in the sector will generate US\$ 2.5 of gross value-added through the forward and backward linkages. In other words, every fisher will create additional two jobs in the economy. So, it is imperative to introduce the value chain and an equitable sharing of value-added in the industry to eliminate the disconnect between the fishing community, governments, and markets. The Blue Economy concept opens a new perspective for economic impact assessment of the marine fisheries by integrating the value-chain approach and including the principle of Natural Wealth and Human Capital Accounting. It also introduces innovative tools such as the Marine Spatial Planning and Blue Carbon Initiative to promote environmental conservation and mitigation of climate change.

Concept of Global Sustainability and Resilience

The scientific knowledge and skills need to be adapted to the local context. Moreover, Economy – Environment – Society is not the three pillars of Sustainable Development¹⁰. Environmental resilience cannot be a trade-off favouring the Economy or Society as it undermines planetary resilience. Policy-wise, Society and Economy must be considered a sub-set of the environment and another way round. Global sustainability requires strong international policy and institutional frameworks – **our global village does not have a strong village council** – and local actions. In a nutshell, global strategies must be flexible and adaptive enough to accommodate local socio-ecological realities. Development should be carried out sustainably based on common ethics and moral standards in daily life. Unfortunately, development has been fragmented into poverty reduction, food and nutrition security, IUU fishing, climate change adaptation, mitigation and resilience, and biodiversity conservation in pursuing sustainable growth. The fragmentation of development issues has made it more difficult for developing countries to mobilise adequate financial resources to undertake sustainable development in an integrative and holistic manner.

Development vs Political Issues

Moreover, political issues such as inequalities can be solved by development actions because it requires strong political will. So, business-as-usual is not likely for those least developed and fragile countries to advance the SDGs. The sustainability professional should be well-trained to systematically avoid the traditional pitfalls of greenwashing, blue-bashing, or ocean-grab in the best interest of developing countries. The development of smart aquaculture remains challenging because of the current sustainable business models. The guiding principle is “**feed no food,**” i.e., food that can be used to feed humans must not be used to feed animals; “**waste no food**”; **convert seagrass into fish food** and use only food waste as animal feed.

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⁹ FAO and NEPAD 2014 – Value of African fisheries

¹⁰ Brundtland Sustainable Development Report 1987 – Our Common Future.