



Building a Sustainable and Resilient Ocean Economy

BACKGROUND NOTE

for the 4th Oceans Forum on
Trade-related Aspects of SDG 14

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by
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Acronyms and abbreviations

ALDFG	abandoned, lost or otherwise discarded fishing gear
CSOs	civil society organizations
COFI	FAO Committee on Fisheries
COVID-19	coronavirus disease
EEZ	exclusive economic zone
FAO	Food and Agriculture Organization of the United Nations
GDP	gross domestic product
IMO	International Maritime Organisation
IUU	illegal, unreported and unregulated fishing
LDCs	Least Developed Countries
MPA	marine protected area
MSMEs	micro, small and medium enterprises
MFN	most-favoured-nation [principle of the WTO]
NTMs	non-tariff measures
NGOs	non-governmental organizations
OECD	Organisation for Economic Co-operation and Development
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
SPS	Sanitary and Phytosanitary [measures]
TBT	Technical Barriers to Trade
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization

Summary

The ocean provides significant social, economic, and environmental benefits to the humanity and the planet. It is central to global food security, contains rich biodiverse habitats, provides invaluable ecosystem services, and absorbs significant amounts of heat and carbon dioxide. It also offers great opportunities for economic growth, employment and development. The ocean economy has been estimated at \$3–6 trillion per year, sustaining at least 150 million direct jobs across a wide range of sectors including fishing, aquaculture, shipping, tourism, offshore wind energy, oil and gas, mining, and marine biotechnology.

Unfortunately, the ocean is under immense pressure from a wide range of unsustainable human activities, both on land and in the sea. These activities pollute the ocean with sewage, mineral and organic contaminants, litter, plastics and agricultural runoffs. Rapid urbanisation of coastal zones further aggravates pollution, habitat loss and pressure on the fragile marine resources and ecosystems. Ineffective fisheries management and illegal, unreported and unregulated (IUU) fishing have resulted in overfishing and the collapse of many fish stocks. Climate change is causing warming, sea-level rise and ocean acidification, all of which exacerbate the strain on many species, habitats and ecosystems.

As a result, the last decades have seen the ocean becoming warmer, more acidic, stormier, higher, more oxygen-depleted, less predictable and less resilient—and neither the problems it is facing nor the wealth it yields are distributed equitably. The situation has deteriorated further since March 2020, when the COVID-19 pandemic swept through continents and countries. The pandemic has caused severe health, social and economic damages worldwide, including to vital ocean economy sectors, many of which were halted or severely disrupted. These disruptions have led to cascading and interrelated impacts, affecting millions of people, in particular the most vulnerable.

Building on the findings and conclusions of the three previous Oceans Fora¹ and other recent high-level international events, this background note analyses current trends and perspectives for sustainable ocean economy, with a specific emphasis on the implications for developing countries, Small Island Developing States (SIDS) and their challenges to meet the SDG 14 targets. It analyses the devastating impacts and implications of COVID-19 on the ocean economy in 2020, but also the opportunities emerging from this tragedy to scale up action based on science and innovation to support the implementation of SDG 14. It focusses on high impact emerging issues and examples for achieving the trade related targets of SDG 14, namely: i) the seaweed sector as a lever for a sustainable ocean economic recovery, ii) transparency, non-tariff measures (NTMs) and fisheries subsidies reform, iii) social sustainability of fisheries and aquaculture value chains, iv) marine litter and plastic pollution, v) maritime transport.

¹ For more details on the 1st to 4th Oceans Fora, see <https://unctad.org/meeting/4th-oceans-forum-trade-related-aspects-sustainable-development-goal-14>.

1. Overview

For many years, the ocean was considered too vast to fail, and its resources so infinite that they can be exploited without worries for the future. It is well recognized that many ocean economy sectors have a great potential for sustainable growth to extract wealth, value addition and create employment (UNCTAD, 2021a). At the same time, they can be an important part of the solution to the humanity's challenges ranging from food security to social and economic development, to environmental protection and mitigation of the impact of climate change.

Unfortunately, the United Nations World Ocean Assessments² reveal that much of the ocean is seriously degraded, with changes and losses in the structure, function and benefits from marine systems. Unsustainable human activity, both on land and in the sea, continue to threaten the ocean's ability to regenerate and sustainably provide goods and services for people around the world. Chemicals, litter and plastics, especially microplastics, continue to pollute the ocean at an alarming rate, with eleven million tons of plastic dumped in the ocean every year. Eighty per cent of global marine pollution comes from agriculture runoff, untreated sewage, discharge of nutrients and pesticides (UN EMG, 2022).

In addition, the impact of multiple stressors on the ocean is projected to increase as the human population grows towards the expected 9.6 billion by 2050. The challenge is particularly overwhelming for developing countries where ocean-based sectors have often expanded without proper governance to duly consider their adverse impact on environmental and social sustainability. Most of these countries are not equipped to handle the challenges before them, in particular SIDS and least developed countries (LDCs) find themselves at the forefront of the negative impacts of climate change and ocean pollution (UNCTAD, 2019a).

Since March 2020, the COVID-19 pandemic has had severe health, social and economic ramifications worldwide, including for the ocean economy. Port and market closures, travel restrictions and supply chain disruptions have interrupted ocean-based industries causing significant income and revenue losses, to marine and coastal tourism, fisheries and aquaculture. As with many crises, it is the most vulnerable groups, such as coastal communities and informal workers, that are hardest hit (UNCTAD, 2022).

For decades, the approaches adopted to address the ocean's challenges were fragmented, focused on disconnected sectoral actions. They privileged either economic performance using an extractive approach of maximizing the resources that can be harvested from the ocean or an environmental protection and full conservation approach that eliminates destruction but significantly limits exploitation. More than ever, the solution is likely in between, using an integrated approach that seeks to achieve effective protection, sustainable production and equitable prosperity. (Stuchtey et al., 2020).

Despite its heavy toll, the pandemic uncovered solutions and ways for rebuilding a more resilient, sustainable and equitable post-COVID world. The pandemic has highlighted the deep interconnections between human and planetary health and the need for nations to work together to respond to global threats. The massive funds mobilized to recover from the COVID contraction should be wisely used to restore economic activity avoiding old patterns of environmental degradation and social inequity, leading to a more sustainable and more resilient future. Building a sustainable ocean economy is one of the most important tasks offering great opportunities of our time. It is critical for achieving the goals of the 2030 Agenda for Sustainable Development, and for emerging from current and future crises with stronger economies, healthier planet and more resilient communities (HLP SOE, 2022).

² For more details, see <https://www.un.org/regularprocess/woa2launch>.

2. State of the ocean economy, challenges and opportunities over the horizon 2030

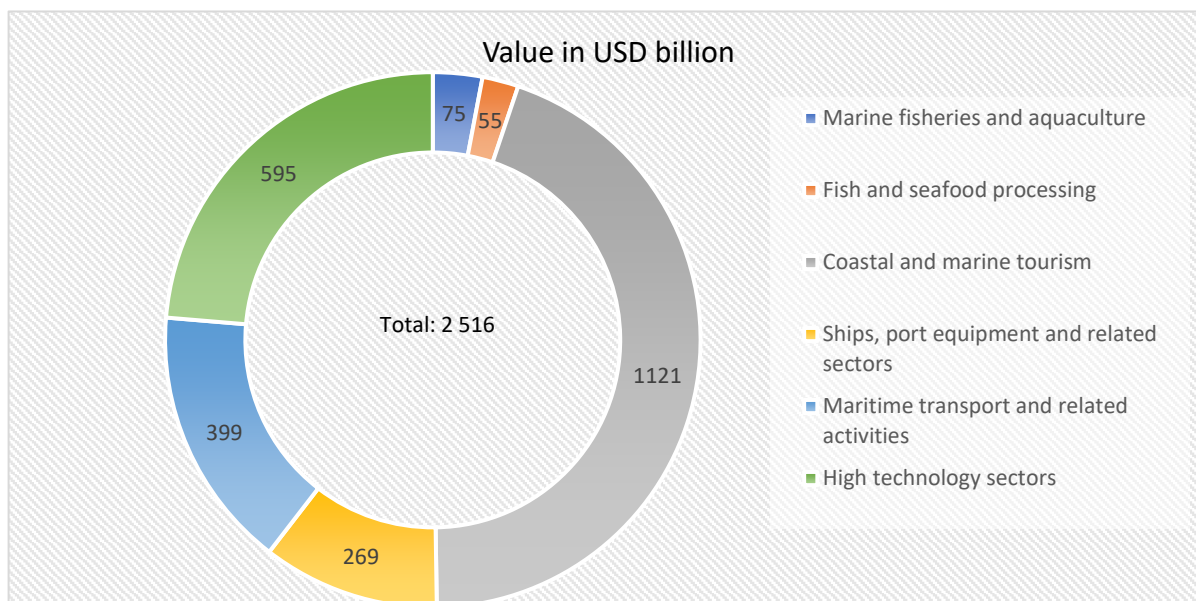
2.1. State of the ocean economy

The ocean provides a diversity of renewable and non-renewable resources that are the intermediate inputs to support a wide range of ocean-based economic activities to produce tradable goods and services. “Sustainable ocean economy”, also referred to as “blue economy”, encompasses economic sectors that sustainably utilize and contribute to the conservation of oceans, seas and coastal resources for the benefit of humanity in a manner that sustains all ocean resources over time (UNCTAD, 2021a). These sectors include traditional marine fisheries, coastal and marine aquaculture, shipbuilding, coastal and marine tourism, and maritime transport. New economic sectors using the ocean have developed over the recent decades, notably based on goods and services related to high technology and innovation. They include for example, renewable energy, marine biotechnologies and bioprospection of molecules and products for the pharmaceutical, cosmetic, feed and food industries (OECD, 2021; UNCTAD, 2021a;2021b). Using the concept of preferable environmental products (EPPs), usually defined as products or services that have a lesser undesirable effect on society and the environment when compared with competing products or services that serve the same purpose, these traditional and emerging sectors are considered to pose a low or moderate environmental risk and should therefore be promoted. Beyond products and services, the ocean also connects cities and countries around the world, driving economic activity and trade.

The mix and importance of ocean economic activities varies from one country to the other, depending on the geography, history, political, social, cultural and economic circumstances and the national vision and policies adopted by each country to reflect its own priorities and interests. However, throughout most continents and countries, there are strong interconnections within the ocean economy sectors and between these sectors and land-based economic activities, especially along the coasts. For example, fish and seafood harvested from the ocean are important for food security of coastal and inland communities, as well as a source of export earnings as the most highly traded food commodity. Disruption to maritime shipping and port services has negative consequences for most sectors including agriculture, textile, energy, health, tourism and many more. A thriving coastal and marine tourism benefits a wide range of sectors such as transportation by air, land and sea, catering and food industry. This connectedness applies not only to what people remove from the sea but also to what they dump into the ocean. It is estimated that over 80 per cent of all global marine pollution originates from land-based activities such as disposal of domestic waste, agriculture and industry (UN EMG, 2022).

Recent studies by UNCTAD (2021a; 2021b) mapped the industries that are part of sustainable ocean economy. The classification builds on existing national and regional ocean classifications and is structured around three categories: goods, services and energy. It includes industries that take place in/on the ocean, goods and services produced by activities based on land but that depend on inputs provided by the ocean, and activities located on land that produce goods and services for ocean-based activities. UNCTAD (2021a) estimates that in 2018 the export value of the ocean economy was \$2 516 billion, with ocean-based goods estimated at \$997 billion, and ocean-based services at \$1 520 billion. The study considers these estimates conservative, the data being incomplete or unavailable for over 40 per cent of ocean industry clusters (Figure 1).

Figure 1. Export values of key ocean economy sectors (UNCTAD, 2021a)



The leading exporters of ocean-based goods remain developed countries from Europe, developing countries from Asia, followed by countries in the Americas (developed and developing). At the country level, trends and patterns are different across subsectors. In most subsectors, an increasing number of countries are trading sustainable ocean-based goods, particularly in less traditional industries such as processed seafood, sport boats, cosmetics and pharmaceuticals using marine ingredients. The level of disaggregation, along with information on market drivers, also reveal that leading countries are venturing into new innovative products and value chains.

A recent report (Stuchtey et al., 2020) reveals that restoring and maintaining the ocean’s health can generate further ocean-based wealth and make the most of the ocean’s resources in a sustainable manner. A shift to a sustainable ocean economy would increase food and energy production without putting extra pressure on marine ecosystems. It is estimated that an investment of \$2.8 trillion today in four sustainable solutions—conservation and restoration of mangroves, decarbonisation of international shipping, sustainable ocean-based food production and offshore wind production—would yield net benefits of \$15.5 trillion by 2050).

2.1.1. State of marine fisheries and aquaculture

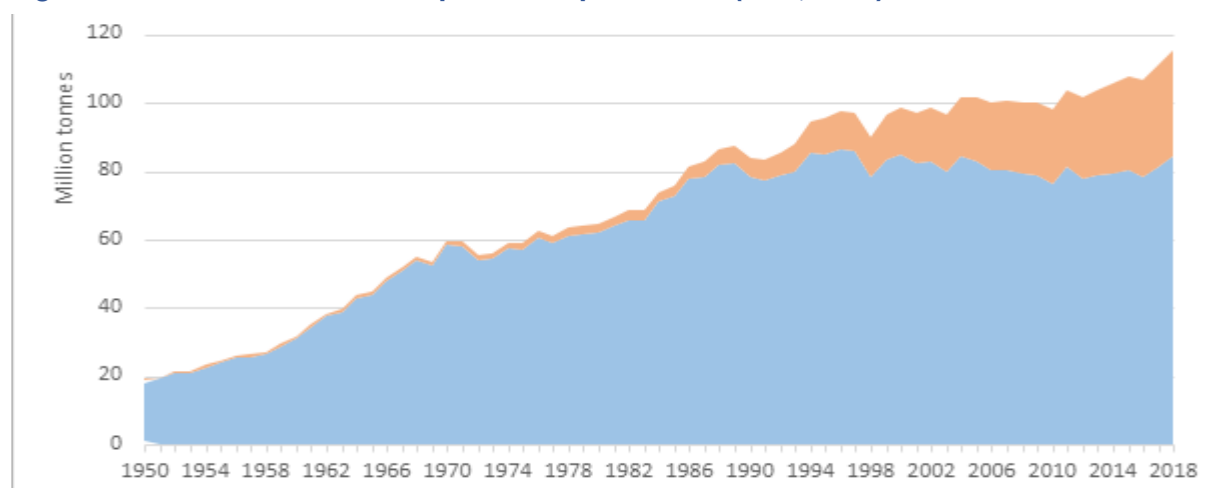
Fisheries and aquaculture make a significant contribution to food and nutrition security, employment, trade, culture, and economic development in the world. Global fish production was estimated at 178 million tons in 2020, supplying 20.4 kg/capita/year of highly nutritious seafood and employing directly around 59 million people. Upstream and downstream activities in capture fisheries, aquaculture, processing, transport, support and logistical services provide additional 200 million employments and many economic benefits, such as value addition and foreign exchange earnings from export to many countries and coastal communities (FAO, 2022). Women represented the majority of workers in secondary activities such as fish processing and distribution.

Around 115 million tons of fish and 34.7 million tons of aquatic plants are harvested from the oceans and seas (Figure 2, Table 1), mainly by small scale operators, who represent around 90 per cent of sea fishers and farmers. As a result, many coastal communities depend on the sector for their livelihoods, food security and income (FAO, 2022). The marine harvest of aquatic products is supplied to resorts, hotels, restaurants, cruise ships and firms that process and export high value species and products to lucrative markets, contributing to value addition and to national foreign exchange reserves.

Whether artisanal or industrial, small or large scale, formal or informal, fisheries and aquaculture operate in an increasingly globalized environment. Fish can be harvested in one country, processed in a second and consumed in a third, reflecting the sector's degree of openness and integration into international trade. Economic benefits of fisheries and aquaculture accrue to coastal countries from the rent extracted from the harvest of marine living resources, onshore value addition and trade. The value of fish harvest from marine fisheries and aquaculture is estimated at over \$277 billion (FAO, 2022).

Fish and seafood are one of the most traded food commodities, supplied in a variety of products and using diverse processes for increasing shelf life and value. A significant share of total fish production estimated at 35 to 38 per cent in live weight equivalent is exported, generating over \$173 billion per year (FAO, 2022). Over 50 per cent of this trade originates in developing countries whose net trade income (export – import), valued at \$46 billion in 2020, is greater than their net trade income of most other agricultural commodities combined (FAO, 2022). In Pacific SIDS, fishing can provide between 30 and 80 per cent of exports– an advantage of the large Exclusive Economic Zones (EEZs) and the economic values they are able to capture from high value fish species such as tuna. Likewise, the share of fish trade flows for some West African countries can represent between 5 to 12 per cent of GDP (UNCTAD, 2019). Fees from fishing licenses are an important source of government revenue and foreign exchange earnings for several developing countries which have agreements with distant water fishing fleet companies.

Figure 2. Marine fisheries and aquaculture production (FAO, 2022)

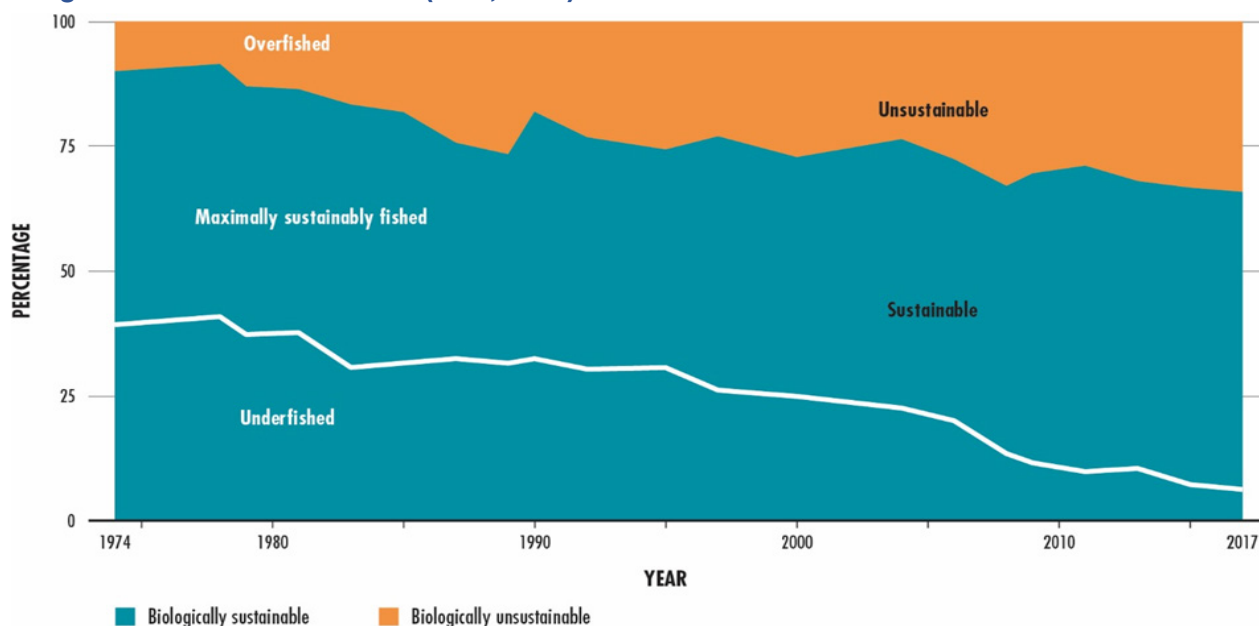


2.1.1.1. Major constraints for marine fisheries and aquaculture

Unfortunately, marine fisheries have suffered from years of overcapacity, overfishing, illegal and unregulated development, pollution and habitat degradation, driven largely by ineffective management policy and lack of enforcement. In many developing countries, in particular SIDS and LDCs, constraining factors include a lack of institutional and human capacity in both the public and private sectors, complexities of inshore fisheries management, post-harvest losses, poorly developed safety regulations for fishing vessels, and underdeveloped national fishing industries for the harvesting and processing of offshore resources.

Based on FAO's analysis of assessed commercial fish stocks, the share of fish stocks within biologically sustainable levels decreased from over 90 per cent in 1974 to 65.9 per cent in 2017, making 34.1 per cent of fish stocks fished at a biologically unsustainable level (figure 3).

Figure 3. State of fish stocks (FAO, 2020)



Fish stocks are further affected by IUU fishing, which accounts for roughly 11–26 million tons of fish catch, or \$10–22 billion in unlawful or undocumented revenue. The World Bank estimates that poor fisheries management results in foregone revenues of more than \$83 billion annually (WB and DESA, 2017).

Since 2002, distorting fisheries subsidies that contribute to overcapacity and overfishing have been the subject of negotiations to establish disciplines at the WTO, where from the outset a positive outcome has been identified as a potential win-win-win for trade, sustainable development, and the environment. In addition, the persistently high volume of post-harvest losses removes large quantities of fish from the market—up to 35 per cent in many developing countries (FAO 2022). Minimizing post-harvest losses is one key to increasing revenues and food security without the need to increase the level of fishing effort and for achieving SDG target 12.3.

Aquaculture has undeniably established its crucial role in global food security and nutrition, reducing the supply–demand gap for aquatic food. Aquaculture systems are highly diverse, producing globally almost equal amounts of fed species (mainly crustaceans and finfish) and non-fed extractive species (herbivorous fish, bivalves and seaweeds) (Naylor et al., 2021).

Aquaculture has expanded significantly since 2000 as a result of intensification, improved nutrition, feeds, technology, genetics and breeding programs, production management and biosecurity. Conversely, fed aquaculture contributes to the pollution of aquatic ecosystems as a result of the increased energy and feed inputs, loss of biodiversity because of escapees, and global warming linked to intensification and greenhouse gas (GHG) emissions. The sector's positive impact on livelihoods and employment is expected to grow through enhanced productivity and modernization, intensification, and increased economic and geographic access to farmed aquatic products. By 2030, aquatic food production is forecast to increase by a further 18 per cent (OECD and FAO, 2021) and it is widely acknowledged that this growth will come mainly from aquaculture. Such growth must not come at the cost of deteriorating aquatic ecosystem health, pollution, animal welfare, biodiversity loss or social inequalities. This requires new, sustainable, innovative and equitable aquaculture development strategies.

To address the challenges to fisheries and aquaculture of the 21st century, the FAO Committee on Fisheries (COFI) unanimously endorsed in 2021 the COFI Declaration for Sustainable Fisheries and Aquaculture³ which recognized the contributions of fisheries and aquaculture in combating poverty and hunger since the endorsement of the 1995 Code of Conduct for Responsible

³ See <https://www.fao.org/3/cb3767en/cb3767en.pdf>.

Fisheries and the need for accelerating management of the sector. Indeed, Research indicates that only fisheries that are well governed and managed can make a long-term contribution to sustainable ocean economy, making governance reform a key component of a transition towards sustainable fisheries. Successful experiences of restoring healthy fish stocks and securing livelihoods through proper management or expanding sustainably aquaculture operations continue to emerge.

Considering this knowledge, the 2021 COFI Declaration identifies priority areas to further transform fisheries and aquaculture, thus developing a twenty-first century vision for the sector where successes from around the globe are shared and scaled to transform aquatic food systems from a perceived problem to a recognized solution for food and nutrition security and environmental and social well-being and economic development. Actions to achieve this objective include building global capacity to regularly collect, analyse and evaluate data that support decision-making and consider trade-offs, particularly in regions with limited data and poor capacity. This objective also strengthens social outcomes, applying actions and initiatives that promote equitable livelihoods, and co-management systems, securing access of small-scale producers to resources and services (FAO, 2022). Likewise, through upgraded seafood value chains, public and private actors, can reduce food loss and waste within the framework of a circular economy, enhance transparency, improve access to lucrative markets and adopt emerging digital tools. Aquatic food value chain actors increasingly adopt these practices, which have seen a significant expansion and uptake since the outbreak of COVID-19.

2.1.2. Other ocean economy sectors

2.1.2.1 Coastal and marine tourism

During the last decade, travel and tourism have become one of the most important sectors in the world economy, accounting for 10 per cent of global GDP and more than 320 million jobs worldwide, servicing some 1.5 billion travelers in 2019. (UNWTO, 2020). In fact, many experts consider that the travel and tourism sector has grown to almost too-big-to-fail proportions for many economies of small and big, developed and developing countries. In addition to employment and foreign exchange, it provides wide opportunities for cultural and social interaction, leisure and recreational activities. Its labor market offers vast opportunities for employment, skills development and entrepreneurship, especially for women and youth, rural and coastal communities and micro, small and medium enterprises (MSMEs). Also, it offers opportunities to people who work in retailing crafts and artisanal goods, offering tour guide services to discover community, heritage, cultural and environmental experiences. to providing home lodging

Coastal tourism refers to coast/beach-based tourism and associated recreational activities such as swimming, sunbathing and surfing and other activities taking place on the coast and for which the proximity of the sea is advantageous (e.g., cultural event, marine wildlife watching of sharks or dolphins). Marine tourism refers predominantly to water-based activities, such as sailing, yachting, cruising, snorkeling, and sport fishing. Coastal and marine tourism represents a major size of tourism, which attracted over 1 billion tourists in 2019 and is forecasted to reach 1.5 billion in 2030 (Tonazzini et al., 2019).

Sustainable coastal and marine tourism can therefore be an important source of foreign exchange, closely tied to the social, economic, and environmental well-being of many countries. It can support sustainable ocean economy, promote conservation and sustainable use of marine environments and species, generate income for local communities, in particular for developing countries, SIDS and coastal LDCs. policies, programs, and interventions aimed at coastal communities in these countries, SIDS and other island economies should benefit from the inclusion of tourism as a sector to help accelerate sustainable consumption and production patterns in the development of sustainable ocean economy (WB and ESDA, 2017).

2.1.2.2. Maritime transport

Maritime transport is estimated to handle over 80 per cent of global merchandise trade by volume and more than 70 per cent by value. It depends on nearly 2 million seafarers worldwide, who make it possible for the world to receive the goods and products needed for everyday life

(UNCTAD, 2020c). Globally, shipping provides the principal mode of transport for the supply of raw materials, consumer goods, essential foodstuffs, and energy. It is thus a prime facilitator of global trade and contributor to economic growth and employment, both at sea and ashore. Some estimates elaborated prior to COVID-19, indicate that international seaborne trade volumes are expected to double by 2030, while port volumes are projected to quadruple by 2050 (World Bank and ESDA, 2017).

Whereas seaports are critical transport infrastructure assets that provide gateways to global markets and access to the ocean economy and its activities, they are also at significant risk of climate change impacts, in particular sea level rise. These risks can have far-reaching consequences for international trade and the development prospects of the most vulnerable nations, but particularly for SIDS, which depend on their coastal transport infrastructure as lifelines for external trade, food and energy security, and tourism.⁴ Based on the latest climate projections, (IPCC, 2021), there is an increasing urgency to accelerate action on adaptation and resilience-building for seaports, in particular in SIDS and other coastal developing countries, and to provide the required support in terms of capacity-building and finance.

The main environmental impacts associated with maritime transport include marine and atmospheric pollution, marine litter, underwater noise, and the introduction and spread of invasive species. New International Maritime Organisation (IMO) regulations require the shipping industry to invest significantly in improving infrastructure, environmental technologies, covering issues such as emissions, waste, and ballast water treatment, less reliance on fossil fuel, innovative low-carbon technologies. Most of these investments are not only beneficial for the environment, but they may also lead to longer-term cost savings, for example due to increased energy efficiency. Benefiting from the economic opportunities arising from the ocean, including trade, tourism, and fisheries requires investment in transport infrastructure and services and policy measures in support of maritime transport.⁵

2.1.2.3. Ocean science, monitoring and surveillance

Ocean science, monitoring, control and surveillance play an important role for sustainable ocean economy. They are necessary to combat illegal activities, including IUU fishing, trans-shipment of contraband and human trafficking. They also encompass activities related to human and environmental safety, including search and rescue, weather forecasting, disaster response, and early detection of and response to harmful threats such as oil spills and other pollution, tsunamis, algae blooms and invasive alien species.

2.1.2.4. Marine biotechnology and bioprospecting

The exceptional biological diversity of the ocean represents an important source of novel genes and natural products, with applications in medicine, food and feed industry, materials, cosmetics and energy and across a wide array of bio-based industries (UNCTAD, 2018). Marine biological prospecting includes the discovery from the ocean environment of novel genes and biological compounds that can lead to commercial development of enzymes, pharmaceuticals, nutraceutical, cosmetics, biofuels, and other products. It is generally considered as having limited environmental impacts generating a growing commercial interest in marine genetic resources. For example, the rate of patent applications related to marine genetic material is rapidly increasing with over 5,000 genes patented by 2010 that were derived from marine organisms (WB and DESA, 2017). Capacity-building and technology transfer relating to marine bioprospecting are likely to increase with the ongoing implementation of the Nagoya Protocol to the Convention on Biological Diversity (CBD), under which researchers expecting to commercialize natural products are required to share monetary and non-monetary benefits with the host country. The non-monetary benefits generally consist of partnerships between researchers in developing and industrial countries, capacity building, and the transfer of appropriate technologies (for example, setting up laboratory facilities in developing country universities).

⁴ See <https://SIDSport-ClimateAdapt.unctad.org>.

⁵ For more information see <https://SIDSport-ClimateAdapt.unctad.org>.

2.2. Impact and implications of COVID-19 on the ocean economy

2.2.1. Impact of COVID-19 on the ocean economy

In addition to unfortunate health impacts and millions of deaths caused by the successive waves of COVID-19 since its outbreak in March 2020, the pandemic has caused the largest economic contraction in modern times, estimated at – 3.5 per cent in 2020. International trade has declined by 9 per cent in 2020, and the equivalent of 255 million full-time jobs were lost (UNCTAD, 2022).

2.2.1.1. *Marine fisheries and aquaculture*

Initial lockdown of markets, ports, borders and trade in 2020 have restricted significantly fishing and post-harvest activities to the extent that several countries and companies considered fishing not an essential activity at the beginning. Most countries experienced sharp drops in fish production, estimated between 40 to 80 per cent during the first wave of the pandemic in 2020. Small-scale fishers and their communities were hit hardest and fleets fishing for export were most impacted because of market closures. When and where fishing was authorized, demand had fallen significantly causing a significant price decrease as a result of reduced spending of households on grocery, the closure of export, tourism and related sectors. Retail sales, initially marked by extreme volatility, bounced back as demand increased, including by direct delivery and through online fish selling platforms (UNCTAD, 2022). Overall, global fish production decreased by less than 5 per cent in 2020, with marine fisheries decreasing by 1.9 per cent (SOFIA, 2022). Demand for processed products such as canned tuna and frozen fish and seafood increased while fresh fish sales were falling due to COVID-19 market closures.

Marine aquaculture struggled to maintain its planned production cycles, as supplies of production inputs such as seeds and feed, market demand and access to credit, were disrupted. Production costs increased significantly to feed the stocked fish to maintain it alive.

2.2.1.2. *Coastal and marine tourism*

Travel restrictions applied worldwide to prevent the spread of the virus across borders brought tourism to a halt. Tourist arrivals decreased by 60 and 80 per cent in 2020, causing losses estimated between \$910 billion and \$1.2 trillion and the closure of many MSMEs. Unlike goods, which can still be stored, traded or consumed at a later stage, a halt to tourism means lost revenues and income that cannot be recouped later.

Furthermore, the strong linkages of the tourism sector with conservation and biodiversity efforts have been severely compromised, resulting in losses of critical natural habitats and wildlife resources. Livelihoods of coastal communities, previously reliant on the revenue from eco and conservation tourism were severely compromised. Indeed, tourism is a key source of income MPAs as many governments and coastal communities use revenue from marine tourism to fund marine research and conservation efforts and undertake monitoring and protection activities in MPAs. As these revenues have dried up because of the COVID-19 related restrictions, increasing fishing pressure was reported in marine protected and conserved areas in many parts of the world, which was encouraged by a reduced management presence (Hockings et al. 2020).

2.2.1.3. *Maritime transportation*

During the early stage of COVID-19 pandemic in 2020, maritime transport services in many countries experienced temporary suspensions and disruptions of the functioning of ports, shipping, mobility of seafarers and supply chains. UNCTAD estimates the global maritime trade to have contracted by 2.3 per cent during 2020 (UNCTAD, 2020c). As a result, various industries faced supply challenges as such as raw material shortages, lead-time issues, total or partial port closures, equipment and labor shortages, as well as road transport constraints. These obstacles have undermined the smooth movement of trade flows and supply chain operations and have significantly eroded the trade liberalization and trade facilitation gains achieved over the years in shipping (Cleopatra Doumbia-Henry, 2020).

Governance mechanisms of maritime transport at different scales have experienced problems of coordination, uneven capacities and claims of authority. Similarly, the social and economic dimensions of the crisis affected countries and communities differently, due to different levels of preparedness of their health, social security systems and infrastructure capacity.

2.2.1.4. Ocean governance

During the last decade, the need for better governance of human activities in the ocean space has seen an upscaling of action-oriented initiatives, consultations, negotiations and political processes on ocean governance, science, climate change, biodiversity and sustainable development. Much of this dynamic has been severely disrupted following the outbreak of COVID-19 as most events were delayed, cancelled or postponed, casting uncertainty over these processes.

At the national level, especially in developing countries, loss of national revenues shifted most of the national resources to address the health and socio-economic impact of the pandemic, leaving limited resources for research and for enforcing rules and regulations, across ocean sectors. In many countries, coast guards were mobilized to assist with domestic crises rather than police the seas, which opened the possibility for illegal activities in the seas.

As a result of COVID-19, surveys for collecting data necessary for fish stock assessments, environmental and pollution monitoring and oceanography have been cancelled in most countries in 2020. Some commercial ships were unable to contribute key ocean and weather observations. Ocean buoys and other systems providing information vital to marine science, climate, and weather forecasts and warnings failed in the absence of proper maintenance (Heslop et al., 2020). Regional Fisheries Management Organizations (RFMOs) also reported reduced monitoring capabilities as inspectors were not able to physically observe operations on vessels.

Likewise, travel restrictions have severely limited physical meetings to exchange scientific information and to enable scientists, managers, and stakeholders to meet and discuss issues and options for marine resource management and other ocean science studies. Most of these meetings have been postponed or moved to virtual formats. Cancelled, postponed or reduced agendas of meetings of RFMOs and international organizations dealing with ocean science have negatively impacted the research and the quality of decisions for managing ocean resources.

2.2.2. Measures adopted to address the impact of COVID on the global ocean economy

To contain the spread of the virus and the disease since the beginning of the pandemic and following each wave, countries often declared state of emergency, confined citizens to their homes, closed borders and most productive activities, except for the essential ones. To compensate for loss of revenues, they adopted economic and social measures, associating funds to compensate loss of wages and revenues, financial packages, and fiscal incentives to resume production and processing, stimulate demand and support export. The type of measures and the extent of their application varied across countries and scales depending on the resources available and the priorities set. Unfortunately, informal sectors including a large proportion of small-scale operations and vulnerable groups and women, were often excluded.

However, in most developing countries, support was insufficient because of limited public funds. Moreover, the fiscal and monetary responses to support vulnerable groups has had aggravating consequences for indebtedness, debt servicing capacity, and debt sustainability more broadly. For example, sub-Saharan Africa experienced a 4.5 per cent increase in “pandemic debt”– the debt taken on above and beyond projections due to the COVID-19 crisis (Heitzig, Aloysius Uche and Senbet, 2021), with serious impacts on the governance of ocean economy sectors.

2.2.3. Rebuilding back better the post COVID-19 ocean economy

Experience of past global crises teaches us that after recovery, each crisis leaves behind it permanent structural changes. COVID-19 is no exception. As a result of the measures and resources deployed to mitigate its impacts and to adapt to the crisis, opportunities for

improvements have emerged. These opportunities are likely to reshape the global economy, unleash technological innovation, redefine consumers' needs and behaviours and the role of society and companies. Most changes have been incremental and have involved adapting to and improving existing practices, but a few have been transformational or disruptive.

As the world emerges from the crisis, successful innovations are likely to become mainstream opportunities, both as a means of addressing immediate needs and as a way of reorienting development to meet future challenges. These innovations represent good opportunities for the future of the ocean economy and have the potential to influence the way in which ocean goods and services are traded, ocean science is undertaken, the mobility of people, automation and the likely adoption of bluer, greener and cleaner economy – social and environmental protection policies being central to economic recovery and the use of the stimulus funding.

The crisis has accelerated the digitalization of ocean economy sectors, expanded electronic monitoring and enforcement of ocean governance, advanced the use of renewable and clean energies and contributed to the development of local markets (FAO, 2022). The pandemic has demonstrated the value of preparedness for protecting and building resilience against health and other natural or human-induced disasters, ensuring measures are evenly distributed across demographic groups, regions and economic sectors. This requires strengthening the capacity of all countries, in particular developing countries, for early warning, risk mitigation and management of health risks and other natural and human-induced shocks.

The pandemic presents an enormous challenge and unique opportunities for achieving the 2030 Sustainable Development Agenda as a roadmap that encompasses most aspects of human and planetary well-being. The pandemic has impacted every one of these aspects and emphasized the fact that the challenges we face cannot be dealt with in isolation. Like a double helix, the SDGs and the COVID-19 pandemic responses are intertwined and cannot be tackled separately (UNCTAD, 2022). This becomes even more important in the case of other contemporary challenges such as post-conflict reconstruction.

2.2.4. Leveraging public and private finance for investment in sustainable ocean economy

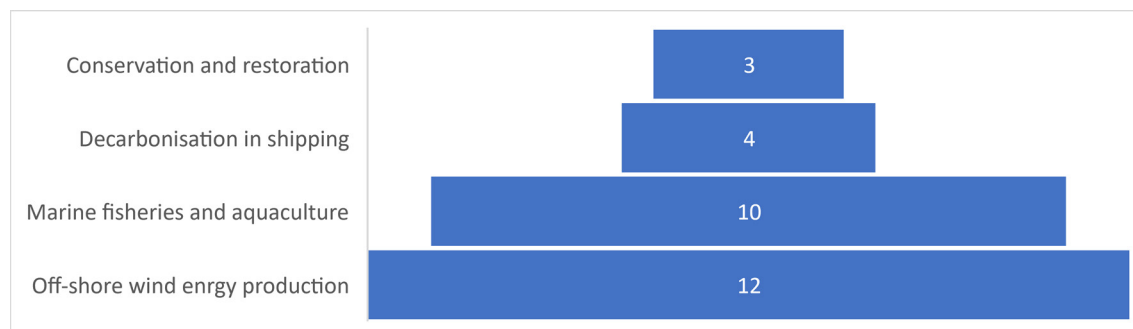
A sustainable ocean economy requires adequate financing to achieve sustained ocean health, infrastructure and governance. However, current ocean economy financing is limited, and the finance gap is large. Recent studies on the state of ocean finance and available finance instruments, identify key barriers to financing a sustainable ocean economy and suggest how to mitigate them, to incentivize the kind of public and private investments needed for science and management in support of a sustainable ocean economy (Sumaila et al., 2021; Vivas Eugui et al., 2021).

The costs of current inaction towards investment in the conservation and sustainable use of the ocean resources are overwhelmingly high and increasing by the day. For example, in the absence of proactive mitigation measures, the cost of climate impacts on the ocean could add up to \$428 billion a year by 2050, due to losses in fisheries, tourism, and ocean carbon absorption, damages arising from sea-level rise and storms (Gaines et al., 2019). Yet, investment in sustainable ocean economy remains insignificant in comparison to the issues faced and the real possibilities to exploit its regenerative potential and resources (Sumaila et al., 2021). It is reported that SDG 14 receives the lowest impact investment of all SDGs (Libes and Eldridge, 2019) and that blended finances directed to SDG 14 were the least across all SDGs (Basile and Butra, 2019). Globally, the total investment for establishing and maintaining MPAs in 2018 was estimated at \$2.3 billion as compared to at least \$7.7 billion needed globally to achieve the 10 per cent target of highly or fully protected areas (Sumaila et al., 2021).

The high-level panel on sustainable ocean economy (Stuchtey et al., 2020) estimated the current investment in sustainable ocean industries, biodiversity and conservation grossly inadequate, needing to at least quadruple to restore and sustainably maintain ocean health. Indeed, restoring and maintaining the ocean's health was estimated to generate further ocean-based wealth and make the most of the ocean's resources in a sustainable manner. It is estimated that an investment of \$2.8 trillion today in four sustainable solutions—conservation and restoration of

mangroves, decarbonisation of international shipping, sustainable ocean-based food production and offshore wind production— would yield net benefits of \$15.5 trillion by 2050 (Figure 4).

Figure 4. Rate of return on investment in sustainable ocean economy solutions



Source: Stuchtey et al., 2020

The high-level panel proposed key actions for countries to establish sustainable ocean development as a national priority to attract investment from sovereign wealth funds and development finance institutions. Through their own and other public or philanthropic funding sources, private investment capital can be de-risked, catalyzing private investment in novel ocean industries and business models like sustainable fisheries reforms, or MPAs financed by tourism fees. This blending of public and private capital can be especially catalytic in increasing investments in developing nations. Governments can also help stimulate the pipeline of sustainable ventures and projects by providing grants or other forms of support to early-stage innovation, as Norway has done to support next-generation offshore aquaculture, and the European Union has done to support offshore wind generation. Seychelles has innovated a debt swap and blue bonds for ocean conservation and climate adaptation. In the offshore energy sector, governments could support renewable energy by providing low-cost infrastructure, setting feed-in tariffs, and providing subsidies for sustainable activities. They could also reduce risk—by ensuring regulatory certainty, providing insurance and offtake/demand guarantees, particularly for capital-intensive offshore investments such as wind energy and large-scale mariculture (Stuchtey et al., 2020).

2.3. Advances and challenges for achieving SDG-14 targets

Sustainable Development Goal 14: “*Life below Water*” seeks to conserve and sustainably use the oceans, seas and marine resources for sustainable development. It has seven targets and three means of implementation dedicated to humanity’s interactions with the ocean.⁶ Goal 14 confirms the prominence of ocean issues within the global agenda and placed ocean health at the heart of sustainable development.

In 2017, the United Nations Conference to Support the Implementation of SDG 14 had the aim of being a “*game changer that will reverse the decline in the health of our ocean for people, planet and prosperity*”. An unprecedented number of commitments were registered by a wide range of entities from governments, United Nations and other intergovernmental organizations, international and regional financial institutions, non-governmental organizations (NGOs) and civil society organizations (CSOs), academic and research institutions, the private sector, philanthropic organizations and other actors – both individually and in partnerships. The registry of voluntary commitments remains open, with 1,633 commitments registered to date.⁷

A recent study assessed the impacts of the voluntary commitments towards achieving the targets of SDG 14 (UN DESA, 2021). In general, the rate of reporting by the holders of voluntary commitments was low, estimated at 24 per cent, limiting the ability to understand the extent and nature of the progress achieved across the range of voluntary commitments. High reporting rate

⁶ For more details, see <https://sdgs.un.org/goals/goal14>.

⁷ See <https://sdgs.un.org/partnerships/action-networks/ocean-commitments>.

(44 per cent) was by “Other Relevant Actors” category, followed by United Nations entities (39 per cent) and intergovernmental organizations (37 per cent). Philanthropic organizations have the lowest reporting rate at 14 per cent, followed by governments (17 per cent) and CSOs (18 per cent). Target 14.6 (prohibiting harmful fisheries subsidies) has the fewest voluntary commitments and reports, while target 14.2 (protecting and managing marine ecosystems) has the most.

Supplementary materials were used to improve the assessment, but the analysis remained limited in its ability to provide a quantitative analysis and a full picture of the impacts of all the commitments. For the indicators for which time series are available, those that measure environmental degradation (14.1.1 and 14.3.1) are showing worsening trends, hinting at continuing rates of pollution. The only area showing progress is protection of marine environments (14.5.1), showing strong political will to enact national legislation, increasing the marine protected areas to 3.3 million km² (UN DESA, 2021).

In ocean science, networks of scientific cooperation have had a global reach, and have resulted in innovative efforts in capacity development and technology transfer. The heightened awareness of ocean acidification is evident in the increasing number of de-acidification action plans developed by both local and national governments. Many innovative approaches, including blue carbon and habitat restoration, are now becoming mainstream, and new technologies are being pioneered to develop artificial reefs, or to transplant and grow coral. New technologies are also being used to make ocean sectors more sustainable, for example by measurably reducing pollution and emissions in shipping and by reducing the environmental impacts of marine aquaculture. The volume of catch certified as sustainable has increased globally, including for small-scale and artisanal fisheries, and efforts are being made to strengthen regional fishery bodies, and strengthen collaboration between them and regional seas programmes. Innovative financing mechanisms have been developed, and many new and traditional funders are supporting marine conservation and sustainable use. Unfortunately, although progress is being made, it is likely not made at a scale that is large enough to make a real difference for the ocean and its biodiversity.

All in all, it has become unfortunately evident that many of the goals set out in the 2030 Agenda are not on track to be achieved within their timeframes, including those goals of relevance to sustainable ocean economy. While there has been progress in key areas, others have lagged. Further, the COVID-19 pandemic has reversed previously favorable trends, delayed further the achievement of targets and indicators. The underlying threats from climate change, biodiversity loss and pollution, need decisive action to be averted, but the advent of the pandemic in conjunction with often stagnant progress in many areas of international development and cooperation have compounded the problem (UN DESA, 2021).

3- Enabling post COVID-19 recovery and building sustainable and resilient ocean economy

As the world recovers from the COVID-19 pandemic, countries face the triple challenge of socio-economic recovery, environmental protection and resilience to human made and natural shocks. Recovery remains fragile and uneven as many countries have increased their public debts, have fewer financial resources available, or are harder hit by climate and other external shocks. Unfortunately, official Development Assistance (ODA) for ocean economy represents a very small segment of only \$2.9. billion in 2019 (OECD, 2021), which looks insufficient compared with the level of challenges faced under the SDGs related to the ocean economy, particularly SDG 14.

Transitioning towards a sustainable ocean economy requires stronger socio-economic recovery and greater resilience against external shocks and climate change. Adopting best practices and coherent sustainable ocean economic policies will ensure that the preservation of marine and coastal ecosystems, on which ocean economies depend, offers further opportunities for higher value-added activities, such as sustainable fishing and aquaculture, seaweed culture, ecotourism, marine biotechnology, and offshore renewable energy. Furthermore, healthy fish stocks and marine ecosystem management can provide a solid base for resilience vis-a-vis external risks.

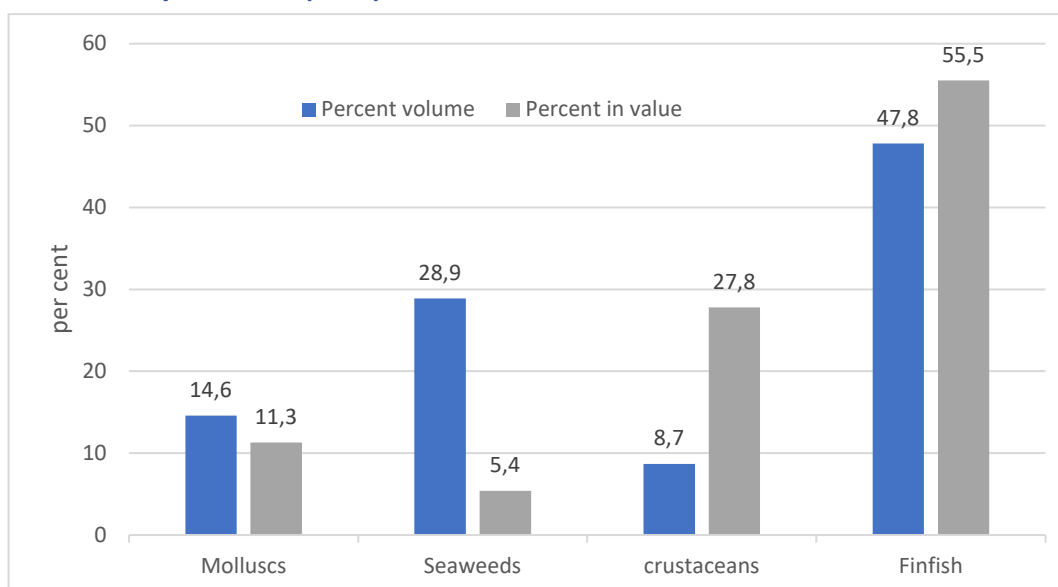
3.1. The seaweed sector as a lever for a sustainable ocean economic recovery

Aquaculture has undeniably established its crucial role in global poverty alleviation, food security and nutrition. This role is expected to grow as aquatic food production is forecast to increase by a further 18 per cent by 2030, mainly from aquaculture (OECD and FAO, 2021). However, such growth must not come at the cost of deteriorating aquatic ecosystem health, ocean pollution, animal welfare, biodiversity loss or social inequalities. This requires new, innovative, sustainable and equitable aquaculture development strategies.

Aquaculture of algae (macroalgae or seaweeds and microalgae) is the second largest sector of world aquaculture production, representing 28.9 per cent in volume (5.3 per cent in value) in 2019 (Figure 5), with most (99%) aquatic algae produced in marine areas. Farming of seaweed is practiced in a relatively smaller number of countries of East and Southeast Asia, which produce 99.5 per cent of aquatic plants. Nevertheless, all other continents are experimenting with algae culture and report increasing production volumes and potentials. Interest in seaweed for improved nutrition, industrial use, and ecosystem services, grew globally during the last decades, beyond the main producing countries China, Japan, Republic of Korea, and parts of South America (Buschmann et al., 2017).

FAO statistics indicate that the production of aquatic plants and algae has more than tripled from 10 million tonnes of wet biomass in 2000 to over 35 million tonnes in 2019 (Table 1). Around 31 to 38 per cent of the global seaweed production is consumed directly as food (Naylor et al., 2021). Three brown and four red algae species have an annual production above 1 million tons. Together, they represented 96 per cent of the aquatic plants production in 2019. The most important species are the brown algae Japanese kelp (*Laminaria japonica*) and the red algae (*Eucheama spp.* and *Gracilaria spp.*) providing respectively, 39, 28 and 10 per cent respectively, of global algae production.

Figure 5. Importance (in per cent) of extractive species and fed species in aquaculture (2019)



Aquaculture of seaweed species contribute significantly to food and nutrition security and provide significant employment opportunities for coastal communities, in particular for women and youth. Human consumption of seaweeds dates back centuries, with about 700 edible seaweed species documented. Coastal communities in several countries and regions have cultural traditions of eating seaweeds. They are frequently consumed in East Asia for example as soup ingredients, salads, sushi wraps and snacks. They have gained increasing global popularity following their introduction into other countries and regions. Being rich in dietary fibers, micronutrients and

bioactive compounds, seaweeds are used in healthy, low-calorie, low-carbohydrate or plant-based diets (Shannon and Abu-Ghannam, 2019).

Table 1. Production volume and value of main farmed algae (FAO, 2022)

Farmed seaweeds	2000		2010		2019	
	Tons	\$ thousands	Tons	\$ thousands	Tons	\$ thousands
Brown seaweeds	8 556 930	3 119 865	11 149 248	4 979 815	16 393 764	7 672 578
Green seaweeds	33 891	58 456	26 924	24 322	16 944	25 560
Others (mainly microalgae)	32 503	35 385	102 489	77 823	73 407	106 584
Red seaweeds	1 972 236	1 385 339	8 895 657	3 778 570	18 251 474	7 024 164
Total seaweeds	10 595 560	4 546 436	20 174 317	8 860 531	34 735 590	1 4828 887

Research indicate that seaweeds could substitute, or at least complement some terrestrial crops and animal production in protein, fat (omega 3 fatty acids) and energy intake, alleviating pressure on freshwater and land resource use and the impacts on biodiversity (Wells et al., 2017; Oliver et al., 2020). Algae grown on sugar derived from sugarcane in a fermentation tank turn the sugar into omega-3 oil which is used as a replacement for fish oil in fish feed⁸.

The brown seaweed *Saccharina japonica* (wakame) and the red algae *Eucheama spp.* are the most productive aquaculture species worldwide (Buschmann et al., 2017). The majority of this seaweed biomass is used as polysaccharide additives and functional food ingredients, and by the non-food sector as hydrocolloid products in nutraceuticals, pharmaceuticals and cosmetics, and to a lesser extent as fertilizers, feed ingredients, biofuels, bioplastics, and other for industrial outputs (Naylor et al., 2021).

Algae are widely recognized for their ecosystem services beyond the provision of food, feed and livelihoods. Seaweed uses photosynthesis by absorbing dissolved nutrients for growth, with little impact on the environment. Bioremediation is one of the main ecosystem services of seaweeds that are effective in reducing nitrogen levels, controlling phytoplankton blooms, and limiting the frequency of toxic algal blooms. In addition, large-scale aquaculture of seaweed positively regulates and improves environmental conditions in coastal ecosystems (Cia et al., 2021). However, the effectiveness of the impact of ecosystem services provided by seaweed farming, still requires attention and research across cultured systems, seasons, and scales.

Seaweed aquaculture has a promising future as a sustainable source of nutritious food that can give a major boost to global, regional, and local economies and food security. Further work is needed to improve awareness and acceptance by the public and to elaborate laws, regulations, and codes of practice to promote the establishment of new and more sustainable farms and expansion of existing ones for seaweeds.

Aquaculture of algae can also be associated with negative environmental impacts on the nearshore or offshore aquatic environment, caused for example using fertilizers and chemicals to control grazers, or the competition for space between cultivated seaweeds and seagrass meadows, or the outbreaks of harmful algal blooms. Of major concern is the sargassum blooms which have been a nuisance in the Caribbean for some years, where they harm coastal biodiversity, fisheries and the tourism industry. When scattered across open water, sargassum serves as an important breeding ground for turtle hatchlings and a refuge for hundreds of fish species. The problem comes when sargassum washes up on the beach and starts to rot, attracting insects and emitting hydrogen sulfide that drives tourists away and causes skin and

⁸ <https://algaprime.com/sustainability/>

respiratory problems⁹. Like aquaculture of fed species, aquaculture of seaweeds needs to pay sufficient attention to scaling, site selection and the health of the wider marine environment, while recognizing and promoting the advantages of seaweed species, including their nutritional attributes, the provision of ecosystem services such as water quality improvement, habitat enhancement, carbon/nitrogen/phosphorus “sequestration” and coastal deacidification.

3.2. Transparency, non-tariff measures and fisheries subsidies reform

3.2.1. Tariffs and non-tariff measures

International trade in goods is subject to two types of measures: tariff and non-tariff measures (NTMs). Tariffs are customs duties levied by governments on imported goods, which must be paid for before entry into the market. NTMs are policy measures – other than ordinary customs tariffs – that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices, or both. In general, while most-favored nation (MFN) tariffs in ocean-based products have been reduced over the years, particularly in developed countries, the incidence and prevalence of NTMs has risen (UNCTAD, 2021b).

Goods from the ocean are widely traded, and trade-liberalization has expanded opportunities for many producing countries to compete in international markets. In general, tariffs across five ocean economy sectors were found highest in low-income countries, averaging 10.2 per cent, and lowest in high income countries, averaging 5.4 per cent. In middle-income countries, average tariffs were 7.9 per cent. The average of applied MFN rates is highest for low-income countries’ imports of processed seafood (18 per cent). This is usually the result of countries’ desire to protect domestic processing industries, or to pursue an import substitution policy. The tariffs in the other sectors are relatively low (UNCTAD, 2021b).

While reduced tariffs have been a facilitating factor in trade-driven development, much of the focus has shifted to examining the role of NTMs in determining trade flows. NTMs are often supposedly made harder to comply with and less transparent than tariffs. NTMs regulations must be enacted in line with WTO principles of transparency, based on relevant international standards or other scientific justification, non-discriminatory, and not more trade-restrictive than necessary (UNCTAD, 2019).

A recent analysis of NTMs applied to all traded products across 88 countries for which NTMs data are available, revealed a high incidence of NTMs across the various sectors of the ocean-based economy. Nearly 97 per cent of the imported products face at least one import NTM and on average 6.7 different import measures apply to each product. For exports, NTMs apply to nearly 57 per cent of exported products and on average each exported product needs to comply with about two different requirements before leaving the home country for destination markets. The prevalence of NTMs is highest for marine fisheries, followed by seafood processing, with 14.5 and 12.7 NTMs applied per traded product, respectively (UNCTAD, 2021b).

Compliance with sanitary, environmental and manufacturing standards is highly relevant to trade in goods from the ocean, fish and seafood. The WTO agreements on Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT) play an essential role in structuring trade regulation and dictate policy space countries have when setting the standards that ocean-based products must comply with (UNCTAD, 2021a; 2021b). In addition, NTMs can be associated with environmental and social measures, often enacted by private standard-setting bodies and certification organisms, mainly NGOs. SPS measures make for a little over 50 per cent of applied NTMs for fisheries and seafood processing sectors, for which TBT measures represent a relatively smaller share, at 14 and 26 per cent respectively. The prevalence of other NTMs, such as quality and price control or finance measures, is less than 10 per cent in most cases (UNCTAD, 2021b).

Marine fisheries and seafood processing products are subjected to pre-shipment inspections in many countries at the time of import. The requirements and practices of border inspections are not always harmonized, fit for the purpose or aligned with the SPS/TBT principles. Developing

⁹ See <https://www.bbc.com/future/article/20201119-atlantic-ocean-the-largest-seaweed-bloom-in-history>.

countries have regularly pointed to the challenge presented by NTMs that vary from one jurisdiction to another. This multitude of approaches imposes significant costs on exporting countries, unnecessary duplication and represent a severe handicap for export from many developing countries with limited resources and capacity for management and infrastructures (UNCTAD, 2019). As fish and seafood products are often perishable, NTMs can add additional burden on exporters due to time constraints in delivery of fresh products to markets.

Further complicating the multiplicity of public NTMs, fish exporters face a wide range of private standards. These private standards have emerged in areas where there is a perception that public institutions are failing to achieve desired outcomes. These include food safety and quality, sustainability and responsible fisheries management, or social and environmental sustainability. Consequently, importing food firms, especially retailers, use their increasing bargaining power vis-à-vis other businesses in the value chain, to impose certification to private standards. The increasing vertical integration and complexity of value chains in fish and seafood has also stimulated the growth of private standards, as business-to-business (B2B) tools used in the context of procurement contracts. Complex value chains – where raw materials are sourced globally, processed in one country and distributed in yet another – require reliable traceability and chain of custody systems that are built into the frameworks included in most private standards schemes (UNCTAD, 2019).

3.2.2. Fisheries subsidies

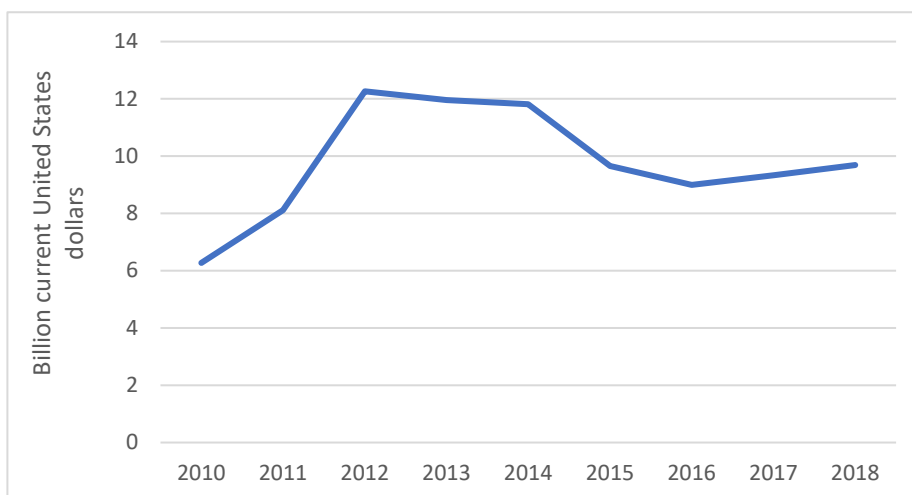
A subsidy is a financial contribution provided by a government to actors in the private sector. The transfer can be direct (grants, tax exemptions, loans at below market rates, and so forth) or indirect, such as services to the private sector (infrastructure, research, and so forth). The impact of fisheries subsidies on ocean sustainability depends according to their use. Certain subsidies support research and transition towards sustainable livelihoods from fishing, while capacity-enhancing subsidies can contribute to overfishing or IUU fishing.

Fisheries subsidies are difficult to estimate and monitor, in part because of a lack of transparency due to low levels of notification under article 25 of the WTO Agreement on Subsidies and Countervailing Measures (SCM), to under reporting or to data-poor fisheries in developing countries. The Organisation for Economic Co-operation and Development (OECD) provides estimates of direct and indirect fisheries support by country for 39 countries. Although the figures are underestimates due to under-reporting and the non-inclusion of certain forms of subsidies, such as tax exemptions, they enable a certain level of comparison between countries.

According to the OECD¹⁰, fisheries subsidies for the 39 reporting countries averaged \$12 billion per year between 2012 and 2014 and have since declined by 20 per cent, averaging 9.4 billion per year between 2015 and 2018. Although fisheries subsidies were lower than in 2014, they have been on an upward trend again since 2016 (Figure 6). This would be a worrisome trend in a non-WTO fisheries subsidies outcome scenario.

¹⁰ For more information, see <https://www.oecd.org/greengrowth/fisheries/fse.htm> (accessed on February 10, 2022).

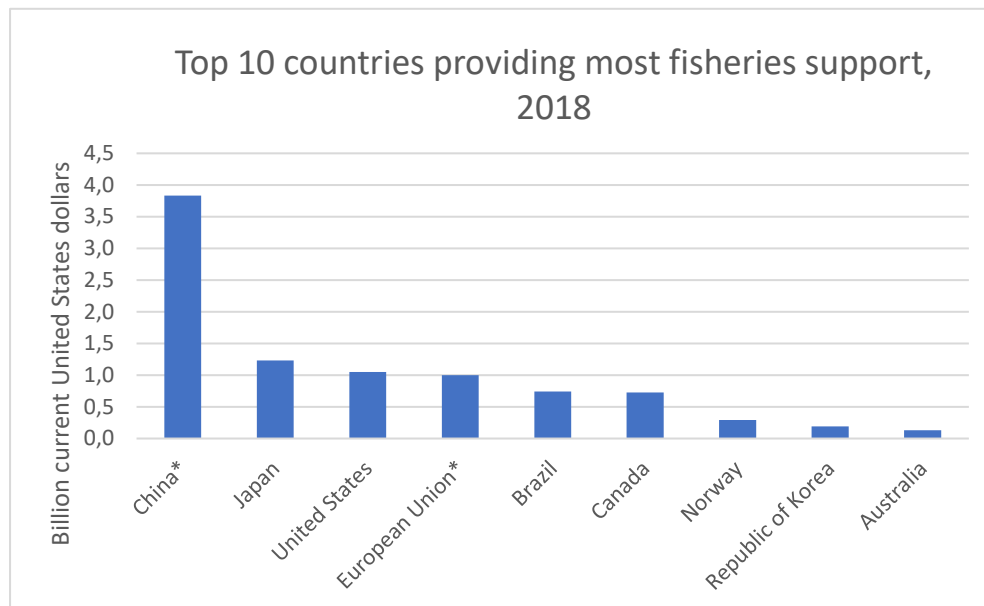
Figure 6: Fisheries support estimate on selected OECD Members and other selected countries, 2010-2018



Source: UNCTAD based on OECD Fisheries Support Estimates data (2022).

The countries that grant the largest amount of fisheries support in value are China (\$3.8 billion), Japan (\$1.2 billion), the United States (\$1.1 billion) and European Union Member States (with also about \$1 billion) (Figure 7). These numbers are cumulative values and do not reflect objectives of the support, nor whether the allocation contributes or not to overfishing.

Figure 7: Top 10 countries providing most fisheries support, 2018

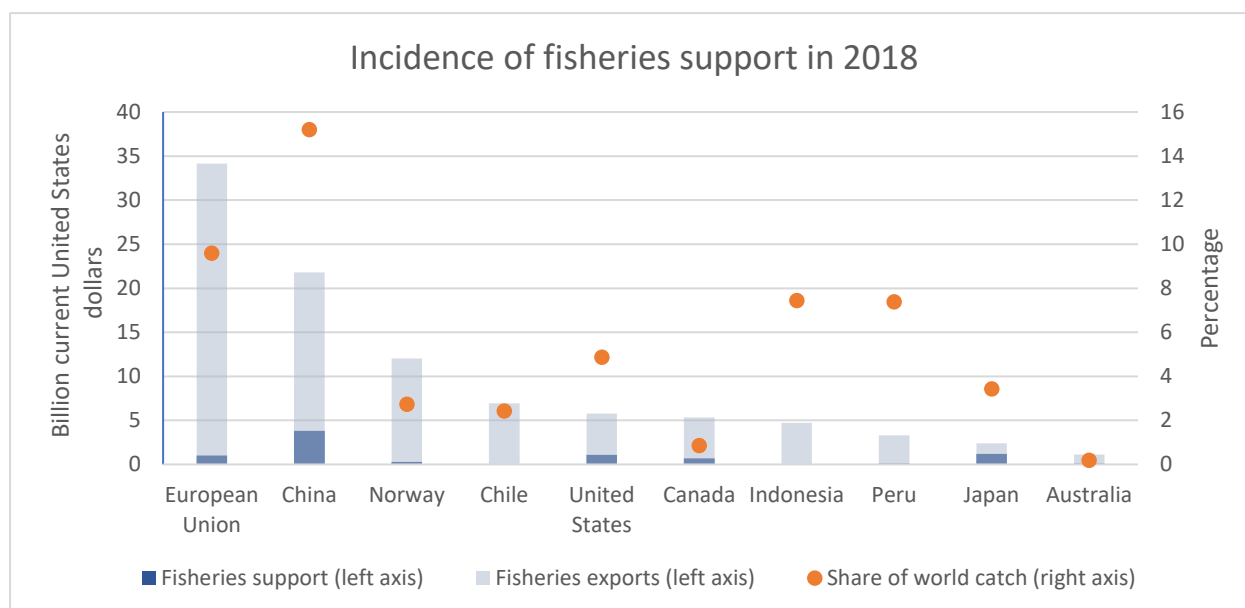


*Data for China is from 2017 as no data was available for 2018 when the report was written. Data for European Union is limited to countries that reported to the OECD.

Source: UNCTAD calculations based on OECD Fisheries Support Estimates (2022).

China grants the largest amount of fisheries support and at the same time is the country that captures the largest share of world catch. Some countries provide a relatively large amount of subsidies but represent a small share of world catch, such as Canada. Although China's fisheries support per capita is small compared to Canada, in aggregate China's subsidies can have a much greater impact on the sustainability of fish stocks (Figure 8).

Figure 8: Incidence of fisheries support, 2018



Source: UNCTAD based on OECD (2022) Fisheries Support Estimates and FAO (2022) Fisheries and Aquaculture statistics.

Figure 8 also allows for a comparison of fisheries support, exports, and per centage of world wild catch. In China, fisheries support represents 17 per cent of fisheries exports, as compared to 18 per cent in the United States, or 50 per cent in Japan. By contrast, certain large fish exporters such as Indonesia and Chile resort much less to fishery subsidies. Export subsidies are prohibited by the WTO Agreement on subsidies and countervailing measures (SCM) because they give domestic producers an unfair advantage compared to producers from other countries. However, a large ratio of fisheries support to export is not a proof of the prevalence of export subsidies, as countries may destine their fisheries support to producers supplying the domestic market (which could be for example the case in Japan and potentially in China).

In 2018, global fisheries subsidies were estimated by academic sources at \$35.4 billion, of which \$22.2 billion are capacity-enhancing subsidies and 22 per cent are fuel subsidies (Sumaila et al. 2019). This represents a 14.5 per cent decrease in global fisheries subsidies since 2009, which were \$41.4 billion. These global estimates make Asia by far the greatest fisheries subsidies provider (55 per cent), followed by Europe (18 per cent) and North America (11 per cent).

Even when fisheries subsidies are not targeted at the export sector, they are often a source of inequality and unfair competition within countries as industrial fishing vessels receive more than 80 per cent of subsidies, at the expense of small-scale fisherfolks (Schuhbauer et al. 2020). This is not only socially but also economically inequitable. A recent study suggests that small-scale fishing fleet are nearly twice as productive than large-scale vessels in the North Atlantic, and 16 per cent more productive in the Mediterranean and Black Sea (Villasante et al. 2022). The productivity gap is explained by the inefficiencies caused by subsidies.

Eliminating subsidies which contribute to IUU, overcapacity and overfishing is Target 6 of Goal 14. After more than 20 years of negotiations at the WTO, countries are expected to reach an agreement at the twelfth Ministerial Conference, scheduled for June 2022, which would seek to phase out subsidies to IUU fishing and prohibit certain subsidies causing overcapacity and overfishing, while taking into consideration the special and differential needs of least developed countries.

Fish subsidies reform and phasing out of certain fish subsidies is a fundamental (and missed) target under SDG 14, which was due by 2020. Lack of action keeps economic incentives for overfishing and stocks depletion, generating a systemic frustration regarding achieving the SDG

targets in general and SDG 14. There is an urgent need to introduce national transparency, implementing and enforcement mechanisms to phase out and reform subsidies that contribute to IUU fishing, overcapacity or overfishing.

It is expected that fish subsidies reform will limit most harmful forms of fish subsidies and enable public resources to shift towards more sustainable public activities including ocean research, fish stock management and restoration. Systems to ban, regulate and monitor granting of public resources in the fisheries sector do not exist in most countries today. Furthermore, lack of data gathering systems, particularly in developing countries, hinders progress and implementation. Implementing such reforms will require significant regulatory, administrative, and institutional and coordination challenges at local, national and international levels. Given the political and technical sensitivity around these reforms, technical assistance and capacity building programs must be introduced to help countries to understand, implement and enforce fish subsidies reform and governance.

3.3. Social sustainability along the fisheries and aquaculture value chain

Fishing is one of the most hazardous occupations, causing over 30,000 deaths yearly (FAO, 2022), where the protection of human and labour rights are still a major challenge in the fisheries and aquaculture sector. Unsustainable practices may trigger different social problems at the various stages of the fisheries and aquaculture value chain, such as modern slavery and bondage, forced labour, and other abuses to vulnerable people, mainly migrants, women, and children. It can also lead to the absence of social protection, social security, healthcare, or formal working relationships (i.e., work contracts). These inadequate working conditions are all structural problems that persist throughout the fisheries and aquaculture value chain. Environmental concerns, such as climate change and biodiversity loss, are likely to compound these social issues, as coastal communities are often the most exposed to those risks.

In addition, the COVID-19 pandemic has led to a severe public health problem, which exacerbated the existing challenges of protecting human and labour rights by disrupting the industry and adding a new and severe health hazard to employment conditions. Disruptions to trade have caused reduced incomes and endangered livelihoods for many fish workers, especially the most marginalised and vulnerable groups in developing countries.

Promoting decent work in the fisheries and aquaculture sector is key to support effective fisheries management and responsible social practices. As a result of the increased awareness of these social issues, the industry, trade associations, labour unions, and policymakers have undertaken initiatives to address the existing weaknesses, seek remedies, and improve performance through increased monitoring, transparency, and information dissemination.

Despite these initiatives and various international instruments (conventions, guidelines, etc.) addressing human and labour rights aiming to ensure equitable social practices, the sector is still struggling with the implementation and enforcement of labour legislation, infringement of small-scale fishers' rights, the existence of child labour and barriers to access social protection. This is because their complexity and diversity create implementation challenges for stakeholders in the fisheries and aquaculture sector.

Since 2017, FAO has been mandated to address these challenges and support the sector, by developing a practical guidance on social responsibility, addressing the recognition and protection of human and labour rights throughout the fisheries and aquaculture value chains. In this respect, FAO has conducted several multi-stakeholder consultations worldwide, where representatives from governments, the industry, NGOs, trade unions, regional fisheries bodies, United Nations agencies (the International Labour Organization (ILO), International Maritime Organization (IMO), UNCTAD and the OECD, and academia, among others participated. Their

active participation to these consultations helped to develop a draft guidance¹¹, which aims at facilitating compliance and supporting the industry by compiling existing relevant international instruments and tools to ensure decent work and good social practices along the fish value chain. The FAO Guidance will be voluntary in nature, and practical covering the different stages of the fisheries and aquaculture value chain, including, pre-harvest, harvest and post-harvest activities. It will also include cross-cutting aspects, such as gender equity and equality, child labour and fair integration of migrant workers.

In addition, during the last Session of COFI in 2021, Members have endorsed the FAO Declaration for Sustainable Fisheries and Aquaculture, which emphasizes the attainment of safe, healthy and fair working conditions for all in the sector, support efforts to prevent and halt forced labour, facilitate access to social protection programmes for fishers and aquaculture producers and their communities, support measures to improve safety at sea, and work towards enhancing the standards of living for all in the sector. The Declaration also aims to promote and strengthen policies to support and recognize the contribution of small-scale fisheries and aquaculture, the fight against IUU fishing, and to ensure women's empowerment.

3.4. Addressing trade related aspects of marine litter and plastic pollution

Marine litter is any persistent, manufactured or processed solid material discarded, disposed of, or abandoned in the marine and coastal environment. Marine litter may include wood, metals, glass, rubber, clothing, paper, industrial chemicals, pharmaceuticals, persistent organic pollutants, plastic litter and microplastics, which are fragments of plastic smaller than 5 mm.¹²

The high and rapidly increasing levels of marine litter, including plastic litter and microplastics, represent a serious environmental problem on a global scale, negatively affecting marine life and biodiversity, ecosystems, livelihoods, fisheries, aquaculture, maritime transport, recreation, tourism and economies. Current estimates indicate that some eleven million tons of plastic enter the ocean each year. The annual global production of plastics is approaching 350 million tons, and this figure could reach as much as 33 billion tons by 2050 if the current consumption rate continues. UNCTAD estimates trade in plastics at \$1 trillion per year, or 5 per cent of total merchandise trade. This is 40 per cent higher than previous estimates and involves all nations in the world. Approximately 76 per cent of all plastic produced between 1950-2017 have become plastic waste (Barrowclough et al., 2020).¹³ As a result, marine litter and microplastics are not only a current issue but can become an expanding global problem. The related environmental and socioeconomic threats are further amplified by the interconnection of marine litter and microplastics with biodiversity degradation and climate change (UN EMG, 2022).

It is estimated that the bulk of marine litter comes from land-based sources with a smaller proportion (less than 6 per cent) arising from the sea-based sources, although this varies significantly between regions. Of particular concern are manufacturing sectors and fast-moving consumer goods, which are packaging-intensive and act as significant land sources of marine pollution. For sea-based sources, abandoned, lost or otherwise discarded fishing gear (ALDFG) are especially relevant, as they threaten many marine species that get entangled in the ALDFGs. Many marine species are also affected by the ingestion of litter, especially plastics, and there is an increasing concern that along with plastics, aquatic animals could be ingesting persistent organic pollutants and toxic compounds, leading to impacts on fish stocks through the food chain and ultimately risks for the marine wildlife and human health.

Marine litter can also cause damage to coral reefs and change the structure of the seabed, affecting the plants and animals that live there, among other negative effects. Aside from

¹¹ FAO. *Report of the Seventeenth Session the Sub-Committee on Fish Trade*. Vigo, Spain, 25-29 November 2019. Report FIAM/R1307 (Tri), accessed at <http://www.fao.org/3/ca8665t/CA8665T.pdf>.

¹² See the initiative website at <https://www.unep.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/marine-litter>.

¹³ [Global plastic trade 40% bigger than previously thought, study finds | UNCTAD](#)

economic consequences, such as the loss of income from tourism, there are also high costs related to removing litter from beaches and harbours and to damage to ships and fishing gear.

Although a number of SDGs indirectly relate to marine litter and microplastics, in particular SDG 12, marine litter is directly referred to in SDG 14 Life below Water in Target 14.1. UNEP is the custodian of indicator 14.1.1 that proposes to measure floating plastic litter as a global indicator of marine pollution.

A recent report (UN EMG, 2022) provides a mapping of all United Nations agencies, programmes, initiatives and other sources of expertise relating to marine litter, including plastic litter and microplastics. Over 40 United Nations entities are supporting Member States in addressing marine litter and microplastics. Some United Nations bodies have explicit mandates in this area and/or conduct major activities that directly benefit the marine environment. Others have more indirect remits for addressing marine litter that derive from their work on the green economy, climate change, international trade or humanitarian issues.

The United Nations Regional Economic Commissions under the United Nations Secretariat, and the Regional Seas Programmes guided by the UNE, serve as bridges between processes at the global, regional, subregional and national levels in implementing the 2030 Agenda for Sustainable Development, including consideration of marine litter pollution. While Regional Commissions deal with economic development, trade facilitation, food security and sustainable development in the regions, the Regional Seas Programmes address the marine environment in the various sea basins. Regional Fisheries Bodies (RFBs) introduce measures to minimize and retrieve ALDFG, and several of the existing RFBs are administered or supported by FAO. Regional fisheries management organizations (RFMOs) have mandates to adopt legally binding conservation and management measures based on the best scientific evidence. Furthermore, Large Marine Ecosystem (LME) activities aim at combating marine litter as part of regional Strategic Action Programmes, while regional organizations such as the European Union address marine litter through numerous regulations and legally binding directives. These regional instruments support national efforts and link them to multilateral requirements while ensuring the integration of the regional dimension in global development policy discussions.

The mandate of UNCTAD has recently been expanded to address the discharge of plastic litter and other waste in the ocean by significantly reducing marine pollution of all kinds and ensuring sustainable consumption and production patterns, privileging a circular economy that offers opportunities to reuse and recycle materials and reduce pressure on strained ecosystems and the climate. It has conducted studies to explore options to promote plastic substitutes and the issues, challenges and considerations that policymakers are likely to face, particularly from a trade and sustainable development perspective, including a preliminary assessment of market and trade-related trends in selected examples of plastic substitutes (UNCTAD, 2021c). It has also explored the role of trade and possible options for a coherent and concerted governance action within the United Nations and the multilateral trading system on the potential of plastics substitutes to reduce plastic pollution and enabling local sustainable manufacturing development in selected developing countries (UNCTAD, 2021d).

On 2nd March 2022, the United Nations Environmental Assembly approved a resolution to develop a treaty designed to bring an end to the scourge of plastic pollution.¹⁴ The UNE resolution addresses the full lifecycle of plastic, including production, design and disposal and will be developed over the next two years. This resolution is considered the most important global environmental deal since the Paris Agreement in 2015. Like other multilateral deals, the success of this agreement would ultimately depend on the final terms of the deal, with delegates set to iron out the finer details by contending with the interests of member states. It should provide the most robust protections for health, climate, biodiversity, and human rights.

¹⁴ To read the full text, see https://wedocs.unep.org/bitstream/handle/20.500.11822/38522/k2200647_unep-ea-5-l-23-rev-1_advance.pdf?sequence=1&isAllowed=y.

4. Policy recommendations

Achieving the SDG 14 targets requires a better alignment of policies across multiple sectors, integrating sustainable human uses with environmental conservation and social equity, using more holistic and integrated approaches. These approaches should aim to ensure policy coherence, identify and manage trade-offs between sector-specific objectives, and take advantage of synergies where science, policies, investment, capacity and innovations can deliver benefits to multiple sectors. It also requires bold initiatives and actions to prioritize and upscale access to affordable financing, which has often been limited and difficult to come by. This situation has become even more difficult as many countries have shifted priorities to address first the impact of COVID-19. In addition, many developing countries have contracted unsustainable levels of external debt that further act as a barrier for transitioning to a sustainable ocean economy.

Fortunately, several examples of successful actions and initiatives do exist, contributing to a common understanding of what constitutes sustainable activities across ocean-based sectors, offering insights into replicating and upscaling best practices and accelerating successful actions. The foundation for a sustainable ocean economy requires strong building blocks that create the conditions for wider change across various ocean sectors, enabling the implementation and acceleration of sector-specific reforms, innovations and research. Following are recommendations to stimulate the discussion during the 4th Oceans Forum on how to move forward along these areas to support a sustainable ocean economy within the framework of the 2030 agenda for sustainable development.

4.2.1 Recommendations to the Members of the Ocean Forum Coalition

The 4th Oceans Forum has selected high impact and emerging issues that need feedback from the Ocean Forum Coalition. The following are key recommendations to consider during the debate around these issues.

4.2.1.1. *The seaweed sector as a lever for a sustainable ocean economic recovery*

The full potential of seaweed mariculture remains largely unknown, the sector lags other food sectors in breeding, pathogen management, and optimization of production systems for nutrient, light and temperature condition.

- ✓ It is urgent to explore options for promoting the sustainable seaweed aquaculture production, research, product development and innovations for multiple objectives and applications including food security, agriculture, human health, biomaterials, plastic substitutes and bioenergy, particularly in developing countries, SIDS and LDCs.
- ✓ Areas that need attention include the development of new seaweed cultivars with higher yield potential, disease resistance, nutritional qualities, and attributes for other application (Verdegem, 2021).
- ✓ Transfer of know-how and upscaling successful experiences with seaweed farming, including how to make optimal use of the prevailing environmental conditions at the production sites, which is largely missing in most countries (Naylor et al., 2021; Verdegem, 2021).
- ✓ New global initiatives to promote seaweed production and use will need to tackle critical social, economic, and regulatory constraints, including unethical supply chain activities, food safety considerations, and limited consumer demand.
- ✓ Seaweed aquaculture needs to pay sufficient attention to scaling, site selection and the health of the wider production environment. Recognition of the provision of ecosystem services by seaweed such as habitat enhancement, carbon/nitrogen/phosphorus “sequestration”, and coastal deacidification.

4.2.1.2. *Transparency, NTMs and fisheries subsidies reform*

Key recommendations to improve transparency, NTMs and fisheries subsidies reform include:

- ✓ Expand information sharing, the exchange of knowledge, best practices, and experience regarding trade-related aspects of SDG 14.
- ✓ Expand the monitoring of economic and trade trends on ocean-based sectors including evolution of tariffs and non-tariff measures in a Post COVID-19 recovery phase.
- ✓ Explore options to support small scale fishers and other small marine based producers to comply and overcome tariff and non-tariff measures including by creating economies of scale, join eco-labeling and branding, supporting the application of risks assessment and best sanitary practices, facilitating testing and recognition of third country sanitary authorities, conducting NTMs requirements assessments, and providing capacity building.
- ✓ Support national and regional fish subsidies reform in terms of objectives, targets, volumes, and modalities so resources can be channeled towards stocks management, the fight against IUU fishing and the development of sustainable ocean-based sectors.

4.2.1.3. Social sustainability of fisheries and aquaculture value chain

In respect of social responsibility, the Forum advice is sought on how to:

- ✓ Improve decent working conditions for all fishers and fish workers throughout the fisheries and aquaculture value chain, by promoting and implementing safe, healthy and fair working conditions, facilitating access to social programmes, providing support efforts to prevent and halt unsustainable practices that may lead to forced labour and combat modern slavery, child labour and any other similar situations.
- ✓ Promote the implementation of internationally agreed standards, conventions and recommendations to ensure decent working conditions for all fishers and fish workers along fish value chains, including supporting mechanisms to the industry to facilitate their implementation of and enforce better social practices.
- ✓ Strengthen the collaboration and cooperation on issues of common interest relating directly or indirectly to fisheries and aquaculture social responsibility involving all stakeholders in the sector, particularly among governments, trade unions, the industry, with the support of United Nations agencies.
- ✓ Support international efforts, processes and global coordination in the area of social responsibility in the fisheries and aquaculture value chains, including the ongoing work by FAO on developing a practical and voluntary guidance focusing on the entire sector value chain.

4.2.1.4. Marine litter and plastic pollution

This 4th Oceans Forum is one of first opportunities to reflect on the resolution, providing clear indications on how to pave the way for ensuring that future developments address the full lifecycle of plastics, including production, design and disposal while providing the most robust protections for health, climate, biodiversity, and human rights. Broad recommendations for consideration include:

- ✓ Advocate to accelerate achieving soonest the adoption of the treaty on ending plastic pollution
- ✓ Accelerate collaboration, awareness increasing and sharing of information, knowledge and best practices to eliminate plastic pollution.
- ✓ Promote further research, development, and adoption of material substitutes to single-use plastics to address plastic pollution in the ocean.
- ✓ Explore opportunities to make use of natural materials, marine byproducts and post-harvest agricultural waste, which could help spur innovation, support circular economy and develop new industrial capacities in developing countries.
- ✓ Promote further development of the Harmonized System (HS), in special classifications relevant to material substitutes. These can enable countries to capture flows of these feedstocks and end-use products more precisely for collection and analysis of trade statistics, essential for policy action.

- ✓ Promote incentives to eliminate plastics, including by addressing the tariff rates applied to plastic and substitute materials to facilitate trade of substitute materials which are less polluting to the ocean.

4.2.1.5. *Leveraging public and private finance*

Adequate financing is necessary to sustain ocean health, infrastructure and governance to promote sustainable ocean economy. Unfortunately, current investment in sustainable ocean economy remains insignificant and the financing levels and sources are very limited. The costs of current inaction towards investment in the conservation and sustainable use of the ocean resources are overwhelmingly high and increasing by the day. The major recommendations are:

- ✓ Exhort governments to establish sustainable ocean development as a national priority to attract investment from sovereign wealth funds and development finance institutions
- ✓ Promote an enabling environment for attracting sustainable ocean finance and develop attractive incentives for public and private investment in the ocean economy.
- ✓ Map public and private sources for ocean-oriented finance targeting emerging ocean-based sectors and activities.
- ✓ Promote public private partnerships to create and better mobilize a full suite of financial tools and approaches, insurance, fiscal and market incentives, while making the benefits they generate accessible to all, especially, women, youth, and marginalized communities.
- ✓ Identify ways to de-risk private investment capital, by promoting public and philanthropic funding sources, ensuring regulatory certainty, insurance, etc. to catalyze private investment in novel industries and business models
- ✓ Develop government grants or other forms of support to promote ocean economy innovations.

4.2.1.6. *Maritime transport*

Globally, shipping provides the principal mode of transport for the supply of raw materials, consumer goods, essential foodstuffs, and energy. It is thus a prime facilitator of global trade and contributor to economic growth and employment, both at sea and ashore. Benefiting from the economic opportunities arising from the ocean, including trade, tourism, and fisheries requires investment in transport infrastructure and services and transport policy measures in support of maritime transport. Key recommendations include:

- ✓ Promote adoption and implementation at the national level of international instruments addressing how to make maritime transport safe and sustainable, while facilitating trade.
- ✓ Flag, port and labor-supplying states, in collaboration with relevant international organizations must address shipping crew deployment, ensuring decent working conditions for the crew and their social protection.
- ✓ Stakeholders in the maritime supply chain, including carriers, ports, inland transport providers and shippers, should work together to ensure that maritime transport remains a reliable, predictable and efficient mode of transport.
- ✓ This requires investing in shipping and ports while devising and implementing sustainable maritime transport solutions such as digitalization, decarbonization, fuel efficiency and preparedness to address natural and human made risks, scaling up investment and building national capacities in climate-proofing.

4.2.2. *Recommendations for the 2nd Ocean Conference*

The second Ocean Conference, to be organized in Lisbon, Portugal from 27 June to 1 July 2022 aims to address many of the deep-rooted problems of our ocean laid bare by the COVID-19 pandemic and which will require major structural transformations and common shared solutions that are anchored in the SDGs. To mobilize action, the Conference will seek to propel much needed science-based innovative solutions aimed at starting a new chapter of global ocean action. Building on its conclusions and recommendations, the 4th Oceans Forum contributes the following for consideration at the Second Ocean Conference in support of the trade related aspects of SDG 14:

- ✓ Recognize the importance of a sustainable ocean-based economy for the sustainable use of marine resources, diversification, inclusiveness, and resilience. This will require greater understanding, clearer definition, and classification aligned with the Sustainable Development Goals.
- ✓ Integrate in a coherent manner, across sectors and institutions, post-COVID-19 policy goals and governance frameworks, to embrace their commitments to the 2030 Agenda for Sustainable Development and its goals related to the ocean economy.
- ✓ Promote the exploration of the trade aspects of an ocean-based economy, including through novel approaches to measuring the ocean economy, developing and promoting new and innovative ocean-based goods and services, particularly those of special importance to developing countries, LDCs and SIDS and with a view to maximizing economic benefits from the sustainable use of marine resources.
- ✓ Promote and disseminate the important work to refine the Harmonized System (international nomenclature for the classification of traded products) for ocean-based goods and services currently undertaken by UNCTAD as a tool to facilitate their potential inclusion in multilateral or regional free trade agreements and environmental goods and services negotiations.
- ✓ Welcome progress in the WTO negotiations on Fisheries Subsidies and call for strengthening cooperation with UNCTAD, FAO, UNEP and DOALOS in its implementation, taking fully into account United Nations' acquis on trade, fisheries, environmental and Law of the Sea agreements and considering target 6 of SDG 14.
- ✓ Promote the FAO COFI Declaration for Sustainable Fisheries and Aquaculture (2021) and encourage the mobilization of financial and technical support for its wider implementation.
- ✓ Welcome the UNE Assembly resolution to develop a treaty to eliminate plastic pollution and call to develop Life Cycle Analysis inventories for both plastics and substitute materials, to support science-based policy, with a particular focus for developing countries.

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