

UNITED NATIONS OCEAN CONFERENCE

Contribution from the Portuguese delegation for the concept notes of the Interactive Dialogues

Introductory note: The Interactive Dialogues should, primarily, be able to follow up on the issues, gaps, challenges, opportunities, and partnerships identified and discussed at the 2017 Conference and at the 2018 Sustainable Blue Economy Conference. While factoring in the effects of the COVID-19 pandemic, they should recommend further innovative, tangible, and measurable action for the purpose of meeting all targets of SDG 14, including partnerships and possible solutions.

DIALOGUE 1 - ADDRESSING MARINE POLLUTION

Status and trends

Marine Litter and Underwater Noise

Marine pollution threatens all forms of marine life and the physical and chemical environment that they depend upon. New challenges include dealing with all sources of marine litter (including macro and micro-plastics, nutrients and sediment, fuel waste, amongst others) and underwater noise which require addressing land-based pollution alongside with the establishment of dialogues and partnerships that should engage public entities, non-governmental organizations (NGO), civil society, private companies and industry, with the support of academia, in a combined effort to develop new products and services that can either contribute to prevent pollution from reaching the marine environment and/or provide innovative solutions, biodegradable and/or compostable alternatives to fossil-based plastic, in parallel with effective circular economy policies.

Additionally, coalitions at regional scale are needed to discuss, facilitate, and quickly implement solutions that increase the prevention, preparedness and response regarding marine accidents with hydrocarbons and other harmful and noxious substances.

There is now a widespread consensus that the ocean cannot absorb the current amount of anthropogenic residues and that the problem of marine litter is not a myth and everyone should be involved. This issue should be discussed not only in the scientific community but also in the public sphere. To tackle this issue, a wide range of programs need to be developed, including ocean literacy initiatives targeting schools and the public, which are a fundamental tool to avoid the existing emotional gap of society regarding ocean issues

Abandoned, Lost or Otherwise Discarded Fishing Gear (ALDFG)

Ghost nets or ALDFG comprises a significant amount of global marine plastic pollution. ALDFG represent economic losses for the fishing industry, pose hazards to navigation at sea, and can entangle marine and terrestrial wildlife. ALDGF may have many different causes, such as bad weather, gear conflicts, excessive gear for the vessel/crew, snagging on living and inert structures, operator error, abandonment, IUU (Illegal, Unreported and Unregulated fishing), among others.

FAO has commissioned several studies to combat ALDGF and, in that sense, several documents have been issued towards this goal recognizing the need to address ALDGF and to mark fishing gear (technical solutions that can be helpful to track and trace fishing gear are already available).

Microplastics

Commercially important organisms can contain microplastics, with organisms from the bottom of the food chain (bivalves, crustaceans and small planktivorous fishes) being more likely to be contaminated with higher concentrations of microplastics, potentially posing a greater risk to their health and having implications for perceived or actual food safety across the food chain.

Currently, there is no evidence that significant amounts of microplastics can translocate to the tissues of fish (e.g., the digestive tract or gills), and as most fish are consumed gutted or as processed pieces (e.g., fillets), there is little evidence that larger fish will transfer microplastics to humans through diet. However, in the case of smaller fish (such as anchovies, sardines, horse mackerel), as well as shellfish and edible seaweeds, where the whole organism is often consumed, there is a greater risk of humans consuming microplastics, with implications for food safety.

Also, microplastics carrying pathogenic microbes or invasive species may decimate native populations of commercially important organisms such as shellfish and crustaceans. Increasing concentrations of microplastic within the marine environment may put a stress on the energetic burden of marine organisms. This would imply that commercially exploited organisms could take longer to reach a harvestable size, leading to decreased profits in the fisheries and aquaculture sector, and presenting lower nutritional value.

It is possible that organisms at aquaculture facilities may be exposed to dietary microplastic through contaminated fishmeal, since the fish discarded to fishmeal is often whole. Fishmeal is frequently used in the aquaculture sector as well as feedstock in the agriculture sector (pig feed and chicken feed). This therefore represents a novel way for microplastics to be introduced into human food, with potential risks to many different agriculture industries.

Challenges and opportunities

Marine Litter

The single greatest challenge in addressing marine litter is the source-to-sea/ridge-to-reef approach to the problem that is required. To be successful, we must also target land-based pollution through circular economy policies and measures that will greatly improve our ability to solve the problem. Below are some examples of measures and actions in this regard:

- Awareness campaigns that promote citizen engagement in data gathering and the correct disposal of residues.
- Improvement of the conditions for receiving and routing marine litter.
- Incentive to the development of programs that tackle marine litter.
- Innovative technologies that create alternatives to the use of, i.e., expanded polystyrene (EPS) and extruded polystyrene foam (XPS).
- Increase consumer information about eco-friendly products *vis à vis* “pseudo-eco-friendly” products, which are no more than marketing strategies that deceive the consumer.
- Promote synergies among existing instruments (funding, capacity, knowledge transfer, amongst others) at national, regional, and global level to ensure a systemic approach to marine litter.

ALDFG

Concerning entanglement records, the distinction between entanglement in active fishing gear and lost or discarded fishing equipment, the so-called ghost nets, remains a major problem. The entire life cycle

of fishing gear manufacture and use must be addressed: gear material manufacture, design and fabrication; storage on land and on-board vessels; use, recycle, and disposal. Data collection is critical to obtain informed knowledge about the sources, amounts, fates and impacts of ALDFG. Effective, long term, sustainable solutions to the ghost net issue need to address the full chain of events that lead to gear loss. Innovation in biodegradable fishing gear that can perform the same tasks as the current fishing gear being commonly used by the industry represents a new technological opportunity and an important step that can have serious influence in reducing the impacts of the ALDFG problem.

Microplastics

Assessing the cost of microplastic pollution on ecosystem services, such as food provisioning through fisheries and aquaculture, is challenging and research is still in its early stages. Understanding the full extent of the impacts of marine pollution requires integrated analysis and comprehensive risk assessments throughout the entire spectrum, whether environmental, social or economic. However, and despite the relevance of marine litter, ALDFG and microplastics as pressing issues, other marine pollution problems are rising, namely ocean pollutants such as chemicals and pharmaceuticals. More research is also needed on the impact of anthropogenic stressors, along with furthering analysing the water cycle in an integrative way (SDG6).

Examples of existing partnerships in Portugal which tackle these different dimensions include:

- (Marine Litter) “Fishermen for a sea without litter”¹- project led by *Docapesca – Portos e Lotas, S.A.* in association with local authorities, municipalities, fishermen associations, waste management companies, NGOs and Public companies.
- (Marine Litter) “There’s River and Sea, there’s Waste to Transform”² – project led by LIPOR and associated municipalities, in partnership with IPDJ (Portuguese Youth Institute).
- (Marine Litter) “Escola Azul” – an educational program of the Portuguese Ministry of the Sea, to improve the level of Ocean Literacy in schools, creating a community that brings together schools, the sea sector, municipalities, industry, NGO’s and other entities with an active role in Ocean Literacy.
- (ALDFG) “*Nem tudo o que vem à rede é peixe*” - project led by the Faculty of Sciences of the University of Lisbon to quantify and minimize the impact of ALDFG, involving Universities, technological centres, national authorities, state laboratories and NGOs.

Possible areas for new partnerships

- Industrial innovation, R&D to develop new eco-friendly materials at a sustainable and affordable cost.
- Partnerships that enhance the circular economy, from the product and producer to the industries and waste management companies, using recycled and biodegradable materials to produce new products or replace existing ones made of plastic.
- Simultaneously and in a transitional manner, introduce incentive mechanisms for the collection and deposit of unused fishing nets or nets collected from the sea.
- New solutions must be simultaneously biodegradable and compostable.

¹ See <http://www.docapesca.pt/pt/comunicacao/noticias/item/mar-sem-lixo.html>

² <https://www.lipor.pt/pt/comunicados-de-imprensa/ha-rio-e-mar-ha-lixo-para-transformar-e-o-projeto-da-lipor-para-a-mudanca-de-comportamentos-e-prevencao-do-lixo-marinho/>

DIALOGUE 2 - MANAGING, PROTECTING, CONSERVING AND RESTORING MARINE AND COASTAL ECOSYSTEMS

Status and trends

Target 14.2 urges all Member States to sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts in the marine environment, including by strengthening their resilience, and to act, by 2020. The designation and effective management of protected areas (Marine Protected Areas -MPA), has been consistently considered among the most suitable solutions for the conservation of biodiversity and ecosystem services, minimizing the effects of increasing pressures on the marine environment, including those resulting from climate change.

Thus, commitments and partnerships are needed at a global and regional scale (in a basin approach) to establish wider, ecologically connected and effective networks of MPA that may provide protection to all forms of marine life and secure protection to structural and functional elements of marine biomes. In this context, the negotiations, under the Convention of Biological Diversity, of a post-2020 Global Biodiversity Framework are crucial to ensure that the marine issues are also reflected, especially with the target of designating 30% of MPA until 2030. This, also, requires partnerships between governments and organizations from different countries in different and across regions of the globe (for example, the OSPAR marine protected areas were established in close cooperation and dialogue between the north-east Atlantic basin member countries). Furthermore, the ongoing negotiations of an implementing agreement for the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ) is also one of the main international processes expected to strengthen and facilitate the international regime for the establishment and effective management of MPA in areas beyond national jurisdiction.

Challenges and opportunities

Challenges arise regarding the SDG target 14.5, "to conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information", including in assessing the effectiveness of these areas in conserving biodiversity and ecosystem services. In this context, the sharing of accurate information on the designation, management, and monitoring of the effectiveness of these areas is essential for a correct assessment of the role that these tools may play in the conservation of biodiversity, and especially in ecosystem services. It is also critical to facilitate the development of indicators on MPAs.

One of the major difficulties in the sustainable use of marine biodiversity is that biodiversity hotspots tend to coincide with socio-economic hotspots. A challenge when implementing marine protected areas remains the involvement of users of these areas, such as fishermen. Raising awareness and understanding on the benefits of marine protected areas and gaining stakeholders support is of vital importance.

In addition to MPAs, the need to manage other areas dedicated to sectoral activities (with area-based management tools) provides an opportunity for cooperation between different stakeholders with responsibilities in maritime spatial planning and management.

Particularly demanding is the identification of gaps, not only knowledge gaps but especially conservation gaps, i.e., species and ecosystems underrepresented (or not represented at all) in existing marine protected areas, species requiring large marine protected areas and/or additional protection measures

(migratory species, like cetaceans and tunas) or the designation and implementation of non-take areas, if needed.

Finally, restoring action is needed for many endangered and in poor condition ecosystems and, thus, governments and regional authorities as well as other stakeholders such as academia, industry, and fishery communities, need to work together to facilitate the implementation of innovative solutions that can contribute to those efforts. *“Blue Azores”*, an international partnership between the Regional Government of the Azores, the Waitt Institute and the Oceano Azul Foundation, is a concrete example of such partnerships, working to protect, promote and value the rich marine resources of the archipelago.

Among the solutions that need to be quickly implemented in depleted marine areas is seaweed reforestation with consequent biodiversity recovery and habitat rebuilding, carbon sequestration, biomass generation (i.e., for biorefinery exploitation), and reef rebuilding, using innovative answers to increase biodiversity and address climate change.

In view of this context, possible questions for the Interactive Dialogue include:

- What actions should be taken to develop methodologies and indicators to assess the effectiveness of protected areas?
- How to ensure the adaptive management of Marine Protected Areas?
- How may concrete actions and tools, particularly co-management agreements, improve cooperation between stakeholders in the designation and implementation of protected areas?
- What mechanisms exist to improve the sharing of information on the effectiveness of protected areas?

Marine protected areas

As above-mentioned, one of the major difficulties in the sustainable use of marine biodiversity is that biodiversity hotspots tend to attract human uses and become socio-economic hotspots. Effective dialogue with stakeholders is needed to understand the concerns and find solutions that fit the communities and government goals.

Possible areas for new partnerships

The designation of networks of effectively managed Marine Protected Areas offers many opportunities for multi-stakeholder collaboration in conducting R&D on the observation and conservation of marine resources. In order to sustainably use marine resources, it is important that stakeholders are involved in the definition and implementation of the measures to be put in place, as well in the monitoring and assessments of results achieved, for instance through partnerships and co-management agreements with fishermen associations, maritime industries and services (such as maritime tourism companies). Successful examples in Portugal also show that partnerships that combine efforts from governmental entities, academia and private foundations can strengthen the creation of Marine Protected Areas.³

DIALOGUE 3 - MINIMIZING AND ADDRESSING OCEAN ACIDIFICATION, DEOXYGENATION AND OCEAN WARMING

³ With protection of marine and coastal ecosystems as one of its missions, the **Atlantic International Research Centre** (the AIR Centre) is part of the EU project **“Mission Atlantic”** for the mapping and assessing present and future status of Atlantic marine ecosystems under climate change and exploitation and the **“CE2COAST”** project for downscaling climate and ocean change to services: observations of ocean climate, biogeochemistry and relevant ecological indicators.

Status and trends

Ocean acidification affects marine biota by reducing survival, development and growth rates. It directly affects important components of the ocean food web, such as primary producers (plankton), coral reefs, shellfish and crustaceans; marine species that are important for fisheries and aquaculture are also affected. Stock behaviour is changing, and fisheries are starting to geographically redistribute. Some species may adapt and thrive while others may not be so fortunate and, progressively, cease to exist (such as carbonate species).

Challenges and opportunities

More action is needed to stop the rate of the acidification, deoxygenation and ocean warming. This action starts on land. To achieve it, we need, among others, more ambition from States and stakeholders on the swift implementation of successively enhanced commitments under the Paris Agreement and the United Nations Framework Convention on Climate Change (UNFCCC).

Responses of species to the varying pH levels, oxygen rates and water temperature remain unclear. One of the immediate consequences of acidification that needs to be fully addressed is the geographical redistribution of species with commercial interest, regarding stocks quantities, or even the disappearance of some species and the appearance of others. These shifts have major impacts in the ecosystems, but they also represent challenges and opportunities to human consumption, including new habits and sources of protein.

Possible areas for new partnerships

The geographical shift in species with commercial interest reinforces the need for international cooperation. The shared knowledge of consumption habits will be of great importance to enable and educate consumers on new species. This international cooperation must include official communication channels, fishermen associations, state laboratories, universities, associations of fish products' buyers or chefs.

Also, partnerships are needed to help build the capacity of scientists, policymakers, and communities to monitor, understand, and respond to ocean acidification, including its impacts on the environment, climate change mitigation and adaptation, economy, and society, locally, regionally, and globally.

DIALOGUE 4 - MAKING FISHERIES SUSTAINABLE AND PROVIDING ACCESS FOR SMALL-SCALE ARTISANAL FISHERS TO MARINE RESOURCES AND MARKETS

Status and trends

Making fisheries sustainable is probably one of the major global challenges we face currently, given the importance of marine resources, particularly fish as a source of protein, and the current threat of overfishing and illegal, unreported, and unregulated fisheries. Additionally, fisheries are an important source of income for a significant part of the world's population, especially in coastal states, and are enshrined in the socio-cultural identity of local coastal communities all around the world.

In developing and developed countries alike, the consumption of fish is increasing, both per capita and in absolute value. Discussing the sustainability of fisheries clearly demands addressing the sustainability of seafood consumption and how to promote it, but it also requires implementing alternative and sustainable production methods that can contribute to the balance of fisheries catches.

In a global market where food systems are complex and seafood may be produced in one place and eaten thousands of kilometres away, the pressure over wild stocks has increased enormously and concerns regarding the depletion of fish species have led to initiatives such as certification schemes (e.g., MSC), traceability methods and communication programmes about fish sustainability, including consumer guides, recommendation lists and environmental education initiatives. However, a serious discussion on food systems at a global scale and how to change them needs to be promoted, which means looking at both production and consumption, supply, and demand (i.e., seafood value chain).

Challenges and opportunities

To promote the adoption of more sustainable technologies and therefore provide for the restoration and rehabilitation of ecosystems, we need input from universities and R&D institutions working with companies and fishermen to innovate in tools that have seen little evolution, such as fishing gear.

An integrated effort between different countries where straddling and migratory species occur is critical to guarantee successful management of stocks. Fish stocks know no borders or flags. Management and protection measures need to be comprehensive to guarantee sustainability, but also equal social and economic conditions for fishermen and other seafood related workers.

Efforts to address overfishing, non-compliance and effective implementation of regulations and management frameworks will continue to be challenged, and in some cases undermined, by factors such as the lack of science-based fisheries management, weak governance and institutional capacity, insufficient geographical coverage, and mandates by RFMO's, low data collection or poor analysis and monitoring capacity.

DIALOGUE 5 - PROMOTING AND STRENGTHENING SUSTAINABLE OCEAN-BASED ECONOMIES, IN PARTICULAR FOR SMALL-ISLAND DEVELOPING STATES (SIDS) AND LEAST DEVELOPED COUNTRIES

Status and trends

Small Island Developing States (SIDS) have a special link and dependency on the Ocean. As such, SIDS are particularly vulnerable to increasing environmental impacts, including climate change and natural disasters (where women, girls, the elderly, and children are amongst the most affected⁴). Additionally, SIDS economies are frequently small and less diversified, making them more exposed to risk.

Key economic sectors in SIDS and coastal areas of least developed countries (LDC) include fisheries and coastal tourism. Artisanal fisheries are often essential for the poorest people and coastal tourism is central for revenues in these countries. Nevertheless, environmental externalities, including pollution from land-

⁴ See https://www.forumsec.org/wp-content/uploads/2019/09/2018-1st-Quadrennial-Pacific-Sustainable-Development-Report_final-as-of-July-4-2019.pdf

based activities, are causing damages that can put at risk biodiversity, the quality of the marine environment and consequently, also the economy. The occurrence of extreme natural disasters is affecting more often and more strongly many places in the world, but SIDS and LDCs are suffering most from these phenomena.

Challenges and opportunities

A sustainable ocean-based economy is relevant to all coastal countries, and it represents a unique opportunity for LDCs and SIDS, whose oceans and seas represent a much larger geographic area than their inland territory.

While stimulating growth in individual sectors of the blue economy can be comparatively straightforward, it is not always clear how a sustainable ocean-based economy, integrating the different sectors, should look like and under which conditions it is most likely to be developed. Each country should weigh in the relative importance of each sector of the Oceans' economy and decide, based on its own circumstances, which ones to prioritize. The contribution of natural oceanic capital to welfare must be properly valued and considered to support the right policy decisions, including with regards to trade-offs amongst different sectors of the ocean-based economy, while safeguarding the environment and preserving the natural capital.

In this context, investment in and use of the best available science, data and technology is critical to underpinning governance reforms and shaping management decisions to enact long-term change. To this effect, the United Nations Decade of Ocean Science for Sustainable Development (2021-30) represents an opportunity to improve LDC's and SIDS' capacity in marine science and scientific research, to protect the marine environment and involve local communities in the development of a sustainable ocean-based economy. Additionally, establishing effective integrated maritime policies and tools is key to achieve results across sectors, which requires international collaboration and cross-border and regional arrangements, particularly for SIDS.

Promoting sustainable ocean-based economies represents one of the major challenges to SIDS and Least Developed Countries to boost a sustainable and inclusive growth. The international community is called on to support these countries through cooperation, knowledge, and innovation networks as well as through the sharing of research infrastructures. This will require new investment and targeted financial instruments — including blue bonds, insurance, and debt-for-adaptation swaps—can help leverage this investment. The private sector can and must play a greater role in the sustainable ocean-based economy.

Possible areas for new partnerships

Partnerships are needed to build on the work developed by scientists under international networks to support policymakers and involve communities in SIDS and LDCs. In 2020, there were 432 partnerships addressing the benefits of sustainable ocean-based economy to SIDS and LDC's, from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture, and tourism⁵. Aside from the need to strengthen implementation and accountability for these partnerships, potential new partnerships could improve marine environment monitoring and observation systems and the surveillance of ocean economy activities, with the use of new tools and instruments such as coastal and marine spatial plans (CMSP is an important step to guide decision-making and for resolving conflicts over

⁵ See <https://sustainabledevelopment.un.org/partnerships/goal14/>

ocean space) and observatories for the ocean-based economy to give decision-makers the fundamental up-to-date information on how all sectors are performing (these can be national or regional, depending on the context).

Finally, it is important to recognize the work being done under the SIDS Accelerated Modalities of Action – also known as SAMOA Pathway – and the SIDS Partnership Framework. Among its many priorities, healthy, productive, and resilient oceans are considered as critical source of livelihoods and an important element of identity for the people of the SIDS. In October 2019, the SAMOA Pathway had its mid-term review and the political declaration that was adopted then (see UNGA Res. 74/3) clearly calls for the scaling up and development of genuine and durable partnerships with all stakeholders at national, regional, and international levels that follow the Small Island Developing States Partnership SMART criteria, that is:

- SIDS-Specific;
- Measurable and monitorable;
- Achievable & Accountable;
- Resource-based & results focused;
- Timeline for implementation & transparency by all parties.

DIALOGUE 6 – INCREASING SCIENTIFIC KNOWLEDGE AND DEVELOPING RESEARCH CAPACITY AND TRANSFER OF MARINE TECHNOLOGY

Status and trends

Science plays an irreplaceable role in support of decision-making processes towards ocean sustainability. There is a need for partnerships among the private sector, the scientific community, and governmental organizations at national, regional, and international scale to gather and analyse big data regarding oceanographic processes. Such scientific capacity and initiative must be promoted, and supported, both politically and financially. Additional debate is needed to address knowledge gaps and technological solutions for data collection and management, which, in turn, can further help decision-making processes to foster a healthy and productive ocean.

Challenges and opportunities

The major challenges and opportunities related with the development of scientific research and transfer of marine technology are essentially linked to the following factors: lack of training, infrastructures, and resources to properly conduct work at sea; scarcity of information, especially in more remote areas, including difficulties in sampling; lack of standard metadata and data, and lack of multidisciplinary studies and approaches, connecting different fields of knowledge. Integrated management policies need to rely on the best available science, hence there is an urgent need to increase scientific knowledge, particularly in seabed mapping, knowledge of marine processes and functions, and ecosystem services, including on carbon stocks and carbon sequestration, as well an urgent need to streamlining existing scientific funding and capacity instruments.

Possible areas for new partnerships

The establishment of partnerships between research centres and centres of engineering and development systems, combining robotics and new technologies, is essential to reinforce the relationship between the

different scientific and operational components. Good examples in this regard could be the **Atlantic International Research Centre** (the AIR Centre), an international non-profit organization for the development of scientific and technological applications in the Atlantic region to promote the creation of highly qualified jobs, paying special attention to the study of ocean-space interactions and the development of sustainability solutions using Earth Observation from the space⁶ and the “*Laboratórios Colaborativos (CoLAB)*”, non-profit private organizations and collaborative platforms between research and industry, joining companies, R&D units and higher education institutions, often stemming from technology interface centres⁷. Thus, scientific multidisciplinary and multisectoral cooperation is key to contribute to a better understanding of such a complex environment.

The same mindset applies to cooperation between countries, particularly developed and least developed, including Small Island Developing States (SIDS) and Land Locked Developing States (LLDC). Such a complex and interlinked environment requires strong collaboration mechanisms, namely on capacity-building and transfer of marine technology. An effective commitment to apply Part XIV of the United Nations Convention on the Law of the Sea, in line with the United Nations Decade of Ocean Science for Sustainable Development, is of paramount importance.

DIALOGUE 7 - ENHANCING THE CONSERVATION AND SUSTAINABLE USE OF OCEANS AND THEIR RESOURCES BY IMPLEMENTING INTERNATIONAL LAW, AS REFLECTED IN THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

Status and trends

Many gaps remain to be closed and most of the challenges (if not all) are still to be dealt with. For instance, persistent lack of progress in the full implementation of UNCLOS and its implementing agreements and other relevant instruments, combined with the absence of a complete network of regional bodies to ensure the needed geographical coverage, hampers our collective ability to conserve and sustainably use marine resources and to ensure a clean, healthy, and productive Ocean for present and future generations. Our inability to effectively address these gaps is amongst the root causes of the many problems that the Ocean faces nowadays.

UNCLOS and related instruments

UNCLOS provides the legal framework within which all activities in the oceans and seas must be carried out and is of strategic importance as the basis for national, regional, and global action and cooperation in the marine sector. It currently has 168 States Parties, including the European Union, and many of its provisions are also considered to reflect customary international law. Aside from the fact that not all UN members are parties to UNCLOS, the membership of its implementing agreements is also not perfect:

- The Agreement relating to the implementation of Part XI of the Convention of 10 December 1982, which was adopted to address certain difficulties with the seabed mining provisions contained in Part XI of the Convention, currently has 150 parties.

⁶ www.aircentre.org

⁷ Their main goal is to create skilled and scientific jobs in Portugal, both directly and indirectly, by implementing research and innovation agendas geared at creating economic and social value based on scientific knowledge and knowledge transfer.

- The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) currently has only 91 States Parties, including the European Union.

Adding to the existing body of instruments, and with the aim of developing a comprehensive global regime to better address the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ), the General Assembly adopted resolution 72/249 of 24 December 2017, to convene an Intergovernmental Conference under the auspices of the United Nations, to consider the recommendations of the Preparatory Committee established by resolution 69/292 of 19 June 2015, to elaborate the text of an international legally binding instrument under UNCLOS. With the ideal deadline of 2020 missed due to the COVID-19 pandemic, the importance of the multilateral negotiations concluding in 2022 should be underlined.

The new international legally binding instrument is designed to complement existing international agreements on issues such as high seas fisheries⁸, deep sea mining⁹, marine pollution¹⁰, intellectual property rights¹¹ and biodiversity protection¹². If negotiations succeed in producing an ambitious regulatory framework, this agreement will constitute a major innovation in global governance of the Ocean and could add robustness to the existing legal framework. The BBNJ negotiations also represent an important shift in focus for UNCLOS, from control and prevention of pollution and living marine resource exploitation, to management of marine protected areas in areas beyond national jurisdiction (ABNJ) for the sake of protection, conservation, and sustainable use of marine biodiversity.

Efforts in ensuring global ratification and participation in current and future instruments should be continuously supported, including further developing regional approaches and instruments where currently there are none, and more visibility should be given to the work being done by all States and stakeholders to implement UNCLOS' provisions.

UNCLOS and Environmental Law

To implement UNCLOS general duty to cooperate in the conservation of marine resources, an international legal order was put in place. However, that order is prone to fragmentation, mostly due to the combination of international measures, instruments and organizations (global, regional and sectorial) that are tasked with addressing many of the Ocean related challenges (marine pollution in all forms, in particular marine plastic litter and microplastics, biodiversity loss, invasive species, eutrophication and dead zones, underwater noise, etc). Moreover, this constellation of bodies and regimes falls short on monitoring, compliance and coordinated action and, therefore, has room for improvement in terms of coherence, measurable, meaningful, and effective results.

At the same time, very solid international multilateral work already exists, mainly being done under the UN Environment umbrella: actions in addressing land-based pollution and protecting the marine environment from the harmful effects of human activities on land, working with regional seas¹³ and encouraging countries to work together to protect and sustainably manage their marine and coastal

⁸ RFMO's regime.

⁹ ISA's regime.

¹⁰ Different regimes, ranging from IMO's MARPOL Convention to many multilateral environmental agreements.

¹¹ Under WIPO (namely the Intergovernmental Conference on Genetic Resources, Traditional Knowledge and Folklore) and TRIPS/WTO.

¹² Under the CBD and Nagoya Protocol regimes.

¹³ See <https://www.unenvironment.org/explore-topics/oceans-seas/what-we-do/working-regional-seas>

environments, protecting the world's coral reefs from the effects of climate change and other human activity, promoting marine protected areas to conserve, manage and protect marine resources, and fighting for clean seas, leading a global movement to highlight the problem of marine litter and tackle it decisively.

UNCLOS' implementation also calls for the implementation of other international environmental law instruments, including soft law and multilateral environmental agreements¹⁴. On controlling greenhouse gas emissions, the United Nations Convention to Combat Climate Change (UNFCCC) and the Paris Agreement are the central instruments for global cooperation and coordination.

The consequences of insufficient action and low ambition on the implementation of these instruments are well known, highlighted in many reports developed under these Conventions and in other assessments, from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the Global Assessment Report on Biodiversity and Ecosystem Services, the International Panel on Climate Change Special Report on Oceans and Cryosphere (IPCC-SROCC), to the Global Environment Outlook (GEO) and the first World Oceans Assessment (WOA).

UNCLOS and Maritime Security

Another area where the lack of implementation of international law, as reflected in UNCLOS and other instruments, is evident is the maritime security. Challenges faced nowadays, namely in the Gulf of Guinea, the Western Indian Ocean and the Caribbean, have shown that sustainable use and protection of ocean and coastal spaces can only come through holistic and effective ocean governance. In this context, the implementation of international law and international cooperation in preventing maritime environmental crimes and fighting transnational organized maritime crime contribute to the conservation and sustainable use of these vital spaces, while ensuring their peaceful and secure use, improving the living standards of populations and coastal communities, and enhancing national and regional capacities to guarantee free, safe and fair international trade and tourism and the sustainable use of their marine resources.

From a perspective of conservation and sustainable use of the Ocean, maritime environmental crimes and transnational maritime crime severely impact marine and coastal ecosystems. Criminal organizations may dump harmful and noxious substances into ocean spaces for profit (toxic waste dumping), allow pollution to happen as a by-product of other illicit activity (oil spills related to piracy or irregular refuelling of trafficking vessels) or create a general state of lawlessness in ocean spaces that leads to a situation where the natural resources cannot be properly enjoyed by their legitimate users (coastal communities) and are illicitly depleted (IUU fishers).

Challenges and opportunities

To stimulate more action and enhance the conservation and sustainable use of oceans and their resources by implementing international law, as reflected in UNCLOS, we must continue to support the efforts to assist States in becoming parties to the relevant instruments and/or in implementing their obligations.

All States, particularly coastal states, are challenged by the implementation of the comprehensive legal framework in UNCLOS and other legal instruments. In the case of developing coastal states and Small

¹⁴ Such as the UN Convention on Biological Diversity, the UNECE Water Convention, the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), the Convention on Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention), the Convention on Persistent Organic Pollutants (Stockholm Convention), the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol), etc.

Island Developing States (IDS), there is a need for sustained capacity-building, infrastructure, including the transfer of marine technology, and increased and improved cooperation and coordination at all levels, particularly cross-sectorial cooperation. In this context, it is important to consider the special challenges faced by IDS, landlocked developing countries (LLDCs) and least developed countries (LDCs), regarding accessing and realizing the benefits arising from the sustainable development of the oceans and their resources, while protecting, conserving, and restoring marine ecosystems. Also, it is necessary to build capacity to ensure broad and multidisciplinary participation in intergovernmental processes and the development of inclusive sustainable solutions to multifaceted problems.

Capacity development is a fundamental tenet of the mission of the UNESCO Intergovernmental Oceanographic Commission (IOC-UNESCO), enabling all Member States to participate in, and benefit from ocean research, global ocean observation and warning systems, technology and services that are vital to sustainable development and human welfare on the planet. The Vision Statement of the IOC Capacity Development Strategy (2015-2021), as contained in IOC-XXVIII/2 Annex 8 and its revised corrigendum, identifies capacity development as the primary catalyst by which IOC will achieve its four high level objectives in the IOC Medium-Term Strategy (2014 – 2021). In this context, IOC has directed its support to Member States in developing:

- (i) a global data sharing platform and data clearing-house mechanism for marine biodiversity data in all ocean basins, including areas beyond national jurisdiction;
- (ii) a mechanism for international cooperation in marine scientific research, coordination in global ocean observation, development of standards, manual, guidelines, and codes of conduct in marine scientific research and data sharing protocols; and
- (iii) a global network of regional centers to enhance capacity, by training the next generation of scientists and area managers in applying international standards and best practices.

Resource capacity, including financial capacity, also remains a significant constraint: reliable and predictable funding is key to achieve significant results. Although several programmes support States in developing such capacity, the overall level of assistance does not match current levels of demand. In particular, financial support is required to assist developing countries in the implementation of UNCLOS and the UNFSA. Such support is generally provided bilaterally or through voluntary trust funds. However, the voluntary trust funds established by UNGA for the implementation of these instruments are for the most part depleted, as funding remains largely dependent on voluntary contributions.

Possible areas for new partnerships

We need to consider new and innovative ways of sustainable financing to ensure a predictable and stable funding scenario to allow developing countries to be able to implement projects on a medium-long-term basis. Where technology constraints are an impediment to effective implementation of a State's obligations, UNCLOS and relevant instruments have provisions for technology transfer. However, implementation of some of these provisions has been insufficient. These need to be effectively implemented across all levels to produce the desired results.

DIALOGUE 8 - LEVERAGING INTERLINKAGES BETWEEN SUSTAINABLE DEVELOPMENT GOAL 14 AND OTHER GOALS TOWARDS THE IMPLEMENTATION OF THE 2030 AGENDA

Introductory note: This new Dialogue was set up to explore the interlinkages between SDG14 and other Goals of the Agenda (including those that were identified during the discussions held in the other 7

Dialogues), as well as consider how effective action to implement Goal 14 supports progress on other SDGs and to what extent action on other SDGs contribute to the successful implementation of Goal 14.

Like the Ocean, SDG implementation is closely interconnected. These need to be considered as a whole. Covering about 71% of the surface of this planet, the Ocean generates more than half of the oxygen we breathe, holds 97% of the world's water, regulates climate, supplies food and pharmaceuticals, provides millions of jobs, offers unlimited recreation, and allows trade and transport. Studies indicate that the ocean-based economy is estimated to be US\$ 125–145 trillion per year. A decline in ocean health, productivity, and resilience due to increasing human pressures by mostly land-based pollution, climate change-induced warming and sea-level rise, ocean acidification and over-exploitation of marine resources is a major threat to achieving sufficient nutrition, livelihoods, and economic growth, especially for coastal communities. Other important ecosystem services such as recreation and coastal protection are also affected. Thus, achieving SDG14 strongly depends on progress on other goals.

However, the interlinkages between SDG14 and other SDGs may not always be synergetic, and, in some cases, we may see negative or neutral feedbacks between targets.

SDG14 & SDG1

SDG14 targets interact with SDG1 targets in ending income poverty and multidimensional poverty (deprivation of non-monetary factors including ecosystem services, education, training, sanitation, and health). Healthy, productive, and resilient oceans and coasts are a critical enabler of poverty alleviation, environmentally sustainable economic growth, and human well-being, especially in coastal communities. Thus, marine conservation is not a luxury; it is a necessity and should be considered for developing business models for sustainable income, food security, poverty alleviation, social welfare and jobs, energy production, peace, and security.

Poor coastal communities in low-income countries are likely to suffer the most from changes in the coastal and marine environments. Protection, restoration, and management of critical coastal and marine habitats have the most direct links to poverty eradication, improving livelihoods and reducing vulnerability related to extreme climate events. Sustainable tourism, fisheries, and coastal agriculture in SIDS and LDC can create decent jobs that reduce income poverty. However, higher economic activities (usually resource intensive in nature) aimed at poverty alleviation can create more pressure on coastal and marine resources and environmental harm and can lead to long-term costs to local economies.

Protection, restoration, and management of critical coastal and marine habitats maintain biodiversity and rebuild fish stocks, being inextricably linked to improved livelihoods and eradicating poverty. The net benefits of target 14.2 include improved revenue from tourism, enhanced biodiversity and fish stocks, and increased potential for income from blue carbon markets. At the same time, coastal habitats protect homes, communities, and businesses from extreme climate related events such as coastal flooding and storm surges and can help reduce the vulnerability of poor people (often with no insurance) and the associated economic impacts.

SDG14 & SDG2

Food security is a major global challenge and increased agricultural production could damage ocean health through nutrient runoff and related pollution. According to the FAO, in 2018, out of 7.6 billion people in the world, one out of every ten persons was suffering from undernourishment or chronic food deprivation. Almost all the hungry people live in developing countries. Experts anticipate that by 2050 the demand for food will be at least 60% more than what it is today. Land-based agriculture cannot meet the

demand. Oceans can be a large part of the solution, provided they are in a healthy condition to be productive and resilient. Seafood is a major factor in food security, as in 2016 global production (seaweed, captured fish and aquaculture) ascended to 190.2 million tons. According to the FAO, fisheries and aquaculture produced, in 2017, circa 153 million tonnes of fish for direct human consumption, a 7-fold increase from 1950, providing 3.3 billion people with almost 20 percent of their average per capita intake of animal protein. 33 per cent of all marine fish stocks monitored by FAO are fished beyond biological sustainable limits, a threefold increase since monitoring started in 1974, with diverging sustainability trends between species and regions.

Oceans are thus essential for ensuring food security and meeting nutritional needs. Nowadays, there is an inability to implement sustainable fisheries management, which also relies on sound monitoring and control. This is often due to lack of institutional and human capacity and of adequate fisheries governance, challenges that climate change, growing populations, environment degradation and biodiversity decline will further exacerbate. Some measures that could improve the current scenario may include the following:

- Effective implementation of binding and non-binding fisheries and aquaculture instruments;
- Reinforce the sustainable management of fish and fisheries resources, nationally, regionally and globally, in line with an ecosystem approach, with fully integrated conservation and sustainable utilization measures across all aquatic systems;
- Eradicate whaling activities and shark finning and significantly reduce the bycatch of marine mammals, birds, reptiles and the capture of sharks and cetaceans;
- Minimize the adverse impacts of fishing and aquaculture activities on marine and freshwater ecosystems and vulnerable habitats, including by avoiding by-catches, especially of large marine predators;
- Reinforce the scientific basis supporting management decisions, in particular by continuing to promote international scientific cooperation and capacity-building and ensure the best available scientific advice is duly considered in the decision-making process;
- Promote sustainable consumption and production patterns of fish and fish products derived from sustainable fisheries and aquaculture, and ensure that fish and fish products are considered in national, regional and global food security, safety, sustainability and nutrition strategies;
- Reinforce international and regional cooperative governance mechanisms, including efforts to implement international instruments, such as the 1995 UN Fish Stocks Agreement and the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated fishing, in order to reduce overfishing, improve the control of fisheries activities and provide adequate protection to vulnerable ecosystems;
- Strengthen the conservation and management regimes of Regional Fisheries Bodies and Regional Fisheries Management Organizations, and improve their performance to enhance fisheries governance and better preserve and restore marine ecosystems and biodiversity, while more effectively contributing to food security, to fair, healthy and sustainable food systems, to fight against IUU fishing, as well as to sustainable growth and jobs, in pursuit of the same goals in line with and complementary to existing international instruments;
- Promote decent work and facilitate access to social protection programmes for fishers and aquaculture producers and their communities by reducing the high number of accidents and fatalities, supporting safety at sea and working towards enhancing the standards of living for all in the sector while encouraging gender equality and equity, consistent with the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (SSF Guidelines), and promoting the

ratification of relevant international instruments for this purpose, particularly of the International Labour Organization and the International Maritime Organization.

Establishing integrated and coordinated multi-sectorial evidence and ecosystem-based management approaches, including marine spatial planning, greatly contributes to the management of these many different activities. Also, marine protected areas limiting access to marine resources to replenish biodiversity stocks contribute to ensure food security as fisheries and other natural resource uses generally benefit from sustainable practices and balanced conservation measures.

SDG14 & SDG3

There has been a growing recognition within the scientific community of the need for a more holistic and coherent approach to understanding the complex links between the seas and oceans on one hand, and human health and well-being on the other. How we interact with and affect our oceans and seas will significantly influence our future on Earth.

Some types of microscopic organisms produce toxins when conditions are favourable. Toxins from harmful algal blooms, sometimes called red tides, can contaminate shellfish such as clams and mussels. Eating contaminated seafood may cause serious illnesses. Harmful algal blooms are also unsafe to touch or swallow, and they can produce airborne toxins that cause health problems when inhaled. Marine ecosystems also contain creatures that can cause harm to human health and well-being (e.g., jellyfish, lionfish).

At the same time, numerous benefits to human health and well-being are also provided in the form of ecosystem services, including the supply of resources such as food and raw materials. Ecosystems support organisms that can serve as the source of future medicinal products (e.g., conotoxin from sea snails, for the treatment of chronic pain). Destruction of these ecosystems, through pollution, unsustainable fishing practices, and extractive industries, for instance, threatens important health-related discoveries. Biotechnology is opening opportunities to exploit marine genetic resources with potential for new drugs and nutraceuticals. Research is also beginning to identify the mental health benefits of interacting with the coastal environment (evidence shows that increased views of blue space is significantly associated with lower levels of psychological distress, proving the positive effects that the Ocean and the Sea has in our body, by reducing stress, certain symptoms of depression, inducing relaxation and encouraging exercise and physical activity). Understanding this complexity can only be achieved with an interdisciplinary approach, drawing from expertise across a diverse range of disciplines within natural, social, and economic sciences, public health, and medicine.

SDG14&SDG4

Over the next decade, the amount and quality of educational and training offer must increase to stimulate mobility between maritime jobs, innovation, and entrepreneurship.

New professional skills with the purpose of attracting more young people and women to ocean related professions should be developed. To this end, investment in education and training of specialists in ocean related subjects must be increased.

We also must invest in ocean literacy involving the people changing the way we think and act on matters concerning oceans. We need to include society itself in this transformation, especially children and youth

people. That is why ocean literacy programs like “Blue School” (Escola Azul) are necessary. Blue School brings Ocean Literacy to schools, to help the school community understand the importance of the Ocean in their lives and their own impacts on the Ocean. It is framed by the Ocean Literacy principles and an Ocean Literacy multiperspective approach. The Blue School network brings together schools, municipalities, research centers, players from industry and business, NGO’s, and museums.

Through critical thinking and creative learning, students develop emotional bonding with the Ocean and can convert knowledge into decision-making and effective action towards the solution. This ultimate purpose is also in line with SDGs 4 (Quality Education), 14 (Life Below Water) and 17 (Partnerships for the Goals).

Under the scope of the All-Atlantic Ocean Research Alliance, the All-Atlantic Blue School Network was created in 2020, involving Angola, Argentina, Brazil, Canada, Cape Verde, France, Ireland, Morocco, Namibia, Portugal, São Tomé and Príncipe, South Africa, UK, and the USA.

Each country will develop national Blue School programmes respecting their social, cultural, and educational features, following Ocean Literacy principles and Blue School guidelines. This will allow for a fruitful international exchange of Ocean Literacy experiences, contributing to quality education and inclusiveness.

SDG14 & SDG5

It is a fact that none of the targets for SDG 14 address gender equality or how marine resources relate to the livelihoods of women and men, including the role such resources can play not only in food security, employment, and poverty reduction but also in marine scientific research and development of knowledge.

According to UN Women, women and girls face the risks of ocean degradation with fewer assets and alternatives for income, and less resilience against mounting losses. Fishing and aquaculture are marked by significant occupational segregation, with men primarily involved in fish and aquaculture harvesting, and women largely concentrated in secondary jobs such as fish processing and marketing. In certain parts of the world, women often work without contracts or health, safety, and labour/social rights protections. Many are constrained by the lack of access to knowledge, technology, infrastructures (such as refrigeration) and other resources.

In the maritime industry, women usually are not included in decisions regarding the management of coastal and marine resources¹⁵. In 2016, only one of the top 100 seafood companies was run by a woman. Efforts in reversing this statistic are crucial to make significant change happen and, nowadays, *gendering shipping*¹⁶ is a new emerging trend of benchmark in the maritime sector, based on obvious good examples of responsible social attitude on solving the gender issues within the industry.

The International Maritime Organization (IMO) has been making a concerted effort to help the industry move forward and support women to achieve a representation that is in line with twenty-first century expectations. Within the framework of maritime development, and through its *Women in Maritime*¹⁷ programme, under the slogan: "Training-Visibility-Recognition", IMO has taken a strategic approach

¹⁵ See report “[Progress on the Sustainable Development Goals: the gender snapshot](#)”, prepared by UN Women with UNDESA. This publication brings together the latest available evidence on gender equality across all 17 Goals, underscoring the progress made as well as the action still needed to accelerate progress.

¹⁶ See Dragomir, Cristina, “[The role of Maritime Labour Convention in reducing maritime gender inequalities](#)” for more details on this matter.

¹⁷ See <http://www.imo.org/en/OurWork/TechnicalCooperation/Pages/WomeninMaritime.aspx>

towards enhancing the contribution of women and girls as key maritime stakeholders. IMO continues to support the participation of women in both shore-based and sea-going posts.

It is worth noting the work being done by the Women's International Shipping & Trading Association (WISTA). WISTA International was formed in 1974 and is a global organization connecting female executives and decision-makers around the world. WISTA International serves as a connector for its network of more than 3,500 female professionals from all sectors of the maritime industry¹⁸. These types of initiatives can help deliver the needed change. States and stakeholders should support a National WISTA Association in their country and assist their respective maritime sectors reach new benchmarks in the industry, in line with SDG5¹⁹.

SDG14 & SDG6

The critical importance of water has been highlighted by the pandemic, as access to safe drinking water, adequate sanitation and hygiene were amongst the first lines of defence. Water should also be at the centre of efforts to “recover better” from COVID-19. Scaling up access to water and sanitation services not only contributes to containing the current crisis but increases resilience to future crises. Additionally, the COVID-19 pandemic has exacerbated existing challenges faced by oceans and marine biodiversity which cannot be fully addressed without a comprehensive strategy that considers the full cycle of water.

Thus, SDG 14 on Oceans and SDG 6 on Water and Sanitation are inextricably linked as oceans and seas are major sources of water in the hydrological cycle and therefore require sustainable management through integrated water management that addresses the multiplicity and diversity of water actors. Following a basin approach (source-to-sea/ridge-to-reef), Ocean sustainability directly links to sustainable water management. Preventing marine pollution and the reduction of sediment uptake from land contributes to improving water quality and ensures coastal protection and healthy coastal marine ecosystems. Conservation of marine and coastal areas, including estuarine areas, can support integrated water resource management and contribute to protecting and restoring water-related ecosystems. Sustainable aquaculture can contribute to water-use efficiency and local water and sanitation management. In return, increasing water-use efficiency may have positive feedbacks on marine and coastal ecosystems and support their conservation and sustainable use. On the other hand, strengthening coastal tourism or aquaculture as part of blue growth might negatively impact water quality and availability. Additionally, effective wastewater management, especially in coastal and urban areas, is a basic condition to prevent the deterioration of ocean's quality. Universal water and sanitation services must be in place to guarantee people's health, social and economic growth, the quality of environment, but also marine and coastal ecosystems protection.

Existing actions for the achievement of SDG 14 and SDG 6 are insufficient, in part due to limited coordination between the ocean and freshwater communities. Collaborative action is therefore imperative if these goals are to be met, especially in a context of climate change. Accelerating action would require building on synergies between various ocean and water-related targets, processes, and initiatives, and providing for enhanced cooperation and coordination. Furthermore, source-to-sea

¹⁸ More than 50 countries support a National WISTA Association (NWA), each of which in turn is a member of and is guided by WISTA International. NWAs provide in-country and regional networking, business and skill-building opportunities, corporate visibility, and also facilitate relationships within the industry. On a global scale, WISTA members have access to a network of executives in the shipping and trading field on whom they can call for referrals, connections, advice or business collaborations.

¹⁹ WISTA Portugal was launched on 18 September 2018 announced by Portugal's Minister of the Sea at the Portugal Shipping Week in Lisbon. WISTA Portugal has over 40 members, from all sectors of the Portuguese maritime industry.

linkages must be properly recognized and addressed as part of SDG implementation to ensure that the linkages between the different goals, and their targets, are considered directly.

SDG14 & SDG7

Increasing the share of renewable energy in the global energy mix and improving energy efficiency, reliability and affordability will enhance sustainability and help reduce ocean acidification through reduced greenhouse gases emissions. Different types of renewable energy harvested in (e.g., waves, tidal) and over (wind, solar) the ocean already contribute to the global renewable energy supply and have the potential to expand further in the future, particularly in island states and coastal regions. These technologies will very likely be complemented by offshore hydrogen production – which finds a powerful match, particularly in offshore wind turbine projects, expanding energy production and storage potential and further the decarbonisation of industry and transports. Strengthening R&I and transfer of marine technology in this field is supporting this expansion and helping increase the share of renewable energy in the global energy mix. More energy infrastructure in coastal and marine areas contributes to energy security. Infrastructure foundations can act as artificial reefs with a resultant increase in fish populations but, on the other hand, it may have negative impacts, such as affecting underwater migration patterns or increasing spatial competition with other uses (coastal and marine protected areas, fisheries, aquaculture, and tourism). But synergies with other uses are also possible and are being considered, both in the production of electricity at utility scale and in off-grid decentralized applications. For example, at utility scale, by integrating offshore wind and waves for a more consistent pattern of produced electricity and, in off-grid applications, by integrating electricity production at the sea with aquaculture or offshore hydrogen generation.

Currently, there are several offshore-related technologies in development depending on the endogenous resource being used, such as: wind, produced by the uneven heating of the Earth surface by the Sun; waves, created by the action of wind passing over the surface of the ocean; tidal range (tidal rise and fall), derived from the gravitational forces of the Earth-Moon-Sun system; tidal currents, water flow resulting from the filling and emptying of coastal regions as a result of the tidal rise and fall; ocean currents, derived from wind-driven and thermohaline ocean circulation; Ocean Thermal Energy Conversion (OTEC), derived from temperature differences between solar energy stored as heat in upper ocean layers and colder seawater, generally below 1000 m; salinity gradients, derived from salinity differences between fresh and ocean water at river mouths; sun, directly converted into electricity also in offshore floating solar panels.

Marine biomass or submarine geothermal are not listed²⁰ but are also part of the energy *mix*. Most ocean energy technologies are being developed to produce electricity or other energy carriers such as hydrogen, although some of them are being developed to deliver other or multiple products derived from the physical and chemical properties of seawater (e.g., fresh water and sea water air conditioning). The development of these energy solutions requires the support of intergovernmental cooperative frameworks that enhance the level of engagement between all the relevant stakeholders, to make effective and meaningful progress in the deployment of technical innovations that harness the energy potential of the Ocean, such as the Ocean Energy Systems (OES)²¹. OES adopts an integrated approach, with ongoing projects dedicated to issues such as jobs, dissemination of technologies, environmental concerns, cost of energy, technology roadmap and performance metrics. Participation in OES not only

²⁰ Since sea water is not the motive power in these technologies.

²¹ **Ocean Energy Systems (OES)** is the short name for the Technology Collaboration Programme on Ocean Energy Systems, an intergovernmental collaboration between countries, founded in 2001, which operates under a framework established by the International Energy Agency (IEA) in Paris. <https://www.ocean-energy-systems.org/about-us/vision-mission/>

contributes to the development of new technologies in this field but also enhances the contracting Parties abilities to take advantage of the benefits that ocean energies have to offer.

SDG14 & SDG8

Sustainable growth of marine and maritime sectors supports employment and economic growth. In the EU, the 'blue' economy represents roughly 5.4 million jobs and generates a gross added value of almost €500 billion a year²². However, further growth is possible in a number of areas, such as aquaculture, coastal tourism, marine biotechnology and marine renewable energies. Essential components and skills are necessary to provide knowledge, capacity, legal certainty and security to the blue economy stakeholders, such as marine knowledge to improve access to information about the sea; maritime spatial planning to ensure an efficient and sustainable management of activities at sea; and integrated maritime surveillance to give authorities a better picture of what is happening at sea (see link with SDG16, below).

Our coasts and seas have the potential to deliver growth and jobs in the coming years. Yet many blue economy sectors are experiencing difficulties in finding the right employees – and most sectors expect these difficulties to continue in the near future. This may be due to skills gap between education offer and labour market needs, especially with regards to technological developments and innovation; a lack of communication and cooperation between education and industry; a lack of attractiveness and awareness of career opportunities in the blue economy; and lack of ocean literacy culture.

Three main actions can have a positive effect in overcoming these difficulties and improve the value of blue economy jobs, namely:

- redefine the notion of 'career' in the blue economy and establish platforms for cooperation between business and education at local/regional or transnational level to develop and implement concrete actions to close the skills gap, tackle the unemployment challenge and raise the attractiveness of "blue careers" among students;
- develop blueprints on sectorial skills cooperation for the maritime technology sector, to better understand which skills are needed in the current market and where they are sought;
- intensify actions in the field of Ocean literacy, at all levels and with all the relevant stakeholders and improve global, regional and local knowledge on ocean issues, in an integrated manner, addressing the environmental, economic, social and legal dimensions of the use of Ocean spaces.

SDG14 & SDG11

Coasts are an attractive zone for human settlement and urban development, often driven by the opportunities for economic activities and natural resources provided by coasts and coastal zones. About 65% of all megacities worldwide are in coastal areas and, as a result, coastal areas generally show higher population densities, growth, and urbanization trends than inland areas, which implies a direct relation between ocean sustainability and sustainable cities and communities. This expansive and intensified utilization and change in coastal areas, which is also related to new uses such as aquaculture, coastal protection infrastructure or port construction, has many negative impacts on coastal ecosystems. Synergies are likely between the reduction in marine pollution and the development of safe housing, environmentally friendly, and smart cities that aim at reducing energy consumption, improving sewer management and minimizing the degradation of oceans and seas at large.

Similar bi-directional benefits occur between sustainable management practices and conservation efforts in the coastal and marine environment and the development of safe, resilient, and sustainable

²² See https://ec.europa.eu/maritimeaffairs/policy/blue_growth_en

settlements including through the growing investment in green infrastructure and nature-based solutions. Conflicts may occur where ocean and coastal conservation and restoration limit options for urbanization, housing, infrastructure or transport upgrading. Promoting the construction of new buildings using local materials may have negative impacts on coastal ecosystems, from which the building materials are removed, and on their conservation and restoration.

Tackling these problems requires making the oceans relevant to people and business in their everyday lives. We must work harder at the local and regional level to clean up coastal environments and get more people choosing to venture into the sustainable blue economy. A solution may lie in integrating urban coastal zones into smart cities programmes similar to those in place in many coastal cities around the world. A smart coastal city would integrate into the marine coastal areas the same observation and data collection technology that's already being applied in cities, spurring innovation in ocean remediation and restoration, and transforming seafronts from blighted industrial zones into clean and healthy public spaces full of amenities²³.

There is already evidence that smart coastal cities stand to generate huge economic benefits from cleaning up their oceanfront districts²⁴ through green infrastructures. Nature-based solutions and circular approaches are also supporting smart coastal cities to improve waste-water treatment to prevent algae blooms and restore oxygen to coastal dead zones. They can use microorganisms to transform the nitrates and phosphates in farm runoff into fertilizer and fish food. Cities can reduce plastic use and invest in making waste management more efficient, instead of exporting solid waste abroad, where it often ends up in the ocean. They can support ocean innovation incubators to advance solutions that restore natural resources like coral reefs, shellfish beds, fisheries, and sea-plant farms. And city governments can pass municipal bonds to provide new funding streams for local ocean improvements with global impacts.

All these initiatives are based on robust data collection and analysis, since data and metadata can significantly enhance our understanding of the ocean for the benefit of business, science, and society.

SDG14 & SDG12

Sustainable Consumption and Production (known as SCP) is about doing more and better with less. It is also about decoupling economic growth from environmental degradation, increasing resource efficiency, and promoting sustainable lifestyles. Sustainable management of natural resources or the reduction of wastes are critical for ending overfishing, for sustainably managing marine and coastal ecosystems and for reducing marine pollution. Halving per capita global food waste at the retail and consumer level, for example, will have positive impacts on ecosystem protection, sustainable fisheries, and marine pollution through reduced nutrient inputs from agriculture.

Achieving sound management of chemicals throughout their lifecycle will also help minimize marine pollution from land-based and offshore industries. Recycling and prevention of waste from land-based sources is a prerequisite for reducing marine litter.

²³ The area surrounding venue of the 2020 UN Ocean Conference, *Parque das Nações* in Lisboa, is a living example of what once was an old and out of order refinery that was converted into a modern urban space with broad open areas with modern smart buildings and gardens, with all sorts of services, hotels and restaurants. This urban reconversion project was completed in 1998 for the EXPO98 (also dedicated to the Ocean) and still stands as a good example of urban integration that transformed the city of Lisboa.

²⁴ Copenhagen began restoring its harbor area 20 years ago, turning it from a grimy dockland into a thriving public space full of water parks where people swim in harbor pools, rent kayaks or picnic boats and take water taxis. The scheme has attracted residents and tourists alike to hotels, restaurants and other amenities on its shores.

Improving ocean literacy and understanding the drivers of ocean decline could support transformations towards sustainable consumption and production. More directly, conserving and sustainably using the oceans, seas and marine resources has the potential to support sustainable consumption and production patterns in ocean-based industries (fisheries, tourism, and maritime transportation, amongst others). The interlinkages between SDG14 and SDG12 involve at least three basic actions to enact the needed change:

- Decoupling environmental degradation from economic growth;
- Applying life cycle thinking across all sectors and tools, increasing the sustainable management of resources and achieving resource efficiency along both production and consumption phases of the lifecycle, including resource extraction, the production of intermediate inputs, distribution, marketing, use, waste disposal and re-use of products and services;
- Seizing opportunities for developing countries and “leapfrogging” to more resource efficient, environmentally sound and competitive technologies, bypassing the inefficient, polluting, and ultimately costly phases of development followed by most developed countries.

SDG14 & SDG13

Ocean and coastal ecosystems are essential climate regulators but are also directly affected by climate change. Restoring and protecting the health of oceans, coasts and marine resources contributes to strengthening the resilience and adaptive capacity of both the natural and human systems to climate change. Coastal ecosystems such as mangroves, saltmarshes and seagrass meadows contribute both to climate adaptation (e.g., protection from coastal and marine hazards) and climate mitigation (through carbon sequestration). Further co-benefits arise from reducing risks and vulnerabilities and strengthening the resilience of coastal communities to climate-related hazards (such as by promoting poverty eradication, food security, sustainable livelihoods, capacity building or biodiversity). Where sustainable ocean management is included as a topic in education, training, and technology transfer in relation to climate change, contributes to raising capacity on climate change adaptation and mitigation and ensuring more effective climate change planning and management. In turn, achieving action on climate change will help limit ocean acidification, already well underway, and will positively affect ocean management and conservation efforts.

The potential for trade-offs is limited but possible. Offshore installations for renewable energy production may have negative impacts on the marine environment, particularly on marine mammals. On the other hand, failing to mitigate climate change and reduce global warming will increase climate related impacts on coastal ecosystems (warming and ocean acidification, sea-level rise and related effects). This may further constrain the protection and restoration of coastal ecosystems and reduce resilience and adaptive capacity towards climate change.

Although it is an essential component to regulate the climate system, the Ocean has long been absent from climate negotiations. Considering this, the Ocean and Climate Platform (OCP) was created on 10 June 2014, on World Ocean Day, with the support of UNESCO’s Intergovernmental Oceanographic Commission (IOC-UNESCO) and an informal group from civil society. Ever since, it has been working to bridge the gap between scientific knowledge and policy making with the main objective of ensuring that the scientific messages on the interactions between the ocean, climate and biodiversity are acknowledged and considered by both policy makers and the general public.

As decided by Parties to UNFCCC gathered at COP 25, the *Blue COP*, a dialogue on the ocean and climate change to consider how to strengthen mitigation and adaptation actions in this context was convened by the Chair of the Subsidiary Body for Scientific and Technological Advice (SBSTA) at its fifty-second session (in June 2020). The Glasgow Climate Pact decisions adopted at COP26 took significant steps forward in

this regard, by inviting the relevant work programmes and constituted bodies under the UNFCCC to consider how to integrate and strengthen ocean-based action in their existing mandates and workplans and to report on these activities and invited the Chair of SBSTA to hold an annual dialogue, starting at the fifty-sixth session of the Subsidiary Body for Scientific and Technological Advice (June 2022), to strengthen ocean-based action.

Furthermore, the Glasgow Climate Pact also highlighted the importance of protecting, conserving, and restoring nature and ecosystems to achieve the Paris Agreement temperature goal, including through forests and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by protecting biodiversity, while ensuring social and environmental safeguards.

SDG14 & SDG15

Ocean and coastal systems are hotspots for biodiversity, both in areas within and beyond national jurisdiction. Halting the loss of biodiversity improves the resilience of ecosystems and supports healthy and productive oceans. Issues such as overexploitation of marine resources and habitat degradation, all forms of pollution, wildlife trafficking, the introduction of invasive alien species or non-compliance with rules on access and benefit sharing arising from the use of genetic resources also have a strong impact on marine and coastal habitats and species, while ocean conservation and sustainable use of marine resources contributes to the reduction of habitat degradation, biodiversity loss and species protection.

Conservation, restoration and protection of transition and freshwater ecosystems will also benefit the health of oceans and seas. These actions reduce impacts from land-based sources, such as pollution, erosion, and low sedimentation uptake. On the other hand, ocean and coastal systems are responsible for important ecosystem services, such as food supply, carbon capture and sustainable tourism and recreation. In this connection, the declaration of 2021-2030 as the “United Nations Decade on Ecosystem Restoration” represents an opportunity to engage in closer synergies between marine and terrestrial ecosystems.

The management of activities on land to avoid pollution runoff to the ocean is important for the conservation of coastal marine ecosystems and demands a source-to-sea/ridge-to-reef approach. Deforestation and farming increase runoff of nutrients and sediment that can flow out to the Ocean, where sediment and nutrient pollutants can decrease water clarity and shade or smother habitats, reducing diversity of benthic organisms, habitat complexity and fish diversity. Thus, in places where coastal waters are strongly influenced by freshwater runoff, the management of marine ecosystems requires actions in connected terrestrial and freshwater habitats.

Management of runoff to coastal marine ecosystems requires identifying the source of impacts to ecosystems, so that appropriate actions can be taken to reduce threats. Between the land-use change and changes in marine ecosystems, multiple processes are operating across space and time that affect marine sediment concentrations: deforestation causes increased sedimentation in rivers and floodplains, rivers transport sediments to the ocean where sediments are dispersed to reefs. As the ocean disperses sediments widely, water quality at a single location in the marine environment may be influenced by rivers that drain multiple catchments. Also, denser ocean observation networks and effective early detection and warning systems are essential for the safety of the populations in coastal zones, particularly in areas more prone to extreme events and marine hazards, such as tsunamis. Sustained long term observations coupled to better constrained modelling and forecasting, and translated into warning systems, evacuation

plans and societal awareness at municipality level in coastal areas are essential for the safeguard of human life.

SDG14 & SDG16

Ocean governance, building on effective, accountable, and transparent institutions and responsive, inclusive, participatory, and representative decision-making, will be essential to achieve SDG14. Likewise, it will contribute to delivering peace, justice, and strong institutions. Specific synergies exist between tackling illegal, unregulated and unreported (IUU) fishing and the reduction of corruption and bribery. Implementing international law as reflected by the UN Convention on the Law of the Sea (UNCLOS) and related agreements, such as the UN Fish Stocks Agreement (UNFSA), would enhance the conservation and sustainable use of oceans and their resources. Aiming for accountable and transparent institutions, as well as inclusive, participatory, and representative decision-making is fully consistent with aiming to improve capacities of marine management organizations to end unsustainable fishing practices or to protect marine ecosystems. In the reverse direction, improving ocean governance for sustainability will be important to achieve SDG16 regarding the oceans.

Maritime insecurity stemming from insufficient implementation, monitoring, and control of international law of the sea has serious consequences on environmental and biodiversity degradation, leading to scarcity of natural resources and the related consequences felt by society and economies. While the effects are global, they are particularly felt by local coastal and/or small island communities especially dependent on traditional maritime activities and whose institutions may lack sufficient capacity or resources to face these challenges.

As the recognition of the link between maritime security and sustainable ocean governance grows, responses are beginning to emerge. States are increasingly recognizing the importance of incorporating maritime security aspects into ocean governance and blue economies plans and aligning resources to meet those priorities. Initiatives such as the Global Maritime Programme of the United Nations Office on Drugs and Crime (UNODC) supports its member states in improving their response to maritime crimes and ensure the rule of law over their marine jurisdictions. Cooperation initiatives such as the G7++ Friends of the Gulf of Guinea (G7++FoGG) and the Contact Group on Piracy Off the Coast of Somalia (CGPCS) call for increased ocean governance focused on strong cross-border, interdisciplinary and public-private partnerships, with the aim of ensuring the peaceful use of their marine regions.

SDG14 & SDG17

SDG17 is an important building block for the 2030 Agenda, aiming at strengthening the means of implementation for all the Goals and their targets. Global partnerships for sustainable development are especially important in the context of oceans, seas and marine resources, owing to the global connectivity of marine ecosystems and the cross-cutting and often far-reaching effects of marine resource use: an example of this can be found within the European Strategic Energy Technology Plan (SET Plan) that has developed efforts on ocean energy and offshore wind energy, whose objectives include to support the implementation of the respective Implementation Plans, developed in order to advance the technology to a level of independent commercial profitability.

Achievement of SDG14 will benefit particularly from effective international cooperation, the mobilization of financial aid, strengthened technology exchange, capacity building, sustained global observation networks and ocean literacy, better policy coherence and cross-sectoral multi-stakeholder partnerships.

IN CONCLUSION...

It is important to recall that Ocean covers about 71% of the surface of our planet, generates more than half of the oxygen we breathe, holds 97% of the world's water, regulates climate, supplies food and pharmaceuticals, provides millions of jobs, offers unlimited recreation, and allows trade and transport, amongst other unparalleled benefits.

In this context, the achievement of SDG14 depends on the compromises done in the implementation of other SDGs. The nature of the 2030 Agenda and its three dimensions (environmental, economic, and social) demands careful balance between protection, conservation and restoration and sustainable use of marine biodiversity. Related and ongoing within the Convention on Biological Diversity (CBD) are the negotiations of an ambitious post 2020 Global Biodiversity Framework (GBF).

Moreover, the implementation of UNCLOS – and its related agreements – together with the implementation of relevant environmental agreements, fisheries bilateral and regional policies, integrated management and spatial planning across geographical scales and administrative silos – particularly at the local, regional and global levels – and integrated maritime surveillance and environmental impact assessments will enable all States, in particular coastal states, to better safeguard, conserve and sustainably use ocean resources within their jurisdiction and globally in areas beyond national jurisdiction.

To take a better advantage of these interlinkages, ocean and coastal observation networks and monitoring frameworks need to be further developed, harmonized, and strengthened, since they provide the data needed to assess progress in the full implementation of SDG14. Tools such as Marine Protected Areas, Marine Spatial Planning (MSP), Integrated Coastal Zone Management (ICZM), Strategic Environmental Assessments (SEA) and Environment Impact Assessments (EIA) guided by the precautionary principle, Access and Benefit Sharing regimes (ABS), together with other area based management tools need to be increasingly part of the tool kit of Governments, local authorities, intergovernmental organizations and relevant stakeholders to improve and reinforce the quality of the decision-making process concerning the conservation and sustainable use of marine resources, at all levels. Finally, a sharp and synergetic combination of strong multi-stakeholder and international cooperation mechanisms together with regional and local approaches to identify the most important trade-offs among SDGs will be essential to achieve the predefined targets.