Contribution from UNESCO and its Integovernmental Oceanographic Commission

Inputs to Partnership Paper Concept Papers

Partnership Dialogue 1: Addressing marine pollution.

1) Status and trends

Nitrogen and phosphorous are two key nutrients. Together they play an important role in the global and local sustainable development agendas. The use of these nutrients is key to growing crops and thus to the world's food security. However, in some parts of the world farmers do not have access to enough nutrients to grow crops and feed growing populations. But in many other parts of the world there is an 'excess' of nutrients in the environment as a result of industrial and agricultural activity and has profound impacts, from pollution of water supplies to the undermining of important ecosystems and the services and livelihoods they support. Worldwide, the number of coastal areas impacted by eutrophication caused by excess nutrients stands at over 500. Dead zones in the world's oceans have increased from 10 cases in 1960 to 405 documented cases in 2008 (169 identified hypoxic areas, 233 areas of concern and 13 systems in recovery);

For the coastal manager, the quality of the groundwater runoff to the sea is of great concern. The chemistry of submarine groundwater discharge (SGD) to the sea is typically changed during its passage through the aquifer and sediments. As coastal groundwaters are often contaminated with sewage, fertilizers, pathogens, pesticides or industrial wastes, SGD can be an important pathway for diffuse pollution to the ocean.

Plastics have become indispensable in many areas of modern life, used for clothing, storage, transportation, packaging, construction and a host of consumer goods. One of plastics' greatest properties, its durability, is also one of the main reasons that plastics present a threat to the marine environment. It is widely recognised that marine debris can have significant ecological, social and economic impacts. Plastics form a large proportion of marine litter, and the widespread occurrence of macroscopic plastic debris and the direct impact this can have both on marine fauna and legitimate uses of the environment, sometimes remote from industrial or urban sources, has been well documented. In general, plastic debris comes in a wide variety of sizes and compositions and has been found throughout the world ocean, carried by ocean currents and biological vectors (e.g. stomach contents of fish, mammals and birds). Plastics degrade extremely slowly in the open ocean, partly due to UV absorption by seawater and relatively low temperatures.

2) Challenges and opportunities

The main challenge in relation to nutrient pollution is how to promote effective nutrient management, minimising negative impacts on the environment and human health, while maximising their contribution to global sustainable development and poverty reduction? This is directly linked with SDG Target 14.1: by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution.

Assessing the coastal aquifer vulnerability to contamination due to human activities and to sea water intrusion often due to the overpumping of groundwater in coastal areas is also important for managing water resources in coastal environmentd. More global efforts are needed to assess Submarine Groudnwater Discharges in coastal aquifers and marine areas.

In recent years the existence of micro-plastics and their potential impact has received increasing attention. Micro-plastics have a range of compositions and can be demarcated by usage and source as: i) 'primary' micro-plastic resin pellets used in the plastics industry, and in certain applications such as industrial abrasives and skin-care products; and, ii) 'secondary' micro-plastics resulting from the degradation and breakdown of larger items, including so-called biodegradable plastics.

Main challenges in realtion to plastic pollution are to:

1. identify the main sources and categories of plastics and microplastics entering the ocean
2. utilize end-of-life plastic as a valuable resource rather than a waste product
3. promote greater awareness of the impacts of plastics and microplastics in the marine environment
4. include particles in the nanosize range in future assessments of the impact of plastics in the ocean
5. evaluate the potential significance of plastics and microplastics as a vector for organisms in future assessments
6. future assessments should address the chemical risk posed by ingested microplastics in greater depth

3) Existing partnerships

The main challenge is how to promote effective nutrient management, minimising negative impacts on the environment and human health, while maximising their contribution to global sustainable development and poverty reduction? This is directly linked with SDG Target 14.1: by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution.

The question of the degree to which micro-plastics and associated chemical loads present a risk to organisms was raised through the GESAMP emerging issues programme. Following the preparation of a scoping paper in 2009, a Workshop was held in June 2010, hosted by UNESCO-IOC in Paris, bringing

together experts from industry, academia, NGOs and policy to examine Plastic particles as a vector in transporting persistent, bio-accumulating and toxic substances in the oceans. The proceedings of this Workshop were subsequently published as GESAMP Reports and Studies No. 82 in 2010. One of the recommendations was that GESAMP should carry out a global assessment. This resulted in the creation of GESAMP Working Group 40. In addition to UNESCO-IOC, WG40 is being supported financially and in kind by the International Maritime Organisation (IMO), the United Nations Environment Programme (UNEP), the United Nations Industrial Development Organisation (UNIDO), the National Oceanic and Atmospheric Administration (NOAA), the American Chemistry Council (ACC) and Plastics Europe.

4) Possible areas for new partnerships

The GPNM needs stronger buy-in from more governments to effectively be able to impact nutrient management at regional and global level.

The continued and expanded engagement of the plastic industry and society at large is critical in combination with the required science to manage the loading of debris and thus microplastic to the marine environment.

Microplastics is an emerging issue of freshwater and marine pollution, which requires urgent attention due to its impacts on aquatic and marine organisms. To assess the contribution of wastewater inputs to freshwater and marine pollution by microplastics, new partnerships operating at the land-sea interface are needed to better assess and mitigate the entry of microplastics into the marine environment. This could be build on UNESCO's International Initiative on Water Quality (IIWQ). Through this initiative, policy recommendations will be proposed on the removal of microplastics and micro-fibers from wastewater and consumer products while engaging with relevant stakeholders, especially industries and civil society organizations, in order to reduce marine pollution by microplastics. Partership with UNEP Global Programme of Action for the Protection of the Marine Environment from Land Based Activities (GPA), UNEP Global Partnership on Marine Litter (GPML) & Plastic Soup Foundation (The Netherlands) would be key in advancing this target.

5) Guiding questions for the dialogue

How best to :

1. identify the main sources and categories of plastics and microplastics entering the ocean
2. utilize end-of-life plastic as a valuable resource rather than a waste product

Partnership Dialogue 2 – Managing, protecting, conserving and restoring marine and coastal ecosystems.

1) Status and trends

Oceans have an essential role for life on earth, sustainable development, employment and innovation, but are exposed to increasing pressures facing oceans – climate change, acidification, eutrophication, biodiversity loss, pollution, over-exploitation and illegal activities. Many countries have undertaken the transition to move towards a more integrated and ecosystem based management of the marine environment, in the pursuit of sustainable development of the ocean and seas.

The 66 Large Marine Ecosystems (LME) of the world are the most productive regions and, within the ocean area, the greatest pressures are generated upon them. The LMEs are relatively large areas of coastal oceans on the order of 200,000 km² or greater with boundaries that are defined by ecological criteria – bathymetry, hydrography, productivity, and trophically linked populations. The ecologically defined boundaries of LMEs generally transcend natural political boundaries and encompass coastal ocean domains of two or more countries, thereby fostering international cooperation among countries moving towards recovery and sustainability of LME goods and services. From the above perspective, LME present a major governance challenge. However, prompt and large scale action is needed to achieve integrated adaptive ecosystem-based management and governance of transboundary resources, to overcome the downward trend of losses of goods and services, and to mitigate the degradation of the LMEs in the face of the accelerating effects of climate change.

Marine/maritime spatial planning (MSP) is an important means to achieve global ocean as well as LME governance goals and Agenda 2030. Marine spatial planning is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process. MSP is therefore a key tool to achieve ocean ecosystem-based economy and requires the active participation of policy makers, stakeholders and citizens.

Over the past ten years MSP has matured from a concept to a practical approach to moving toward sustainable development in the ocean. Integrated marine spatial plans have been implemented by about 20 countries, while by 2030 it is expected that at least a third of the surface area of the world's exclusive economic zones will have government-approved marine spatial plans.

Stonger mechanisms to better protect underwater cultural heritage in marine and coastal ecosystems are crucial. Cultural heritage is an integral and significant part of them and holds vast potential for scientific research and education, but also for tourism. Until today this heritage is yet little known and protected, but is greatly threatened by development, port construction and looting.

The UNESCO World Heritage List currently includes 49 ocean places – distributed across 37 countries – recognized for their unique marine biodiversity, singular ecosystem, unique geological processes or incomparable beauty. Despite their iconic World Heritage status, none of the World Heritage marine sites are immune to the effects of accelerating ocean industrialization, increasing pressure for coastal development or the serious impacts from climate change. The latest scientific data suggests that up to 15 of the universally outstanding coral reef systems on UNESCO's World Heritage List might be affected by the time the current bleaching event is over. Nearly a third of all marine sites on the UNESCO World Heritage List are threatened by unsustainable or illegal fisheries. Most sites struggle to comprehend the increasingly dangerous mix of cumulative and combined effects

2) Challenges and opportunities

Today only a few countries have legislation that explicitly authorises MSP. Most countries rely on existing, mainly the land use planning, legislation or other advisory arrangements to undertake and implement MSP.

Very few trans-boundary MSP examples exist in practice, although the European Union is encouraging a regional, transboundary approach among its Member States and all its sea basins.

MSP has also challenges to address in the immediate future, considering MSP as part of a larger planning and management process that requires effective coordination among authorities, economic sectors and citizens.

Moving towards ocean ecosystem-based economy to achieve SDG14.2 require investments and other management actions that should consider restoring and maintaining ecosystem services to support economic development. MSP can evolve as one of the most effective tools to govern LMEs. Scenario building must be integrated in the MSP processes in order to plan future-oriented maritime activities.

Most countries and regions are currently rethinking their ocean ecosystem based economies. Preliminary analysis and evaluations are being developed on the impact of MSP to increase the stability, transparency and predictability of investments in a changing climate. Larger implementation of MSP can be a trigger to stimulate larger participation of the private sector generating, thus, much larger share of the "blue" economy in overall global economy than it is the case today.

Finally, taking in consideration that 60% of the World Ocean lies in the areas beyond national jurisdiction, and many of these areas are constituent part of the LMEs, MSP in the high seas could play an effective area-based management role.

UNESCO's Man and the Biosphere Programme encourages countries to establish biosphere reserves in order to promote a sustainable development based on local community efforts and sound science. These can be an effective mechanism to achieve target 14.2 at the local level. Coastal and marine biosphere reserves can be used as a tool for sound innovative practices from a social, cultural and environmental perspective, with a view to bringing added value to local socioeconomic activities and, thereby, improving the livelihoods of the region's population.

The 1972 World Heritage Convention unites 193 nations behind a shared commitment to preserve the world's outstanding heritage for the benefit of present and future generations. World Heritage marine sites cover about 10 percent by surface area of all existing marine protected areas, and serve as prime ocean observatories and windows to the past. These sites are in a unique position to lead by example and inspire improved management in marine protected areas the world over.

3) Existing partnerships

At national and regional scale there are many existing partnerships partly covering the dialogues that we are proposing on marine/maritime spatial planning (MSP), the most important ones are based in the European Union, North America and SIDS which marine/maritime legal frameworks have created the synergies and fora for collaboration and exchange of good practices in between public administrations, stakeholders and citizens.

LME:Learn, currently being implemented by GEF, UNDP and IOC of UNESCO, is an example of a partnership that can assist in improving global ecosystem-based governance of ocean areas in general and Large Marine Ecosystems and their coasts in particular, by generating knowledge, building capacity, harnessing public and private partners and supporting south- to-south learning and north-to-south learning. Scientific component is a basic element of LME:Learn and sharing the scientific knowledge can greatly contribute to science based MSP in large ocean areas.

Another example of partnership is the "Biosphere Reserves as a Tool for Coastal and Island Management in the Southeast Pacific Region" (BRESEP) Project aims to create biosphere reserves and strengthen existing one, in coastal zones and islands in the South-East Pacific in Chile, Colombia, Ecuador, Panama and Peru. The project promotes biosphere reserves as a tool for sound innovative practices from a social, cultural and environmental perspective, with a view to bringing added value to local socioeconomic activities and, thereby, improving the livelihoods of the region's population.

4) Possible areas for new partnerships

The Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), the Directorate General for Maritime Affairs and Fisheries of the European Commission, (DG MARE), the Permanent Commission for the South Pacific (CPPS), the Kingdom of Belgium and SUEZ are committed to support the implementation of the universally agreed Agenda 2030 for Sustainable Development in a comprehensive, consistent and holistic way, both at regional and international level, and in particular the dedicated goal SDG 14 and the Strategic Plan for Biodiversity 2011-2020 and its 20 Aichi Biodiversity Targets.

This new partnership proposes the ocean (at global scale) to implement a more holistic approach able to encompass multi-disciplinary and trans-disciplinary actions when developing MSP towards ocean ecosystem-based economy to achieve SDG14.2.

In addition to the actors typically involved in the existing partnerships, , such as LME:Learn, we must engage local communities and authorities to actively participate in design of the future they want for

their coastal and seas. Citizens need to understand the important role that is reserved for them. Giving priority to these new actors in regional and global dialogues will contribute to the implementation success of our partnership.

This partnership will reinforce the interaction of national, regional (including large marine ecosystems) and global approaches, including cross-border dialogues to address initiatives to manage, protect, conserve and restore marine and coastal ecosystems through marine spatial planning as priority area with strategic objectives for mutual cooperation and building institutional capacities of nations around the world.

As expressed during the 2nd Intenational MSP conference held at IOC/UNESCO in March 2017, Relevant actors at regional and global scale are willing to participate in the implementation of of this partnership.

Partnerships are also needed to improve the protection and research of underwater cultural heritage, as well as responsible public access to it. UNESCO and its Secretariat of the Convention on the Protection of the Underwater Cultural Heritage offer to link their wide network of experts, universities and NGOs working in the research and protection for underwater cultural heritage to other ocean initiatives.

Cooperation between the UNESCO's World Heritage Centre with other United Nations partners (such as UNESCO's Intergovernmental Oceanographic Commission and the International Maritime Organization), States Parties, civil society organizations, academic institutions, private sector and philanthropic organizations could be catalytic in protecting key marine and coastal ecsosystems.

5) Guiding questions for the dialogue

1) MSP is part of larger planning and management process—How can we coordinate and cooperate better with authorities responsible for terrestrial spatial planning, economic development planning, water quality management, sectoral management planning and private sector initiatives?

2) Moving toward a "Blue Economy"—how can we ensure that investments and other management actions toward a sustainable "Blue Economy" will include restoring and maintaining ecosystem services that support economic development? How can we achieve larger private sector engagement?

3) Incorporating the future in MSP—planning is a future-oriented activity. How can we better think about "where we want to go", e.g., spatial scenarios, and "how do we get there", e.g. planning?

4) Monitoring and evaluation of MSP plans—How can we better define and measure "successful" MSP? How can we better determine the equity in MSP?

5) Trans-boundary MSP—Management actions in one jurisdiction often affect neighbouring jurisdictions. How can we manage these interactions through MSP? How can we improve LME governance through MSP? How appropriate is an LME a spatial unit for MSP?

6) MSP in the High Seas—60% of the World Ocean lies in the High Seas or Areas Beyond National Jurisdiction—how can we demonstrate MSP as an effective area-based management process in the High Seas?

Partnership Dialogue 3 – Minimizing and addressing ocean acidification.

1) Status and trends

Ocean acidification has emerged as one of the most worrying global threats to marine organisms, ecosystems, services, and resources. This "other CO2 problem", which only developed as a research field some 15 years ago, is still poorly known to the general public. However, it has potentially dramatic ecological and socio-economic consequences for countries relying on marine resources, adding to multiple stressors on ocean ecosystems including other climate-driven changes (temperature, sea level rise, and deoxygenation) and local pressures from pollution, overexploitation, and habitat destruction.

One fourth of the carbon dioxide released into the atmosphere from anthropogenic activities is taken up by the ocean, considerably helping to limit climate change. But this vital service to humanity is not without consequence: when carbon dioxide enters the ocean it changes seawater chemistry, resulting, among other changes, in increased seawater acidity (decreased pH). These changes could severely impact biological processes, such as the creation of shells and skeletons of many marine organisms. Since the industrial revolution mean surface ocean pH has dropped by 0.1 units, corresponding to an increase in acidity of 26%. If CO2 emissions continue at the present rate, mean surface pH is predicted to fall by another 0.3 to 0.4 units (equivalent to a 100-150% increase in acidity) by the end of this century.

2) Challenges and opportunities

The PD could be structured around three main themes or pillars, which can be used to showcase inherent challenges in achieving SGD 14.3:

1. The science of ocean acidification – identify scientific opportunities and challenges to assess ocean acidification impacts at national/regional/global levels.

2. Socio-economic impacts of Ocean Acidification – identify and predict socio-economic impacts of ocean acidification on all scales. What kinds of assessments and analysis are needed?

3. Present solutions to mitigate ocean acidification impacts – Identify successful adaptation and mitigation solutions to combat the effects of ocean acidification; highlighting the role of local/regional partnerships.

Organizing the challenges and opportunities into these three pillars offers the possibility to identify key knowledge gaps, partnerships and voluntary commitments to advance Target 14.3. .

Increased cooperation is needed between scientific programmes on ocean acidification,e.g. IOC-WESTPAC, its sustained ocean observation activities, the Global Coral Reef Monitoring Network, and the Global Alliance of CPR Surveys in order to achieve the SDG target 14.3.

Existing gaps in sustained ocean observation of the ocean carbon system, particulary in highly vulnerable areas hamper the delivery of data needed to report to the indicator 14.3.1. Increasing support to the Global Ocean Acidification Observing Network (GOA-ON) and its regional partners, as well as the related reporting mechanisms, e.g. data centres will be needed to ensure the provision of the information needed to reduce the impacts of ocean acidification on marine life.

3) Existing partnerships

The **Global Ocean Acidification Observing Network (GOA-ON)** is an international network of more than 354 members representing 66 nations, supported by the IOC-UNESCO and IAEA. GOA-ON is guiding the development of an integrated system for the detection and attribution of ocean acidification (OA) and ecosystem response. Its "regional hubs" help to coordinate OA observing efforts and to communicate research findings and gaps to the GOA-ON Executive Council, policymakers, and the public. Regional networks foster capacity and community building and will ensure that local efforts are represented in the GOA-ON.

The **International Blue Carbon Initiative** (IBCI - coordinated by IOC, Conservation International and IUCN) works to protect and conserve coastal blue carbon ecosystems by providing scientific capacity building activites.

The **Blue Carbon partnership** (serveral member states, organizations and the IBCI), aims to implement coastal Blue Carbon policies worldwide.

4) Possible areas for new partnerships

Actions and partnerships addressing ocean acidification need to should aim at :

-Increasing cooperation of **IOC, its scientific programmes on ocean acidification, in particular IOC-WESTPAC, its sustained ocean observation activities (Global Ocean Observing System), the Global Coral Reef Monitoring Network** to ensure and increase OA observations of coral reefs, one of the most vulnerable ecosystems, as well as work with the **Global Alliance of CPR Surveys** monitoring calcifying plankton sensitive to OA.

-Expand the GlobalOcean Acidification Observing Netwrok network and its reporting mechanisms to deliver the information needed to report towards the SDG indicator 14.3.1 (custodian agency), **cooperative support by IOC-UNESCO and IAEA for a GOA-ON secretariat.**

- Explore innovative public-private partnerships, such as between science and industry (e.g. with maritime, tourism and aquaculture industry) to provide possible sustained funding.

- Strengthen dialogues between natural scientists and socio-economists to identify vulnerabilities and possibilities for adaptation, where relevant drawing on successful partnerships and lessons learned from other domains such as climate change.

- Implement Blue carbons policies worldwide and Protect and conserve coastal blue carbon ecosystems, which locally actively reduce ocean acidification (seagrass) and which could when degraded cause additional GHG emissions – e.g. via the **Blue Carbon partnership and the International Blue Carbon Initiative.**

5) Guiding questions for the dialogue

Pillar 1 – Observation of Ocean Acidification, what ways to improve the measurements at the national/regional and global level ?

Pillar 2 – Socioeconomic Impact – what do we know about the socioeconomic impacts, what kind of actions can be taken to increase knowledge and predictions?

Pillar 3 –What effective Mitigation and Adaptation measures which can be and are already put in place?

Partnership dialogue 5 - Increasing economic benefits to SIDS and LDCs and providing access for small-scale artisanal fishers to marine resources and markets

1) Status and trends

Underwater cultural heritage has a strong importance for the identity of SIDS and LDCs and the understanding of their past and future. It has also a high tourism development potential and can help to create income and employment. The enhancement of protection of this underwater cultural heritage, its research and the fostering of responsible tourism dialogue are needed.

Studies show that some 37% of world tourism is culture related and that there is a strong link between the protection and valorisation of cultural heritage and increase in tourism. Every USD invested in the protection and valorization of a heritage site increases economic activity around it by a factor of up to 12, depending on the site and the development (particularly in tourism, i.e. hotels, food, transport). It is hence essential to better protect the SIDS' and LDCs cultural heritage to protect the cultural identity of their populations, but also to increase its social benefits by valorization and in order to foster sustainable tourism development.

Underwater cultural heritage has a particularly great importance and potential for SIDS and also some LDCs. The strong cultural connection to the sea is a specificity shared by all of them due to their vast Territorial Waters and Exclusive Economic Zones, covering immense parts of the world's oceans often

larger in extension than the land-territories they surround. A large part of the traces of the populations living in these regions are preserved under water.

Sunken cities, shipwrecks, venerated as well as prehistoric sites embody a yet mainly unused potential for research, education and development, while also illustrating historic reaction to climate change, which happened over all times of human existence. They also have a specifically great potential for the development of sustainable tourism and many of the sites are very attractive and (at least potentially, if not yet actual) accessible to visitors. A large number of promising sites has however not yet been researched, protected and valorised though access, dive trails, glass bottom boat trails, snorkelling visits, cultural boating routes or other. Moreover, these precious heritage sites are highly threatened by treasure-hunting and industrial operations.

4) Possible areas for new partnerships

UNESCO and its Secretariat of the Convention on the Protection of the Underwater Cultural Heritage offer to link their wide network of experts, universities and NGOs working in the research and protection for underwater cultural heritage to other ocean initiatives.

Partnership Dialogue 6 – Increasing scientific knowledge, and developing research capacity and transfer of marine technology

1) Status and trends

Marine science, and its supporting technologies, through improving knowledge and applying it to management and decision-making, can make a major contribution to eliminating poverty, to ensuring food security, to supporting human economic activity, to protecting and preserving the world's marine environment and to helping predict, mitigate the effects of and respond to natural events and disasters, and generally, to promoting the use of the oceans and their resources for the objective of sustainable development. Ocean research and observation activities are covering a wide range of interests, sectors, users and uses, disciplines, transfer of technology, skills and technology development, industrial developments and now - biotechnology of potentially very large significance. All of these activities are of great socio-economic importance in pursuance of the goal embedded in UNCLOS for the equitable and efficient utilization of the resources of the ocean resources. Observations of the oceans so far largely rest on the scientific communities involving several disciplines and institutions. Nevertheless, a gradual shift in the methods of observing the ocean is underway from exploration to ensuring more sustainable activities with the aim to provide ocean services, possibly eventually matching the meteorological weather services.

Investing in underwater cultural heritage research and protection is also critical in allowing for a comprehensive socio-historic understanding of the oceans. It allows for a better understanding of

humanity's past relation with the ocean and the historic impact of the ocean on human life. It can also contribute to understanding climate change and the rise of the sea level. However, in many States is the technological know-how yet missing and national capacities are under-developed, while in others it is very advanced.

2) Challenges and opportunities

As means of implementation for SDG 14 (***SDG 14a***), scientific understanding of the ocean is fundamental to carry out an effective management of the human activities that affect the marine environment and the biota that it contains. Ocean research is also essential to predict or forecast, mitigate and guide the adaptation of societies to cope with the many ways the ocean affects human lives and infrastructures at different spatial and temporal scales. Nations around the world have increased investment in ocean research, this is reflected in the number of marine scientists, research and education institutions and significant infrastructure investments for ocean observations. However, gaps in capacity-building hamper less developed countries in taking advantage of what the ocean can offer them, as well as reduce their capability to address the factors that degrade the ocean. Ocean research or related services and acquisition of sufficient credible scientific data and information are still weak in most countries due to their high cost. National ocean research policies to support sustainable development plans are rare. Most developing States are inadequately equipped to be able to fully benefit from ocean activities and resources and to deal with impacts on the marine environment and continue to express the need for transfer of technology and technical assistance.

Significant knowledge gaps exist - coming from:

- gaps in systematic ocean observations,
- ocean research gaps, and
- differences in the capacity of nations to do and use ocean science.

The Partnership Dialogue could be organised around three key themes as follows:

1. Building scientific knowledge : Marine research and observations for sustainable development. (focus would be on addressing knowledge and research gaps, how increased understanding can form the basis for scientific guidance on options for adaptation of human social and economic systems to a changing ocean and informing SDG 14 implementation)
2. Applying knowledge for societal benefits (focusing on science/policy interface, ocean literacy, strengthening science integration into ocean governance processes)
3. Developing reseach and technological capacities (focusing on mechanisms for building human, institutional capacity in ocean research through innovative solutions)

3) Existing partnerships

Examples of key global partnerships in marine scientific research include (not exhaustive):

- The development of a permanent infrastructure to observe the ocean under the Global Ocean Observation System (GOOS), also complementary to the Global Climate Observing System (GCOS);
- The development of ocean biological data repositories under the Ocean Biogeographic Information System (OBIS);
- International sea-floor mapping initiatives under the General Bathymetric Chart of the Oceans (GEBCO);
- Global earth system science under the World Climate Research Programme (WCRP), Future Earth Projects, and the Integrated Marine Biochemistry and Ecosystem Research (IMBER) programme;
- Global efforts to synthesize ocean research results into marine assessments of the state of the ocean under the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects (Regular Process), and recently approved IPCC Special Report on the Ocean and Cryosphere.
- The development socio-economic assessment and valuation approaches of ocean wealth under the Economics of Ecosystems and Biodiversity (TEEB) initiative.

Examples of key international activities in capacity development include:

- The **International Seabed Authority (ISA)** has a number of training streams, the Endowment Fund supporting the participation of qualified researchers from developing countries in cooperative research on the seabed;
- The **FAO/Norway Nansen programme** supports the development of technical capacity for the implementation of the ecosystem approach in the management of marine fisheries in developing countries;
- **GEF International Water Programme on Large Marine Ecosystems** contributes to building technical and institutional capacity in regions for the assessment and transboundary management of shared resources;
- The **IOC Capacity Development Strategy and Programme** is aiming to assist Member States with developing and sustaining the necessary capacity in ocean sciences, observation and services. This includes the establishment of IOC regional training centers through the Global Ocean Teacher Academy and other IOC sub-regional bodies;
- The DOALOS-IOC/UNESCO Training course on the conduct of marine scientific research under UNCLOS;
- The **Partnership for Observation of the Global Oceans**, POGO, which brings together major oceanographic institutions around the world to promote global oceanography and related education and training;
- Various **ocean literacy networks** that aim to raise awareness of citizens on how the ocean influences people and how people influence the ocean. These include the European Marine Science Educators Association, the Consortium for Ocean Science Exploration and Engagement, amongst others.

Regional, thematic, and global ocean observing system efforts are joining forces under a common framework to deliver a more integrated, multi-purpose and fit-for-purpose Global Ocean Observing

System, providing underpinning information for ocean research and information services that can monitor progress on SDG 14 as well as deliver a series of additional benefits related to climate, early warning, economic support, and ocean health.

4) Possible areas for new partnerships

Work is therefore needed to enhance systematic monitoring to deliver a fit-for-purpose ocean observation system, to increase scientific knowledge through mission-driven research, to develop ocean research capacity and transfer marine technology to all nations.

One mechanism to track scientific knowledge and technology transfer is the Global Ocean Science Report (GOSR) launched by IOC Member States in 2014. The GOSR was established to assist local and national governments, academic and research institutions, as well as international organizations and donors, in making informed decisions on future research investment. It summarizes information about the status of ocean research, investment in research infrastructure and human capacity, as well as potential gaps in marine sciences programmes in need of further investments. The Inter-Agency and Expert Group on Sustainable Development Goal Indicators accepted that parts of the GOSR will serve the indicator for SDG 14.a. The 1st edition of the GOSR will be launched at the SDG 14 Conference in June 2017. More than 40 countries have contributed data on national science investment.

IOC Member States are promoting a proposal to launch an International Decade on Ocean Science for Sustainable Development under the auspice of the United Nations to support the implementation of Agenda 2030 by establishing a ten year cooperative programme on ocean science to support effective ocean governance, stewardship and sustainable development of the ocean (blue) economy and by identifying and filling the significant remaining gaps in our knowledge. The *International Decade of Ocean Science* would stimulate the development of new observation technologies which could help to address many of our remaining information gaps, such as the mapping of the ocean space and its sub-soil in three dimensions. The entire process of developing and implementing the *Decade* could also help to build stronger cooperation between the different bodies responsible for ocean science while facilitating a faster and more effective delivery of knowledge to policy and decision-makers. Several countries are now supporting this initiative that will be presented at the June Conference.

Transfer of marine technology (TMT) is often considered as a tool to support capacity development. A reference and guiding documentis the IOC Criteria and Guidelines on the Transfer of Marine Technology (CGTMT) which is directly referenced in SDG 14.a. A dedicated partnership to develop regionally driven TMT mechanisms should be envisaged. These would build on the establishment of regional clearing house mechanism in various ocean basins that would provide interested users in member states with direct and rapid access to relevant sources of information, practical experience and scientific and technical expertise in TMT, as well as to facilitate effective, scientific and financial cooperation.

5) Guiding questions for the dialogue

What new innovative technologies can be used to monitor and assess ocean conditions in a cost efficient way?

What are key remaining ocean knowledge gaps and how can these be addressed through international cooperation?

How can we ensure fair and equitable transfer of marine technologies to LDCs and SIDS? What can mechanisms can be used? How do we ensure greater access and use to ocean data being collected by internarional programmes and developed nations?

How do we promote the development of national ocean research policy in adequation with Agenda 2030 objectives?

What kind of partnership with the private sector, NGOs and UN bodies can be promoted for boosting ocean science?

How do we keep track on capacity development needs and opportunity in the context of SDG 14?

How do we address brain drain issues in ocean science?

What can ocean literacy contribute to building societal awareness on ocean issues?

Partnership 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

1) Status and trends

The UNESCO Convention on the Protection of the Underwater Cultural Heritage was adopted in 2001 in order to combat the extensive pillage, commercial exploitation and illicit or unethical traffic of underwater cultural heritage. It is a comprehensive treaty, which fully addresses these issues regarding all waters. Its content and benefits should be part of the discussions of the partnership dialogue.

The 2001 Convention increases the legal protection of sites *in situ* and prohibits the illicit and/or unethical recovery and traffic of artefacts. The Convention is thus very relevant at a time when the pillage and commercial exploitation of underwater cultural heritage as well as the industrialization of the seabed constitute major issues that have not yet found an appropriate solution in most regions of the world.

The Convention, however, goes further than that. It also responds to the need for scientific guidance and the facilitation of State cooperation. Underwater archaeology is still a developing discipline. 71 % of the earth is covered by oceans and the majority of the global seabed has not yet been researched for heritage. Research capacities are still lacking and awareness of the immense patrimony lying on the

ocean beds, rivers and lakes is very low. Only through exchange of knowledge and training can this situation be improved and bring the important underwater cultural heritage to benefit the public.

Last but certainly not least, the Convention addresses the needs to mitigate the impact of industrial seabed activities, such as trawling, dredging, mineral extraction and so on, with the protection of submerged archaeological sites. These impacts are considerable, but with wise planning and collaboration, not only excellent results for heritage protection and the development of underwater archaeology can be achieved, but also the enterprises concerned can benefit in terms of corporate responsibility and public image.

By character, the 2001 Convention has been drafted exclusively as a heritage protection treaty. It provides a blanket protection to all traces of human existence of a cultural, historical or archaeological character, which have been partially or totally under water, periodically or continuously, for at least 100 years. It does not address the ownership of heritage nor does it change maritime zones or jurisdiction. Today the Convention is much supported by the scientific community and a large number of States has already ratified it.

4) Possible areas for new partnerships

UNESCO and its Secretariat of the Convention offer to link their wide network of experts, universities and NGOs working in the research and protection for underwater cultural heritage to other ocean initiatives.

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