Report of the Fifth Workshop of the second round of regional workshops held under the auspices of the United Nations in support of the second cycle of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects

Doha, State of Qatar, 28-29 November 2018

I. Summary of discussions

The present document provides a summary of the discussions and information emanating from the fifth regional Workshop of the second round of workshops in support of the second cycle of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects (Regular Process), covering the region of the Indian Ocean (including the Arabian Sea and the Bay of Bengal), the Red Sea and Gulf of Aden and the ROPME/RECOFI area. The Workshop was held in Doha, State of Qatar, from 28 to 29 November 2018.

The presentations, discussions, as well as the Chair's and Joint Coordinator's summary of the Workshop are synthesized under the following overarching topics: (a) Presentation on the outline for the second world ocean assessment and the preliminary timetable and implementation plan for the preparation of the second world ocean assessment; (b) Presentation on the review of the outcome of the Workshops for the Indian Ocean, the Arabian Sea, the Red Sea and Gulf of Aden and the ROPME/RECOFI area, held in Zanzibar, United Republic of Tanzania, in December 2017, and in Bali, Indonesia, in November 2018, respectively; (c) Consideration of the intended structure of the various chapters (and sections of chapters) of the second world ocean assessment; (d) Consideration of selected chapters and sections of chapters in the light of the structure of the outline for the second world ocean assessment, including possible chapter frameworks; (e) Consideration of important issues in other chapters; and (f) Consideration of learning points/needs and resources that may be relevant to the inventory of capacity-building opportunities relevant for the Regular Process being compiled and maintained by the secretariat, and to the multi-stakeholder dialogue (case studies of good practices) and capacity-building partnership event, to be held in early 2019. The annexes to the present summary provide other details of the Workshop and its outcomes, including the agenda and list of participants.

II. Background

The programme of work for the period 2017-2020 for the second cycle of the Regular Process, developed by the Ad Hoc Working Group of the Whole on the Regular Process (Ad Hoc Working Group of the Whole)[1] and endorsed by the General Assembly,[2] includes in the activities for 2018 the holding of a second round of regional workshops to, *inter alia*, support the development of the second world ocean assessment by enabling the collection of regional-level data and the meeting of relevant members of writing team.[3] The "Guidelines for the second round of Workshops in 2018 to Assist the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic

1 See the attachment to A/71/362.

2 See General Assembly resolution 71/257, paragraph 299.

3 See paragraph 8 (h) of the Programme of Work 2017-2020, attachment to A/71/362.

Aspects" developed by the Group of Experts of the Regular Process give guidance to the arrangements of the workshops. The Guidelines provide for, *inter alia*, the purpose, objectives, participants and outputs of the workshops, as well as for the various operational and administrative considerations on their implementation. The Guidelines are provided in Annex 1 to the present report.

In accordance with the Guidelines, the objectives of the second round of workshops are to:

(a) Support the development of the second world ocean assessment by enabling the collection of regional-level information and data to enable relevant members of writing teams for specified chapters to meet, as well as to interact with experts from the region in the fields covered by those chapters;

(b) Enable the regional experts to better understand the approaches of the Regular Process and to develop their skills in integrated assessment, covering environmental, social and economic aspects;

(c) Enable the writing teams for the chapters selected for the Workshop with the help of the Joint Coordinators and the members of the Group of Experts of the Regular Process ("the Group of Experts") who are present, to discuss the structure of their chapter, its relationship with the other chapters of the outline for the second world ocean assessment ("the outline") and responsibilities for developing the chapter text;

(d) Provide opportunities for the members of the Group of Experts present to highlight important issues within the outline other than those of the selected chapters, in order to broaden understanding of the full range of the Regular Process;

(e) Consider what learning points / needs and resources may be relevant to the inventory of capacity-building needs and opportunities relevant for the Regular Process being compiled and maintained by the secretariat, and to the multi-stakeholder dialogue (case studies of good practices) and capacity-building partnership event, to be held in early 2019;

(f) Consider what capacity-building steps might be taken, both at global and regional levels, in relation to the issues covered by the selected chapters.

III. Conduct of the Workshop

The Workshop was held under the auspices of the United Nations, represented by the Division for Ocean Affairs and the Law of the Sea of the Office of Legal Affairs, which also serves as the secretariat for the Regular Process, and hosted by the Government of the State of Qatar. It was held at the Four Seasons Hotel in Doha, State of Qatar. The Workshop was conducted in accordance with the draft agenda (Annex 2).

The Workshop was chaired by Mr. Yousef Al-Hamar, member of the Standing Committee, Ministry Municipality and Environment. It was attended by the Joint Coordinators of the Group of Experts of the Regular Process, Mr. Renison Ruwa (Kenya) and Mr. Alan Simcock (United Kingdom of Great Britain and Northern Ireland). Participants also included representatives from the following countries: Australia, Bangladesh, Brazil, Canada, China, Côte d'Ivoire, Djibouti, France, Japan, Madagascar, Mozambique, New Zealand, Philippines, Portugal, State of Qatar, Sierra

Leone, Sri Lanka, Sudan, Uganda, United Kingdom, and United States of America and from intergovernmental organizations (IGOs), regional scientific bodies, universities and academic research institutes (see Annex 3, List of Participants).

Overall, the Workshop was attended by 55 participants, 19 of whom were females. A total of 20 participants were proposed members of writing teams for the second world ocean assessment; six members of the Group of Experts who were Lead members for relevant chapters of the second world ocean assessment also participated in the Workshop. The United Nations was represented by the Deputy-Secretary of the Ad Hoc Working Group of the Whole on the Regular Process and Programme Management Officer of the secretariat of the Regular Process.

The Workshop opened with welcoming remarks delivered on behalf of the Government of the State of Qatar by His Excellency, Mr. Ahmed Bin Hassan Al Hammadi, Secretary-General of the Ministry of Foreign Affairs, State of Qatar and Chairman of the Standing Committee of the Convention on the Law of the Sea. While recalling the genesis of the Regular Process and the interest the State of Qatar has had in this process over the years, Mr. Al Hammadi explained the importance of the Process in contributing to the strengthening of the regular scientific assessment of the state of the marine environment, so as to expand the scientific basis for the development and management of national marine policies. The fact that the first cycle of the Regular Process (2010-2014) culminated in the production of the First Global Integrated Marine Assessment (first World Ocean Assessment, or WOA I), which lay the necessary groundwork for future action, was also noted. Mr. Al Hammadi stressed on the importance of conducting regional workshops for collecting the needed data and information which in turn would support the effective implementation of the second cycle of the Regular Process (2016-2020), hence ensure the production of a comprehensive second world ocean assessment. The representative of the United Nations also delivered opening remarks. The draft agenda for the Workshop was subsequently adopted.

The opening segment was followed by the consideration of the items on the agenda, which included plenary sessions, a number of presentations, breakout group discussions and feedback from participants. The second day started with presentations on important issues in other chapters of the second world ocean assessment, followed by meetings in breakout groups dealing with the relevant chapters identified for discussion at the Workshop. In the afternoon, a rapporteur from each breakout group reported to the plenary on the discussions in their group, following which the Workshop considered the remaining items on the agenda.

The Workshop concluded with a presentation by Mr. Alan Simcock, as requested by the Chair, summarizing the main elements that emerged during the discussions. It was noted that real progress had been made in developing the layout of the chapters discussed, including with regard to the allocation of drafting responsibilities for those chapters.

It was noted that, while the discussions on offshore oil and gas and seabed mining made good progress, there was a need to identify the economic and social aspects of these topics. The need to identify any development in this field, including by receiving inputs from countries who benefit from these areas of work, was stressed. Mr. Simcock noted that the Workshop contributed to filling the gaps of regional expertise from the Indian Ocean, since during the Workshop several experts expressed interest to be nominated to the Pool of Experts of the second cycle.

Mr. Simcock's summary was followed by closing remarks by the Chair of the Workshop together with the representative of the United Nations.

IV. Summary of discussions

The discussions which took place under the various agenda items provided an important opportunity for members of the writing teams as well as experts from the region to discuss the outline for the second world ocean assessment, as well as the relevant chapters of the second world ocean assessment that were the focus of the Workshop. These discussions have been summarized below.

A. Presentation on the outline for the second world ocean assessment and the preliminary timetable and implementation plan for the preparation of the second world ocean assessment

Mr. Alan Simcock gave a presentation on the outline for the second world ocean assessment and the preliminary timetable and implementation plan. The presentation covered the history of the preparation of the outline, including its adoption by the tenth meeting of the Ad Hoc Working Group of the Whole. Mr. Simcock noted that the outline was based on the DPSIR (Drivers, Pressures, State, Impacts, Responses) framework.

He noted that the introduction to the second world ocean assessment would restate the main principles governing the Regular Process. The focus would be on scientific and policy developments since the collection of the data on which WOA I was based and, where possible, trends would be brought out.

Regarding the future summary of the second world ocean assessment, it was noted that, as in WOA I, it would be presented to the General Assembly for its approval. It was noted that the summary should not aim to be a chapter-by-chapter summary, but to present an integrated view of the conclusions across the board, as well as continue to present a comprehensive view of knowledge gaps and capacity-building gaps and needs. It was also noted that, as compared to the summary for WOA I, the summary for the second world ocean assessment would need to be substantially shorter – perhaps 25 pages, rather than 60 pages.

As regards the chapter structure, it was noted that it envisages the following: a one-paragraph summary of the findings of the second world ocean assessment; a summary of the baselines set by WOA I; a description of environmental changes as well as of economic and social changes; the identified information gaps and capacity-building gaps.

Regarding the state of the marine environment, it was noted that the consideration of the following was expected: the identification of trends in the physical and chemical state of the ocean; trends in species biodiversity; trends in habitat biodiversity; trends in the interaction of human society and the ocean; coastal communities; human health and the ocean; maritime industries; and maritime cultural services including the extent to which marine cultural resources are conserved, support for cultural activities linked to the sea, and the scale of use of objects from the sea valued for cultural reasons.

As regards trends in pressures, it was noted that the following needed to be addressed: developments in pressures from climate change; developments in pressures from human activities (land-based; exploitation of living marine resources; exploitation of non-living resources; other human activities (shipping, tourism etc.), and their cumulative impacts.

Participants were informed that the chapter structure would also consider trends in benefits from management tools, including the following: marine spatial planning; other management approaches e.g., ecosystem-based, culture-based, community-based, and area-based (including marine protected areas (MPAs), etc.); adaptation to climate change and resilience building and understanding of the overall benefits from these activities.

Mr. Simcock also outlined the key milestones in the preliminary timetable and implementation plan for the second world ocean assessment, such as the approval of the Lead and Co-Lead members for the chapters of the assessment (drawn from the Group of Experts) as well as the constitution and approval of the writing teams. He highlighted that the drafting of the assessment would be followed by a review process by the Group of Experts, followed by peer review, followed by two rounds of review by States in 2020. He informed participants that the expectation was that the Group of Experts would finalize the document and then submit the assessment to the Ad Hoc Working Group of the Whole in the spring of 2020, following which it would be submitted to the General Assembly in the fall of 2020.

B. Presentation on the review of the outcome of the Workshop for the Indian Ocean, the Arabian Sea, the Red Sea and Gulf of Aden and the ROPME/RECOFI area, held in Zanzibar, United Republic of Tanzania, in December 2017 and in Bali, Indonesia, in November 2018

Mr. Renison Ruwa (Co-Chair of the regional Workshop for the Indian Ocean, the Arabian Sea, the Red Sea and Gulf of Aden and the ROPME/RECOFI Area held in Zanzibar, United Republic of Tanzania, in December 2017) gave a presentation on the outcome of that Workshop.

Regarding the key elements discussed at the 2017 regional Workshop, Mr. Ruwa noted that the discussions focused on existing or future assessments in the region, so as to identify how the assessment under the Regular Process can best build on these; the possible structure of the assessment of the second cycle; regional priorities for consideration in the preparation of the second assessment; how to make the assessment of the second cycle most helpful to policy-makers in the region, including with respect to the implementation of the United Nations 2030 Agenda for Sustainable Development (2030 Agenda); possible steps which may be undertaken within the region to support contributions to the second assessment; capacity-building needs and opportunities relevant to the science-policy interface and how the activities undertaken during the second cycle of the Regular Process may contribute; how capacities to achieve integrated assessments of the marine environment can be improved; and what steps could be taken, either within the region or at a global level, to improve the information available for the assessment of the second cycle, and to improve the information available for future assessments.

Mr. Ruwa further noted that the regional workshop stressed the importance of including all relevant stakeholders in the process, so as to make sure that all the

identified priorities were addressed. He noted that the following key principles had been identified: good governance, sustainability; issues of wellbeing; gender, aspects of ocean acidification; microplastics; coastal erosion; coral bleaching; ocean modelling; blue economy; safety and security at sea, particularly for fishermen; illegal unreported and unregulated (IUU) fishing; mariculture and interaction with capture fisheries; Ecosystem Approach to Fisheries (EAF); productivity of the ocean; invasive alien species; biodiversity; access to and benefit-sharing of the ocean resources. He also noted that capacity-building was considerably emphasized, in particular with respect to modelling and technology innovation, for biodiversity assessments, for building science-policy connections, and for building technical capacity related to the Sustainable Development Goals (SDGs). He further stressed the importance of technical development and the sharing of technical knowledge in order to achieve the targets set by the 2030 Agenda.

Mr. Alan Simcock (Co-Chair of the regional Workshop for the Indian Ocean, the Arabian Sea, the Red Sea and Gulf of Aden and the ROPME/RECOFI Area held in Bali, Indonesia, in November 2018) gave a presentation on the outcome of that Workshop. He noted that the participation at the Workshop had been hampered by the recent natural events which occurred in Indonesia. He then provided a brief description of the outcome of the discussions held on the relevant chapters of the second world ocean assessment tabled to be discussed in this regional Workshop.

He also noted that the discussions on chapter 4 on “Drivers” demonstrated the difficulty in drawing the line between drivers and the pressures. It was noted that the main pressures identified were those identified in WOAI and some interesting ideas came forward on how to identify other pressures.

With regards to sub-chapter 7E on “Tropical and subtropical coral reefs”, it was noted that the breakout group did not get all the needed information in order to proceed.

With regards to chapter 8 on “Trends in the state of human society in relation to the ocean”, he observed that the lack of experts, who were not able to attend the meeting due to the recent natural events that had occurred in Indonesia, did not allow for a comprehensive discussion on this topic. However, the discussion at that Workshop had collected useful information as to how this issue could be approached in other chapters.

With regards to the discussions which took place on chapter 14 on “Changes in coastal and marine infrastructure”, the importance of distinguishing coastal population versus inland population was stressed. It was noted that the UN Statistical Commission could help in better defining this important distinction.

As regards chapter 15 on “Changes in capture fisheries and harvesting of wild marine invertebrates”, Mr. Simcock noted that this chapter was one of the most developed.

With regards to the discussions on chapter 24 on “Development in tourism and recreation activities”, the difficulties in measuring how States, as well as the local population, benefit from tourism, was noted. The discussions tried to find a response to the question on how the development of tourism impacts the access of local people to coastal areas/beaches that they were originally able to access freely.

C. Consideration of the intended structure of the various chapters (and sections of chapters) of the second world ocean assessment

The presentation on the review of the outcome of the Workshop for the Indian Ocean, the Arabian Sea, the Red Sea and Gulf of Aden and the ROPME/RECOFI Area held in Bali, Indonesia, was followed by a presentation by Mr. Renison Ruwa of the intended structure of the various chapters (and sections of chapters) of the second world ocean assessment. The presentation highlighted the following proposed structure: (a) a one-paragraph abstract of the chapter or section; (b) a very short summary of the situation recorded in WOA I; (c) a description/overview of environmental changes between 2010 and 2020; (d) a description of the economic and social consequences and/or of the other economic or social changes (including, where appropriate, changes in global distribution of benefits and disbenefits and issues relating to concepts of natural capital); (e) a description of the main (remaining) information gaps in relation to the subject matter; and (f) a description/assessment of the main capacity-building gaps in the field. With regard to the abstract, it was noted that clear, simple language would be essential. Each chapter was expected to include a summary of relevant parts of WOA I and would address environmental changes between 2010 and 2020 (mindful that some observations in 2017 to 2020 will not be available). It was noted that, as much as possible, information should be put in a table format (some cells may have to be descriptive text, not numerical data) and should be region-specific. Regarding the short summary of the relevant situations in WOA I, it was observed that a key challenge would be the ability to provide enough information to enable new readers to understand what was in WOA I in a succinct and engaging manner. As regards the relevant economic and social consequences and/or other economic or social changes, it was noted that each chapter should answer questions, such as what (if anything) has happened to economic and social aspects and whether there have been independent economic or social changes that have had environmental impacts.

On the main remaining information gaps, it was noted that WOA I summarized information gaps that needed to be filled, both for assessments and management. The second world ocean assessment would therefore need to look at any changes or improvements, as well as any new information sources. Finally, chapters in the second world ocean assessment would need to consider the main remaining capacity-building gaps - what has changed since WOA I, whether there are new solutions that need enhanced capacity to support them, and whether there are new problems where capacities do not yet exist. It was noted that the multi-stakeholder dialogue and capacity-building partnership event to be held in January 2019 could be an important information source in this regard.

In the ensuing discussions, in response to a question on the need for information and data in the Indian Ocean to ensure the sustainable management of the ocean resources, it was noted that monitoring studies should be conducted in the region to help overcome this issue. It was also noted that this would be possible only with a structured networking system among experts and various institutions.

Another participant, while highlighting the fact that the Indian Ocean has the highest marine biodiversity, listed limited information and data and the inability to produce ideography, as well as limited oceanography, as major challenges in the region. In this regard, the difficulty for policy makers to understand where the trends come from was noted. In response to this assertion, it was noted that the State of Qatar developed a

programme on the state of the marine environment called "Outlook of the state of the marine environment" which is reviewed every five years.

D. Consideration of selected chapters and sections of chapters in the light of the structure of the outline for the second world ocean assessment, including possible chapter frameworks

The discussions under this item of the agenda were preceded by a brief introduction of the respective chapters by the Lead members or Convenors, followed by the participants being divided into parallel breakout groups to review the substance of chapters and related capacity-building needs, where possible. The breakout group sessions were followed by a plenary session during which each group's rapporteur reported on the discussions in the group. The following is a brief summary of the introduction, presentations and discussions.[4]

(i) Chapter 7: "Trends in the state of biodiversity of marine habitats" (Hilconida Calumpong)

Ms. Hilconida Calumpong, Lead member for the chapter, gave a brief presentation on the development of the chapter. While providing some general considerations on the proposed structure of the chapter, she noted that the sub-chapters of chapter 7 that would be discussed at the Workshop would be the following: sub-chapter 7A on Sand and mud substrates (soft bottom), sub-chapter 7B on Rocky substrates and reefs, sub-chapter 7C on Intertidal zone, sub-chapter 7D on Atoll and island lagoons, sub-chapter 7G on Estuaries and deltas, sub-chapter 7M on High-latitude ice, sub-chapter 7P on Open ocean, sub-chapter 7Q on Ridges, plateaus and trenches, and sub-chapter 7R on Hydrothermal vents and cold seeps. It was decided that due to the lack of expertise on some sub-chapters, namely: sub-chapter 7K on Salt marshes, sub-chapter 7L on Submarine canyons, chapter 7N on Seamounts and pinnacles, and sub-chapter 7O on Abyssal plains, these sub-chapters, which were originally tabled for discussion at this Workshop, would not be discussed.

It was noted that while WOAI addresses the state of various taxa of seagrasses, mangroves and microalgae in two different chapters (chapter 48 and 49), the second world ocean assessment is planning to address these issues in one chapter (chapter 6). The importance of improving the number of experts in these issues in the Pool of Experts was noted. In this regard, the need for ensuring gender balance in some of these chapters was also stressed.

Breakout group report and plenary discussions on sub-chapters 7A "Sand and mud substrates (soft bottom)", 7B "Rocky substrates and reefs" and 7C "Intertidal zone"

Mr. Ronaldo Christofoletti provided some general comments regarding sub-chapters 7 A, B and C. In an effort aimed at ensuring a better flow of the sub-chapters, he proposed a minor change in the sequence of sub-chapters, by having sub-chapter 7 C

4 It is noted that the level of detail for the summaries varies depending on, inter alia, the chapter topic, chapter size (number of sub-chapters), the level of detail in the presentations and the number of experts available to provide input in the groups.

on the intertidal zone as a first sub-chapter. It was noted that the rationale for such a change was based on the fact that the intertidal extends to include many different habitats covered in chapter 7, including sand and mud (7A), rocky substrates (7B) and also mangrove, lagoon, seagrass, and other habitats.

Ms. Julia Sigwart presented the report from the breakout session on sub-chapters 7A, 7B and 7C. While recalling the idea of moving sub-chapter 7C on the intertidal zone to the beginning of chapter 7, she noted that the intertidal is not a habitat per se, but has special significance to the world ocean assessment. In terms of habitat, the intertidal is composed of many different habitat areas, which are covered in separate sub-chapters. It was noted that sub-chapter 7C would be discussing the special significance of the intertidal, and additional intertidal habitats that are not covered by other sub-chapters, as well as the impacts of sea level rise on habitat change. It was also noted that this sub-chapter would review the trends in artificial habitats, such as rock armour and urban or built structures. It was recalled that in WOA I there was a chapter on land-sea interface (chapter 26), which is a relevant baseline for this chapter, and that there is also further data on intertidal habitats included in chapter 36 of WOA I.

With regards to sub-chapter 7A on sand and mud substrates (soft bottom), it was noted that anthropogenic activities, such as sand mining and the laying of submarine cables and pipelines, have impacted soft bottom habitats. It was noted that, despite the importance of mudflat, such a concept appeared only twice in the WOA I. In this regard, it was noted that efforts should be made to properly cover such an issue in the second world ocean assessment. With regards to sand habitats, it was noted that their coverage should include or at least cross reference information about coral rubble and coral sands. Ms. Sigwart also highlighted that sand habitats are highly impacted by tourism. They have also, in some cases, led to regulation of footfall (either for habitat protection, and/or human safety and crowd control), such as in Oman and Spain.

With regards to sub-chapter 7B on Rocky substrates and reefs, it was noted that this sub-chapter would include rocky intertidal, hard substrates that are not bedrock, and non-rock-hard substrata, cobble and boulder. While noting that rocky reefs should extend to include biogenic substrata (e.g. bivalves and polychaetes), it was indicated that hard substrates will also be extended to artificial structures, including metal and plastic, e.g. artificial reefs, and ship breakwaters. Dredging and blasting, as well as ocean warming were listed as direct and indirect threats. It was also noted that the rocky intertidal is not valued in coastal tourism/ human activities, and that there is a lack of awareness of its value to biodiversity. In this regard, it was noted that, by contrast, rocky substrate species (seaweed, molluscs) have very high commercial value either from harvest or aquaculture. Ms. Sigwart noted that rocky substrata host a very high density and very rich biomass, and that rock outcrops in the intertidal and subtidal also provide connectivity among areas which are separated by soft bottom. The impacts of coastal construction, as well as anti-fouling surfaces and toxins were noted, together with the increasing positive effects of blue engineering. Dynamite fishing and underwater blasting, and their adverse effect on coral reefs and other habitats, outflow from desalination plants, and impact of floating facilities on substrata below were listed as issues of specific major concern to the Indian Ocean region which are covered by the scope of habitats in chapter 7. The critical importance of taxonomy and fundamental science in the Indian Ocean was also stressed.

Breakout group report and plenary discussions on sub-chapter 7G "*Estuaries and deltas*"

Ms. Dana Hunt presented the report from the breakout session on sub-chapter 7G on Estuaries and deltas. It was noted that as the world becomes more urbanized and globalized, estuaries and deltas are increasingly the site of large populations, fisheries, recreation/tourism and shipping, placing tremendous pressure on their resources and health. In this regard, it was noted that these habitats are subject to multiple stressors, although interactions between these stressors are poorly constrained. The need to identify readily measurable indexes of ecosystem and human health/wellbeing that can be broadly applied across diverse systems, was stressed. While it was recalled that estuaries and deltas represent key sites where freshwater meets the ocean, it was noted that they interact with a large number of other chapters/ecosystems, such as saltmarshes, mangroves, seagrasses, open ocean, riverine inputs, shipping and invasive species. Ms. Hunt also described the advances in knowledge on these environments. In this regard, it was noted that these environments are affected by pulse and press disturbances at multiple time scales. The increased use of observing systems / technologies to capture rapid changes in the environment, such as satellites, global observing networks, buoys, as well as the recognition of the interconnections between habitats were noted. Physical destruction of ecosystems, invasive species, climate change, human population pressure, increased global shipping and sedimentation were listed among some of the causes/impacts which are resulting in changes in the status of these areas.

With regard to the region-specific impacts, the rapid urbanization, the potential impacts of increased shipping by the "northern passage" on poorly studied Arctic estuaries, as well as the conservation of iconic species, were listed as major factors. Ms. Hunt, while recalling the critical data gaps in certain regions, invited other representatives to contribute more information regarding region-specific impacts. In conclusion, Ms. Hunt provided a list of potential issues which are expected to be developing in the next 10 to 20-year period. In this regard, increasing population and coastal urbanization, climate change impacts, such as sea level rise, as well as alteration of food webs due to loss of keystone species, top predator, or ecosystem engineer species, were mentioned. Moreover, reduced access to recreation, fisheries, clean water and poverty-conflict were also listed as potential issues. The importance of governance in maintaining or improving the status of the ecosystems and human outcomes was also stressed.

Breakout group report and plenary discussions on sub-chapter 7D "Atoll and island lagoons"

Mr. Colin Woodroffe presented the report from the breakout session on sub-chapter 7D on Atoll and island lagoons. It was noted that, while low-lying reef islands are perceived as particularly vulnerable – especially to sea level rise, their resilience remains uncertain. Moreover, it was noted that habitable reef islands are threatened by a combination of bleaching of coral (global warming), erosion and inundation (sea level rise) and dissolution (ocean acidification), and maybe more storms – and that many are also subject to direct human impacts (reclamation, degradation of coral systems). Mr. Woodroffe also clarified that the overall value of calcareous biogenic sediment is poorly known, but combined climate drivers – and modelled projections – indicate that many such reef-related environments will transition from net

production to net loss during the 21st century. While noting that atolls are ring-shaped coral reefs in mid-ocean and that lagoons comprise unconsolidated calcareous sediment, he clarified that this chapter would also cover reef islands – the small islands composed of calcareous bioclastic sand and shingle that occur on atoll rims or in other reef environments. The strong link with sub-chapter 7E on Coral reefs, 7I on Seagrasses and also 7A on Sand and mud substrates, was noted. It was noted that chapter 7 of WOA I on Calcium Carbonate Production and Contribution to Coastal Sediments is of great relevance for this chapter. It was also noted that the advances in remote sensing offer opportunities to monitor reef island shorelines, through satellite imagery of high resolution, airborne Light Detection and Ranging (LiDAR), and drones.

With regards to observations of reef island change, some of the many cases of island erosion were mentioned. In this regard, the severe effect of this activity in the Solomon Islands was noted. The aspect of longer-term trend of production – supply – vs dissolution and removal, bioerosion was also noted. As regards the socioeconomic aspect, it was noted that, while the reef islands are home to small populations, they can represent the only land available to some, such as in the case of the Maldives and Tuvalu. While noting the ongoing concern expressed by the international community regarding the future of several entire island nations, recent engineering solutions, ranging from individuals who protect their shoreline, to state-level reclamation (airfields on islands), to major infrastructure projects (South China Sea) were mentioned among some of the possible solutions to solve this issue. Moreover, displacement of persons and inter-island migration were also highlighted. It was noted that there are several thousands of reef islands – many on rims of atolls, others on barrier reefs or other reef settings. While noting that climate change drives, in particular warming which increases coral bleaching, sea level rise, ocean acidification as well as storm and rare tidal events, recently received a lot of attention, it was observed that many vulnerable islands have been impacted by direct human impacts, such as reclamation, coral mining and reef dynamiting. With regards to knowledge and capacity-building gaps, it was noted that more research is needed about rates of production of organisms, i.e. large benthic foraminifera, coralline algae, or coral (breakdown to sand), and on how these respond to climate drivers. The fact that small islands developing States (SIDS) have little capacity and are highly dependent on aid was also mentioned.

Breakout group report and plenary discussions on sub-chapter 7M "High-latitude ice (including that over areas of open ocean)"

Mr. Grant Bigg presented the report from the breakout session on sub-chapter 7M on High-latitude ice. While noting that chapter 46 of WOAI on High-Latitude Ice and the Biodiversity Dependent on it, would be used as the baseline in the development of this chapter, he noted that this chapter would not only deal with the Arctic and Southern Ocean, but also with adjacent Arctic seas. It would also deal with various aspects, ranging from changing sea ice extent and thickness, changing iceberg flux, changing ice shelves and changing habitat (extent, concentration, thickness, zone of influence), to changing biodiversity (taxa-level view of algae, plankton, fish, marine mammals, sea birds), as well as implications for fisheries, hydrocarbon exploitation, navigation, and tourism. With regards to changes in the Arctic which have occurred over the years, while noting that most of the literature focuses on what might happen,

but not on what has happened in these areas, it was noted that the sea ice has been reduced and got thinner, and that more icebergs have been carved out from the ice-sheet, leading to the changing geochemical and freshwater fluxes. As regards the Southern Ocean, it was noted that a hemispheric sea ice trend has yet to be developed.

Mr. Bigg also noted that sea ice algae are more vulnerable to impacts of climate change and that increased iceberg flux affects Arctic macrozoobenthic communities. Mixed impacts on sea bird population were also highlighted. With regards to human impacts, it was noted that polar fish populations are likely to reduce, hence reducing fisheries dependent on these species, but allowing expansion of sub-polar pelagic fisheries. There were signs of continued stalling in polar hydrocarbon exploration. While noting the decreasing sea ice hazard for hydrocarbon operations, Mr. Bigg noted the increase in iceberg hazards. The increased maritime traffic in the North-East passage, north of the Russian Federation, and increased tourism cruises in the North and South polar seas, as well as the presence of inadequate marine protected areas (MPAs) in the Arctic, were also mentioned. As regards knowledge and capacity-gaps, while recommending algal monitoring and noting the lack of baselines and time series for Arctic fisheries, he suggested improved management strategies for krill. The lack of field-based studies around icebergs, as well as the need for new satellite instruments to be used in remote environments was also stressed.

Breakout group report and plenary discussions on sub-chapter 7P "Open ocean"

Mr. Peter Croot presented the report from the breakout session on sub-chapter 7P on the Open Ocean. It was noted that this chapter would be reflecting the changes and new developments of chapter 36F of WOAI on the Open Ocean and Deep Sea. He listed ocean warming, ocean acidification and ocean deoxygenation among the major impacts on the open ocean. With regards to the regional differences, he stressed on the importance of looking at the El Niño Southern Oscillation (ENSO) activity. With regards to changes or potential changes in maritime activity, ocean noise, as well as pollution, in particular from aerosol deposition of nitrogen (N) and phosphorus (P), microplastics and Persistent Organic Pollutants (POPs) were noted.

With regards to new and emerging technologies, it was noted that Essential ocean Variables (EoVs) should be used as metrics to make assessments of changes in the ocean. Mr. Croot also noted the importance of data as a means to predict significant changes which might occur. In this regard, the importance of having a good integrated ocean observing system, such as the Global Ocean Observing System (GOOS) was stressed. Moreover, satellite remote sensing, such as remote sensing phenology (RSP), as well as marine genomics and proteomics and passive acoustic and seismic tomography were also mentioned. In conclusion, while recalling the importance of the blue economy for States, Mr. Croot noted that relevant data acquisition since WOA I had stalled and that the second world ocean assessment would try to remedy this situation.

Breakout group report and plenary discussions on sub-chapter 7Q "Ridges, plateaus and trenches"

Ms. Hiromi Watanabe presented the report from the breakout session on sub-chapter 7Q on Ridges, plateaus and trenches. While highlighting the need to recruit additional members in the writing team for this sub-chapter, she noted that the group tried to

come up with a definition for these environments. In this regard, it was noted that, while mid-ocean ridges could be defined as “geologically active chains of submarine mountains formed by plate tectonics” or “a linear structure that elevates from seafloor”, trenches could be denfined as “long, narrow, characteristically very deep and asymmetrical depressions of the seafloor, with relatively steep sides” or “Linear depression in the seafloor related to the oceanic subduction”. It was recalled that ridges and trenches are the result of geological processes that shape our planet, hence they are different since they do not have the same geology, biology nor habitats. While noting that the chapter would describe the main mid-oceanic ridges (geophysically, geologically, and the scarce ecological data), the linkages with chapters 6, 7F, 7R, 7N, 7L, and 19 were also noted. The need to identify knowledge gaps in these environments, as well as technological and capacity-building gaps was stressed. The links between the supporting, provisionining and regulating services within the deep sea as well as their distribution among habitats present in the deep sea, were also mentioned.

Breakout group report and plenary discussions on sub-chapter 7R “Hydrothermal vents and cold seeps”

Ms. Ana Colaço presented the report from the breakout session on sub-chapter 7R on Hydrothermal vents and cold seeps. With regards to the description of the environmental changes, it was noted that the chapter would address changes in the overall status (which can include the physical or biological state), factors associated with the change, as well as impacts of the change on/interactions with other components of the marine ecosystem. Climate change, ocean acidification and bottom trawling were listed as currently significant challenges globally, while mineral extraction, dumping of wastes from mining, bioresource extractions and geoengineering (CO_2 sequestration) were listed as potential threats for the present and the future.

With regards to the economic and social consequences and/or of the other economic or social changes, the following were listed: loss of genetic diversity (for bioinspiration, and adaptation and resilience to climate change); loss of cultural heritage; loss of carbon sequestration capacity; loss of nursery grounds for fished species; toxicity of commercial fish species and impact on tourism (whale watching); reduction of dispersal capacity (due to the impact of climate change multiple stressors on larvae); destruction of habitats (due to bottom trawling and mineral extraction); habitat change (caused by acidification, deoxygenation, warming, turbidity, hydrodynamics); and loss of populations. It was noted that the chapter would provide an anticipated outlook on the issue over the near to medium term (10 to 20-year period). Basic biology, taxonomy, connectivity and function were listed among the key remaining knowledge gaps. With regards to key remaining capacity-building gaps, the following were listed: access to technology, technology development and innovation; how to bring together basic knowledge in developing countries, and regions; and how to objectively communicate better the importance of the marine ecosystems to decision-makers.

(ii) Chapter 19: "Changes in seabed mining" (Joshua Tuhumwire)

Mr. Joshua Tuhumwire, the Lead member for the chapter, introduced the key issues to be covered under the chapter.

Breakout group report and plenary discussions

Mr. Pedro Madureira presented the report from the breakout session on chapter 19 on changes in seabed mining. While indicating that the structure and the content of this chapter would be developed based on chapter 23 of WOA I on Offshore Mining Industries, he stressed on the need for a better geographical distribution in the writing team for this chapter. It was noted that the chapter would provide a very short summary of the situation recorded in the WOA I, a description of the lack of knowledge in this area together with a list of drivers and pressures. It was also noted that this chapter would describe the connection of this topic with Sustainable Development Goals (SDGs). In this regard, it was noted that this topic has direct linkages with several SDGs, including SDG 1 (End poverty), 7 (Ensure access to affordable, reliable, sustainable and modern energy for all), 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all), 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), and 10 (Reduce inequality within and among countries). Mr. Madureira indicated that this chapter would also describe the changes in scale and significance of seabed mining using the baseline defined by the WOA I, as well as the studies and most of the ongoing and completed projects referred in WOA I. Having provided a brief description of the 29 contracts of the International Seabed Authority (ISA), it was noted that the main information for this chapter could come from the Area given the high number of contracts.

With regards to new technological developments since WOAI, it was noted that the Government of Japan conducted the world's first pilot test of excavating and ore lifting for seafloor polymetallic sulphides under the sea area near Okinawa Prefecture. This test succeeded in excavating the seafloor polymetallic sulphides lying approximately 1,600 meters below sea level, continuously collecting and lifting them together with seawater by a submersible pump onto the ore-lifting support vessel. Mr. Madureira noted that the success of this test marked a large step toward the establishment of technologies required for the development of ocean mineral resources. With regards to the environmental aspects, it was noted that the chapter would address the advances in knowledge and environmental impacts, policies and legislation (new regulations and policies, global, regional and national developments), as well as data and information gaps. In this regard, while highlighting the main impacts from the exploitation of polymetallic nodules, it was noted that the distribution of sediment plume is considered to be one of the main issues, hence requiring a better understanding in order to comprehend how it will affect the deep sea. In an effort aimed at assessing the current status in the deep-sea areas, it was noted that new data would be taken also from new mining projects. With regards to capacity-building, it was noted that the structure of this section was still under development and that the group agreed to use a similar structure to the one used for WOA I.

(iii) Chapter 20 "Changes in hydrocarbon exploration and extraction" (Joshua Tuhumwire)

Mr. Joshua Tuhumwire, the Lead member for the chapter, introduced the key issues to be covered under the chapter. In response to a question as to whether beach nourishment would be considered under this chapter, it was clarified that this issue would be covered in chapter 13 of the second world ocean assessment on changes in erosion and sedimentation.

Breakout group report and plenary discussions

Mr. Yeboue Kacou Seraphin presented the report from the breakout session on chapter 20 on Changes in hydrocarbon exploration and extraction. While noting that offshore production accounts for approximately 30% of global oil production and 27% of global gas production, he indicated that these percentages have remained stable since early 2000s and are unlikely to change anytime soon despite the rapid onshore development of unconventional resources, such as oil sands and shale oil and gas. It was noted that offshore production currently accounts for an estimated 20% of the world's oil reserves and 30% of global gas reserves. With regards to the location of offshore exploration and production activities, it was noted that oil and gas supply is produced offshore mostly in Africa mainly in the Gulf of Guinea, Australia's North-West Shelf, Brazil, the Caspian Sea, the Gulf of Mexico, the Gulf of Thailand, the North Sea, in the ROPME/RECOFI area, and off Sakhalin Island on the Russian Pacific coast. It was noted that world oil production rose by only 0.6 million b/d in 2017, below average for the second consecutive year. Mr. Seraphin also noted that the production fell in the Middle East (-250,000 b/d) and South and Central America (-240,000 Kb/d) and that such loss was outweighed by growth in North America (820,000 b/d) and Africa (390,000 b/d).

With regards to advanced and emerging technologies in exploration and production activities, it was noted that the main constraints for offshore production concern cost and the environment. In this regard, it was noted that, despite technological advances, each stage of the oil and gas production process – from exploration, drilling and extraction to the construction of purpose-built platforms and vessels – requires a very substantial investment. It was noted that the costs of many offshore oil and gas projects have come down sharply in recent years, as companies try to ensure their viability in a shale-inspired lower price environment. Mr. Seraphin then went on to describe four major environmental disasters recorded in the last 10 years as well as their impact.

As regards the social and economic aspect for workers, it was noted that the number of workers in exploration and production activities is increasing but that the exact number is difficult to estimate. It was noted that the salaries of offshore oil and gas industry workers have a broad range and that expatriate workers receive a higher salary than local workers. Mr. Seraphin also noted that most offshore workers spend extended periods, between one to several weeks, at their workplace away from their family. Workers are exposed to a hazardous and stressful environment, and are often victims of pirates' activities, including kidnapping.

With regards to social and economic aspects for communities and population, it was noted that offshore petroleum activity has had significant, and sometimes dramatic,

effects on infrastructure development, education and training, and research and development. It was noted that industry activity has also increased the entrepreneurship and competitiveness of local individuals and companies, and generated population growth, commonly reversing previous demographic trends. The fact that the offshore petroleum industry generated upward pressure on wages and increased the price of housing and office space, was also noted.

With regards to the economic benefits and disbenefits of the exploration and production activities, it was noted that, while these activities provide a revenue for the local industry and are gaining international, national and local interest in supporting sustainable economic development, they can also result in increased corruption as well as favouring the distortion of economies.

With regards to the main gaps in this field, it was noted that, while in some regions there is lack of data and information for a baseline, the current capacity-building gaps lead most oil and gas producers to use expatriate workers. In this regard, the lack of an appropriate training structure, education, and industry in some countries were listed as the main causes of this gap.

(iv) Chapter 31 "Developments in the understanding of overall benefits from the ocean to humans" (Alan Simcock of behalf of Mohammed Essam Yassin)

Mr. Alan Simcock gave a brief presentation of chapter 31 on behalf of the Lead member, Mr. Mohammed Essam Yassin, who was unable to be at the Workshop. The difficulty in measuring how El Niño–Southern Oscillation (ENSO) impacts the ocean was mentioned as a major obstacle to providing an overall evaluation of the oceans and therefore a comprehensive description of the value for humans. The lack of data was listed as a major obstacle hampering implementation. In this regard, it was noted that there is a large amount of data on shipping, however there is no information regarding the revenues from those activities. It was noted that Charting Progress II, a comprehensive report on the state of the United Kingdom seas, could be seen as a recent development which provides data on the gain from those activities. In conclusion, some general considerations were made, namely: fish consumption and the movements of goods between countries became more equal, and that offshore and wind farm energy provided an example of an economic activity which contribution to the Gross Domestic Product (GDP) of coastal countries could be measured. With regards to tourism, it was noted that the Pacific Rim countries are developing their tourist industry more than the rest of the world.

Breakout group report and plenary discussions

Mr. Justin Ahanhanzo presented the report from the breakout session on chapter 31 on Developments in the understanding of overall benefits from the ocean to humans. The relevance of this chapter to the countries in the Indian Ocean was stressed. In this regard, it was noted that immense socioeconomic benefits and the welfare of the people in the region derive from the industrial and economic exploration and exploitation of ocean and coastal resources. It was noted that the breakout group shared two different views: a pessimistic view focussing on the lack of economic valuation and limited progress in ocean economics and theories, and a positive view which focuses on the progress and developments in ocean-related issues at global,

regional and national levels. Developments in the knowledge of the world ocean, understanding its overall benefits including for humans, were listed as the actions aimed at increasing awareness, with the goal of understanding the overall benefits from the oceans to humans.

Among the human benefits, fish and seafood consumption; maritime transport, shipping; offshore and coastal energy businesses; developments in offshore mining; coastal and seaside tourism; use of marine genetic resources; and deep-sea exploration and exploitation, were mentioned. Moreover, offshore oil and gas, telecommunications cables, leisure and recreation, military defence, fisheries, aquaculture, water abstraction, desalination, mineral extraction, renewable energy, coastal defence, waste disposal, education, power transmission and storage of gases, were also listed. The increased awareness at the global level aimed at understanding overall benefits from the ocean for humans, was noted. In this regard, the Ocean Science Report (2017), the high-level United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development held in New York (2017 UN Ocean Conference), the proclamation of the UN Decade of Ocean Science for Sustainable Development (2021-2030), and the 2020 UN Ocean Conference to be held in Portugal were listed among some of the completed and ongoing initiatives with this aim. It was noted that at the regional level, there have been developments led by regional sea conventions and bodies. In this regard, the Bay of Bengal Programme (BOBP), the Indian Ocean Rim Association (IORA), the Nairobi Convention for the Protection, Management and Development of Coastal and Marine Environment of the Western Indian Ocean (Nairobi Convention), the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention/Red Sea Convention), the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA), and the Regional Organization for the Protection of the Marine Environment (ROPME) were mentioned. Also, the African Union Blue Economy and Integrated Maritime Strategy and related programmes, the Blue Commonwealth 2017, and the European Commission Blue Economy Strategy and related programmes were listed.

The limited case studies on progress in economic valuation was stressed. In this regard, while noting the advancements at the global level, and pointing to the critical lack at the regional level on this issue, Mr. Ahanhanzo recalled the Charting Progress II report. As regards the Indian Ocean, it was noted that the region as a whole needs regional and country case studies and benchmarks, which are paramount for a better understanding of the situation in the region. The importance of fostering ocean science research, education and job training, ocean governance and policy development was also stressed. In conclusion, Mr. Ahanhanzo noted that the conceptual problems of definitions, such as tourism, as well as sources and quality of data. The availability of data as well as data sharing, were identified by the breakout group as issues which would hamper implementation. As a possible way forward, it was agreed that the Lead member would approach those experts in the Pool of Experts with relevant expertise in order to include them in the writing team. It was also agreed that the regional institutions, mechanisms and bodies, would be contacted for case studies/data, that literature search should go back to 2014, and that information pertaining to traditional and local knowledge should be obtained by approaching regional and international institutions, such as FAO, UNDP, UNEP, and UNESCO.

E. Consideration of important issues in other chapters

The members of the Group of Experts and participants discussed issues relating to other chapters. Mr. Simcock observed that the purpose of the discussions was to ensure that any issues raised were brought to the attention of participants at the other workshops as they related to any of the chapters to be discussed at those workshops, with the overall aim of ensuring consistency across the assessment.

Mr. Justin Ahanhanzo gave a presentation on "The Contribution of the IOC-UNESCO to the regional workshops for the Indian Ocean including the Arabian Sea and the Bay of Bengal, the Red Sea and Gulf of Aden and the ROPME/RECOFI area". While recalling the nature of IOC-UNESCO as the only intergovernmental body of the UN system specializing in ocean science, services, observations, data exchange, and capacity development, he noted that the UN General Assembly, in its resolution 72/73 on Oceans and the law of the sea, proclaimed the United Nations Decade of Ocean Science for Sustainable Development for the 10-year period beginning on 1 January 2021, within existing structures and available resources, and called upon the IOC-UNESCO to prepare an implementation plan for the Decade in consultation with Member States, specialized agencies, funds, programmes and bodies of the United Nations, as well as other intergovernmental organizations, non-governmental organizations and relevant stakeholders. It was noted that the preparatory phase for the Decade (2018-2020) foresees the conduct of several regional workshops, the convening of a planning group composed of scientific experts which would perform the functions of expert advisory body, as well as a stakeholder forum composed of global stakeholders which would perform the functions of consultative body.

The presentation then went on to describe the IOC Regional Committee for the Central Indian Ocean (IOCINDIO). It was noted that IOCINDIO plans, promotes and coordinates the implementation of cooperative regional marine scientific projects, and supports the Training Education and Mutual Assistance (TEMA) activities of direct interest to its member States and to meet specific regional needs. While it was noted that IOCINDIO also assists in the implementation of regional components of the IOC's global ocean science programmes and ocean services, Mr. Ahanhanzo also noted that such a Committee also facilitates the transfer of scientific knowledge and technology in the field of marine research and related ocean services, especially to the developing countries of the IOCINDIO region. It was also noted that IOCINDIO also facilitates the exchange of oceanographic data and information within and outside of the region, and identifies the needs for training, education, and mutual assistance in the marine sciences.

With regards to the Indian Ocean home-grown capacity empowerment approach, it was noted that capacity development should take on an "operational" profile, making use of robust ocean science, technology, innovation, observing and forecasting systems, appropriate to Indian Ocean countries. In conclusion, it was also noted that institutions should be strengthened through being responsible for the development and implementation of marine services; that there should be an expansion of the use of new telecommunications technology for the delivery of services; and that on-the-job training for individuals should be linked to pre-operational pilot projects.

Mr. Syed Muntasir Mamun gave a presentation entitled "Where the Land meets the Sea: Blue economy business opportunities in the context of climate change adaptation and disaster risk reduction". It was suggested that utilizing innovation models could allow reimagining unsettled spaces, inchoate markets and nascent brands from

developing regions of the world to secure superior value for their produce. In particular, it was noted that for the blue economy sector where climate resilience and disaster risk reduction are both a domestic and global priority, such a deployment of a "minimum viable innovation schema" could effectively synergize commercial activities with public sector interventions for livelihoods support and stakeholder participation for ecological protection. The study validated the idea with a case on the mangroves honey from the Sundarbans.

It was also noted that the study had been developed with a regional focus - building the argument on the assumption that in the years ahead the Indian Ocean region would become a strategic competition space where each of the littoral States and landlocked States could have a significant role to play. In this regard, the potential role that the State of Qatar could play was noted.

F. Consideration of learning points/needs and resources that may be relevant to the inventory of capacity-building opportunities relevant for the Regular Process being compiled and maintained by the secretariat, and to the multi-stakeholder dialogue (case studies of good practices) and capacity-building partnership event, to be held in early 2019

Mr. Marco Boccia provided information on capacity-building under the Regular Process, noting that it is one of the core objectives of the Regular Process. He noted that participants attending the first round of regional workshops held in 2017 identified capacity-building as an important element for the Process. It was noted that a fully-searchable capacity-building inventory has been compiled and continues to be updated on the website of the Division. It was also noted that a two-day multi-stakeholder dialogue (with case studies of good practices) and capacity-building partnership event ("the Event") would be held in New York in early 2019 to build awareness on the Regular Process and the science-policy interface at all levels, while allowing for in-depth multi-stakeholder dialogues on current opportunities, gaps and needs in capacity, as well as building capacity to participate in, and make use of, assessments.

The importance of increasing the number of National Focal Points was emphasized, it being noted that they were important for, among other things, assisting with the nomination of experts to the Pool of Experts, as well as awareness-raising and outreach concerning the Regular Process. Moreover, the importance of filling the geographic and capacity gaps with respect to the composition of the Pool of Experts was also highlighted. In this regard, it was noted that out of more than 570 members of the Pool of Experts there were less from developing countries, and less than half were women. It was also noted that some gaps in expertise were in part due to a lack of available courses of study/academic courses in certain topics, particularly those related to the socioeconomic aspects of ocean issues.

G. Overview of the outcome of the Workshop presented by the Co-Chairs and the Joint Coordinators

Mr. Alan Simcock noted that the Workshop had a very thorough look at the main issues of the chapters under consideration, making real progress in defining the layout of the various chapters. With regards to the discussions on chapter 19 on "Changes in

seabed mining" and on chapter 20 on "Changes in hydrocarbon exploration and extraction", it was noted that notwithstanding the good progress made, more work would need to be done in order to identify the economic and social aspects of these topics. The importance of also identifying any development in these fields, as well as on the contribution from oil and gas activities for interested countries, was also stressed.

With regards to the importance of ensuring the participation of experts from the Indian Ocean region, it was noted that the Workshop was an opportunity for many experts from the region to become part of the writing team of the various chapters discussed at the Workshop.

ANNEX 1: Guidelines for the second round of Workshops in 2018 to Assist the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects

Purpose and objectives

1. The programme of work for the period 2017-2020 for the second cycle of the Regular Process, developed by the Ad Hoc Working Group of the Whole on the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects,[5] and endorsed by the General Assembly,[6] includes in the activities for 2018 the holding of a second round of regional workshops to, *inter alia,* inform the collection of regional-level information and data for the preparation of the second world ocean assessment, to build capacity and to facilitate outreach and awareness-raising.[7] These Guidelines apply to the second round of regional workshops and are intended to give guidance for the arrangements for such workshops.

2. The objectives of each of these workshops should therefore be to:

(a) Support the development of the second world ocean assessment by enabling the collection of regional-level information and data for the preparation of the second world ocean assessment and to enable relevant members of writing teams for specified chapters[8] to meet, and to interact with experts from the region in the fields covered by those chapters;

(b) Enable the regional experts to understand better the approaches of the Regular Process and to develop their skills in integrated assessment, covering environmental, social and economic aspects;

(c) Enable the writing teams for the chapters selected for the workshop, with the help of the Joint Coordinators and the members of the Group of Experts of the Regular Process ("the Group of Experts") who are present, to discuss the structure of their chapter, its relationship with the other chapters of the Outline for the second world ocean assessment ("the Outline") and responsibilities for developing the chapter text;

(d) Provide opportunities for the members of the Group of Experts present to highlight important issues within the Outline other than those of the selected chapters, in order to broaden understanding of the full range of the Regular Process;

(e) Consider what learning points / needs and resources may be relevant to the inventory of capacity-building inventory of needs and opportunities relevant for the Regular Process being compiled and maintained by the secretariat, and to the multi-stakeholder dialogue (case studies of good practices) and capacity-building partnership event, to be held in early 2019.

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5 See the attachment to A/71/362.

6 See General Assembly resolution 71/257, paragraph 299.

7 See, inter alia, paragraphs 9 (c) and 13 (b) of the Programme of Work 2017-2020, attachment to A/71/362.

8 Where a separate writing team is established for a section of a chapter, this section may be treated as a chapter for the purpose of these guidelines.

(f) Consider what capacity-building steps might be taken, both at global and regional levels, in relation to the issues covered by the selected chapters.

3. The Group of Experts will inform the Bureau of the Ad Hoc Working Group of the Whole ("the Bureau"), for its consideration, of the chapters which will be the focus of each regional workshop.

Number and locations

4. States, relevant organizations, bodies, funds or programmes within the United Nations system and intergovernmental regional organizations are invited to offer to host workshops in 2018 for the following ocean areas:

(a) The North Pacific;

(b) The South Pacific;

(c) The Indian Ocean (including the Arabian Sea and the Bay of Bengal), the Red Sea and Gulf of Aden and the ROPME/RECOFI area;[9]

(d) The North Atlantic, the Baltic Sea, the Mediterranean Sea and the Black Sea; and

(e) The South Atlantic (between the African and American coasts) and the wider Caribbean.

5. Separate workshops will not be held for the Arctic Ocean or the Southern Ocean. Instead, correspondence which was initiated during the first round of regional workshops in 2017, will continue between the relevant international bodies and forums for those areas (in particular, the Antarctic Treaty System and the Arctic Council) and the Group of Experts of the Regular Process to enable those bodies and forums to contribute their views on the issues relevant to the workshops. If requested, members of the Group of Experts and Pool of Experts will make themselves available for consultation.

6. To the extent that resources permit, one or two further meetings of writing teams may be held during the first half of 2019 where the Bureau considers it desirable to do so. The themes of such meetings will be determined by the Bureau on the basis of recommendations from the Group of Experts.

Timing

7. Seven possible time-slots have been identified for workshops to be held between June and December 2018:

(a) 25 – 29 June, 2018;

(b) 2 – 27 July, 2018;

(c) 30 July – 10 August, 2018;

(d) 24 – 28 September, 2018;

(e) 15 – 26 October, 2018;

9 Regional Organization for the Protection of the Marine Environment (ROPME) Members: Bahrain, Iran (Islamic Republic of), Iraq, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. Regional Commission for Fisheries (RECOFI) Members: Bahrain, Iran (Islamic Republic of), Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates.

(f) 5 – 9 November, 2018;

(g) 26 – 30 November, 2018.

These Guidelines will be supplemented by details regarding the format of the workshops and the proposed composition and structure of the meetings of the writing teams.

8. Potential hosts are invited to indicate within which of these time periods they would wish to host a workshop.

Activities of workshops

9. The agenda of a workshop to support the Regular Process should reflect the objectives set out in paragraph 2 above. The activities of a workshop should take full account of the principles for the Regular Process recommended by the Ad Hoc Working Group of the Whole and endorsed by the United Nations General Assembly in 2009 and reaffirmed by the United Nations General Assembly in 2016,[10] and the various recommendations of the Ad Hoc Working Group of the Whole.

Hosts

10. Workshops are to be hosted by Member States, members of United Nations specialized agencies and relevant organizations, bodies, funds or programmes within the United Nations system. They are to be organized under the auspices of the United Nations,[11] in coordination with the secretariat of the Regular Process and with the assistance of members of the Group of Experts and Pool of Experts, as appropriate. For the organization of such workshops, as they affect these regions, hosts may request the cooperation of relevant regional intergovernmental organizations and/or that of relevant national scientific institutions.

Participation

11. Member States of the United Nations, members of United Nations specialized agencies and relevant organizations, bodies, funds or programmes within the United Nations system, shall be entitled to participate in any workshop that they consider relevant to them, up to the number of available places. Relevant regional intergovernmental organizations in the region are encouraged to participate, including regional seas organizations, regional fisheries management organizations and arrangements, relevant regional intergovernmental marine science organizations and intergovernmental organizations and arrangements undertaking work in relation to large marine ecosystems. For practical reasons, the logistics and the number of invitees will need to be managed by the host in consultation with the secretariat of the Regular Process, as well as in consultation with the Bureau, as appropriate. Member States should consider arranging for their National Focal Points for the Regular Process to assist with identification of participants for regional workshops and the organization of such workshops as required, and where possible, to participate in relevant workshops.

12. Non-governmental organizations in consultative status with the Economic and Social Council or with Convention secretariats, relevant non-governmental organizations which accredited to the United Nations Conference on Sustainable

10 See A/64/347, annex, and paragraph 285 of General Assembly resolution 71/257.

11 Such workshops will require the conclusion of a host country agreement.

Development (“Rio + 20”)or which participated in the United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (“United Nations Oceans Conference”) in accordance with General Assembly resolution 70/303: Modalities for the United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development, relevant scientific institutions and organizations representing major groups as defined in Agenda 21 may request invitations to participate in the workshops. Relevant regional marine science institutions and organizations and relevant regional arrangements undertaking work in relation to large marine ecosystems are particularly encouraged to participate. The organizations, arrangements and institutions referred to in this paragraph should be those active in ocean affairs and marine science whose participation can help advance the work and objectives of the Regular Process. Hosts may reserve a number of places in the workshop to be filled by such invitations.

13. Each workshop should include at least one member of the Group of Experts, one member of the Pool of Experts, as appropriate, and one member of the secretariat of the Regular Process, which will be coordinated with the secretariat of the Regular Process. The Joint Coordinators of the Group of Experts will be invited to participate in all the workshops. If possible, all members of the Group of Experts from States in the area covered by the workshop should participate. The Lead Members from the Group of Experts for the chapters selected for the workshop as well as relevant members of the writing teams should also be invited to participate. The participation of the members of the Group of Experts and of the Pool of Experts, as appropriate, from developing countries from the region and the Joint Coordinator from the developing country, as well as that of the relevant members of the writing teams, will be supported within the provision made in the regular budget of the United Nations for 2018/2019.

14. Hosts may, as appropriate, encourage the participation of relevant members of the Pool of Experts, including their attendance in the regional workshops and seeking their input on organization, networking, and substantive input to the preparation and review of the outcome of the workshops. Preference should be given to experts in the fields covered by chapters selected for the workshop.

Chair and secretariat

15. Hosts should designate a chair (or co-chairs) of the workshop, who will be expected to take responsibility for summarizing the outcomes of the workshop with the aid of the workshop support staff and members of the Group of Experts. Hosts may consider inviting a member of the Group of Experts and, as appropriate of the Pool of Experts, to be the chair, or a co-chair, of the workshop. Hosts may provide guidance, where needed, on what the priorities for the region are, as well as on potential participants and other modalities for the workshops.

16. Hosts should provide support staff to organize proceedings in consultation with the secretariat of the Regular Process and the members of the Group of Experts and, as appropriate, of the Pool of Experts, who are taking part, and to help the chair(s), the member(s) of the Group of Experts and the secretariat to provide a summary of the outcome.

Output of workshops

17. The output of the workshop should take the form of:

(a) Notes by the writing teams on the issues discussed in relation to each of the chapters selected for the workshop. To deliver these, each writing team should be asked to designate one of its members to take responsibility for the production of these notes;

(b) A summary of other discussions and presentations taking place in the workshop. The member(s) of the Group of Experts, of the Pool of Experts, as appropriate, and the secretariat of the Regular Process will help to produce this summary. Provision should be made for the participants to comment on a draft of the summary and for the final version to be revised by the chair(s) and representative(s) of the Group of Experts and of the Pool of Experts, as appropriate, in the light of such comments.

18. The secretariat of the Regular Process will play an important role in ensuring that the output of each workshop is captured and presented in a way which will support the work of the second cycle of the Regular Process.

19. Those functions would include capturing the relevant information presented (directly and indirectly) during the workshops, including regional/national informational needs with respect to the Regular Process and its outputs.

20. The secretariat would also assist in the preparation of the summary of discussions. It would also be responsible for the development and adaptation of the outreach materials relevant to the Regular Process and its outputs.

21. The division of work in preparing the written output of each workshop should be agreed between the host and the secretariat of the Regular Process, in consultation with the member(s) of the Group of Experts and of the Pool of Experts, as appropriate.

Follow-up to the workshops

22. The final version of the summary of discussions, which could include (subject to the discretion of the relevant writing team) the notes on specific chapters, should be made publicly available on the Regular Process website.

23. The secretariat of the Regular Process should ensure that liaison continues after the workshop with bodies that have contributed to it and with National Focal Points in the region. In particular, the secretariat should seek to facilitate follow-up on capacity-building possibilities identified by the workshop both with respect to the further clarification of needs as well as the identification of best practices.

ANNEX 2: Draft agenda

Workshop in Support of the Second Cycle of the Regular Process

Draft Agenda

Doha, State of Qatar, 28 – 29 November 2018

1. Welcome and opening remarks by representatives of the Government of the State of Qatar and of the United Nations Secretariat, Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs and the Co-Chairs of the Workshop.

2. Adoption of Agenda for the Workshop.

3. Presentation by one of the Joint Coordinators of the Group of Experts of the Regular Process of the Outline for the second world ocean assessment and the Timetable and Implementation Plan, and discussion of general issues related to them.

4. Review of the outcome of the Workshop for the Indian Ocean, the Arabian Sea, the Red Sea and Gulf of Aden and the ROPME/RECOFI area, held in Zanzibar, United Republic of Tanzania in December 2017, and in Bali, Indonesia, in November 2018:

(a) Introduction by one of the Co-Chairs of that Workshop;

(b) Consideration of regional information sources identified in that Workshop and progress in making them available for the second world ocean assessment;

(c) Consideration of further information sources that might be made available;

(d) Discussion of other aspects of the report of the outcome of the Workshop.

5. Presentation by one of the Joint Coordinators of the intended structure of the various chapters (and sections of chapters) of the second world ocean assessment, namely:

(a) A one-paragraph abstract of the chapter or section;

(b) A very short summary of the situation recorded in the First Global Integrated Marine Assessment (World Ocean Assessment I);

(c) A description of environmental changes between 2010 and 2020;

(d) A description of the economic and social consequences and/or of the other economic or social changes (including, where appropriate, changes in global distribution of benefits and disbenefits and issues relating to concepts of natural capital);

(e) A description of the main information gaps in relation to the subject matter;

(f) A description of the main capacity-building gaps in the field

6. Consideration in the light of this structure for selected chapters and sections of chapters of the Outline for the second world ocean assessment, including possible chapter frameworks. These discussions may take place in parallel groups and should review the substance of the following chapters and related capacity-building needs:

Break-out groups on:

(a) Parts of Chapter 7: Trends in the state of biodiversity of marine habitats (discussion led by Hilconida Calumpong)

• Sub-Chapter 7A: Sand and mud substrates (soft bottom)

• Sub-Chapter 7B: Rocky substrates and reefs

• Sub-Chapter 7C: Intertidal zone

• Sub-Chapter 7D: Atoll and island lagoons

• Sub-Chapter 7G: Estuaries and deltas

• Sub-Chapter 7K: Salt marshes

• Sub-Chapter 7L: Submarine canyons

• Sub-Chapter 7M: High-latitude ice

• Sub-Chapter 7N: Seamounts and pinnacles

• Sub-Chapter 7O: Abyssal plains

• Sub-Chapter 7P: Open ocean

• Sub-Chapter 7Q: Ridges, plateaus and trenches

• Sub-Chapter 7R: Hydrothermal vents and cold seeps

(b) Chapter 19: Changes in seabed mining (discussion led by Joshua Tuhumwire)

(c) Chapter 20: Changes in hydrocarbon exploration and extraction (discussion led by Joshua Tuhumwire)

(d) Chapter 31: Developments in the understanding of the overall benefits from the ocean to humans (discussion led by Alan Simcock on behalf of Essam Mohammed)

II. Presentations to the plenary by a representative of each of the breakout groups

7. Presentation on important issues in other chapters that members of the Group of Experts present wish to emphasize and discussion of issues on other chapters that the members of the Workshop wish to raise.

8. Presentation by a member of the Group of Experts of the Regular Process on integrated assessments covering environmental, social and economic aspects.

9. Consideration of what learning points/needs and resources may be relevant to the inventory of capacity-building opportunities relevant for the Regular Process being compiled and maintained by the secretariat, and to the multi-stakeholder dialogue (case studies of good practices) and capacity-building partnership event, to be held on 23-24 January 2019.

10. Overview of the outcome of the Workshop presented by the Co-Chairs and the Joint Coordinators.

11. Closure of the Workshop.

ANNEX 3: List of Participants

#	TITLE	FIRST NAME	LAST NAME	COUNTRY / ORGANIZATION
1	Mr.	Mohamad	Abdallah	State of Qatar / Ministry of Municipality and Environment
2	Mr.	Yousef	Al-Hamar	(Chair) State of Qatar / Ministry of Municipality and Environment, Member of the Standing Committee of the Convention on the Law of the Sea
3	Mr.	Awatif	Abdelgadir Bashir Mohamed	Sudan / University of Red Sea –Faculty of Marine Sciences and Fisheries –Department of Marine Biology
4	Mr.	Mohamed	Adbelmoati	State of Qatar / Ministry of Municipality and Environment
5	Ms.	Donia	Abdelwahed	Programme specialist at the UNESCO Qatar Office in Doha
6	Mr.	Justin	Ahanhanzo	Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), Coordinator-Technical Secretary of the IOC Regional Committee for the Central Indian Ocean (IOCINDIO) and IOC Regional Liaison Officer for Latin America and the Caribbean, Asia and the Pacific and Africa
7	Mr.	Adbelrahman	Al-Bin Ali	State of Qatar / Ministry of Municipality and Environment
8	Mr.	Khalid	Al-Khalaf	State of Qatar / Ministry of Municipality and Environment
9	Mr.	Ali	Al-Kuwari	State of Qatar / Ministry of Municipality and Environment
10	Mr.	Jassim	Al-Mohamady	State of Qatar / Ministry of Municipality and Environment
11	Ms.	Shouq	Al-Naimi	Qatar University
12	Ms.	Najla	Al-Naimi	Qatar University
13	Ms.	Jawaher	Al-Qahtani	Qatar University
14	Ms.	Naema	Al-Qahtani	State of Qatar / Ministry of Municipality and Environment
15	Mr.	Souldan	Ali Hamadou	Djibouti / Ministry of Equipment and Transport

16	Ms.	Maria Ana	Almeida Colaco	Portugal / MARE-Açores; OKEANOS-Açores/Instituto do MAR
17	Mr.	Emidio	Andre	Mozambique / Instituto Nacional de Investigação Pesqueira
18	Ms.	Maria	Bebianno	Portugal / University of Algarve
19	Mr.	Grant	Bigg	Australia / University of Sheffield
20	Ms.	Hilconida	Calumpong	Philippines / Institute of Environment and Marine Sciences, Silliman University
21	Mr.	Mohammad	Chowdhury	Bangladesh / Associate Professor and Director, Institute of Marine Sciences and Fisheries, University of Chittagong
22	Mr.	Ronaldo Adriano	Christofoletti	Brazil / Federal University of São Paulo (UNIFESP)
23	Ms.	Ana	Colaço	Portugal / IMAR-Institute of Marine Research
24	Mr.	Peter	Croot	New Zealand / National University of Ireland, Galway
25	Mr.	Koffi Robert	Dapa	Côte d'Ivoire / Production & Operation Service at PETROCI HOLDING
26	Mr.	Dedimuni Sajjaha	De Silva	Sri Lanka / Geological Survey and Mines Bureau
27	Ms.	Kaltham	Fakhroo	Qatar University
28	Mr.	Luis Filipe	Fuentefria De Menezes Pinheiro	Portugal / Department of Geosciences and CESAM, University of Aveiro
29	Mr.	MD. M. Maruf	Hossain	Bangladesh / Professor, Institute of Marine Sciences & Fisheries (IMSF), University of Chittagong
30	Ms.	Dana	Hunt	United States of America / Duke University
31	Mr.	Fahad	Ibrahim	State of Qatar / Ministry of Municipality and Environment
32	Ms.	Nadia	Ismail	State of Qatar / Ministry of Municipality and Environment
33	Mr.	Yeboue	Kacou Seraphin	Côte d'Ivoire / Ministry of Petroleum, Energy, and Renewable Energies

34	Mr.	Osman Keh	Kamara	c/o Sierra Leone Embassy
35	Ms.	Hiromi	Kayama	Japan / Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
36	Ms.	Ellen	Kenchington	Canada / Department of Fisheries and Oceans
37	Ms.	Ninsemon	Kida Rosa	Côte d'Ivoire / Ministry of Petroleum, Energy and Renewable Energies
38	Mr.	Pedro	Madureira	Portugal / Task Group for the Extension of the Continental Shelf (EMEPC)
39	Mr.	Syed Muntasir	Mamun	Bangladesh / Saïd Business School, University of Oxford and Ministry of Foreign Affairs
40	Mr.	Ghssan Mohamed Ahmed	Mohamed	Sudan / Marine Environment Protection Society
41	Mr.	Mohammed	Muthana	State of Qatar / Ministry of Municipality and Environment
42	Ms.	Noora	Naqadan	Qatar University
43	Mr.	Motasim	Omer	Sudan / Animal Resources Research Corporation, Fisheries and Aquatic Animals Research Center, Sudan, Khartoum
44	Ms.	Bing	Qiao	China / China Waterborne Transport Research Institute
45	Mr.	Jacquis	Rasoanaina	Madagascar / Ministry of Environment, Ecology and Forests
46	Mr.	Renison	Ruwa	Kenya / Marine and Fisheries Research Institute
47	Mr.	Keyur	Shah	State of Qatar / Ministry of Municipality and Environment
48	Dr.	Mohamed	Shamrukh	State of Qatar / Ministry of Municipality and Environment
49	Ms.	Julia Dorothy	Sigwart	United States of America / Queen's University Belfast, Marine Laboratory
50	Mr.	Alan	Simcock	United Kingdom of Great Britain and Northern Ireland / Joint Coordinator of the Group of Experts
51	Mr.	Joshua T.	Tuhumwire	Uganda / Gondwana Geoscience Consulting LTD

52	Mr.	Colin	Woodroffe	Australia / University of Wollongong
53	Mr.	Moriaki	Yasuhara	Japan / The University of Hong Kong
54	Mr.	Marco	Boccia	(Secretariat) United Nations Division for Ocean Affairs and the Law of the Sea
55	Mr.	Juan Carlos Silvestre	Pena Alvarez	UN Office of Internal Oversight Services (OIOS)