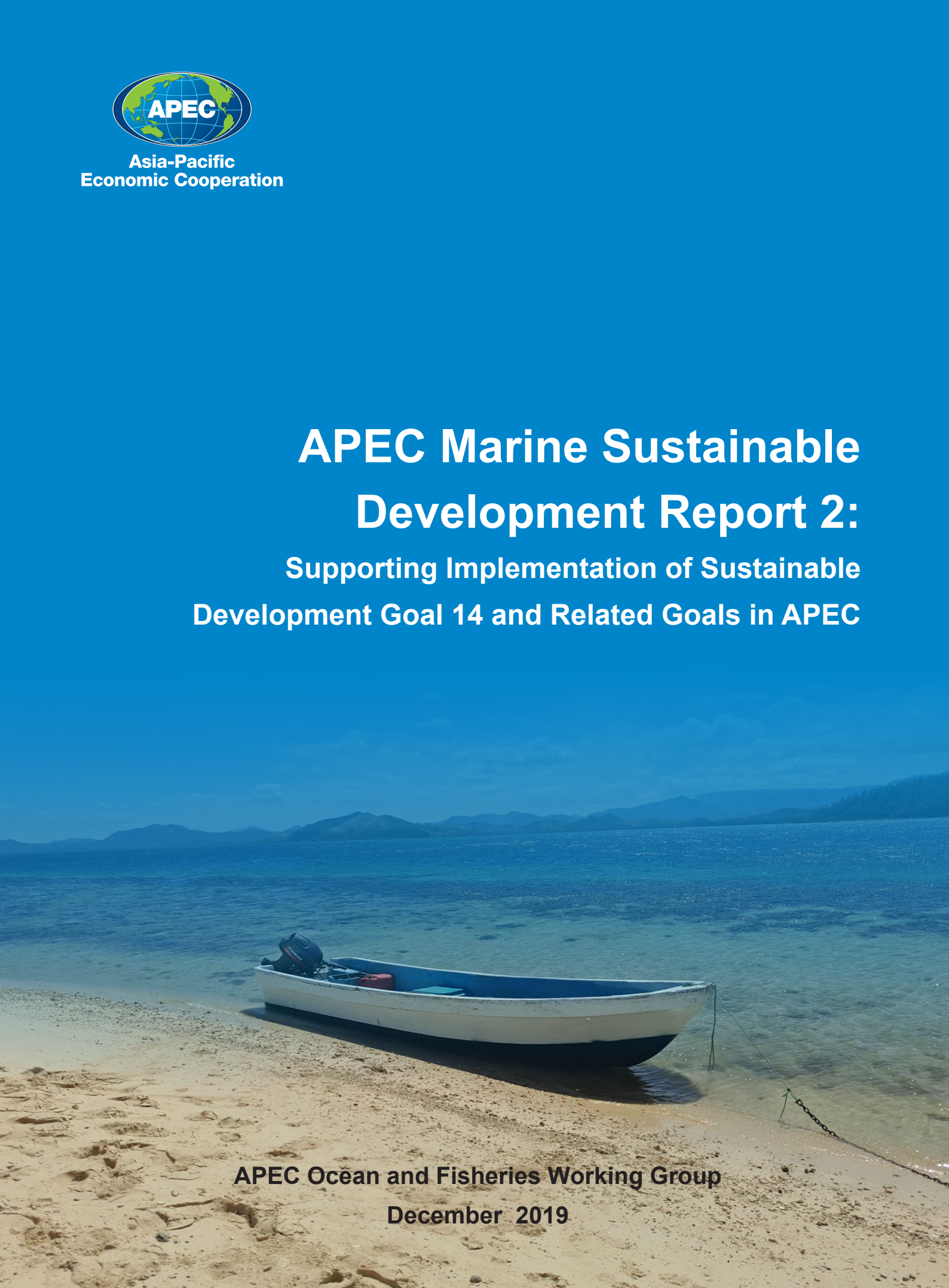
Asia-Pacific
Economic Cooperation

APEC Marine Sustainable Development Report 2:

Supporting Implementation of Sustainable Development Goal 14 and Related Goals in APEC



APEC Ocean and Fisheries Working Group

December 2019

APEC Project: OFWG 01 2017S

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APEC#219-OF.01.1 ISBN: 978-981-14-4260-5

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Acknowledgement

The APEC Marine Sustainable Development Report 2 is the result of a collaborative effort of APEC economies together with a number of institutions and individuals with the strong supports from APEC Secretariat.

This report would not have been possible without the financial support of the Ministry of Natural Resources, P.R.China who funded the development of the report, including the 2017 Workshop on APEC Marine Sustainable Development Report 2.

China Institute for Marine Affairs (CIMA)/MNR has been coordinating the production of AMSD 2 Report by offering human resources and in-kind supports in report drafting, publishing and printing, as well as the related workshops organizing during the whole process. We are grateful to the following institutions for their assistance for the development of the report—APEC Marine Sustainable Development Center, The Nature Conservancy, Conservation International and Association of Pacific Rim Universities. We would also like to thank the institutions and individuals who contributed valuable time and expertise into the APEC Survey on Economies Experience on Implementation of SDG 14 and Related Goals.

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Executive Summary

As the second report of the APEC Marine Sustainable Development Report (AMSD) series, this report is developed on the foundation of AMSD 1 and reflects new and ongoing trends and endeavors of APEC and its member economies in fostering ocean-related sustainable development. Titled with *"Supporting Implementation of Sustainable Development Goal 14 and Related Goals in APEC"*, AMSD 2 reviews APEC economies' achievements on promoting sustainable development pursuant to the framework of Sustainable Development Goals (SDGs), in particular SDG 14.

By understanding the economic, environmental and social values provided by ocean and seas to APEC communities, and identifying the threats to the long-term sustainability in this region, the report offers an overall view on the status of the ocean and seas and their contributions to sustainable development.

It stresses that ocean, seas and marine resources play a pivotal role in supporting sustainable and inclusive growth in APEC. APEC region accounts for 65% of world maritime transportation (measured by contained port throughput in 2017) and 51% of global marine capture production (share of Pacific Ocean in marine capture production in global oceans in 2016). Fisheries, aquaculture and tourism are important sources of income and livelihood for coastal communities. More than 50 million fishers and fish farmers were engaged in fishing sectors in Asia in 2018, which constituted 85% of world fishing labor force. Travel and tourism sector contributed 55 million jobs in the APEC region in 2017, which was 3.7% of total employment in this region.

However, the health and productivity of ocean and coasts in the Asia-Pacific are facing severe threats from pollution, biodiversity loss, declining resources, multiple conflicting coastal uses, and climate change and natural hazards. About 60% of the mangroves in the Asia-Pacific region and 70% of coral reefs in the Southeast Asia are threatened or lost. Estimated 13% to 61% of fish stocks in the Pacific Ocean are overfished, with the highest percentage in the Southeast Pacific.

By reviewing APEC economies' efforts on the conservation and sustainable use of marine resources, and identifying APEC's efforts on creating enabling environments for SDGs implementation by its member economies, the report highlights APEC's potential on fostering sustainable development by advancing regional economic integration, making high-level commitments, encouraging cross-fora collaboration and mobilizing multi-stakeholder resources.

To reverse the decline of marine ecosystems and resources, many APEC economies have initiated concrete measures on implementing SDG 14 through policies, plans and programs on marine pollution control, marine and coastal ecosystem conservation and restoration, conservation of marine and coastal areas, fisheries management, and development of marine economy. Broader endeavors have been taken by some economies on implementing the 2030 Agenda include establishment of institutional mechanisms to provide leadership and coordination, and the adoption of implementation policies and plans.

Although the measures for promoting ocean conservation and sustainable use vary, good practices share the following characteristics:

- multiple and mutually reinforcing objectives, addressing environmental, economic and social dimensions of sustainability;
- participation of a wide range of stakeholders, including local communities, general public, producers and consumers; and
- harnessing the power of information, data, scientific knowledge and technology to design and implement effective solutions toward sustainability.

It should be noted, however, that while ocean-related sustainable development has received an unprecedented level of political support in recent years, and progresses made on many fronts, significant challenges remain. As the premier economic cooperation forum in the Asia-Pacific region, APEC has the capacity to promote sustainable development by encouraging broad cooperation and collaboration to address ocean-related challenges. To strengthen APEC's contribution in fostering regional sustainable development, the report proposed the following suggestions for consideration by APEC:

- further identifying the linkage of APEC's work with goals related to SDGs, and identifying how APEC fora could contribute to member economies' efforts to addressing goals related to SDGs;
- encouraging the incorporation of SDG related goals in the design and implementation of APEC programs and projects to assist member economies' efforts toward SDGs implementation;
- supporting APEC economies in fulfilling their Voluntary Commitments, by supporting capacity building programs and initiatives;
- facilitating the formation of multi-stakeholder partnerships, and promoting cooperation among APEC economies to create enabling environment for them to achieve SDGs; and
- promoting the sharing of data, information and good practice among APEC economies, and encouraging scientific study and analysis to develop proper policies which will contribute to the full achievement of SDGs by APEC economies.

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Chapter 1
Background

1.1 Introduction to the APEC Marine Sustainable Development Reports

APEC covers a dynamic and prosperous region supporting 40 percent of the world population and generating more than half of world's services and products.[1] Ocean and seas—which underpin trade, provide food and nutrition, and support sustainable growth and decent work—are important for human well-being and critical to the shared prosperity of APEC. However, due to increasing adverse impacts from anthropogenic activities and climate change, ocean and coasts in the Asia-Pacific region are facing severe threats and losing their productivity and vigor. It is a common challenge and urgent task faced by APEC community to reverse this trend and safeguard our ocean and seas for the sake of long-term economic, environmental and social sustainability of this region.

In this context, the APEC Ocean and Fisheries Working Group (OFWG) is leading the project of the APEC Marine Sustainable Development Report (OFWG 01 2017S) to identify gaps and challenges faced by APEC economies on promoting ocean-related sustainable development and foster APEC economies' collaboration towards sustainable development.

1.1.1 APEC Marine Sustainable Development Reports at a glance

As a report series developed and updated regularly under the auspices of OFWG, the *APEC Marine Sustainable Development Report* (hereinafter referred to AMSD report) is a portal to reflect the status of the environmental and socioeconomic aspects of ocean and coastal systems in Asia-Pacific region and to share APEC economies' experiences on sustainable marine and coastal management.

The first AMSD report (AMSD 1) was endorsed by the third OFWG meeting and published by APEC Secretariat in 2014. As a first step toward a systematic evaluation of ocean-related sustainable development in APEC, it covers status on marine ecosystems and fishery resources, Blue Economy, disaster resilience and other ocean provided socioeconomic benefits, and delivers the key message to strengthen the science/policy interface. Furthermore, by mainstreaming ocean-related issues into APEC's work, AMSD report would raise the awareness and political will of APEC Leaders in advancing ocean conservation and sustainable development.

After endorsement, AMSD 1 has gained acknowledgement from APEC high levels. The 22nd APEC Economic Leaders' Declaration welcomed the AMSD report. The Forth APEC Ocean-related Ministerial Meeting (AOMM) recognized the importance of the AMSD report and directed OFWG to update the report.

1 APEC, 2018. APEC at a Glance. Singapore: APEC Secretariat. Available from: https://www.apec.org/Publications/2018/05/APEC-at-a-Glance. [Accessed 27 February 2019]

Building on the experiences on developing AMSD 1, the second AMSD report (AMSD 2), with the theme of *Supporting Implementation of Sustainable Development Goals 14 and Related Goals in APEC,* reflects new trends and endeavors of APEC economies towards ocean sustainable development within a global sustainable development agenda—2030 Agenda for Sustainable Development (hereinafter referred to the 2030 Agenda). AMSD 2 will take the internationally recognized Sustainable Development Goals (hereinafter referred to SDGs), particularly SDG 14, as a framework to review APEC economies' progress contributing to the global efforts to achieve sustainable development. Therefore, AMSD 2 is expected to be an important APEC contribution to the 2030 Agenda, as recognized by the APEC Ministerial Meeting in 2016.

1.1.2 The characteristics of AMSD reports

During the process of developing AMSD 1 and AMSD 2, some fundamental characteristics have been identified and established to show an abstract of the working mechanism, methodology and core aspects of AMSD reports, which also lays the foundation for the future development and dissemination of this series reports. These characteristics include but not limited to the following:

(1) High-level relevance

Achieving sustainable development is at the heart of APEC's mandate.[2] AMSD reports implement the APEC Leaders' instructions by mainstreaming ocean-related affairs in APEC. Meanwhile, by reflecting issues with international importance, such as marine debris, biodiversity, and climate change, AMSD reports mark APEC's work as part of efforts on addressing global problems.

(2) Multidisciplinary and policy relevance

AMSD reports are developed in a multi-disciplinary approach. Environmental, economic and policy information are assessed systematically to demonstrate the entire picture of the state of APEC's ocean and coasts and their contributions to regional development. The reports could lay an assessment base for future policy development at regional and economy level.

(3) Stakeholder participation

Full participation of member economies and other stakeholders is the foundation for developing AMSD reports. Member economies take a leading role by setting themes, developing frameworks and endorsing final reports. Academia and non-governmental organizations also have active participation with professional inputs.

(4) Expert mechanism

The core expert group and advisory expert group constitute the main working mechanism of AMSD reports.

2 Declaration of The 5th APEC Economic Leaders' Meeting in 1997.

The core expert group is composed of experts nominated by APEC economies, who take charge of the whole process of the reports preparation and responsible for drafting the general report.

The advisory expert group, composed of scientists, social science researchers and experienced practitioners, are gathered for offering consultation on specialized issues involved in AMSD reports, as well as linking the AMSD reports with latest scientific updates and policy developments.

(5) Dynamic

Following the periodically updating scheme, AMSD reports could track the recent developments of international and regional processes related to ocean affairs, and update to the latest policies and actions the economies take to safeguard ocean and coasts. Moreover, the core expert group and advisory expert group are open to absorb expertise and knowledge needed in addressing new topics. This indicates the dynamic process of AMSD reports to reflect emerging issues.

The above-mentioned main characteristics of AMSD reports make it a holistic, far-reaching and policy-oriented report tracing APEC's progress on ocean-related sustainable development.

1.1.3 From AMSD 1 to AMSD 2

The initiative on compiling the AMSD Report was proposed by China and endorsed by the first OFWG meeting in May 2012. AMSD 1 was prepared by a core expert group with significant contributions from APEC economies and strong support from the Secretariat. AMSD 1 represents the first step toward a systematic evaluation of ocean-related sustainable development in APEC and provides an opportunity for OFWG and participating economies to reflect on and share experiences in this important area.

Recognizing the importance of AMSD 1, following its endorsement, the working group agreed to develop it into a series reports updating every four to five years as a living documentation of APEC economies' progresses on ocean-related sustainable development.[3] In the same year, during AOMM 4, APEC Ministers directed OFWG to update AMSD report, which established the mechanism of periodic updating.

Two years later, at the seventh OFWG meeting in September 2016 in Peru, China proposed to prepare AMSD 2 to reflect new trends and efforts, and suggested placing AMSD 2 in the global context of achieving SDGs. The Working Group endorsed this proposal and the preparation work for AMSD 2 began.

3 APEC OFWG meeting document. Summary Report of OFWG 3. 2014/SOM2/OFWG/SUM.

1.2 Aims and structure of AMSD 2

As the second report of the AMSD series, AMSD 2 has a clear focus—SDG 14 and related Goals in APEC. With this central theme, AMSD 2 will reflect APEC and its economies' efforts in achieving SDGs, especially SDG 14, and identify the remaining challenges in promoting ocean-related sustainable development in the APEC region.

1.2.1 Aims of AMSD 2

AMSD 2 will be developed on the foundation of AMSD 1 and reflect new and ongoing endeavors of APEC member economies in fostering ocean-related sustainable development and achieving SDGs. The aims of AMSD 2 include, but are not limited to, the following:

1) Reviewing the status and challenges of oceans and seas in the Asia-Pacific region, especially the status and trends after the endorsement of AMSD 1;
2) Sharing information and experience of APEC economies on conservation and sustainable use of the oceans, seas and marine resources;
3) Stock taking the endeavors of APEC member economies in achieving SDGs, particularly SDG 14 and other Goals relevant to oceans and coasts;
4) Proposing suggestions that could serve as long-term priorities for consideration by APEC economies and relevant sub-fora, particularly OFWG, to enhance trade, investments, marine environmental protection and marine economic development; and
5) Exploring potential areas for collaborative work by APEC economies related to SDG 14.

AMSD 2 moves a step further than AMSD 1 by using the ocean-related SDGs as an assessment framework, which makes it possible to map APEC economies' work within the broader international context. By illustrating APEC economies' efforts in marine pollution control, marine and coastal ecosystem conservation and restoration, conservation of marine areas, fisheries management, minimizing ocean acidification and promoting sustainable marine economy, AMSD2 will offer an overall review of ocean-related sustainable development in the APEC region.

1.2.2 Structure of AMSD 2

AMSD 2 has a two-fold structure: a general report which gives an overall synthesis of states, progress and prospects of ocean-related sustainable development at a regional level; and a collection of economy reports submitted by individual economies on a voluntary basis offering more detailed information with respect to

relevant economies. This structure allows the AMSD report to identify common and critical issues faced by the APEC community as well as to illustrate the developments and the remaining challenges in individual economies.

General Report of AMSD 2 aims at providing a holistic view of ocean-related sustainable development in APEC by including the following four chapters:

Chapter 1 Background gives an introduction to the AMSD report series and depicts the international context on sustainable development within which AMSD 2 was developed.

Chapter 2 Challenges and Opportunities for APEC Economies in Addressing SDG 14 and Related Goals highlights the threats to the long-term sustainability of ocean and coasts in the Asia-Pacific region and analyzes the potential and advantages of APEC in supporting economies to achieve ocean-related SDGs.

Chapter 3 Progress in Achieving Sustainable Development in APEC reflects the endeavors of APEC and its member economies in promoting sustainable development in ocean-related areas through policies, plans, initiatives and collaborations. By mapping various activities promoting implementation of SDG 14 and related goals, this Chapter attempts to show what has been achieved in APEC in pursuing sustainable development.

Chapter 4 Vision for the Future summarizes experience and lessons learned and implies potential area for future work.

1.2.3 Methodology for developing AMSD 2

After the seventh OFWG meeting endorsed the proposal on developing AMSD 2 in 2016, China began to prepare for the report drafting. In March 2017, OFWG endorsed the project "APEC Marine Sustainable Development Report 2 (OFWG 01 2017S)" as an APEC self-funded project proposed by China and cosponsored by Chile.

The core expert group drafted the General Report of AMSD 2 with the material and inputs coming from member economies and advisory opinions from advisory expert group. The core expert group is composed of experts nominated by five economies—Chile; China; Hong Kong, China; Peru and the United States. The advisory expert group is composed of professionals from universities, research institutions and public departments joining the report drafting at different periods. A full list of core expert group members and advisory expert group members is included in the contributor page of the report.

A workshop was organized on November 3 and 4, 2017 in Xiamen, China, to formulate the outline of AMSD 2. The draft outline including chapter structure and key points, was endorsed by the 10th OFWG meeting in 2018, which laid the foundation for succeeding report drafting.

2017 Workshop on APEC Marine Sustainable Development Report 2

A survey was organized in 2018 to gather information on APEC economies' implementation on SDG 14 and related Goals. Questions on policy framework, institution-building, and information collection to implement SDGs in economy level, collaborations among economies, and overall effects of implementing SDG 14, are included in the survey. To January 2019, seven economies—Chile; China; Hong Kong, China; Malaysia; Papua New Guinea; Chinese Taipei and Thailand—have participated in the survey and offered elaborate information on the questions required, which is an important source of reference for drafting the report. The questionnaire and analysis of survey results are included in Annex 1 and Annex 2 of the report.

In February 2019, after an intensive work by the core expert group, the first draft of the General Report of AMSD 2 was completed and submitted to the 12th OFWG meeting for comments and suggestions. The draft General Report was revised based on comments from March to August. The finalized General Report was completed in September 2019 and endorsed by the Ocean and Fisheries Working Group.

1.3 Progress in ocean-related sustainable development at global level

1.3.1 Role of the ocean in Sustainable Development Summits

The oceans have long been identified as an essential component of sustainable development and have

assumed increasing importance over time. In the United Nations (UN) Conference on Environment and Development (UNCED), often referred to as the Earth Summit, which took place in 1992, oceans were integrated into global sustainable development agenda for the first time. *Agenda 21* recognized oceans as an essential component of the global life-supporting system and a positive asset that presents opportunities for sustainable development. In the following decadal summits on sustainable development, the oceans' contribution to the sustainability of the planet and human society has been reiterated and further understood. Ten years after UNCED, the World Summit on Sustainable Development (WSSD) made a further step in capturing ocean-related sustainable development from a socioeconomic perspective. The summit agreed that oceans, seas, islands and coastal areas are critical for global food security and for sustaining economic prosperity and the well-being of many economies. In 2012, the United Nations Conference on Sustainable Development (UNCSD), often referred to as Rio+20, included oceans as one of its seven critical discussion issues. While re-stressing socioeconomic benefits, the inter-reaction between oceans and other global systems such as global biosphere and climate system has been recognized. Its outcome document—*The Future We Want* emphasized oceans' contributions to poverty eradication, sustained economic growth, food security and creation of sustainable livelihoods and decent work, while protecting biodiversity and the marine environment and addressing the impacts of climate change.

Rio+20 brought new momentum to global sustainable development by, including but not limited to, calling for the establishment of post-2015 development agenda and creating new institutional arrangement for sustainable development review and follow-up—the High-level Political Forum for Sustainable Development (HLPF).

1.3.2 The 2030 Agenda and its core element—SDGs

After three years' negotiation, *Transforming Our World—the 2030 Agenda for Sustainable Development* was adopted by the UN General Assembly (UNGA) in September 2015. The 2030 Agenda calls for bold and transformative actions to shift the world on to a sustainable and resilient path. As an integral part of this agenda, a set of SDGs including 17 goals and 169 targets were announced and represented global determination to achieve sustainable development in all fields. Specially, SDG 14 is for ocean and coasts, namely "conserve and sustainably use the oceans, seas and marine resources for sustainable development" and demonstrates the incorporation of ocean affairs into the sustainable development agenda.

SDG 14 comprises seven quantitative and qualitative targets addressing marine pollution, ecosystem conservation, ocean acidification, sustainable fisheries, marine protected areas (MPAs) and sustainable use of marine resources and three means of implementation targets aim at prompting scientific research, protecting artisanal fisheries and fostering implementation through international law.

After adoption, the 2030 Agenda and SDGs gained responses from global, regional and national levels and stakeholders. Intergovernmental organizations within and beyond UN systems such as UNDP, UNEP, UNESCO, FAO, World Bank and OECD have made efforts to integrate SDGs into their working domains. Action plans, assessment reports and action-oriented initiatives were released and launched to mobilize resources from multiple sectors.

1.3.3 Global efforts to implement SDG 14 and related Goals

(1) The UN conference to support the implementation of SDG 14

To support implementation and maintain political momentum to achieve SDG 14, 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 (often referred to the UN Ocean Conference) was held at the UN headquarters in New York from June 5th to 9th, 2017. The Conference, co-hosted by governments of Fiji and Sweden, held plenary meetings, partnership dialogues and a special event commemorating World Oceans Day. More than 4000 participants from governments, intergovernmental organizations, non-governmental organizations (NGOs), private sectors, scientific community and academia, major groups and other stakeholders attended the conference.

An intergovernmental negotiated declaration titled *Our Ocean, Our Future: Call for Action* was adopted by the conference. This concise outcome document of 14 paragraphs calls for decisive, urgent and collective actions to reverse the decline of ocean health and identifies actions to be taken to support the timely and effective implementation of SDG 14. During the conference, more than 1300 Voluntary Commitments[4] (VCs) were made by all kinds of stakeholders from different ocean basins and focused on wide ranging topics. Together with VCs, the *Call for Action* marked a breakthrough in the global approach to the management and conservation of the oceans.

Enhancing sustainable development through revitalized partnerships is highlighted by the 2030 Agenda and other outcomes of sustainable development summits. To strengthen existing partnerships and stimulate new ones safeguarding healthy oceans and seas, seven thematic partnership dialogues were organized during the conference. Solutions and commitments were offered to prevent marine pollution, conserve marine and coastal ecosystems, address ocean acidification, make fisheries sustainable, increase economic benefits of Small Island Developing States (SIDSs) and Least Developed Countries (LDCs), enhance scientific

4 Before the closure of the Conference on 9th June 2017, 1379 Voluntary Commitments were registered to the secretariat. After that, Voluntary Commitments are still open to register. Until February 2019 when this section of report was drafted, the Conference website showed 1509 Voluntary Commitments were registered. All voluntary comments are available at https://oceanconference.un.org/commitments/. [Accessed 19 January 2019]

knowledge and implement SDGs through international law.

The UN Ocean Conference, as the first conference in UN system focusing on promoting global sustainable development through ocean governance, has increased awareness of ocean's contribution to human welfare and the urgency to address ocean problems.

(2) Relevant global processes/ initiatives promoting ocean related sustainable development

Many efforts were carried out globally to combat pollution to protect ocean health. The marine debris problem is global in scale and intergenerational in impact. In 2011, the National Oceanic and Atmospheric Administration (NOAA) co-hosted the Fifth International Marine Debris Conference in cooperation with the UNEP, which developed and created a document known as the Honolulu Strategy.[5] The Honolulu Strategy provides a global framework for prevention and management of marine debris. Various initiatives on combating marine debris have been launched by governments, international communities and other stakeholders. For example, Global Partnership on Marine Litter was launched in June 2012 at Rio+20 aiming to enhance international cooperation and find solutions for marine debris and its impacts on economies, ecosystems and human health.[6] The "Osaka Blue Ocean Vision" was shared by G20 Leaders in June 2019 Summit, which aims to reduce additional pollution by marine plastic litter through comprehensive lifecycle approach. The *G20 Implementation Framework for Actions on Marine Plastic Litter* was endorsed as a framework which G20 members would implement, continuously share and report their voluntary actions, utilizing the opportunity of the G20 Resource Efficiency Dialogue and other multi-stakeholder framework.

Marine ecosystem and biodiversity conservation are attached with significant importance worldwide. Effectively managed MPAs were considered as an important tool for conservation of marine biodiversity. According to The Convention on Biological Diversity (CBD) Aichi Target 11, by 2020, at least 10% of coastal and marine areas, especially areas of particular important for biodiversity and ecosystem services, are to be conserved through effectively and equitably managed MPAs. In 2015, this target was adopted as part of SDG 14—Target 14.5.

Since 1993, when the CBD entered into force, the area of MPAs in the world's oceans and coastal waters has increased from 0.3%[7] in 1993 to 7%[8] in 2018. To achieve the 10% target, more efforts on establishing and

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5 UNEP and U.S. NOAA, 2011. The Honolulu Strategy—A Global Framework for Prevention and Management of Marine Debris. Nairobi and Wanshington, DC: NUNEP and U.S. NOAA. Available from: https://marinedebris.noaa.gov/solutions/honolulu-strategy. [Accessed 7 February 2019]

6 UN Partnership for SDGs, Global Partnership on Marine Litter (GPML)[website]. Available from: https://sustainabledevelopment.un.org/ partnership/?p= 7471. [Accessed 21 January 2019]

7 Secretariat of the Convention on Biological Diversity, UNEP, 2017. United Nations Decade on Biodiversity: Global Marine Protected Area Target of 10% to Be Achieved by 2020. Montreal: CBD Secretariat.

8 UNEP-WCMC, IUCN, and NGS, 2018. *Protected Planet Report 2018.* Cambridge, Gland, and Washington, D C: UNEP-WCMC, IUCN and NGS.

effectively managing MPAs are required.

Sustainable fisheries and aquaculture are the foundation for global food security and livelihoods. Three targets—SDG 14.4, 14.6 and 14.b call for global action on sustainable fisheries. Relevant international tools and instruments have been developed to enhance fishing management and encourage small-scale fishing, including the FAO Code of Conduct for Responsible Fisheries, the FAO Port State Measures Agreement, Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries, and eco-labelling guidelines.[9]

Scientific understanding of oceans' responses to pressures and management action is fundamental for sustainable development. Ocean observations and research are also essential to predict the consequences of change, design mitigation and guide adaptation. Intergovernmental and non-governmental organizations such as the Intergovernmental Oceanographic Commission (IOC) of UNESCO, the Scientific Committee on Ocean Research (SCOR) and the Scientific Committee on Antarctic Research (SCAR) play a significant role in facilitating marine scientific research and related cooperation.

In 2017, the UNGA declared a *United Nations Decade of Ocean Science for Sustainable Development* (UN decade of Ocean Science) from 2021 to 2030. The IOC was tasked to prepare and coordinate the development of an implementation plan for the UN Decade of Ocean Science during the preparatory phase (2018–2020). This Decade will provide a common framework to ensure that ocean science can fully support countries to achieve the 2030 Agenda.

Monitoring and assessment of the marine environment, including social and economic conditions, provide a solid basis for actions protecting ocean science and promoting science-based policy making. Cases of regular environmental monitoring and assessment includes the Global Environment Outlook (GEO) of UNEP, the International Panel on Climate Change (IPCC) Assessment Reports, and the Regular Process for Global Reporting and Assessment of the State of the Marine Environment Including Socioeconomic Aspects (Regular Process or WOA).

WOA is a global mechanism for reviewing the state of the marine environment, including socioeconomic aspects, on a continual and systematic basis by providing regular assessments at the global and supra regional levels. After the first cycle of WOA was completed in 2015, beside the integrated assessment report, a technical abstract on the SDG 14 was prepared and provided a first evaluation of the Goals and Targets relevant to the various aspects of the marine environment.[10]

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9 FAO, 2017. *FAO Working for SDG 14–Healthy Oceans for Food Security, Nutrition and Resilient Communities.* Rome: FAO.

10 United Nations, 2017. *The Ocean and the Sustainable Development Goals under the Sustainable Development: a Technical Abstract of the First Global Integrated Marine Assessment*. New York: United Nations.

Chapter 2

Challenges and opportunities for APEC economies in addressing SDG 14 and related Goals

The Asia-Pacific region experiences the fastest economic growth in the world. Its rich resources are crucial for regional development. The GDP of APEC economies represents up to 60% of global GDP in 2017.[11] The marine resources have been playing a pivotal role in supporting sustainable economic growth, providing food security and facilitating trade and investment. This chapter illustrates the pillars of sustainable development including economic, social and environmental prospects that are essential for achieving the SDGs for APEC economies.

2.1 The importance of the oceans to sustainable development in the APEC region

Oceans are the essential component of the Earth's natural system, supporting ecological balance, climate regulation and global well-being. Marine sustainable development is prioritized by the APEC members to strengthen food security, provide livelihood, protect marine environment and address climate change. Policies and action plans have been developed to effectively sustain the economic growth, social stability, and resource conservation for the next coming generations.

2.1.1 Providing sustained economic growth

The economic value of natural capital puts oceans as the seventh largest economy in the world. In term of "gross marine product", oceans contribute goods and services worth at least 24 trillion USD annually.[12] The primary drivers of ocean industries in the APEC region include marine fisheries, aquaculture, transportation, tourism, and energy.

APEC region is the world's largest producer of fish.[13] The Pacific Ocean is a major source of world capture fish which contributed 51% of the global marine capture production in 2016.[14] Asia accounted for about 89% of world aquaculture production in 2016.[15] The fishing industry is a dominating sector in some APEC economies. Coral reef-related fisheries in Indonesia and the Philippines alone are valued around 2.2 billion USD/year.[16] The Pacific islands supplied one third of the world's tuna with a first-sale value over 4 billion

11 APEC Policy Support Unit, 2018. *APEC In Chart 2018*. Singapore: APEC Secretariat.

12 Hoegh-Guldberg, O. et al, 2015. *Reviving the Ocean Economy: the Case for Action—2015*. Gland: World Wide Fund For Nature.

13 Central Intelligence Agency, 2017. *The World Factbook 2017*. Washington, D C: Central Intelligence Agency. Available from: https://www.cia.gov/library/publications/download/download-2017/index.html. [Accessed 18 January 2019]

14 Arthur's calculation based on data from FAO, 2018, *The State of World Fisheries and Aquaculture 2018—Meeting the Sustainable Development Goals*.

15 FAO, 2018. *The State of World Fisheries and Aquaculture 2018—Meeting the Sustainable Development Goals*. Rome: FAO.

16 ADB. ADB Regional Technical Assistance 7303: Regional Cooperation on Knowledge Management, Policy and Institutional Support to the Coral Triangle Initiatives—*The Blue Economies of the CTI: Gearing for Rio+20*. Mandaluyong: ADB. Available from: http://www.coraltriangleinitiative.org/sites/default/files/resources/PES%20Learning%20notes%204_Oct%202011_0.pdf. [Accessed 18 January 2019]

USD in 2014.[17] In Peru, fishing is the third-largest contributor to the domestic GDP. In early 2017, Peruvian canned tuna exports rose 141% year-on-year to 764,543 metric tons.[18]

Maritime transportation is crucial to the world's trade by connecting people and goods. More than 80% of the global business by volume and more than 70% of its value are being carried on board and handled by seaports worldwide.[19] APEC is the busiest region as measured by the amount of maritime transportation. The container port throughput of APEC economies in 2017 was 488 million TEU, accounting for 65% of world total.[20] Moreover, ship building is a main sector in some APEC economies, with Korea, China and Japan being the top ship building economies that accounted for 92% of global delivery in 2016.[21]

Tourism is a vital economic sector in many parts of the world. According to the World Travel and Tourism Council, the direct contribution of travel and tourism to GDP in 2017 was 1,402 billion USD (2.9% of the total GDP) in the APEC region. This contribution is expected to rise by 4.2% annually and reach 2,218 billion by 2028. Meanwhile, travel and tourism directly supported 55,167,500 jobs (3.7% of total employment), expected to rise by 2.1% annually to 69,176,000 jobs (4.4% of total employment) in 2028[22] in the APEC region. Noting that every 10% increase in tourist arrivals in APEC is associated with a 1.2% increase in trading and 0.8% increase in imports in the destination economy, growing tourism sector will also benefit the economic prosperity of the APEC region by enhancing trade and investment.[23] Highly diversified marine ecosystems and landscapes is the major attraction of tourists in this region. For example, reef-based tourism in the Philippine and Indonesia is valued at around 258 million USD annually.[24]

Renewable energy is a fast-growing energy source. The oceans are viable sources of renewable energy in various forms, such as offshore wind, waves, tides, currents, biomass, and thermal power.[25] As the type of

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17 UNESCAP. *Policy Brief: SDG 14 in Asia and the Pacific: An Accelerator Approach for Implementation*. Bangkok: UNESCAP.

18 Mereghetti, M., 2017. Peru pushes tuna sector, fishery to contribute more to its GDP. *Under Current News* [online]. 4 May 2017. Available from: https://www.undercurrentnews.com/2017/05/04/peru-pushes-tuna-sector-fishery-to-contribute-more-to-its-gdp/. [Accessed 18 January 2019]

19 UNCTAD, 2017. *Review of Maritime Transport 2017*. Geneva: UNCTAD.

20 Author's calculation based on data from UNCTAD statistic center. Available from: https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=13321 [Accessed 18 January 2019]

21 UNCTAD, 2017. *Review of Maritime Transport 2017*. Geneva: UNCTAD.

22 World Travel and Tourism Council, 2018. *Travel and Tourism Economic Impact APEC 2018*. London: World Travel and Tourism Council. Available from: https://www.wttc.org/-/media/files/reports/economic-impact-research/regions-2018/apec2018.pdf. [Accessed 18 January 2019].

23 *Id.*

24 Asian Development Bank. ADB Regional Technical Assistance 7303: Regional Cooperation on Knowledge Management, Policy and Institutional Support to the Coral Triangle Initiatives—*The Blue Economies of the CTI: Gearing for Rio+20*. Mandaluyong: Asian Development Bank. Available from: http://www.coraltriangleinitiative.org/sites/default/files/resources/PES%20Learning%20notes%204_Oct%202011_0.pdf. [Accessed 18 January 2019]

25 Appiott, J., Dhanju, A., and Cicin-Sain, B., 2014. Encouraging renewable energy in the offshore environment. *Ocean & Coastal Management*, 90, 58-64.

renewable energy with the benefits of predictability and stability, ocean energy, such as tides and waves, has huge potential in future energy supply.

2.1.2 Contributing to food security and livelihoods

Coastal areas are the home to a majority of the world's population. Most of the megacities are located in the coastal area and deltas, more than 40% of the world's population live within 100 kilometers of the coast.[26] Marine ecosystems are critical for food supply and income generation for coastal communities.

Fish and fish products have a crucial role in nutrition and global food security, as they represent a valuable source of nutrients and micronutrients. Fish production in APEC economies totaled 148 million metric tons in 2016, with 71% sourced from marine areas.[27] As fish production grows, improvements in food security have contributed to better nourishment and a more balanced diet throughout the region. Fish consumption in APEC economies increased from 29.29 kg per capita in 2000 to 37.57 kg per capita in 2013.[28] In some economies such as Japan, Korea and Malaysia, fish consumption is even higher due to cultural and geographic factors.

Fisheries and aquaculture activities are a major source of livelihoods in the APEC region. In 2016, 85% of the global population engaging in the fisheries and aquaculture sectors was in Asia (50, 468 thousands fisher and fish farmers), followed by Africa (10%, 5, 671 thousands fisher and fish farmers) and Latin America and the Caribbean (4%, 2, 466 thousands fisher and fish farmers).[29] According to FAO statistics, some economies in APEC have the largest fisher groups. In China, about 14 million people rely on fishing and aquaculture for a living.[30] In Indonesia, fisheries provide employment for nearly 6 million people.[31]

2.1.3 Source of marine biodiversity and ecosystem services

The biological diversity of the Pacific Ocean is extremely rich. For a range of marine species including corals, mangroves and fishes, the tropical waters of the Coral Triangle are the center of the world's biodiversity. Figure 1 shows patterns of marine biodiversity worldwide, with the mid to low latitude Pacific Ocean displaying relatively high biodiversity and the Southwest Pacific representing the maximum biodiversity.

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26 IOC/UNESCO, IMO, FAO, and UNDP, 2011. *A Blueprint for Ocean and Coastal Sustainability, An Inter-agency Paper toward the Preparation of The UN Conference on Sustainable Development (Rio+20)*. Paris, London, Rome and New Your: IOC/UNESCO, IMO, FAO, and UNDP.

27 Author's calculation based on fish consumption data from Fisheries and Aquaculture, FAO Data Center, available from: http://www.fao.org/figis/servlet/TabSelector#lastnodeclicked. [Accessed 17 January 2019]

28 Author's calculation based on fish consumption data from Fisheries and Aquaculture, FAO Data Center, available from: http://www.fao.org/figis/servlet/TabSelector#lastnodeclicked. [Accessed 17 January 2019] and population data from APEC, StatsAPEC, available from http://statistics.apec.org/index.php/key_indicator/index. [Accessed 17 January 2019]

29 FAO, 2018. *The State of World Fisheries and Aquaculture 2018—Meeting the Sustainable Development Goals*. Rome: FAO.

30 *Id*.

31 *Id*.

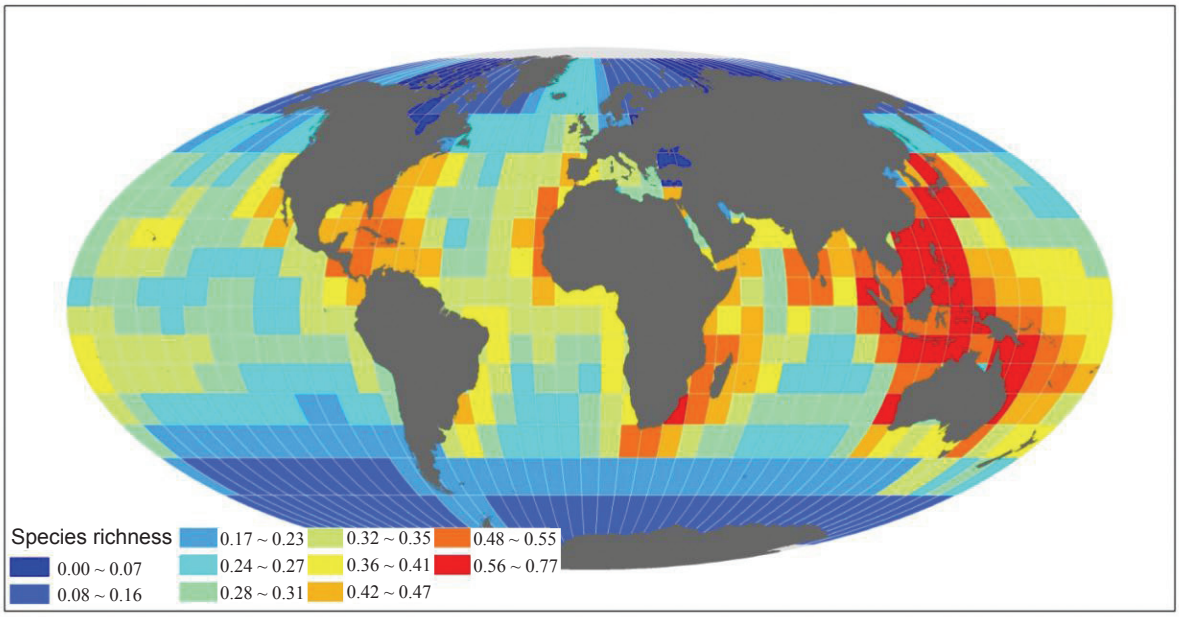

Figure 1: Global patterns of marine biodiversity

Source: Tittensor, D.P., Mora, C., Jetz, W., et al., 2010. Global patterns and predictors of marine biodiversity across taxa. *Nature*, 466: 1098-1101. Available from: http://www.nature.com/nature/journal/v466/n7310/full/nature09329.html; http://data.unep-wcmc.org/datasets/17.

The Asia-Pacific region is home to 45% of the world's coral reefs[32] with the majority located along the Southeast Asia and Western and Central Pacific islands. Healthy coral reefs are a natural purifier of coastal waters. They store carbon in soils for thousands of years, purify water, and reduce pollution such as agricultural runoff and sewage. The Coral Triangle, which covers 5.7 million square kilometers of ocean waters compassing Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands and Timor-Leste, is a global centre of marine biodiversity.[33,34] Approximately 2,228 species or 37% of the total 6,000 coral reef fish species live in this area.[35]

Another marine biodiversity hotspot is shellfish reefs (such as oyster reefs and mussel beds). They were once dominant structural and ecological components in temperate and subtropical estuaries, spreading throughout Asia-Pacific. Current and historic distributions of these ecosystems range from Australia, New Zealand, China, to Canada, the U.S., Mexico and Chile. Aside from being exploited as source of

32 APEC Secretariat, 2005. *Creating the International Standard for the Trade in Live Reef Food Fish*. Singapore: APEC Secretariat.

33 Allen, G.R., 2008. Conservation hotspots of biodiversity and endemism for Indo-Pacific coral reef fishes. *Aquaculture Conservation: Marine and Freshwater Ecosystems*, 18: 541–556.

34 Stone, G. S., et al., 2011. Oceans: *Heart of Our Blue Planet*. Arlington: Earth in Focus Editions.

35 Coral Guardian – Support Ecosystem Conservation.The Coral Triangle [website]. Available from: https://www.coralguardian.org/en/coral-triangle/. [Accessed 18 February 2019]

food, shellfish are important ecosystem engineers, providing multiple ecosystem services including water filtration, nutrient removal, shoreline protection, and habitats provision.[36] As filter feeders, bivalve shellfish improve water quality by removing suspended solids, reducing harmful algal blooms and denitrification in surrounding sediments—a single oyster filters up to 50 gallons of water per day.[37] Reef structures absorb wave energy, serving as barriers to storms and shoreline erosion. Reefs also provide nursery habitat for foraging fish and a variety of invertebrates, including commercially valuable species, such as croaker, blue crab and silver perch.[38]

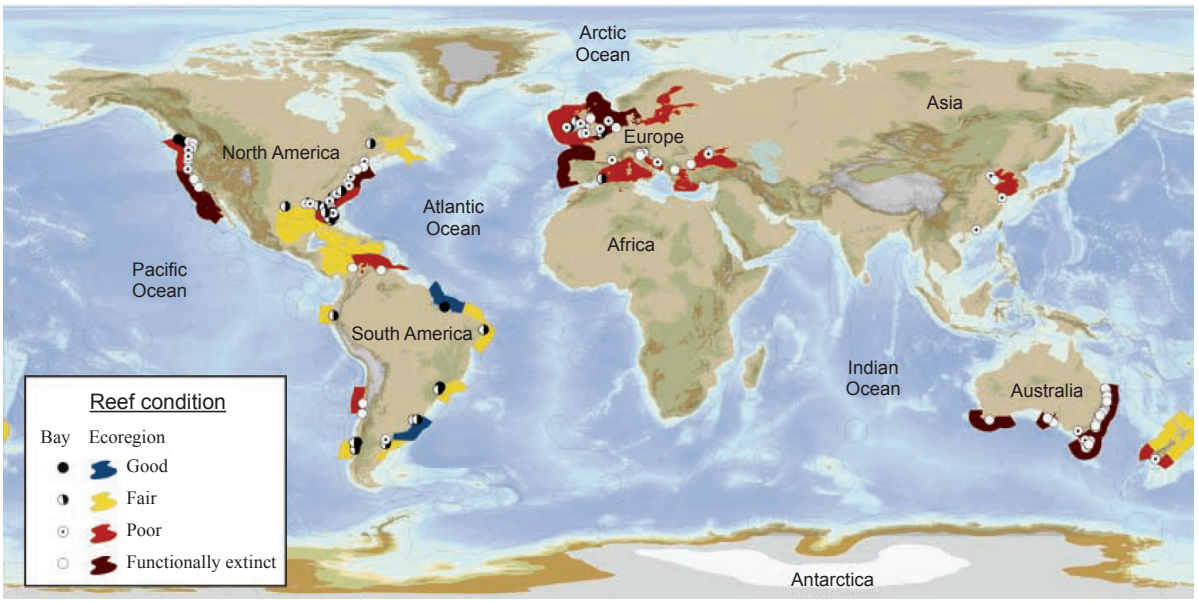

Figure 2: The global condition of oyster reefs in bays and eco-regions

The condition ratings of good, fair, poor, and functionally extinct are based on the percentage of current to historical abundance of oyster reefs remaining: less than 50% lost (good), 50% to 89% lost (fair), 90% to 99% lost (poor), more than 99% lost (functionally extinct). Source: Oyster Reefs at Risk and Recommendations for Conservation, Restoration, and Management. BioScience.2011. Available from: https://doi.org/10.1525/bio.2011.61.2.5

Mangroves are a critical marine ecosystem in Asia-Pacific. South and Southeast Asia contain 41% of the world's mangrove forests, with Australia having another 10% (Figure 3). [39] The aerial roots of mangroves retain sediments from soil erosion, and the roots, trunks and canopy reduce the force of oncoming wind and

36 Beck, M.W., Brumbaugh, R.D., Airoldi, L., et al., 2009. *Shellfish Reefs at Risk: A Global Analysis of Problems and Solutions.* Arlington: The Nature Conservancy.

37 U.S. NOAA, Oyster Reef Habitat [website]. Available from: https://www.fisheries.noaa.gov/national/habitat-conservation/oyster-reef-habitat [Accessed 19 January 2019]

38 U.S. NOAA, Oyster Reef Habitat [website]. Available from: https://www.fisheries.noaa.gov/national/habitat-conservation/oyster-reef-habitat. [Accessed 19 January 2019]

39 Spalding, M., Blasco F., and Colin F., 1997. World Atlas of Mangroves. Okinawa:The International Society of Mangrove Ecosystems.

waves and reduce flooding. Researchers found that, a 100-meter wide mangrove forest can reduce wave heights by 13% ~ 66%.[40] Moreover, mangroves form a complex aquatic food web that provides nursery bases for marine mollusks, waterfowl and small mammals. They also play an important role in the functioning of adjacent ecosystems, including terrestrial wetlands, saltmarshes, seagrass beds and coral reefs.[41]

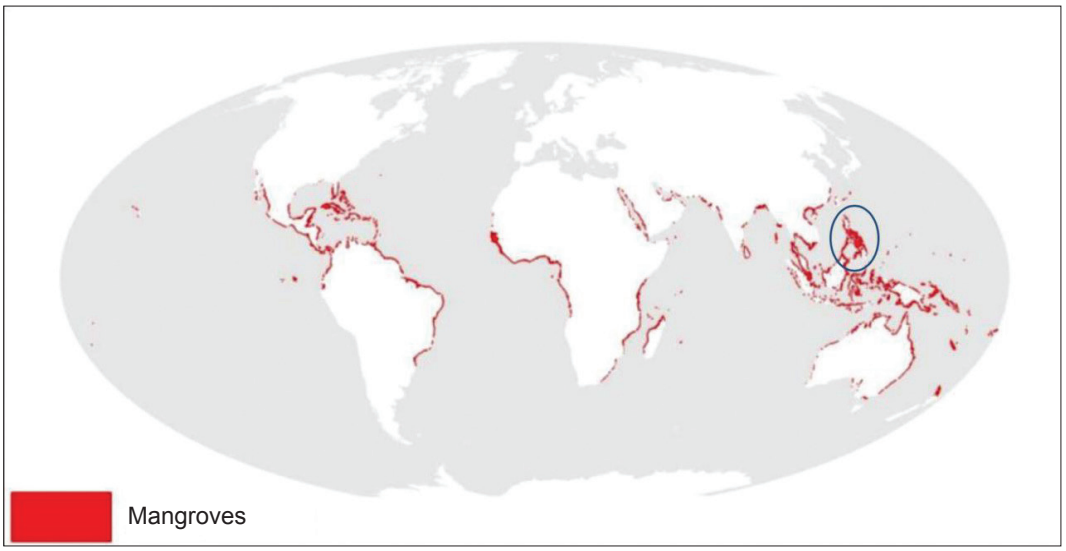

Figure 3: World mangrove distribution

Source: Spalding, M., Kainuma, M. and Collins, L., 2010. *World Atlas of Mangroves* (version 2.0). A collaborative project of ITTO, ISME, FAO, UNEP-WCMC, UNESCO-MAB, UNU-INWEH and TNC. London: Earthscan. Available from: www.routledge.com/books/details/9781844076574; http://data.unepwcmc.org/datasets/5.

2.1.4 Strengthening resilience to climate change

Climate change can impact the ocean, its ecosystems, maritime activities and coastal populations, both directly and indirectly. Simultaneously, healthy ocean and marine ecosystems are crucial for climate change adaptation and mitigation. Oceans have served as a buffer against climate change by absorbing CO_2 and excess heat emitted to earth systems. It absorbs more than 25% of the anthropogenic CO_2 and 93% of the excess heat trapped by greenhouse gases on earth.[42,43] Coastal ecosystems and vegetated

40 McIvor, A., Möller, I., Spencer, T., and Spalding, M., 2012. *Reduction of Wind and Swell Waves by Mangroves*. Natural Coastal Protection Series: Report 1. Cambridge Coastal Research Unit Working Paper 40. Arlington and Wageningen: The Nature Conservancy and Wetlands International.

41 Spalding, M., Blasco F., and Colin F., 1997. *World Atlas of Mangroves*. Okinawa:The International Society of Mangrove Ecosystems.

42 Herr, D. and Galland, G.R., 2009. *The Ocean and Climate Change: Tools and Guidelines for Action*. Gland: IUCN. Available from: https://cmsdata.iucn.org/downloads/the_ocean_and_climate_change.pdf. [Accessed 18 January 2019]

43 Anisimov, O.A. et al., 2007. *Polar Regions (Arctic and Antarctic) in Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the fourth assessment report of the intergovernmental panel on climate change, Parry, M.L. et al. eds. Cambridge and New Your: Cambridge University Press.

marine habitats such as seagrasses, salt marshes, macro-algae, mangroves and coral reefs occupy 0.2% of the ocean surface but are important carbon sinks for sustaining a healthy atmosphere. Despite the smaller aboveground biomass and areal coverage of vegetated coastal ecosystems, they have the potential to contribute substantially to long-term carbon sequestration resulting from the higher rate of organic carbon sequestration in sediments.[44]

Coastal habitats are natural defenses against hazards and protect coastal communities from life and economic loss. In some cases, such as the Great East Japan Earthquake, coastal forests and sand hills functioned as dampers and fences against tsunami.[45] The economic value of this climate adaptation service is vast. In Malaysia, the value of intact mangrove swamps for storm protection and flood control has been calculated at 300,000 USD per kilometer, which is the cost of replacing them with rock walls.[46]

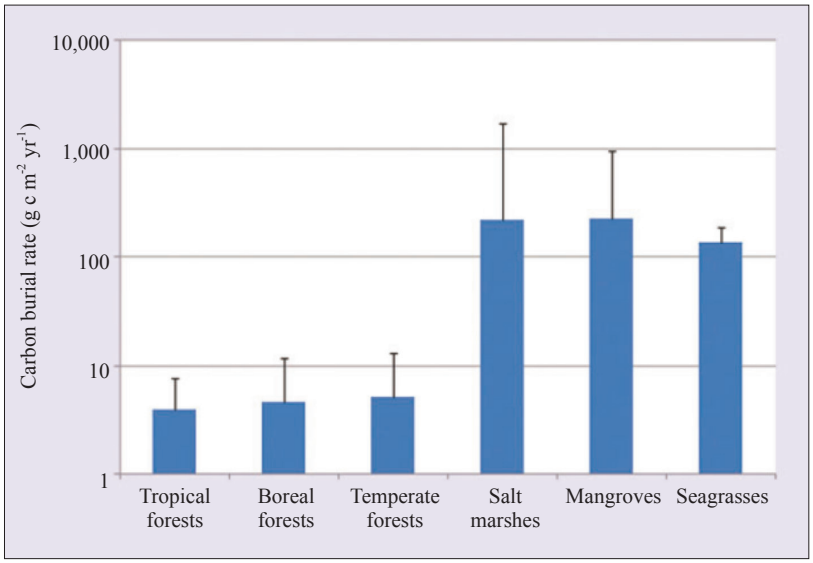

Figure 4: Mean long-term rate of Carbon Sequestration (g C m^{-2} yr^{-1}) in soils in terrestrial forests and sediments in coastal vegetated ecosystem

Source: Carlos, M., Duarte. 2013. The role of seagrass in climate change adaptation and mitigation, The University of Western Australia and Spanish National Research Council.

2.1.5 Sustaining cultural diversity

The oceans have an impressive role in shaping, sustaining and connecting cultures. The aesthetic, religious,

44 Mcleod, E., Chmura, G.L., et al., 2011. A blueprint for blue carbon: toward an improved understanding of the role of vegetated coastal habitats in sequestering CO_2. *Frontier in Ecology and the Environment*, 9(10).

45 Wisner, B., Gaillard, J.C., and Kelman I., eds., 2012. *Handbook of Hazards and Disaster Risk Reduction and Management.* London, New York: Routledge.

46 Herr, D. and Galland, G.R., 2009. *The Ocean and Climate Change: Tools and Guidelines for Action*. Gland: IUCN. Available from: https://cmsdata.iucn.org/downloads/the_ocean_and_climate_change.pdf. [Accessed 18 January 2019]

and spiritual meanings derived from the ocean permeate all aspects of peoples' lives and form the way they manage their relationships with the ocean. Traditional and indigenous knowledge is an essential asset in managing the marine resources. As an example, the Yolngu people who live in Arnhem Land in Northern Australia used "Yolngu song cycles" to describe the journey and specify the flows and transformations of water that further unify land, river, sea, and sky into a coherent whole.[47] The individual cultures of the Pacific islands, expressed in their art, music, songs, and dances, often demonstrate a preoccupation with the value of ocean tourism and provide income to local people. Furthermore, the indigenous community is also involved in co-management of sustainable practices and conservation of biodiversity. In the Canadian Arctic, where a wealth of important biodiversity in a natural or semi-natural state is displayed, considerable efforts have been made to integrate wild species use with maintenance of wild populations. The importance of wild species for subsistence and cultural reasons motivates the indigenous communities to place constraints on mining and fossil fuel exploration activities, creating a synergy between conservation and social concerns.

2.2 Threats to the long-term sustainability of coastal and ocean resources

2.2.1 Marine pollution

With the advancement of industrialization, increased urbanization and tourism activities, coupled with a growing coastal population, marine pollution is becoming a global serious problem, particularly in the APEC region, where exists a thriving shipping industry, large coastal populations, and growing tourism. Sedimentation, oil leakage, toxic compounds and plastic debris all negatively impact the coastal marine environments. All these activities contribute to the endangerment of ecological goods and services derived from marine ecosystems. Though information is lacking on illnesses linked to seafood, it is believed to be increasing in parallel with marine pollution. Meanwhile some marine pollution, such as marine debris, can be visible, but it is often the pollutants that cannot be seen that cause the most harm.

Marine plastic pollution has been a growing concern for decades.[48] Experts estimated most of the marine debris found in the oceans, whether it is washed up on the shores or spiraling in gyres, comes from land-based sources.

Apart from plastic wastes, there are problems with other toxins that do not disintegrate rapidly in marine environment. Many pollutants, such as Ag, Cu, Cd, Pb, As, dichlorodiphenyltrichloroethane (DDT),

47 Johnston, B.R., Hiwasaki, L., Klaver, I.J., Ramos-Castillo, A., and Strang, V. eds., 2012. *Water, Cultural Diversity, and Global Environmental Change: Emerging Trends, Sustainable Futures?*. IOC/UNESCO and Springer: Paris and Dordrecht.

48 Xanthos, D. and Walker, T.R., 2017. International policies to reduce plastic marine pollution from single-use plastics (plastic bags and microbeads): a review. *Marine Pollution Bulletin*, 118 (1–2).

polychlorinated biphenyls (PCBs), pesticides, furans, dioxins, phenols, and radioactive waste are mainly from land-based activities.[49] Heavy metallic chemical elements that have a relatively high density are toxic or poisonous at low concentrations. Examples are mercury, lead, nickel, arsenic, and cadmium. These toxins can be accumulated in the tissues of many species of aquatic life through bioaccumulation process. They are also known to accumulate in benthic environments, such as estuaries and bay muds.

Marine pollution comes from many sources, both land-based and sea-based. Industrial discharge is a main source of chemicals and toxins which may harm marine ecosystems. For example, copper, a common industrial pollutant coming from mining and other activities, can interfere with the life history and development of coral polyps.[50] Additionally, deep sea mining is a relatively new mineral retrieval process that takes place on the ocean floor[51,52,53] and the complete consequences of full-scale mining operations are still unknown. Ships can pollute waterways and oceans in many ways. Oil spills can have devastating effects. While being toxic to marine life, polycyclic aromatic hydrocarbons (PAHs), found in crude oil, are very difficult to clean up, and can last for years in the sediment and marine environment.[54]

2.2.2 Invasive species

Invasive species are defined as non-native species that can cause or are likely to cause harm to ecosystems, economies, and/or public health.[55] Marine invasive species compete with native marine organisms for habitats and food, breed with closely related native species, thus reducing genetic diversity of marine organisms and endangering marine life in Asia-Pacific.

Although few economies in the Asia-Pacific region have documented research on invasive (non-indigenous) species, evidence suggests that marine invasive species can adversely affect the habitats that they invade, both ecologically and economically.[56] Over 500 non-native species have been found in coastal marine habitats

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49 Li, D.J. and Daler, D., 2004. Ocean pollution from land-based sources: East China Sea, China. *A Journal of the Human Environment,* 33 (1).

50 Young, E., 2003. Copper decimates coral reef spawning. *New Scientist* [online]. 18 November 2003. Available from: https://www.newscientist.com/article/dn4391-copper-decimates-coral-reef-spawning/. [Accessed 17 January 2019]

51 Ahnert, A. and Borowski, C., 2007. Environmental risk assessment of anthropogenic activity in the deep-sea. *Journal of Aquatic Ecosystem Stress and Recovery*, 7 (4).

52 Glasby, G., 2000. Lessons learned from deep-sea mining. *Science*, 289 (5479).

53 Halfar, J. and Fujita, R.M. 2007. Danger of deep-sea mining. *Science*, 316 (5827).

54 Abdel-Shafy, H. I. and Mansour, M. S., 2016. A review on polycyclic aromatic hydrocarbons: source, environmental impact, effect on human health and remediation. *Egyptian Journal* of Petroleum, 25 (1):.

55 Ahnert, A. and Borowski, C., 2000. Environmental risk assessment of anthropogenic activity in the deep-sea. *Journal of Aquatic Ecosystem Stress and Recovery*, 7 (4).

56 Center for Ocean Solutions, 2009. *Pacific Ocean Synthesis: Scientific Literature Review of Coastal and Ocean Threats, Impacts, and Solutions*. California: The Woods Center for the Environment, Stanford University.

of North America, hundreds of which can be found in a single estuary.[57] Ballast water taken up at sea and released in port is a major source of invasive species, such as the spreading harmful algae.[58] Invasive species may outcompete native species, disrupt local ecosystem food chain, facilitate the spread of new diseases, introduce new genetic material, and alter underwater seascapes. Invasive species are responsible for about 120 billion USD annually in lost revenue and management costs in the U.S. alone.[59]

2.2.3 Biodiversity loss

Human-dominated marine ecosystems are experiencing accelerated loss of populations and species, with largely unknown consequences.[60] Changes in marine biodiversity are directly caused by over exploitation, pollution, harmful algal blooms, low oxygen, and habitat destruction, or indirectly through climate change and related perturbations of ocean biogeochemistry.[61,62,63,64,65] In recent years, regional ecosystems such as estuaries, coral reefs, and coastal and oceanic fish communities are rapidly losing populations, species, or entire functional groups. Marine biodiversity loss is a huge concern in the region, leading to losses in food sources and economic opportunities while increasing the negative impacts of coastal hazards.

Human activity has accelerated the degradation of coastal ecosystems through the decline of ecological resilience. Productive marine ecosystems such as coral reefs, mangrove forests, salt marshes, seagrass beds, shellfish reefs and kelp forests in the Asia-Pacific region have been adversely affected.[66] About 60% of the mangroves in the Asia-Pacific have already been cleared because of coastal development, land reclamation and aquaculture activities.[67] More than 70% of coral reefs in the Southeast Asia are threatened by overfishing, destructive fishing practices, sedimentation from land-based activities[68] and ocean warming. Shellfish reefs, as

57 The U.S. Commission on Ocean Policy, 2004. *An Ocean Blueprint for the 21st Century*. Washington, D C: U.S. Commission on Ocean Policy.

58 Meinesz, A., 2003. The Impact of Invasive Species. *NOVA Science Progamming on Air and Online*[Online]. Available from: https://www.pbs.org/wgbh/nova/algae/impact.html. [Accessed 20 January 2019]

59 Pimentel, D., Zuniga, R., and Morrison, D., 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. *Ecological Economics*, 52 (3).

60 Worm, B., et al., 2006. Impacts of biodiversity loss on ocean ecosystem services. *Science*, 314 (5800).

61 Dulvy, N.K., Sadovy, Y. and Reynolds, J. D. 2003. Extinction vulnerability in marine populations. *Fish And Fisheries*, 4 (1).

62 Lotze, H.K., et al., 2006. Depletion, degradation, and recovery potential of estuaries and coastal seas. *Science*, 312 (5781).

63 Pandolfi, J.M., et al., 2003. Global trajectories of the long-term decline of coral reef ecosystems. *Science*, 301 (5635).

64 Jackson, J.B., et al., 2001. Historical overfishing and the recent collapse of coastal ecosystems. *Science*, 293 (5530).

65 Dulvy, N.K., Sadovy, Y., and Reynolds, J.D., 2003. Extinction vulnerability in marine populations. *Fish and Fisheries*, 4 (1).

66 Asia Pacific Forum for Environment and Development, 2010. *APFED II Final Report-Driving Innovation for Sustainable Asia and Pacific*. Kanagawa: APFED secretariat.

67 Mimura, N., et al., 2008. *Asia-Pacific Coasts and Their Management: States of Environment (Vol. 11)*. Springer Science & Business Media.

68 Burke, L., Selig, E., and Spalding, M., 2002. *Reefs at Risk in Southeast Asia*. Washington, D C: World Resources Institute. Available from: http://www.wri.org/sites/default/files/pdf/rrseasia_full.pdf. [Accessed 18 January 2019]

shown in the Figure 2 in 2.1.3, have also declined dramatically globally and in the Asia-Pacific region. It has been estimated that 85% of world's oyster reefs have been lost, across 144 bays and 40 eco-regions.[69] This profound loss is caused by over-exploitation, destructive fishing practice, coastal development and dredging, introduction of non-native shellfish, disease and others.

Changes in coastal ecosystems structure and function have negative impacts on marine resources. Coral reef and shellfish reef associated commercial fisheries are experiencing an obvious decline in the past decades. While used to being wild-harvested across all regions, most of the shellfish fisheries have collapsed. Currently, 75% of the world's remaining wild captured oysters comes from only five eco-regions in North America (out of 40 globally), yet the condition of the reefs in these eco-regions is poor or functionally extinct.[70]

2.2.4 Declining resources

The potential of marine ecosystems to provide resources in APEC region is being eroded and threatened by ill-controlled marine pollution, ocean acidification and warming, destructive fishing practices, intensive transport, and inadequate governance. The region's fish stocks have been severely declined due to overfishing and destructive fishing practices. Approximately 57% of world fish stocks are fully exploited and another 30% are over-exploited, depleted, or recovering.[71] Among the sixteen major statistical areas in the world oceans, the Southeast Pacific lists the second highest percentage in unsustainable stocks (61%), slightly lower than the Mediterranean and Black Sea (62%).[72]

2.2.5 Multiple conflicting uses of the coasts and oceans

The coastal zone, comprising both land and sea sides, is a major attraction in many sectors—ocean commerce, tourism, aquaculture, fishery, military, and a variety of industries.[73] This transitional area between the land and sea is also characterized by very high biodiversity. Land conversion, sea dredging, and water pollution from urban, industrial, commercial, and agricultural development has caused the modification of coastal seas. Conversely, sea use strongly affects the land and intertidal areas—for example, beach erosion, pollution from tankers, and property destruction from storm surges, flooding, and wave action. Dense populations, rapid

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69 Beck, M.W., Brumbaugh, R.D., Airoldi, L.,et al., 2009. *Shellfish Reefs at Risk: A Global Analysis of Problems and Solutions*. Arlington: The Nature Conservancy.

70 Beck, M. W., Brumbaugh, R. D., Airoldi, L., et al., 2011. Oyster reefs at risk and recommendations for conservation, restoration, and management. *Bioscience*, 61 (2).

71 FAO, 2018. *The State of World Fisheries and Aquaculture 2018 - Meeting the Sustainable Development Goals*. Rome: FAO.

72 *Id.*

73 Clark, R. J., *Resolving Resource Use Conflicts in Coastal Zones. In:* Wolanski, E. eds. 2009. *Oceans and Aquatic Ecosystems-Volume II*, Oxford: EOLSS Publications.

urbanization processes together with the increasing economic activities along the coastal areas of APEC economies pose great threats to the health and sustainability of ocean and coastal areas. During 2010–2016, the total population in APEC economies increased by 116 million,[74] with more than half of them living in coastal areas (within 60 km from the sea). Also, 15 out of 46 of the world megacities are located in the coastal areas of APEC economies.[75] Meanwhile, APEC economies maintain higher GDP growth rate compared to the global average. GDP per capita growth of APEC economies in 2010–2017 ranged from 2.1% to 3.9%, which was higher than the global average of 1.2% to 3.0% in the same period.[76]

However, rapid socioeconomic transitions have come at a high cost, causing an accelerated and permanent loss of biodiversity in the ecosystems of the Asia-Pacific region.[77] The coasts and oceans are facing increasing conflicts from multiple and intensive uses than ever before. Habitation in the coastal zone, fisheries and aquaculture, shipping, tourism, land-use practices (agriculture and industrial development), ecosystem protection and restoration and other activities overlaps in coastal areas. The conflicts between economic growth and nature conservation go deeper than the chaotic appearance. However, with the ever-growing need of ocean and coastal resources, multiple conflicts between different stakeholders from the APEC economies will persist for some time, making the scientific management of ocean and coastal areas a long-term task.

2.2.6 Climate change and natural hazards

Climate change is placing increasing pressure on APEC coastal regions. It is predicted that 40% of global economic losses from natural disasters will be in Asia-Pacific, with the greatest losses in Japan and China.[78] As the Fifth Assessment Report of IPCC (2014) stresses, climate change-related impacts stemming from extreme weather events such as heat waves, extreme precipitation and coastal flooding have already been observed.[79]

Sea level rise: APEC economies are all strongly linked with the ocean, have large populations in low-elevation coastal zones (LECZs), and are thus vulnerable to sea level rise. In 2017, global sea level was 77 mm above the 1993 average.[80] Since 1993, the regional rates for the Western Pacific were up to three

74 Author's calculation based on World Bank Open Data. Available from: http://data.worldbank.org. [Accessed 18 January 2019]

75 UNDESA, 2016.The World's Cities in 2016. New York: United Nations.

76 Author's calculation based on APECstat Data. Available from: http://statistics.apec.org/index.php/apec_psu/glossary. [Accessed 19 February 2019]

77 Karki, M. et al. eds., 2018. *Summary for Policymakers of the Regional Assessment Report on Biodiversity and Ecosystem Services for Asia and the Pacific.* Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Secretariat.

78 UNESCAP, 2017. *Asia-Pacific Disaster Report 2017*. Bongok: UNESCAP.

79 IPCC, 2014. *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of IPCC*. Cambridge and New York: Cambridge University Press.

80 U.S. NOAA, Climate Change: Global Sea Level [website]. Available at: https://www.climate.gov/news-features/understanding-climate/climate-change-global-sea-level. [Accessed 15 February 2019]

times larger than the global mean.[81] Due to sea level rise projected throughout the 21st century and beyond, coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion.[82] The impact of storm surges increases the rise of mean sea level, which enlarges the affected area of inundation and causes greater loss on coastal infrastructure. It is predicted that the number of people exposed to flooding from 1-in-100-year storm surge events is the highest in Asia, and China, Indonesia and Viet Nam are listed among those with the top vulnerability.[83]

Heat extremes: Climate change can exacerbate the impacts of heat waves that may cause mortality. Southeast Asia is projected to be the region most affected by heat extremes. Under Representative Concentration Pathways 8.5 (a scenario with the highest greenhouse emissions), with reference to the 1986−2005 baseline, ensemble-mean changes in mean annual temperature in South and Southeast Asia will be greater than 3°C in late 21 century.[84]

Monsoons and heavy rainfall: The monsoon system is a critical factor for the water supply over large parts of Asia. In southern Asia, rainfall is primarily driven by the monsoon. In the period 1980−2010, the average record-breaking rainfall increase was 12% globally—but 56% in Southeast Asia.[85] The number of record-breaking rainfall events has significantly increased globally over the last decades with the strongest increases found over Southeast Asia.[86]

EI Niño/La Niña: EI Niño refers to the warming of surface waters over the central and eastern equatorial Pacific Ocean which affects the global atmospheric circulation, altering weather patterns around the world and temporarily elevating global temperatures. Year 2015/2016 experienced a strong EI Niño, which marked 2016 as the warmest year according to WMO record. The 2015/2016 EI Niño event reached a peak Oceanic Niño Index (ONI) value of +2.6 °C for a three-month period (November 2015 to January 2016),[87] making it one of the three strongest events since 1950, the other two in 1997/1998 and 1982/1983.[88]

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81 IPCC 5, 2014. *Climate Change 2014*: *Synthesis Report*. Cambridge and New York: Cambridge University Press.

82 IPCC, 2014. *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of IPCC*. Cambridge and New York: Cambridge University Press.

83 Neumann, B., Vafeidis, A.T., Zimmermann, J. and Nicholls R.J., 2015. Future coastal population growth and exposure to sea-level rise and coastal flooding—a global assessment. *PLOS ONE*, 10 (6). Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0118571. [Accessed 18 January 2019]

84 IPCC, 2014. *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge and New York: Cambridge University Press.

85 Lehmann, J., Coumou, D. and Frieler, K., 2015. Increased record-breaking precipitation events under global warming. *Climatic Change*, 132 (4).

86 Asian Development Bank, 2017. A Region At Risk: The Human Dimensions of Climate Change in Asia and The Pacific. Bangkok: Asian Development Bank.

87 U.S. NOAA. National Weather Service–Climate prediction Center, Cold & Warm Episodes by Season [website]. Available at: https://origin.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ONI_v5.php. [Accessed 20 February 2019]

88 Tang, Y., Zhang, R.H., Liu, T., et al., 2018. Progress in ENSO prediction and predictability study. *National Science Review*, 5 (6).

Tropical cyclones: The tropical cyclone is one of the most damaging weather systems causing storm surges, floods and high winds.[89] The western North Pacific Ocean is the most active tropical cyclone region on earth.[90] During 2013–2017, 149 tropical cyclones were generated over the western North Pacific.[91] Consensus projections of future tropical cyclones for late 21st century in global warming scenarios continue to indicate a decrease in tropical cyclone number, an increase in storm surge risk due to sea level rise, in tropical cyclone-related rainfall, and in maximum intensities which is closely related to societal impacts.[92] For example, Super Typhoon Hato struck southern China in August 2017, which brought severe flooding along the Pearl River, wind gusts and heavy rainfalls to China and Viet Nam. It has been the strongest typhoon that made landfall on Pearl River Estuary since 1965, causing a direct economic loss of 5.154 billion CNY and affecting more than 1 million people in Guangdong province.[93]

Ocean acidification: The current rate of ocean acidification is over 10 times faster than any time in the last 55 million years.[94] Increasing acidity has possible consequences, such as decreased survival and growth of calcifying organisms,[95] depressing the immune responses of blue mussels,[96] and coral bleaching. Recent studies show that the Arctic Ocean and North Pacific are particularly susceptible to acidification.[97] The coral reefs in Great Barrier Reef (Australia),[98] Hawaii (the U.S.),[99] Japan,[100] and Indonesia have experienced significant bleaching events due to the ocean acidification.

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89 WMO, 2017. Global Guide to Tropical Cyclone Forecasting. WMO: Geneva, Switzerland.

90 Knapp, K.R., Kruk, M.C., Levinson, D.H., et al., 2010. The international best track archive for climate stewardship (IBTrACS) unifying tropical cyclone data. *Bulletin of the American Meteorological Society*, 91 (3).

91 Ying, M., Zhang, W., Yu, H., et al., 2014. An overview of the China Meteorological Administration tropical cyclone database. *The Journal of Atmospheric and Oceanic Technology*, 31.

92 Rapporteur report of Topic 7.1 – Tropical cyclone and climate change – of the 9th Session International Workshop on Tropical Cyclone held in Hawaii in December 2018. Available from: https://www.wmo.int/pages/prog/arep/wwrp/tmr/documents/IWTC-9_Subtopic_7-1.pdf. [Accessed 20 February 2019]

93 Ministry of Natural Resources, P.R.China, 2018. China Marine Disaster Bulletin, 2017.

94 IGBP, IOC, SCOR, 2013. Ocean Acidification Summary for Policymakers – Third Symposium on the Ocean in a High-CO_2 World. Stockholm: International Geosphere-Biosphere Programme.

95 Kroeker, K.J., Kordas, R.L., Crim, R., et al., 2013. Impacts of ocean acidification on marine organisms: quantifying sensitivities and interaction with warming. *Global Change Biology*, 19, doi: 10.1111/gcb.12179.

96 Bibby, R., et al., 2008. Effects of ocean acidification on the immune response of the blue mussel Mytilus edulis. *Aquatic Biology*, 2, doi: 10.3354/ab00037.

97 Qi, D., Chen, L., Chen, B., Gao, A., et al., 2017. Increase in acidifying water in the western Arctic Ocean. *Nature Climate Change*, 7.

98 Plumer, B., 2016. The unprecedented coral bleaching disaster at the Great Barrier Reef, explained. *Vox Energy & Environment* [online]. Available from: https://www.vox.com/2016/3/30/11332636/great-barrier-reef-coral-bleaching. [Accessed 18 January 2019]

99 Corals in peril at a popular Hawaiian tourist destination due to global climate change, *Science Daily* [online], 30 May 2017. Available from: https://phys.org/news/2017-05-corals-peril-popular-hawaiian-tourist.html#jCp. [Accessed 18 January 2019]

100 McCurry, J., 2017. Almost 75% of Japan's biggest coral reef has died from bleaching. *The Guardian*[online]. Available from: https://www.theguardian.com/world/2017/jan/12/almost-75-of-japans-biggest-coral-reef-has-died-from-bleaching-says-report. [Accessed 18 January 2019]

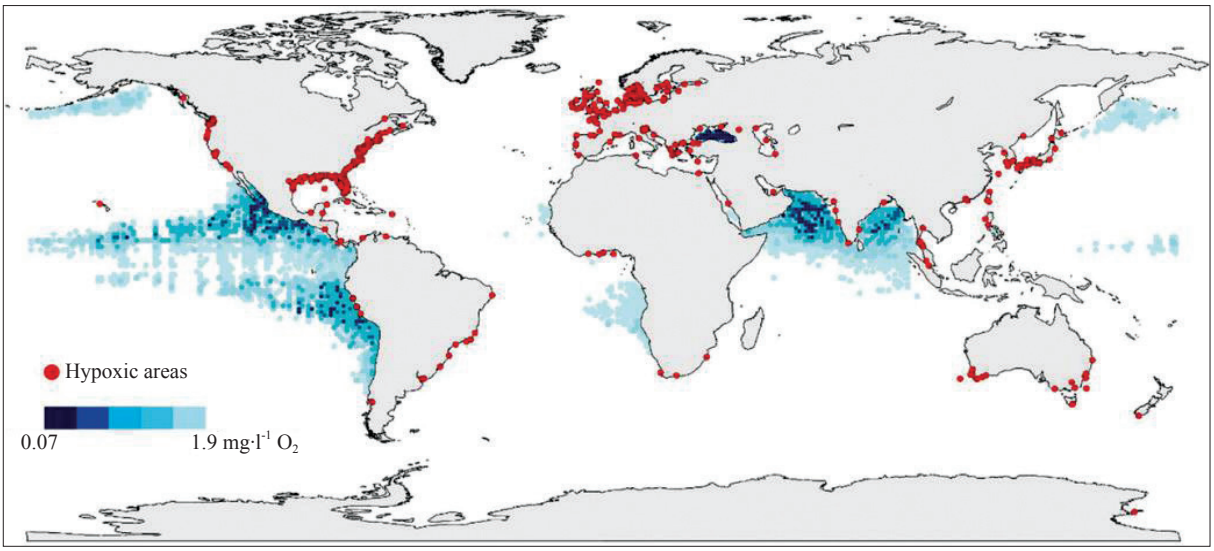

Figure 5: Distribution of hypoxic areas

The global map indicates coastal sites where anthropogenic nutrients have exacerbated or caused O_2 declines to <2 mg liter^{-1} (<63 µmol liter^{-1}) (red dots), as well as ocean oxygen-minimum zones at 300 m of depth (blue shaded regions). Source: the World Ocean Atlas 2009.

Ocean deoxygenation As a consequence of increased carbon dioxide, oxygen minimum zones (OMZs) in the world's oceans are expanding, both horizontally and vertically, due to climate change, and resulting in habitat loss for organisms that are sensitive to low-oxygen concentrations.[101] At least 500 dead zones have now been reported near coasts (Figure 5), compared with less than 50 in 1950s. As there is a lack of monitoring in many regions, the real number may be much higher.[102]

Harmful algae bloom (HAB) HABs consist of organisms that can severely lower oxygen levels in natural waters. Some HABs can produce toxins, which kill marine life and cause significant harm to human health, the environment and economies. They have been increasing in size and frequency worldwide (Figure 6), a fact that many experts attribute to global climate change and human activities. It is predicted that there might be more harmful blooms in the Pacific Ocean.[103,104]

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101 Gilly, W.F., Beman, J.M., Litvin, S.Y. et al., 2013. Oceanographic and biological effects of shoaling of the oxygen minimum zone. *Annual Review of Marine Science*, 5 (5).

102 Carrington, D., 2018. Oceans suffocating as huge dead zones quadruple since 1950. *The Guardian*[online]. Available from: https://www.theguardian.com/environment/2018/jan/04/oceans-suffocating-dead-zones-oxygen-starved. [Accessed 18 January 2019]

103 Algal blooms likely to flourish as temperatures climb. *The Straits Times* [online], 20 July 2016. Available from: https://www.straitstimes.com/world/united-states/algal-blooms-likely-to-flourish-as-temperatures-climb. [Accessed 18 January 2019]

104 Harvey, C., 2016. The Pacific blob caused an "unprecedented" toxic algal bloom — and there's more to come. *Washington Post* [online], 29 June 2016. Available from: https://www.washingtonpost.com/news/energy-environment/wp/2016/09/29/warm-oceans-caused-last-years-toxic-blob-and-more-algae-blooms-may-be-in-store/. [Accessed 17 January 2019]

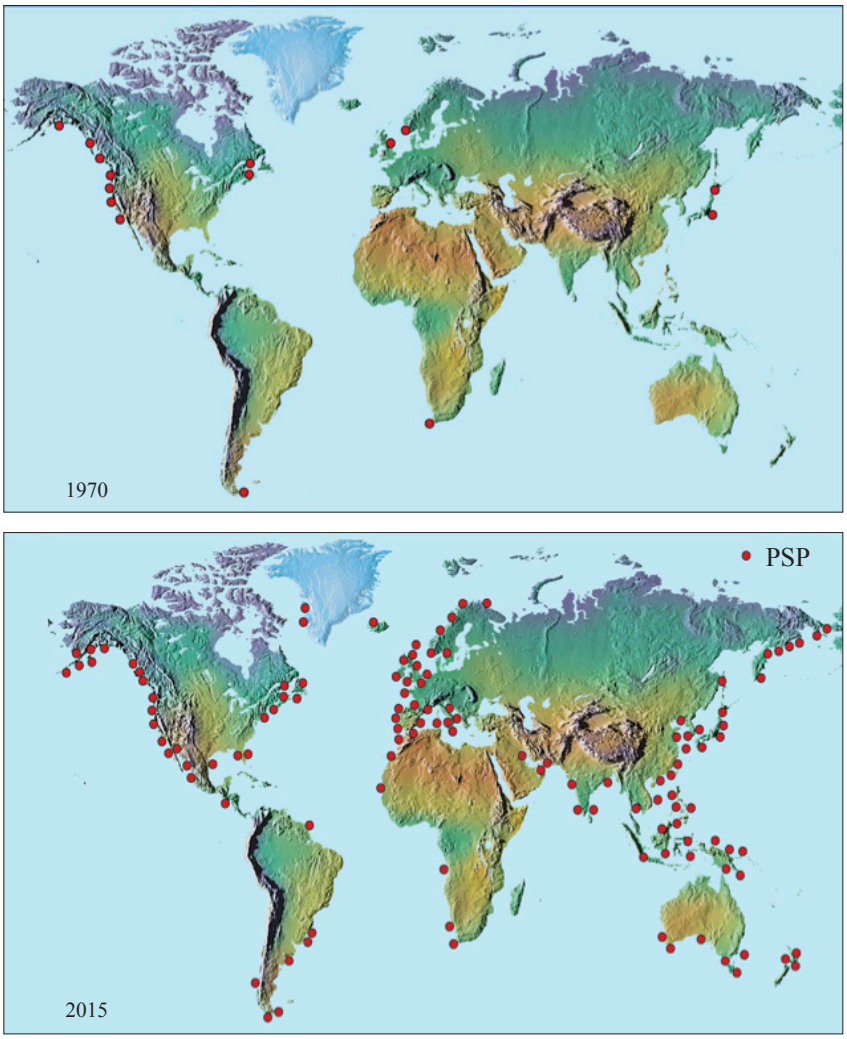

Figure 6: Global distribution of Paralytic Shellfish Poison (PSP)

Global distribution of Paralytic Shellfish Poison (PSP) toxins recorded of 1970 and 2015. Source: Woods Hole Oceanographic Institution, Distribution of HABs throughout the World. Available from: https://www.whoi.edu/redtide/ regions/world-distribution.

2.3 The role of APEC in supporting economy implementation of SDGs

As the leading organization on economic cooperation in Asia-Pacific region, APEC has a profound influence on promoting sustainable development in this region through deepening economic integration, fostering economic and technical cooperation, promoting cross-sectoral collaboration, raising awareness and mobilizing resources from multi-stakeholders. APEC will contribute to the global agenda of sustainable development by supporting implementation by member economies in this region.

2.3.1 Promoting sustainable development by realizing economic growth and achieving social advancement

APEC is the premier economic forum in the Asia-Pacific, a driver of economic growth and integration, and a coordinating mechanism of trade agreements. APEC's primary goal is to support sustainable economic growth and prosperity in the Asia-Pacific region by championing free and open trade and investment, promoting and accelerating regional economic integration, encouraging economic and technical cooperation, enhancing human security, and facilitating a favorable and sustainable business environment. By steering economic growth in the APEC region over the past 30 years, APEC has established a solid foundation to achieve long term sustainability in this region.

The 17 SDGs embodied in the 2030 Agenda reflect a delicate balance of three dimensions of development—economic, social and environmental. Among SDGs, some directly rely on sustainable economic development, such as SDG 1—No Poverty, SDG 2—Zero Hunger, SDG 8—Decent Work and Economic Growth, SDG 9—Industrialization, Innovation and Infrastructure, SDG 10—Reduced Inequality, and SDG 12—Responsible Consumption and Production; others indirectly benefiting from economic growth. Sustained, inclusive and sustainable economic growth is essential and indispensable for reaching SDGs in full scale.

In APEC region, growth has soared with real GDP increasing from 19 trillion USD in 1989 to 42 trillion USD in 2015. Meanwhile, residents of the Asia-Pacific saw their per capita income rise by 74%, lifting millions out of poverty and creating a growing middle class in just two decades.[105] The coverage and quality of social services such as health care and education have also improved during past years. Life expectancy at birth in the APEC region rose from 73.6 to 76.1 from 2000 to 2010. The net endorsement ratio in secondary education in most economies is higher than 70% in recent years.[106] In the past decade, the Asia-Pacific region has experienced vitalized economic growth as well as prominent social advancement, which lays the basis for achieving SDGs in this region for the next ten years.

2.3.2 Supporting SDGs implementation by high-level commitments and actions

APEC is the highest-level economic forum in the Asia-Pacific region and has strong leadership in advancing regional development. APEC Leaders set overarching goals and targets for regional economic integration and prosperity through APEC Economic Leaders' Meetings. Implementing the instructions from Leaders' Meetings, APEC Ministers set out clear priorities for trade and investment and other sectors through APEC

105 APEC. Achievements and benefits [website]. Available from:https://www.apec.org/About-Us/About-APEC/Achievements-and-Benefits. [Accessed 18 January 2019]

106 APEC Secretariat, 2014. *APEC Marine Sustainable Development Report*. Singapore: APEC Secretariat.

Ministerial Meetings and APEC Sectoral Ministerial Meetings. These high-level political commitments have an important role in guiding economies' policy and actions, achieving sustainable development and encouraging inter-economy collaboration.

Sustainable development is at the heart of APEC's mandate.[107] The 24th APEC Economic Leaders' Declaration in 2016 and the 25th APEC Economic Leaders' Declaration in 2017, regarded the 2030 Agenda as "a framework for inclusive growth" and "a balanced and comprehensive multilateral framework for international cooperation", which underpins APEC's efforts to "eradicate poverty and build an inclusive and sustainable future for all". This recognition from APEC Leaders will help mobilize political and financial resources at regional and economy levels from government, business and other stakeholders.

In order to promote sustainable development in specific fields, APEC Ministers and high-level officials set forward action plans and initiatives that recommend policy measures and actions for member economies. In the ocean-related area, a set of declarations, action plans and practice recommendations were set out as collective outputs of APEC sub-fora on protecting marine environment, enhancing food security, promoting Blue Economy, among others. Examples include the *Can Tho Statement on Enhancing Food Security and Sustainable Agriculture in Response to Climate Change* (2017), *APEC Policy and Practice Recommendations on Overcoming Barriers to Financing Waste Management Systems and Reducing Marine Litter* (2016), *APEC High Level Policy Dialogue on Food Security and Blue Economy Plan of Action* (2015). These recommendations offer policy solutions on crucial and pressing challenges that economies faced in achieving sustainable development and therefore supporting SDGs implementation in APEC region.

2.3.3 Supporting SDGs implementation through cross-fora collaboration

SDGs are interlinked and integrated in nature.[108] The implementation of SDGs requires cross-disciplinary involvement and cross-sector collaboration by all stakeholders. As a forum emphasizing the promotion of discussion on cross-cutting issues, APEC holds great potential to encourage economies' cooperation on and contributions to SDGs implementation in the Asia-Pacific region. The Senior Offials' Meeting Steering Committee on Economic and Technical Cooperation (SCE), one of four APEC high level committees, has 17 sub-fora covering energy, tourism, health, technical cooperation, among others, to assist APEC Leaders and Senior Officials in enhancing the technical capacity of APEC's diverse members to achieve sustainable, inclusive, innovative and secure economic growth. All the 17 sub-fora under SCE could basically cover the 17 SDGs of 2030 Agenda. Moreover, APEC highly underscores cross-fora collaboration among APEC working

107 Declaration of the 5th APEC Economic Leaders' Declaration in 1997.

108 United Nations, 2015. *Transforming Our World: the 2030 Agenda for Sustainable Development*. A/RES/70/1.

groups, task forces, groups of experts and policy partnerships to share diverse views on cross-cutting issues and identify potential opportunities for collective actions. In recent years, such efforts have been seen by a noticeable rise in the number of cross-cutting agendas across SCE fora and APEC Committees, such as the following: Structural Reform and Gender (collaboration of EC and PPWE); Compendium on Methodologies for SMEs Internationalization (collaboration of CTI and SMEWG); Food Security Symposium, including the Joint ATCWG, HLPDAB, OFWG, PPFS Meeting; Workshop on Promoting Regional Connectivity of Professionally Qualified Engineers in APEC (collaboration of GOS and HRDWG); Healthy Women and Healthy Economies (PPWE and HRDWG); Implementing the APEC Women in STEM Framework (PPWE and PPSTI); and other cross-fora meetings and cross-fora participation. The Senior Offials' Meeting in 2017 endorsed the *APEC Guidelines for Promoting Cross-Fora Collaboration*, which identifies elements of cross-fora collaboration requiring operational guidance, such as co-endorsement processes, cross-committee collaboration, and joint implementation of projects, and provides standard measures for APEC fora to apply in engaging in cross-fora efforts.

These efforts of SCE and APEC secretariat are to build a culture of collaboration among APEC fora, encourage diversity in views on cross-cutting issues; apply multi-disciplinary approaches to discussing issues and finding solutions; and to lay the foundation for economies on applying a holistic approach and rising synergies of sectoral management.

2.3.4 Mobilizing resources on SDGs implementation through multi-stakeholder partnerships

APEC actively involves key stakeholders such as the business sector, industry, academia, policy and research institutions, and interest groups in its working streams, to facilitate the attainment of APEC goals and strengthen the quality of APEC's work. APEC fully appreciates the key role that business plays in driving economic growth and involves the international business community at all levels of the APEC process. At the highest level, APEC has created the APEC Business Advisory Council (ABAC). ABAC comprises up to three high-level business representatives from each of APEC's 21 member economies and presents recommendations to improve the business and investment environment in an annual dialogue with APEC Economic Leaders. At the working level, representatives from the private sector are invited to join APEC working groups and expert groups to provide inputs into various areas of APEC's ongoing work.[109] This close cooperation with the business community gives APEC the advantages to involve private sectors to strengthen their understanding and supports on SDGs and mobilize financial and technical supports.

109 APEC. Stakeholders participation [website]. https://www.apec.org/About-Us/How-APEC-Operates/Stakeholder-Participation. [Accessed 19 January 2019]

Academic and research institution participation is actively engaged in APEC's work. A regular mechanism supporting APEC's collaboration with academia is the APEC Study Centres Consortium, which comprises some 100 universities, research centers and centers of academic excellence across the APEC region. It facilitates cultural and intellectual exchanges in the Asia-Pacific region and assists the APEC process by undertaking advanced, collaborative interdisciplinary and policy-relevant research. Another case is the APEC—APRU collaboration. The Association of Pacific Rim Universities (APRU) is a consortium of 50 leading research universities in 17 of the APEC economies.[110] APRU has been closely working with APEC shortly after its establishment in 1997 and has guest membership status with APEC working groups such as HRDWG, PPSTI and the APEC Education Network. By engaging in APEC working groups' work and participating in a number of high-level discussions, APRU share knowledge and expertise in the areas of science, technology and human resources development, encourage scholars to address key areas of concern raised through the APEC process and offer recommendations based on independent research.

The collaboration with the business community, academia and other stakeholders has enhanced APEC's leadership and capacity on raising awareness, collecting ideas and finding solutions to address common challenges faced by APEC economies. This strong coordinating and mobilizing ability of APEC helps facilitate APEC economies' implementation of SDGs in various working streams.

110 APRU, 2018. *APRU Impact Report 2018: Amplifying Impact – Transformative Solutions to Asia-Pacific Challenges*. Hong Kong, China: APRU International Secretariat.

Chapter 3

Progress in achieving sustainable development in APEC

3.1 Overview of APEC initiatives and regional cooperation in promoting sustainable development

3.1.1 SDGs' alignment with APEC goals

As early as 1993, the APEC Economic Leaders' Economic Vision Statement stated, "Our environment is improved as we protect the quality of our air, water and green spaces and manage our energy resources and renewable resources to ensure sustainable growth and provide a more secure future for our people". This statement provides the mandate for APEC's work on sustainable development. The Economic Leaders' Declaration endorsed in Canada in November 1997 stated that "achieving sustainable development remains at the heart of APEC's mandate", which attached great importance of promoting sustainable development with APEC's work. In 2010, APEC launched the Growth Strategy aimed at achieving balanced, inclusive, sustainable, innovative, and secure growth. This strategy can help ensure that regional growth and economic integration are sustainable and widely shared among all populations in APEC.

The 2030 Agenda for Sustainable Development is a comprehensive, universal and ambitious framework set for global development efforts. To ensure that APEC maintains its global leadership as a forum that can, through cooperation, tackle the most pressing problems, and continue to be an incubator of ideas for the future, the APEC Leaders have committed to the 2030 Agenda as it represents "a balanced and comprehensive multilateral framework for international cooperation" during the 24th APEC Economic Leaders' Meeting.[111] The 25th APEC Economic Leaders' Declaration has reaffirmed to "commit to implementing the 2030 Agenda" and to "ensuring that no one is left behind in the efforts to eradicate poverty and build an inclusive and sustainable future for all", as the 2030 Agenda represent "a framework for inclusive growth".[112] APEC also reaffirmed the commitment to implement the Addis Ababa Action Agenda, which provides a comprehensive roadmap to help economies implement policies to attract and mobilize diverse sources of financing critical for the realization of the SDGs.[113]

Meanwhile, APEC has developed a holistic set of policies and measures which can help APEC economies' implementation of SDGs. For instance, APEC adopted *the Food Security and Climate Change Multi-Year Action Plan (2018–2020)* and "urged economies to work together to promote sustainable agriculture, aquaculture and fisheries to assess and reduce food loss and waste, enhance food safety, agricultural productivity and resilience against climate change, and reduce greenhouse gas emissions".[114] Moreover, APEC

111 Declaration of the 24th APEC Economic Leaders' Meeting in 2016.
112 Declaration of the 25th APEC Economic Leaders' Meeting in 2017.
113 Declaration of the 23rd APEC Economic Leaders' Meeting in 2015.
114 Declaration of the 25th APEC Economic Leaders' Meeting in 2017.

established the Steering Council of Mainstreaming Ocean-related Issues to strengthen the work in addressing cross-cutting issues of ocean cooperation among relevant APEC fora, established the APEC Virtual Working Group on Marine Debris (VWGMD) to promote innovative solutions to marine debris, hosted the APEC Blue Economy Forum to "encourage economies to enhance the forum as a vehicle of regional blue economy cooperation",[115] "facilitated the update of the *APEC Marine Sustainable Development Report* to promote regional marine sustainable development",[116] and strengthened policy and technical cooperation to improve sustainable use of natural resources while securing long-term food supply, including addressing the negative impacts of IUU fishing on fish stocks, the marine environment and food security.

3.1.2 APEC projects supporting SDGs implementation by member economies

Projects are a vital part of the APEC process to implement the outcomes of APEC high level commitments and play an integral role in helping translate the policy directions of APEC Economic Leaders and Ministers into actions and help create tangible benefits for people living in the Asia-Pacific region. "To advance sustainable development across the entire spectrum of our work plan",[117] implementation of related initiatives has been carried out by relevant APEC sectoral fora.

The following table provides an overview of the ocean-related APEC projects from 2014 to 2018. A series of APEC projects related to food security, marine spatial planning, aquaculture, marine debris, sustainable fishing and climate change, have been applied and implemented by different APEC working groups to sustain its commitment to assist member economy efforts to implement SDGs.

Table 1 The ocean-related APEC projects (since 2014)

No.	Year	Group	Project Title (Project Number)	Proposing Economy
1	2014	OFWG	The Third Blue Economy Forum (OFWG 01 2014S)	China
2	2014	OFWG	The 16th APEC Roundtable Meeting on the Involvement of the Business/Private Sector in Sustainability of the Marine Environment (OFWG 02 2014S)	Chinese Taipei
3	2014	OFWG	Workshop on the Climate Change's Impact on the Oceans and Fisheries Resources—Ensuring Adaptation, Food Security and Sustainability, and Mitigation on Fisheries including Aquaculture (OFWG 02 2014)	Japan

115 Joint Statement of the 28th APEC Ministerial Meeting in 2016.
116 Joint Statement of the 28th APEC Ministerial Meeting in 2016.
117 Declaration of the 6th APEC Economic Leaders' Meeting in 1998.

Table 1 Continued

No.	Year	Group	Project Title (Project Number)	Proposing Economy
4	2014	OFWG	Assessing the Economic Value of Green Infrastructure in Coastal Ecosystems to Disaster Risk Reduction and Response and Coastal Resilience in the APEC Region (OFWG 03 2014A)	United States
5	2015	CD	Addressing Marine Debris Through Pilot Projects To Design Economically Sustainable Waste Management Infrastructure (CD 01 2015S)	United States
6	2015	OFWG	Developing a Manual of Good Practices to Improve the Supply Chain of Marine Products Aiming to Maintain Health of the Fish Stock, Strengthening Food Security and Enhancing Trade in the Asia-Pacific Region (OFWG 01 2015A)	Peru
7	2015	OFWG	The 17th APEC Roundtable Meeting on the Involvement of the Business/Private Sector in Sustainability of the Marine Environment (OFWG 01 2015S)	Chinese Taipei
8	2015	PPSTI	Building Regional Ocean and Land Observation Systems to Safeguard APEC Resources and Communities (PPSTI 03 2015S)	Australia
9	2015	OFWG	APEC Public – Private Dialogue on Facilitating Infrastructure Investment to Enhance Food Security (PPFS 01 2015T)	Viet Nam
10	2015	OFWG	Training Workshop on Coastal Eco-Aquaculture Model for Sustaining Food Security (OFWG 03 2015S)	China
11	2015	OFWG	Food Security Analysis Training and Symposium (ATC 01 2015S)	China
12	2015	EPWG	Strengthening Public Alert and Early Warning Capacity (EPWG 02 2015A)	United States
13	2016	OFWG	The 18th APEC Roundtable Meeting on the Involvement of Business/ Private Sector in Sustainability of the Marine Environment (OFWG 01 2016S)	Chinese Taipei
14	2016	OFWG	Capacity Building for Marine Debris Prevention and Management in the APEC Region (OFWG 01 2016A)	Korea
15	2016	OFWG	APEC Workshop on Marine Science, Technology and Innovation towards Science Based Management and Sustainable Use of Oceans and Marine Resources (OFWG 03 2016)	Japan
16	2016	PPFS	APEC Forum on Inclusive Food System and Food Security in the Asia-Pacific Region through Public-Private Partnership (PPFS 03 2016S)	Korea
17	2016	PPFS	Policy Forum: Towards an APEC Partnership on Climate Change and Food Security (PPFS 02 2016S)	United States, Viet Nam
18	2016	PPFS	Challenges for Water and Food Security, in a Context of Climate Change in the APEC Region (PPFS 02 2016)	Peru
19	2016	PPSTI	Smart Climate Information and Accountable Actions: Achieving Sustainable Food Security in a Changing World (PPSTI 01 2016)	Korea
20	2016	EWG	Research on Energy Storage Technologies to Build Sustainable Energy Systems in the APEC Region (EWG 04 2016A)	China

Table 1 Continued

No.	Year	Group	Project Title (Project Number)	Proposing Economy
21	2016	PPSTI	From Science to Action: The Use of Weather and Climate Information for Efficient Disaster Risk Management (PPSTI 06 2015S)	Korea
22	2016	TELWG	APEC Workshop on ICT for Disaster Risk Reduction and Management (DRRM) (TEL 03 2015S)	Philippines
23	2017	OFWG	Developing Public-Private Partnerships to Support Waste Management Infrastructure and Reduce Marine Litter (OFWG 02 2017S)	United States
24	2017	OFWG	Workshop on Best Practices Sharing on Marine Debris Management in Coastal Cities of APEC Region (OFWG 04 2017S)	China
25	2017	OFWG	APEC Training Workshop on Marine Spatial Planning and Marine Protected Areas Management (OFWG 05 2017S)	China
26	2017	OFWG	Study on the Origin and Distribution of Microplastic in Typical and Marine APEC Region (OFWG 06 2015S)	China
27	2017	OFWG	Capacity Building for Marine Debris Prevention and Management in the APEC Region Phase 2 - Implementation of Advanced Marine Debris Management Policies (OFWG 02 2017A)	Korea
28	2017	OFWG	APEC Marine Sustainable Development Report 2 (OFWG 01 2017S)	China
29	2017	PPFS	Smallholders and SMEs' Response to New Climate Scenarios regarding Sustainable Water Use as a Contribution to Food Security (PPFS 01 2017)	Chile
30	2017	EPWG	Tsunami Treat Assessment for National Tsunami Warning Center of APEC Economies (EPWG 01 2017A)	Chile
31	2017	EPWG	Capacity Building and Emergency Preparedness for Sustainable Development at Agricultural Communities through "Plant Back Better" Initiatives (EPWG 03 2017A)	Chinese Taipei
32	2017	ATC WG	Needs Assessment for Sustainable Agriculture in APEC Region and the "Food-Security-Climate-Resource Nexus" Workshop (ATC 02 2017S)	China
33	2017	OFWG	Exchange of Experience to Add Value to Organic Waste from Small-Scale Fisheries and Aquaculture through its Reuse and Conversion into Innovative Products, which Contribute to Enhance Food Security (OFWG 03 2017)	Chile
34	2017	PPFS	Workshop on Sharing Rural Development Experiences for Food Security and Quality Growth (PPFS 03 2017S)	Korea
35	2017	PPSTI	Building Resilient Agro-Food Systems from Production to Consumption: Interdisciplinary Approaches for Sustainable Food Security Using Climate Information (PPSTI 01 2017S)	Korea
36	2017	ATC WG	Workshop on Pathway Exploration on Agricultural Sustainable Development (ATC 03 2017S)	China
37	2017	EWG	Integrated Energy System Planning for Equitable Access to Sustainable Energy for Remote Communities in the APEC Regions using North Sulawesi as a Pilot Project/Test Bed (EWG 13 2017A)	Australia

Table 1 Continued

No.	Year	Group	Project Title (Project Number)	Proposing Economy
38	2017	EPWG	Workshop on Tsunami Disaster Reduction in APEC Economies (EPWG 03 2016S)	Japan
39	2017	PPSTI	The STI Contribution to Policy Making on Natural Disaster Resilience: Better STI, Better Resilience, Better Competitiveness (PPSTI 07 2017)	Chile
40	2018	OFWG	APEC Workshop on Innovative Marine Debris Solutions (OFWG 02 2018S)	China
41	2018	OFWG	APEC Training Workshop on Marine Sustainable Fisheries Development (OFWG 04 2018S)	China
42	2018	OFWG	APEC Training Workshop on Eco-Aquaculture to Enhance Food Security in APEC Region (OFWG 01 2018S)	China
43	2018	OFWG	Value Added Utilization of Fishery Waste to Enhance Food Security (OFWG 03 2018S)	China
44	2018	OFWG	Symposium on Causative Species of Harmful Algal Blooms and Mechanism of their Migration Dynamics in Asia-Pacific Region (OFWG 06 2018S)	China
45	2018	OFWG	The 5th APEC Blue Economy Forum (OFWG 05 2018S)	China
46	2018	PPFS	Assessing and Stocktaking on Economy-Level Policies relating to Sustainable and Climate Resilient Agriculture, Fisheries, and Aquaculture - MYAP on Food Security and Climate Change (PPFS 01 2018)	PNG
47	2018	PPFS	Workshop on Sharing Information on Best Practices and Policies on Women Participation in Agriculture and Fisheries to Enhance Food Security and Sustainable Livelihoods in the APEC Region (PPFS 03 2018)	PNG
48	2018	IEG	Workshop on Sustainable and Inclusive Investment Policies within the APEC Region (IEG 01 2018)	PNG
49	2018	OFWG	Update of 2009 APEC Report on Economic Costs of Marine Debris to APEC Economies (OFWG 01 2018A)	United States
50	2018	OFWG	Promoting Trade of Products that Replace those with Mercury to Reduce Marine Pollution (OFWG 02 2018A)	Chile

Source: APEC Project Database, https://aimp2.apec.org/sites/PDB/default.aspx

3.1.3 APEC and member economies' collective efforts towards SDGs

APEC OFWG has been enhancing public and private sector partnerships, including participation and communication in OFWG's work to implement SDGs. Since the third OFWG meeting in 2014, working groups like PPFS, PPSTI and CD attended OFWG meeting to explore opportunities of cross-fora collaboration and a number of non-members or observers also participate OFWG meetings to conduct ocean-related dialogue and cooperation.

Table 2 APEC OFWG non-member/observers participation (since 2014)

Meeting	Non-members or Observers	SDGs-related themes
OFWG 3	TNC, American Chemistry Council, ABAC	MPA, marine debris, food security
OFWG 4	PPFS	food security
OFWG 5	ABAC, PEMSEA	land and ocean observation, ICM
OFWG 6	FAO, Rainbowfish Ocean Technology Co.	climate change, ocean technology
OFWG 7	Rainbowfish Ocean Technology Co.	ocean technology
OFWG 8	APRU, Rainbowfish Ocean Technology Co.	fisheries management, ocean governance, food security, climate change, ocean technology
OFWG 9	TNC	marine resources conservation
OFWG 10	APRU,TNC,FFA,ABAC	aquaculture management, SDG Ocean target trade-off structure, IUU fishing, food loss
OFWG 11	TNC, FFA, Rainbowfish Ocean Technology Co.	marine debris, sustainable fisheries, marine technology

Source: Summary Report of OFWG, http://mddb.apec.org/Pages/search.aspx

OFWG has also enhanced cross-fora collaboration with an aim to discuss cross-cutting themes for cooperative work and partnerships. Since 2016, OFWG had OFWG-PPFS joint meetings discussing climate change, fisheries, food security and other cross-fora issues. OFWG would also have joint meeting with PPFS and other theme-related fora during the Food Security Week. For instance, OFWG attended the APEC High-Level Policy Dialogue on Food Security and Sustainable Agriculture in Response to Climate Change in 2017 with ATCWG, HLPDAB and PPFS to explore opportunities of cooperation and collaboration on cross-cutting themes and endorsed *Can Tho Statement on Enhancing Food Security and Sustainable Agriculture in Response to Climate Change*.

Likewise, OFWG designed the liaisons with other APEC sub-fora to promote communication and coordination on related areas. For instance, OFWG and the APEC Chemical Dialogue formed the Virtual Working Group on Marine Debris (VWGMD) to encourage public and private sector cooperation and to focus on innovative solutions for land-based waste management, with the Steering Committee including the American Chemistry Council, World Plastics Council, Ocean Conservancy, WWF, DOW, Amcor, Coca Cola and P&G. Once formed, OFWG, CD and VWGMD sponsored the High-level Meeting on Overcoming Barriers to Financing Waste Management in Tokyo, 2016, and APEC High Level Meeting on Accelerating Waste Management Solutions to Reduce Marine Litter in Indonesia, 2017. The VWGMD also finished a report named *Facilitating Trade and Investment in Sustainable Materials Management Solutions in the APEC Region: Promoting an Enabling Regulatory*, which has been endorsed by the Committee on Trade and Investment in 2017 and welcomed by APEC Ministers.

Meanwhile, OFWG encourages broad participation of other APEC sub-fora, regional and international organizations, private sector and public in APEC workshops. For instance, the APEC workshop on Best Practices Sharing on Marine Debris Management in Coastal Cities of APEC Region held during November 2017 in Xiamen, China, attracted about 150 participants from various stakeholders, including government (52%, delegates from government of nine economies), academic institutions (20%, delegates from universities and research institutions), NGOs (10%, such as Tangaroa Blue Foundation, Paulson Institute), private sectors (7%, such as Dell Technologies) and the public (5%, such as Nanputuo Charity and local community). This workshop shows wide participation of APEC for combating marine debris, which was also put into the United Nations General Resolutions on "Oceans and the law of the sea" (A/72/L.18) in Article 215.

3.2 APEC economies' commitment towards implementing SDG 14

Many APEC economies presented their Voluntary National Review at the High-level Political Forum for Sustainable Development, committing to undertake broader reporting periodically, and submitted their Voluntary Commitments (VCs) during the first UN Ocean Conference. This section will introduce vital policy measures and commitments at economy level to create an enabling environment for the implementation of SDG 14 and other related SDGs, including but not limited to institutional mechanisms, the incorporation of SDGs into domestic development framework, fostering ownerships of SDGs and etc.

3.2.1 Institutional mechanisms

Coordination institutions with high authority to lead the comprehensive and effective implementation of SDGs have been created by several APEC economies for their respective domestic implementation: Canada has mandated the Minister of Children, Families and Social Development to lead its implementation of the 2030 Agenda in collaboration with other related ministries; Chile created the National Council for the Implementation of the 2030 Agenda for Sustainable Development, composed of the Ministry of Foreign Affairs, the Ministry of Economic Affairs, Business Development and Tourism, the Ministry of Social Development and the Ministry of the Environment, so as to identify public policies and private initiatives that could contribute to their implementation and address gaps and challenges; China established the domestic coordination mechanism comprising 43 government departments to guarantee implementing SDGs;[118] Japan established the SDGs Promotion Headquarters (Figure 7) headed by the Prime Minister to foster close

118 *Executive Summary of China's Actions on the Implementation of the 2030 Agenda for Sustainable Development.* Available from: https://sustainabledevelopment.un.org/memberstates/china. [Accessed 19 January 2019]

cooperation among relevant ministries and government agencies, and to lead the comprehensive and effective implementation of SDGs-related measures;[119] Malaysia established a National SDG Council, chaired by the Prime Minister to plan and monitor SDGs implementation;[120] Indonesia published the Presidential Decree on Implementation and Achievement of Sustainable Development Goals, and established the National Coordination Team led by the President and coordinated by the Minister of National Development Planning/ Head of the National Development Planning Agency of Indonesia;[121] and Thailand has the National Committee for Sustainable Development (CSD) chaired by the Prime Minister as its main and highest mechanism responsible for sustainable development.[122]

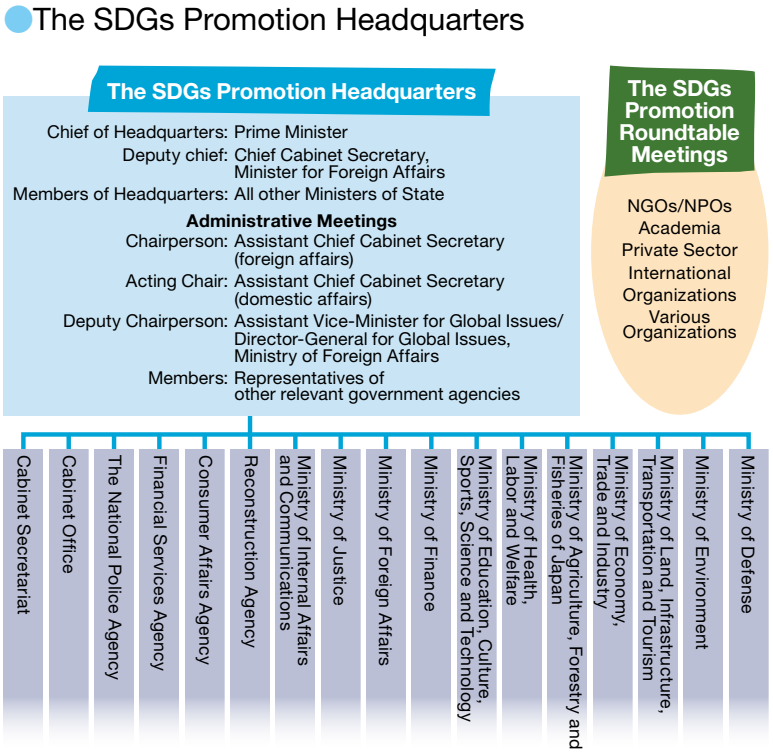

Figure 7: The SDGs Promotion Headquarters of Japan

Source: Ministry of Foreign Affairs of Japan, 2017. *The 2030 Agenda for Sustainable Development and Japan's Implementation*.

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119 *Japan's Voluntary National Review Report on the implementation of the Sustainable Development Goals*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

120 Government of Malaysia, 2017. *Malaysia Sustainable Development Goals Voluntary National Review 2017*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

121 Republic of Indonesia, 2017. *Voluntary National Review (VNR): Eradicating Poverty and Promoting Prosperity in a Changing World*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

122 Government of Thailand, 2017. *Thailand's Voluntary National Review on The Implementation of The 2030 Agenda for Sustainable Development*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

3.2.2 Incorporating SDGs into domestic development framework

Some APEC economies have made efforts on mainstreaming SDGs into domestic development plans and strategies, including but not limited to incorporating the 2030 Agenda into their domestic mid-and-long term development strategies to make sure relevant strategies, action plans, and initiatives align with the SDGs. Australia has made key policies and commitments relevant to all SDGs, and SDG 14 covers 13 key programs, initiatives, strategies and plans; Japan formulated and adopted the SDGs Implementation Guiding Principles, which sets out Japan's vision, priority areas, implementation principles and framework, and approach to implement the 2030 Agenda;[123] China has released *China's National Plan on the Implementation of the 2030 Agenda for Sustainable Development* reflecting its guiding thoughts, general principles, overall approaches and action plan for the implementation of the 2030 Agenda;[124] Korea adopted *The Third Basic Plan for Sustainable Development (2016–2035)*, which is updated every five years and inherit Korea's longtime commitment to sustainable development;[125] Viet Nam also included the 2030 Agenda in its *National Action Plan* with 17 SDGs and 115 specific targets, which fits national conditions and development priorities.[126] Furthermore, APEC economies have fostered ownership to implement policy measures for the 2030 Agenda through participation and cooperation with a wide range of stakeholders, including local governments, NGOs/NPOs, academia, private sectors, international organizations, etc.

3.2.3 Commitments and measures for SDG 14

APEC economies have not only actively participated in the global ocean-related process—like CBD, GEO, WOA, and the UN Decade of Ocean Science—but have also actively participated in the first UN Ocean Conference to support the implementation of SDG 14, during which they made Voluntary Commitments and then took concrete measures to conserve and sustainably use the oceans, seas and marine resources.

Among about 1500 Voluntary Commitments aiming to contribute to the implementation of SDG 14 registered by all various stakeholders, 618 VCs are submitted by governments worldwide, while governments of some APEC economies registered 145 VCs, which represents 23.5% of governments across the globe. With a total of 65 commitments including the provision of monetary resources, APEC economies committed up to

123 *Japan's Voluntary National Review Report on the implementation of the Sustainable Development Goals.* Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

124 *China's National Plan on the Implementation of the 2030 Agenda for Sustainable Development.* Available from: https://www.fmprc.gov.cn/web/zyxw/t1405173.shtml. [Accessed 19 January 2019]

125 The Government of the Republic of Korea. *Year One of Implementing the SDGs in the Republic of Korea: From A Model of Development Success to A Vision for Sustainable Development*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

126 *Viet Nam's Voluntary National Review on the Implementation of the Sustainable Development Goals*. Available at https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

5,589 million USD. As illustrated in Figure 8, all ten targets of SDG 14 have been covered by VCs made by economies, within which more than 70% focus on Target 14.1, 14.2 and 14.a.

Detailed commitments and measures of APEC economies for SDG 14 will be introduced according to seven themes: (i) prevention and reduction of marine pollution, (ii) protection and restoration of marine and coastal ecosystems, iii) conservation of marine and coastal areas, (iv) minimization of ocean acidification, (v) sustainable fishery management, (vi) Blue Economy development, (vii) scientific research and capacity building, all of which covers all subsequent targets of SDG 14 and would demonstrated APEC's commitments and measures for the implementation of SDG 14.[127]

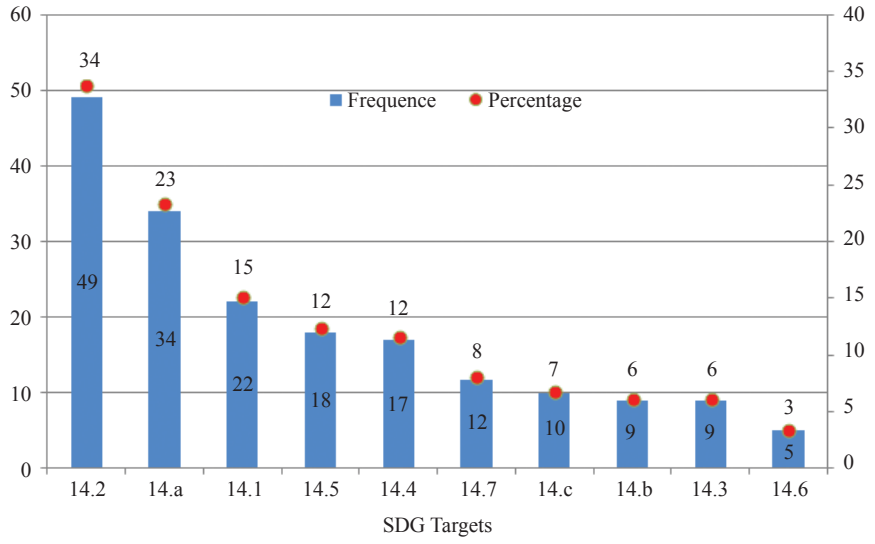

Figure 8: Frequency of SDG targets to be addressed in VCs

(1) Prevention and reduction of marine pollution

To prevent and significantly reduce marine pollution of all kinds, APEC economies have been taking active measures on marine debris and other pollution. Australia established the Tropical Water Quality Hub and the Marine Biodiversity Hub, separately with funding of 31.8 million AUD and 23.88 million AUD as part of the National Environmental Science Programme as its long-term commitment to environment from 2015–2021.[128] Canada launched a 1.5 billion CAD national Oceans Protection Plan in 2016 to help Canadian waters and coasts to be safe and clean.[129] Chile passed a law in 2018 that aims to protect the environment by prohibiting

127 Author's Estimate based on Voluntary Commitments registered at UN Ocean Conference. Data on VCs are available from: https://oceanconference.un.org/commitments/resources. [Accessed 19 January 2019]

128 Australian Government, 2018. *Report on the Implementation of the Sustainable Development Goals*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

129 Government of Canada. *Canada's Implementation of the 2030 Agenda for Sustainable Development*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

the delivery of plastic bags in stores and supermarkets.[130] Indonesia committed to reduce 70% of its plastic debris from 2017 by the end of 2025 through launching its *National Action Plan on Marine Plastic Debris*.[131] Japan developed the Deep-Sea Debris Database to public, expecting to speed up activities on SDG 14.1, and has formulated the National Action Plan for Marine Plastic Litter which arranges Japanese initiatives and efforts aiming to reduce additional pollution by marine plastic litter.[132] New Zealand launched a 10-year 20 million NZD Living Water Programme focused on improving biodiversity and water quality at five significant catchments.[133] In addition to this, New Zealand has banned single-use plastic bags and the sale of products containing plastic microbeads,[134] and implemented draft National Policy for Freshwater Management.[135] Singapore issued the *Environmental Protection and Management Act* as a legislative measure to address pollution, which includes marine pollution from land based sources, and extended the *Maritime Singapore Green Initiative* to December 31 2019 to reduce the environmental impact of shipping and shipping-related activities.[136] Chinese Taipei amended the *Marine Dumping Fees Collection Regulations* in 2016 and announced the *Marine Debris Management Action Plan* in 2018.[137] Thailand has established the *20-Year Pollution Management Strategy* and *Pollution Management Plan 2017–2020* as collaborative efforts to assure proper protection of marine environment.[138] U.S. and China initiated Sister Cities Partnerships to address marine debris in 2015, and cities in the U.S. (San Francisco and New York) and China (Xiamen and Weihai) are selected as participating cities to share best practices to reduce the flow of trash into the ocean.

(2) Protection and restoration of marine and coastal ecosystems

To protect and sustainably manage marine and coastal ecosystems, APEC economies have made their commitments and policy measures. Australia committed to fund 6 million AUD to the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security to conserve the hyper-biodiversity of ocean in this

130 APEC OFWG meeting document. Economy Report – Chile, 2018/SOM3/OFWG/002.

131 Coordinating Ministry for Maritime Affairs of the Republic of Indonesia, 2017. Indonesia Against Marine Plastic Debris [website]. Available from: https://oceanconference.un.org/commitments/?id=14387. [Accessed 19 January 2019]

132 Ministry of Education, Culture, Sports, Science and Technology, and JAMSTEC, Japan, 2017. Data sharing and use for contributing to SDG 14 on marine biodiversity and marine debris [website]. Available from: https://oceanconference.un.org/commitments/?id=17602. [Accessed 19 January 2019]

133 Fonterra and Department of Conservation, New Zealand. Living Water, Frequently Asked Questions [website]. Available from: https://www.livingwater.net.nz/assets/pdf/Living%20Water%20FAQs%20-%20Dec%202017.pdf. [Accessed 16 September 2019]

134 New Zealand Ministry for the Environment. Single-use plastic shopping bags ban kicks in 30 June 2019 [website]. Available from: https://www.mfe.govt.nz/news-events/single-use-plastic-shopping-bags-ban-kicks. [Accessed 16 September 2019]

135 New Zealand Ministry for the Environment. Action for healthy waterways: Our proposals, your views [website]. Available from: https://www.mfe.govt.nz/consultation/action-for-healthy-waterways. [Accessed 16 September 2019]

136 Government of Singapore. Singapore's management of marine pollution from land based sources [website]. Available from: https://oceanconference.un.org/commitments/?id=18968. [Accessed 19 January 2019]

137 APEC OFWG meeting document. Economy Report – Chinese Taipei, 2016/OFWG/019 &2018/SOM3/OFWG/003.

138 APEC OFWG meeting document. Economy Report – Chinese Taipei, 2018/SOM1/OFWG/004.

region;[139] Canada has established the Coastal Restoration Fund accounting for 75 million CAD to address historically degraded areas and support projects that contribute to coastal restoration plans;[140] Chile approved its *National Biodiversity Strategy 2017–2030* which establishes the main strategic guidelines and domestic goals for the conservation and sustainable use of biodiversity up to 2030; China has launched the Blue Bay Restoration Action, which aims to restore threatened ecosystems in coastal and marine areas with ecological importance, and 5.2 billion RMB has been spent on Blue Bay restoration projects from 2016 to 2018; Hong Kong, China has formulated its first *Biodiversity Strategy and Action Plan (2016–2021)*, with 67 specific actions in four major areas;[141] Indonesia has issued a National Marine Spatial Plan to support an integrated and sustainable use of marine and coastal areas and committed to restore the Pristine Raja Ampat Reefs destroyed by Caledonia Sky Cruise Vessel;[142] Mexico implemented the *Strategic Action Program of the Gulf of Mexico Large Marine Ecosystem* with 12.9 million USD from 2017 to 2021 to improve coastal and marine ecosystem health;[143] New Zealand will be completing a review and revision of their National Plan of Action for Sharks in 2020, is in the process of reviewing the *Hector's and Maui Dolphin Threat Management Plan*[144], will release an updated National Plan of Action for Seabirds in early 2020, and is continuing to implement the *Threat Management Plan for the New Zealand Sea Lion 2017–2022* and the associated *Squid 6T Operational Plan* to help mitigate the threat to sea lions in commercial fisheries operations;[145] The Philippines implemented the National Coastal and Marine Ecosystems Management Program aiming to comprehensively manage, address and reduce threats and drivers of degradation of coastal and marine ecosystems;[146] and Thailand has enacted the *Marine and Coastal Resources Management Resources Act* together with the establishment of the National Committee on Marine and Coastal Resources Management, and committed to

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139 Department of the Environment and Energy, Australia, 2017. Coral Triangle Initiative Australian Support Program [website]. Available from: https://oceanconference.un.org/commitments/?id=16870. [Accessed 19 January 2019]

140 Government of Canada, 2017. Ocean Protection Plan–Coastal Restoration Fund [website]. Available from: https://oceanconference.un.org/commitments/?id=19273. [Accessed 19 January 2019]

141 APEC OFWG meeting document. Economy Report – Hong Kong, China. 2017/SOM3/OFWG/003.

142 Republic of Indonesia, 2017. *Voluntary National Review (VNR): Eradicating Poverty and Promoting Prosperity in a Changing World*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

143 Ministry of Environment and Natural Resources of Mexico, 2017. *Promote Marine Spatial Planning and Other Coastal and Marine Planning and Management Instruments in Mexico.* Available from:https://oceanconference.un.org/commitments/?id=20224. [Accessed 19 January 2019]

144 Department of Conservation, New Zealand. Hector's and Māui Dolphins Threat Management Plan Review. Available from: https://www.doc.govt.nz/get-involved/have-your-say/all-consultations/2019/hectors-and-maui-dolphins-threat-management-plan-review/. [Accessed 16 September 2019]

145 New Zealand Ministry for Primary Industries and Department of Conservation. New Zealand sea lion/rāpoka Threat Management Plan 2017–2022. Available from: https://www.doc.govt.nz/Documents/conservation/native-animals/marine-mammals/nz-sea-lion-tmp/nz-sea-lion-threat-management-plan.pdf. [Accessed 16 September 2019]

146 Department of Environment and Natural Resources, Government of the Philippines. Coastal and Marine Ecosystems Management Program [website]. Available from: https://oceanconference.un.org/commitments/?id=17929. [Accessed 19 January 2019]

restore 17,000 hectares of marine and coastal habitats.[147]

(3) Conservation of marine and coastal areas

To accomplish the target 14.5, that is, to conserve at least 10% of coastal and marine areas by 2020, APEC economies set domestic targets of their own combining the implementation of related measures. Australia has 40% of its waters included in marine parks, exceeding the target 14.5;[148] by December 2017, Canada protected 7.75% of its marine and coastal areas by establishing federal, provincial and territorial MPAs as well as implementing other effective area-based conservation measures, and committed to meet the target 14.5 by 2020;[149] Chile has MPA in 43% of its exclusive economic zone; China committed to increase the proportion of marine reserves to 5% in sea areas under China's jurisdiction and keep 35% of its coastline as natural coastline by 2020;[150] Indonesia has developed a tool called Management Effectiveness for Marine Protected Areas to evaluate the effectiveness of MPA management, so as to realize the target of establishing 20 million hectares of MPAs by 2020;[151] Malaysia has introduced policies and measures including *the National Coastal Zone Physical Plan* and the *Coral Triangle Initiative Malaysia National Plan of Action,* to sustainably manage marine and coastal areas;[152] Thailand has about 15.68% of its total marine areas under ecosystem management measures, such as non-hunting areas, marine fishery sanctuaries and environment protection areas;[153] and Singapore established its first marine park in 2014 called *the Sisters' Island Marine Park* which spans 40 hectares around Sisters' Islands and has a variety of habitats including coral reefs, sandy shores and seagrass meadows.[154]

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147 Government of Thailand. *Thailand's Voluntary National Review on the Implementation of the 2030 Agenda for Sustainable Development*. Available from: https://sustainabledevelopment.un.org/content/documents/16147Thailand.pdf. [Accessed 19 January 2019]

148 Government of Australia. *Report on the Implementation of the Sustainable Development Goals*. Available from: https://sustainabledevelopment.un.org/content/documents/20470VNR_final_approved_version.pdf. [Accessed 19 January 2019]

149 Government of Canada. *Canada's Implementation of the 2030 Agenda for Sustainable Development*. Available from: https://sustainabledevelopment.un.org/content/documents/20312Canada_ENGLISH_18122_Canadas_Voluntary_National_ReviewENv7.pdf. [Accessed 19 January 2019]

150 *China's National Plan on the Implementation of the 2030 Agenda for Sustainable Development*. Available from: https://www.fmprc.gov.cn/web/zyxw/t1405173.shtml. [Accessed 19 January 2019]

151 Republic of Indonesia, 2017. *Voluntary National Review (VNR): Eradicating Poverty and Promoting Prosperity in a Changing World*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

152 Government of Malaysia. *Malaysia Sustainable Development Goals Voluntary National Review 2017*. Available from: https://sustainabledevelopment.un.org/content/documents/15881Malaysia.pdf. [Accessed 19 January 2019]

153 Government of Thailand. *Thailand's Voluntary National Review on the Implementation of the 2030 Agenda for Sustainable Development*. Available from: https://sustainabledevelopment.un.org/content/documents/16147Thailand.pdf. [Accessed 19 January 2019]

154 Government of Singapore. *Singapore's Sustainable Development Goals Voluntary National Review 2017: Towards a Sustainable and Resilient Singapore*. Available from: https://sustainabledevelopment.un.org/content/documents/19439Singapores_Voluntary_National_Review_Report_v2.pdf. [Accessed 19 January 2019]

(4) Minimization of ocean acidification

To minimize and address the impacts of ocean acidification, APEC economies are also contributors to international efforts to study and monitor the oceans, including but not limited to the Integrated Marine Observing System and the Global Ocean Acidification Observing Network (GOA-ON). Australia committed to foster greater blue carbon awareness and cooperation in the Indian Ocean region to mitigate the impacts of climate change;[155] New Zealand continued to support the implementation of the "New Zealand Pacific Partnership on Ocean Acidification" with approximately 1.48 million USD, aiming to build resilience through practical adaptation actions, capacity building and awareness raising in the Pacific region over four years to 2019;[156] and the U.S. made its contributions through the International Atomic Energy Agency's Peaceful Uses Initiative to the Ocean Acidification International Coordination Center, which communicates, promotes, and facilitates global efforts on ocean acidification science research.[157]

(5) Sustainable fishery management

This part would introduce detailed commitments and measures of APEC economies for sustainable fishery management. Australia supported the implementation of the *A New Song for Coastal Fisheries* to strengthen the regional community-based ecosystem approach to fisheries management.[158] Canada served as the depository for the *Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean*, which will prevent unregulated commercial fishing in an area measuring approximately 2.8 million square kilometers.[159] Chile has 44 main fisheries and 32 Management Committees, which are implementing 21 management plans for these fisheries and 15 plans to reduce discards and incidental fishing.[160] China released *the 13th National Five-Year Plan on Fisheries* in 2016 and declared to designate 550 National Juvenile Fish Protected Areas and 80 National- and Provincial- Aquatic Organism Protected Areas by 2020.[161] New Zealand are continuing consultation on their Fisheries Change Programme which seeks to ensure the

155 Department of Foreign Affairs and Trade, Australia. To Foster Greater Blue Carbon Cooperation In The Indian Ocean region [website]. Available from: https://oceanconference.un.org/commitments/?id=19028. [Accessed 19 January 2019]

156 New Zealand Ministry of Foreign Affairs and Trade in partnership with the Secretariat of the Pacific Regional Environment Programme.New Zealand Pacific Partnership on Ocean Acidification [website]. Available from: https://oceanconference.un.org/commitments/?id=18232. [Accessed 19 January 2019]

157 APEC OFWG meeting document. Economy Report – U.S., 2017/SOM1/OFWG/006.

158 Department of Foreign Affairs and Trade, Australia. Progressing Implementation of the New Song for Coastal Fisheries Pathways to Change [website]. Available from: https://oceanconference.un.org/commitments/?id=17058. [Accessed 19 January 2019]

159 Government of Canada. *Canada's Implementation of the 2030 Agenda for Sustainable Development*. Available from: https://sustainabledevelopment.un.org/content/documents/20312Canada_ENGLISH_18122_Canadas_Voluntary_National_ReviewENv7.pdf. [Accessed 19 January 2019]

160 Government of Chile, 2018. *Status of the Main Chilean Fisheries, Year 2018*.

161 Ministry of Agriculture and Rural Affairs, P.R.China, 2016. *The 13th National Five-Year Plan on Fisheries*.

sustainable economic, social, and cultural value of New Zealand's fisheries.[162] Peru has launched the National Program of Innovation in Fisheries and Aquaculture (PNIPA), which promotes an enabling environment for sector innovation, co-finances research, development and innovation projects and mobilizes actors through innovation networks. Overall, this program has a high impact on technological, economic, social, environmental and institutional development.[163]

(6) Blue Economy development

Since the "Blue Economy" was the brought-up during the Forth APEC Ocean-related Ministerial Meeting in 2014, APEC economies have been enhancing the development of Blue Economy with their actions. Australia funded the 3 million AUD Blue Economy Aquaculture Challenge, supporting ten winning submissions that have potential to transform sustainable aquaculture practices;[164] Canada's "Blue Economy" accounts for approximately 36 million USD annually in GDP and 350,000 jobs;[165] China's 13th Five-Year Plan for Economic and Social Development stated the need to widen space for the development of Blue Economy, and China has continually held several APEC Blue Economy Forums to explore the approaches toward sustainable marine economy; and Indonesia continuously improved the access to financing for small scale fishermen to enhance the sustainable ocean economy.[166] Meanwhile, many APEC economies co-hosted or attended the Blue Economy Conference in Nairobi of 2018, which demonstrated their commitments to support healthy and productive oceans, and to build sustainable economies.

(7) Scientific research and capacity building

APEC economies have also taken various measures in scientific research and capacity building. Australia provided training and support for officials from Pacific Island countries to help them prevent, deter and eliminate illegal fishing, and WWF-Australia has worked with industry and technological partners to implement the use of blockchain technology in tuna fishes in the Pacific islands.[167] Canada committed to enhance its science capacity and has recently invested over 200 million USD in ocean science research and monitoring, new technologies, expertise and partnerships to ensure that its policies and decisions are based

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162 Fisheries New Zealand. Fisheries Change Programme [website]. Available from: https://www.fisheries.govt.nz/protection-and-response/sustainable-fisheries/strengthening-fisheries-management/fisheries-change-programme/. [Accessed 17 September 2019]

163 Economy Report – Peru, 2018/SOM1/OFWG/035; PNIPA official web site. Available from: https://www.pnipa.gob.pe/mision-y-vision/. [Accessed 19 January 2019]

164 Department of Foreign Affairs and Trade, Australia. Blue Economy Aquaculture Challenge [website]. Available from: https://oceanconference.un.org/commitments/?id=17446. [Accessed 19 January 2019]

165 Government of Canada. Canadian Investments in Ocean Science Research and Monitoring [website]. Available from: https://oceanconference.un.org/commitments/?id=19298. [Accessed 19 January 2019]

166 Republic of Indonesia, 2017. *Voluntary National Review (VNR): Eradicating Poverty and Promoting Prosperity in a Changing World*. Available from: https://sustainabledevelopment.un.org/vnrs/. [Accessed 19 January 2019]

167 Government of Australia. *Report on the Implementation of the Sustainable Development Goals*. Available from: https://sustainabledevelopment.un.org/content/documents/20470VNR_final_approved_version.pdf. [Accessed 19 January 2019]

on the best available information.[168] New Zealand has a strong focus on science and innovation investments in the marine environment. Examples include the Sustainable Seas National Science Challenge, with a New Zealand government investment of 71.7 million NZD over 10 years.[169] New Zealand's Fisheries Management system also expends roughly 22 million NZD on fisheries research each year, which is used to support stock assessments and assessments of environmental impacts, and to manage fisheries sustainably through means such as on-board cameras and EITT. China has compiled the Catalogue of China's Marine Scientific and Technical Achievements and its Transfer, so as to guide and fasten international cooperation and transfer of marine scientific and technical achievements.[170]

3.3 Good practices in achieving sustainable development

As discussed in 3.2, significant progresses have been made in sustainable development in APEC economies, in which oceans play a vital role. Good practices have emerged in many areas, which contribute to the achievement of SDG 14 and other Goals. This section aims to provide a snapshot to such good practices and their impacts on the ground, which are categorized into four areas:

- Coastal and marine ecosystem conservation and disaster resilience;
- The role of the ocean on food security and food-related trade;
- Marine science, technology and innovation; and
- Blue Economy.

These are four priority areas for APEC's Ocean and Fisheries agenda, as adopted by the Forth APEC Ocean-related Ministerial Meeting in Xiamen, China, 2014.

3.3.1 Coastal and marine ecosystem conservation and disaster resilience

In some APEC economies, various measures have been taken to enhance coastal and marine ecosystem conservation and disaster resilience, which contribute to the achievement of several Goals, including SDG 14 (Life Below Water) and SDG 13 (Climate Action). Such measures include, but not limited to, reducing marine pollution from shipping and land-based sources, the establishment and effective management of MPAs, integrated coastal and ocean planning and management, restoration of coastal and ocean habitats, and disaster preparedness.

168 Government of Canada. Canadian Investments in Ocean Science Research and Monitoring [website]. Available from: https://oceanconference.un.org/commitments/?id=19298. [Accessed 19 January 2019]

169 New Zealand Ministry of Business, Innovation and Employment. New Zealand Marine Science Investments [website]. Available from: https://oceanconference.un.org/commitments/?id=21068. [Accessed 19 January 2019]

170 Department of Science and Technology, State Oceanic Administration, P.R.China. Strengthen Scientific and Technical Innovation and International Cooperation [website]. Available from: https://oceanconference.un.org/commitments/?id=17142. [Accessed 19 January 2019]

Box 1 Indonesia's efforts to reduce marine plastic debris

The Indonesian government[171,172] is committed to reducing 70% of its plastic debris from 2017, and has taken steps including:

- launching the National Action Plan on Marine Plastic Debris that contains numerous strategies and concrete plans on land, on coastal areas, and at sea aimed at significantly reducing marine plastic debris;
- structuring a domestic program to address the land-based management of waste over a period of four years with finance of up to one billion USD;
- integrating the issue of Marine Plastic Debris into the curriculum of its national education.

The Indonesian Waste Platform was founded in 2015 to catalyse the collaboration between government, business and civil society to design solutions and deliver against the National Plan of Action on Marine Debris. The program focuses on three priorities:

- fostering connectivity and connection;
- organizing symposium and peer-to-peer capacity building;
- leading innovative projects on the ground.

For example, the program has worked with 180 teachers across Flores and Komodo islands in a "train-the-trainers" model to bring this curriculum to dozens of schools, to develop the concept of School Waste Banks and combine the educational component to include developing in-school recycling centers: waste banks that reward children with points for collecting recyclables from their community and families, whilst raising money for the school.

Box 2 APEC High Level Meeting on Accelerating Waste Management Solutions to Reduce Marine Litter

In September 2017, the United States, in close coordination with Indonesia and other partners, convened an APEC High Level Meeting to discuss solutions to reduce marine litter in the APEC region. The Meeting was part of an OFWG project co-sponsored by China, Chinese Taipei, Japan, Republic of Korea, Russia, and Thailand.[173]

The Meeting was attended by representatives from APEC member economies, multilateral development banks, subject matter experts, the private sector, and civil society organizations to promote policies that incentivize and de-risk investment in waste management infrastructure and enable the formation of effective public-private partnerships to prevent land-based sources of marine litter. The objectives of the meeting included: 1) advancing implementation of the APEC Policy and Practice Recommendations; 2) promoting innovative financing mechanisms; 3) supporting the design and implementation of national strategies; 4) providing input to the East Asia Summit Conference on Combating Marine Plastic Debris and other international efforts; and 5) catalyzing new collaborations and partnerships.

Several suggestions were presented for things APEC could do to help facilitate investment including: developing policy recommendations to address investment barriers (particularly with regards to creating markets for offtake products); developing consistent definitions and Public-Private Partnership constructs; harmonizing technology and regulatory standards; disseminating information on potential technologies; development of technical implementation guidelines; and improving the availability of national waste data.

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171 Coordinating Ministry for Maritime Affairs of the Republic of Indonesia. Indonesia Against Marine Plastic Debris [website]. Available from: https://oceanconference.un.org/commitments/?id=14387. [Accessed 19 January 2019]

172 Indonesian Waste Platform, About This Platform [website]. Available from: http://www.indonesianwaste.org/en/about-this-platform-3/. [Accessed 19 January 2019]

173 APEC OFWG meeting document. Economy Report – U.S., 2018/SOM1/OFWG/005.

Box 3 Chile's effort to adapt fisheries and aquaculture to climate change

Chile[174] is developing the project "Strengthening the Adaptation Capacity of the Chilean Fisheries and Aquaculture Sector to Climate Change" in collaboration with GEF, FAO and the Chilean Government. This initiative is aimed at overcoming barriers and weaknesses of the Chilean institutional framework, technology availability and implementation of good practices in the fisheries sector and strengthening the knowledge of Climate Change in fisheries and aquaculture communities. Currently, there are pilot experiences in four fishing coves located in different geographic areas of Chile being carried out. They were chosen to represent key examples to replicate learnings in environmental, technical, socioeconomic and institutional aspects that lead to implement a fisheries and aquaculture management system with adaptation capacities to climate change. This initiative seeks to increase resilience of the Chilean fisheries and aquaculture sector based on an ecosystem and precautionary approach.

3.3.2 The role of the ocean on food security and food-related trade

Enhancing the role of the ocean on food security and food-related trade contributes to SDG 14 and other Goals, such as SDG 1 (No Poverty) and SDG 2 (Zero Hunger). Good practices in this area include improving fisheries management and fishery law enforcement, addressing destructive fishing practices, and supporting small scale, sustainable fishing practices.

Box 4 Enhanced productivity in the fisheries sector in the Philippines

To address the issues of poverty and low productivity in fishing communities in the Philippines,[175,176] the government initiated the Community Fishing Landing Centers (CFLCs) in strategic coastal communities. The CFLCs serve the following functions:

- to reduce fisheries post-harvest losses from 25 percent to 18 percent, through the provision of cold storage and handling capacities, and to improve the conditions of fisher folk communities with high poverty incidence;
- to house post-harvest equipment and tools that will enable fishermen to preserve the quality of their fish and fishery products, which they could eventually sell for a higher price;
- to serve as venues for skills training for disaster-resilient fisheries-based livelihoods and resource management such as monitoring fish catch and stock assessment;
- to improve the access of buyers or consumers to safe and quality fish and fishery products, and to provide a one-stop fish trade hub within a community.

Since its launch in 2013, the number of registered fishermen increased from 50,000 to over 1.6 million in 2015. The CFLCs have initially been run by local government units, but are planned to be turned over to fisherfolk communities or cooperatives.

174 APEC OFWG meeting document. Economy Report – Chile, 2018/SOM3/OFWG/002.

175 Bureau of Fisheries and Aquatic Resources, Government of the Philippines, 2015. Philippine Fisheries Profile 2015. Quezon City: BFAR.

176 Community Fish Landing Centers (CFLC) to boost the fishing sector – Villar. Available from: http://senate.gov.ph/press_release/2015/ 0219_villar1.asp. [Accessed 19 January 2019]

Box 5 Bonus for Restocking and Harvest of Algae in Chile

In 2017 the Fishing Coves Law was adopted, which regulates the declaration and allocation of territories associated to the productive development of small-scale fisheries and its communities.[177] This law establishes that policies, plans and programs shall consider an ecosystem look not only to the biological aspect but to the territory in which the 461 Chilean fishing coves are located and how they relate to productive and social aspects, including extractive and transforming fisheries activities, as well as recreational fishing, small-scale aquaculture, tourism, sale points of sea products, local handcrafts and gastronomy. Additionally, it seeks the strengthening of social capital through the promotion of partnership of small-scale fishermen and incorporation of women and family in the extractive activity.

With the aim of supporting small-scale activities, in May 2016, the National Congress approved a Law that fosters algae restocking and farming, benefiting a significant number of small-scale fishermen and aquaculture producers that wish to diversify in a productive manner and contribute to the sustainability of the coastal areas. To support the implementation of this Law, in 2018 the Chilean Government opened a program called Bonus for Restocking and Harvest of Algae which supports small aquaculture producers, fishermen and small-scale fisheries organizations for undertaking local projects that foster harvest and restocking of this resource. The State contributes with up to 70% of the total cost of the projects. Public investment amounts to 1,846 million USD.

3.3.3 Marine science, technology and innovation

Marine science, technology and innovation support the achievement of SDG 14 and other Goals, such as SDG 9 (Infrastructure). Good practices include the development of databases and monitoring networks, and the science base for sustainable use and management of ocean resources, and building of capacity for research and monitoring.

Box 6 China's National Ocean Development Plan by Science and Technology

In 2016, China released the "National Ocean Development Plan by Science and Technology (2016–2020)" , to further implement innovation-driven development strategy, to enhance the sustainable use of marine resources, and to rise the quality and efficiency of growth in marine sectors. The Plan has set five key tasks, including:

- to accelerate the dissemination of high technology and create a new engine for the development of the marine sectors;
- to promote the application of scientific and technological achievements and foster new impetus for the construction of ecological civilization;
- to build a coordinated development model and form a new capability of marine technology services;
- to strengthen international cooperation and open up a new situation of open and shared development;
- to innovate the management mechanism and create a new environment for overall coordination and development.

As a mean to advance the implementation of the Plan, by 2017, 12 marine industrial clusters have been qualified as Demonstration Pilots for Marine Technology Innovation. These pilots, which are located in China's nine coastal provinces, have technology advantages and industrial foundations in maritime sectors such as port, ocean engineering, biotechnology, renewable energy and mariculture. They serve as multi-purpose centers to enhance research capacity, foster technology dissemination, develop successful business mode, organize personnel training and support local economic development.

177 APEC OFWG meeting document. Economy report – Chile, 2018/SOM1/OFWG/041.

Box 7 New Zealand's Marine Science Investments

New Zealand[178,179] government has invested in several marine science programmes, which contributes, either directly or indirectly, to fulfilling SDGs. Such investments include:

- The Marine Environment Platform: This is a 115 million NZD, seven-year research which aims to provide a deep understanding of coastal and oceanic environments, fisheries, seafloor resources and aquaculture in order to deliver increased economic returns from marine resources, while maintaining marine ecosystem integrity and biodiversity.
- The Sustainable Seas National Science Challenge: a ten-year, multidisciplinary programme, aiming to enhance utilization of New Zealand's marine resources within environmental and biological constraints.
- Transformation of the New Zealand Seafood Industry through Ecosystem Stock Management; Domestication of Species; and Market Driven Quality Enhancement: a seven-year programmed by SeaFood Innovation Ltd, a research partnership of two privately owned companies within the fishing industry, funded predominately by the New Zealand Government.

These programmes help strengthen the science base for sustainable use of ocean resources, monitoring and research capacity, and enhance society's collective understanding of the marine environment. For example, the Sustainable Seas National Science Challenge initiated a new dialogue on ecosystem-based management and expanded the collective understanding of how EBM applies to the marine environment, and produced tools for monitoring and decision support.

3.3.4 Blue Economy

In the Xiamen Declaration, APEC Ministers recognized the potential linkages between Blue Economy, sustainable development and economic growth. Progresses in developing Blue Economy contribute to SDG 14 and other Goals, such as SDG 8 (Economy) and SDG 12 (Sustainable consumption and production). Good practices in developing Blue Economy include the provision of policy and institutional support for Blue Economy, upgrading of and application of environmentally friendly techniques to traditional sectors, and sharing of best practices.

178 New Zealand Government. New Zealand Marine Science Investments [website]. Available from: https://oceanconference.un.org/commitments/?id=21068. [Accessed 19 January 2019]

179 New Zealand Government. New Zealand's Progresses Towards The SDGs – 2019. Available from: https://www.mfat.govt.nz/assets/Uploads/New-Zealand-Voluntary-National-Review-2019-Final.pdf at 99. [Accessed 19 January 2019]

Box 8 Blue Economy Aquaculture Challenge

In 2016, Australia funded the Blue Economy Aquaculture Challenge,[180] a 3 million AUD challenge calling for innovators, entrepreneurs, designers, NGOs and academics to rethink advances in aquaculture across the Indo-Pacific Region. While focused on SDG 14, many of the solutions promised outcomes linked to other SDGs, such as health, nutrition, gender equality, employment, and sustainable production and consumption. Over 220 entries from 41 countries were submitted by the private sector and non-government organizations, and 10 winners were selected for their potential to transform sustainable aquaculture practices. The winners received funding and tailored support to pilot and scale their projects.

For example, EnerGaia, a winning entrant, has expanded its operations bringing their modular tank system for growing nutritious spirulina from rooftops in Bangkok to small scale farms in India. Another winner, AgriProtein, is the world's largest producer of black soldier larvae, a replacement for ocean-caught fish meal food. Fed on waste, it produces similar growth as ocean-caught fish meal.

Box 9 APEC Blue Economy Forums

Since 2011, five APEC Blue Economy Forums have been organized by the APEC Marine Sustainable Development Center, which focus on themes such as:

- Promoting the Green Growth of Marine Economy;
- Achieving Blue Economy in the Context of Sustainable Development;
- Public and Private Sector Dialogue; and
- Pathways and Practices for Cooperation.

The forums aim to advance regional understanding of Blue Economy, facilitate the mainstreaming of Blue Economy, and develop consensus on establishing regional cooperation. Each forum was attended by over 150 people from various APEC economies and other interested parties. These forums have achieved the following results:

- providing a platform for sharing of approaches and experiences on Blue Economy;
- promoting concrete cooperation to strengthen conservation of marine ecosystem which the human being depends on and profit from;
- encouraging the engagement of private sector to pursue Blue Economy practices;
- enhancing the management and sustainable use of marine resources with the science & technology innovation to benefit economic growth and the livelihood of local communities;
- promoting the sustainable use of marine resources and ecosystem service;
- improving the policy and financial support for the enterprises; and
- enhancing the blue governance to ensure the Blue Economy development.

180 Department of Foreign Affairs and Trade, Australia. Blue Economy Aquaculture Challenge [website]. Available from: https://oceanconference.un.org/commitments/?id=17446. [Accessed 19 January 2019]

Box 10 Blue Bay Restoration Action in China

Since 2010, Chinese government has initiated Restoration and Conservation Projects on Sea Areas, Islands and Coast Zones. Sits in coastal and island municipalities have been selected for carrying out projects on sewage treatment, landscape rebuild, sandy shores rebuild, wetlands restoration, habitats restoration and other conservation and restoration measures. A specialized fund was established for organizing these projects, as a sub-fund of China's central funds from sea area use fee. From 2010 to 2017, with the implementation of Restoration and Conservation Projects on Sea Areas, Islands and Coast Zones, 1240 ha of beach and over 2000 ha of coastal wetland was restored in coastal areas of China, with the total investment of 13.7 billion RMB.

With experience gained from previous projects, in 2016, China's 13th Five-Year Plan for Economic and Social Development declared the Blue Bay Restoration Action, which aims to restore threatened ecosystems in coastal and marine areas with ecological importance. From 2016 to 2018, 18 sites have been selected to implement Blue Bay demonstration projects. Various measures have been taken, such as rebuilding natural shorelines, restoring coastal wetlands including mangroves and sea bird habitats, and removal of artificial sea walls. According to the project assessment, ecosystem service in coastal demonstration sites has been prominently enlarged by rebuilding the integrity of ecological functions, particular in the Beidai River, Jiaozhou Bay, Xiamen Bay and Liaohe Estuary.

Chapter 4

Vision for the future

Fostering sustainable development, including through supporting the 2030 Agenda as a framework for inclusive growth, is a concrete commitment made by APEC Leaders. Since its foundation in 1989, APEC has made large contribution to advancing regional sustainable development by steering economic growth, facilitating trade and investment and enhancing cross-fora collaboration on a range of environment and development issues. APEC is also a well-placed platform for discussion and cooperation related to the ocean.[181] Ocean cooperation, with ties to food security, nutrition and trade, is embodied in APEC's work. Through the work of OFWG and other sub-fora, APEC has made great endeavors on promoting sustainability of ocean and marine resources, and advancing sustainable and inclusive growth in the Asia-Pacific region. The 2019 APEC Priorities place "protecting our oceans and marine ecosystem" as a key issue under the priority of "sustainable growth". This implies new opportunities and momentum for APEC to continuously advance ocean-related sustainable development in this region.

4.1 Learning from APEC and its member economies' endeavors towards implementing the 2030 Agenda

Since the adoption of the 2030 Agenda for Sustainable Development, APEC has taken steps to support the implementation of the 2030 Agenda by member economies. During the 25th APEC Economic Leaders' Meeting, APEC Leaders reaffirmed "support for the 2030 Agenda for Sustainable Development, as a framework for inclusive growth". Existing programs and projects in APEC by member economies contribute to the 2030 Agenda for Sustainable Development in a number of ways, including but not limited to the following:

- promoting sustainable development by steering economic growth and achieving social advancement, which directly contribute to some SDGs while laying the foundation for the achievement of others;
- supporting APEC economies' SDGs implementation by high-level commitments and actions plans, which provide guidance for designing and implementing programs and projects that contribute to achieve SDGs;
- supporting APEC economies' SDGs implementation through cross-fora collaboration, which promotes holistic and synergistic efforts across different disciplines and sectors; and
- mobilizing resources to support APEC economies' SDG implementation through multi-stakeholder partnership, which helps solicit wider support, particularly from the private sector, for the SDGs.

181 Annex G – APEC Ocean Cooperation in the Asia Pacific Region of the Joint Statement of the 26 th APEC Ministerial Meeting in 2014.

At the economy level, many APEC economies have initiated efforts to enable the implementation of the 2030 Agenda, including SDG 14. Such efforts include but not limited to the following:

- the establishment of institutional mechanisms to provide leadership and coordination among different government agencies with responsibilities related to sustainable development;
- the adoption of policies and plans for implementing the 2030 Agenda; and
- voluntary commitments and concrete measures addressing specific challenges and targets related to SDG 14.

Many of these efforts in promoting ocean-related sustainable development build on existing policy frameworks and processes, and further financial and institutional resources have been mobilized to achieve SDG 14 at all levels, from local initiatives to trans-boundary cooperation. Although the work for enabling measures to implement SDG 14 varies from one economy to another, good practices typically have the following characteristics:

- multiple and mutually reinforcing objectives, addressing environmental, economic and social dimensions of sustainability;
- participation of a wide range of stakeholders, including local communities, general public, seafood producers, and consumers;
- harnessing the power of information, data, scientific knowledge and technology to design and implement effective solutions toward sustainability.

It should be noted, however, while ocean-related sustainable development has received an unprecedented level of political support, and progresses have been made on many fronts, challenges remain. According to a recent review by the UNESCAP, regional progress in the Asia-Pacific toward SDGs focused on improving environmental stewardship has been insufficient, and there is a need to strengthen measures to conserve and sustainably use ocean, sea and marine resources (SDG 14). [182]

4.2 Prospect on further implementing SDG 14 and related Goals by APEC economies

As the premier economic cooperation forum in the Asia-Pacific region, APEC has the capacity to promote ocean-related sustainable development by leading multi-disciplinary, intra- and cross-sector and multi-stakeholders' collaboration in addressing major ocean-related challenges faced by member economies such as marine debris, marine ecosystem and resources decline, unsustainable fisheries, climate change and natural

182 UNESCAP. *Asia and the Pacific SDG Progress Report 2017*. Bangkok: UNESCAP.

hazards. To strengthen APEC's role in supporting member economies' implementation of SDGs, through resource mobilizing, capacity development, awareness raising and other means, the following could serve as long-term priorities for consideration by APEC:

4.2.1 Further incorporation of goals related to SDGs into APEC's work

Many of APEC's existing plans and projects directly or indirectly contribute to implementing SDG 14 and related Goals by member economies. There are opportunities to further integrate SDGs in APEC's future endeavors, including:

- further identifying the linkage of APEC's work with goals related to SDGs, and identifying the approaches of how APEC fora could contribute to addressing goals related to SDGs, including but not limited to: creating an enabling environment for sustainable development by facilitating trade and investment and enhancing connectivity, promoting sustainable practices in production and consumption, and increasing communication and transparency on how APEC economies have contributed to SDGs;
- implementing commitments on advancing regional sustainable development made by APEC Leaders and Ministers; considering the incorporation of goals related to SDGs into the strategic plans of relevant APEC sub-fora, (such as OFWG and PPFS);
- promoting the incorporation of goals related to SDGs in the design and implementation of APEC programs and projects to assist member economies' efforts toward SDGs implementation; and
- promoting cross fora cooperation in APEC, in particular among OFWG, PPFS and PPSTI, through joint workshops and projects, in line with APEC's guidelines for cross fora cooperation.

4.2.2 Supporting APEC economies in fulfilling their Voluntary Commitments

APEC economies have made an unprecedented level of political commitments toward ocean-related sustainable development. The 2030 Agenda recognizes that individual economies have primary responsibility for their sustainable development, and effective partnerships at global and regional levels can facilitate and support the efforts taken by individual economies. In this context, APEC, as a regional framework for economic cooperation, could play an important role in supporting its economies in implementing the 2030 Agenda by:

- supporting capacity building programs and initiatives, including by encouraging APEC centers such as the APEC Study Center, APEC Marine Sustainable Development Center, APEC Oceans and Fisheries Information Center, and APEC Marine Environmental Training and Education Center to engage actively in capacity building and awareness raising;

- facilitating the formation of multi-stakeholder partnerships for ocean-related sustainable development, including public-private partnerships;
- encouraging businesses to adopt more sustainable means of production and consumption and enhance financial supports for sustainable solutions;
- promoting scientific and technological innovation and cooperation for ocean conservation and sustainable management in APEC economies, building on existing efforts undertaken by OFWG and the PPSTI; and
- encouraging cross-border cooperation in APEC economies' implementation of SDGs, prioritizing the control of marine pollution, conservation of large marine ecosystems, addressing ocean acidification and sustainable fisheries management.

4.2.3 Promoting sharing of information and good practice towards sustainable ocean management

Information and data are the keys to decision-making towards sustainable ocean management. Although there are various data gathering and reporting processes in place at both regional and economy levels, of marine pollution control, marine disaster risk management, fisheries management, and biodiversity conservation, in general, there is still a need for more transparent and accessible information and data which can support member economies in developing holistic and effective ocean management policies. Relevant efforts could include:

- stocktaking projects, programs and initiatives taken by APEC and its sub-fora on ocean-related sustainable development;
- reviewing cooperation, collaboration and joint relationships among APEC economies on sustainable ocean management and their efforts to achieve SDGs;
- identifying challenges and areas in needs of further inputs/efforts; and
- encouraging sufficient study and analysis to support APEC fora and member economies to develop proper policies, which will advance sustainable ocean management and contribute to the full achievement of SDGs by member economies.

List of Acronyms

Acronyms	Full Name
ABAC	APEC Business Advisory Council
ATCWG	APEC Agricultural Technical Cooperation Working Group
AMSD	APEC Marine Sustainable Development Report
AOMM	APEC Ocean-related Ministerial Meeting
APEC	Asia-Pacific Economic Cooperation
APRU	Association of Pacific Rim Universities
CBD	Convention on Biological Diversity
CD	APEC Chemical Dialogue
CFLCs	Community Fishing Landing Centers, the Philippines
CSD	National Committee for Sustainable Development, Thailand
CTI	APEC Committee on Trade and Investment
DDT	Dichlorodiphenyltrichloroethane
EC	APEC Economic Committee
EITT	Enabling Innovative Trawl Technology
EPWG	APEC Emergency Preparedness Working Group
EWG	APEC Energy Working Group
FAO	Food and Agriculture Organization
FFA	The Pacific Islands Forum Fisheries Agency
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEO	Global Environment Outlook
GO2NE	Global Ocean Oxygen Network
GOA-ON	Global Ocean Acidification Observing Network
GOS	APEC Group on Services
HAB	Harmful Algae Bloom
HLPDAB	APEC High Level Policy Dialogue on Agricultural Biotechnology
HLPF	High-level Political Forum for Sustainable Development
HRDWG	APEC Human Resource Development Working Group
ICM	Integrated Coastal Management
IEG	APEC Investment Experts' Group

Continued

Acronyms	Full Name
IOC	Intergovernmental Oceanographic Commission of UNESCO
IPCC	International Panel on Climate Change
IUCN	International Union for Conservation of Nature
LDCs	Least Developed Countries
LECZs	Low-elevation Coastal Zones
IUU	Illegal, Unreported, Unregulated fishing
MPAs	Marine Protected Areas
MTF	APEC Mining Task Force
NGOs	Non-governmental Organizations
NPOs	Non-Profit Organisations
OECD	Organization for Economic Co-operation and Development
OFWG	APEC Ocean and Fisheries Working Group
OMZs	Oxygen Minimum Zones
ONI	Oceanic Niño Index
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PNIPA	National Program of Innovation in Fisheries and Aquaculture, Peru
PPFS	APEC Policy Partnership on Food Security
PPSTI	APEC Policy Partnership for Science, Technology and Innovation
PPWE	APEC Policy Partnership on Women and the Economy
SCAR	Scientific Committee on Antarctic Research
SCE	APEC Steering Committee on Economic and Technical Cooperation
SCOR	Scientific Committee on Ocean Research
SDGs	Sustainable Development Goals
SIDSs	Small Island Developing States
SMEs	Small and Medium Enterprises
SMEWG	APEC Small and Medium Enterprises Working Group
STEM	Science, Technology, Engineering and Mathematics
TELWG	APEC Telecommunications & Information Working Group
TNC	The Nature Conservancy
TPTWG	APEC Transportation Working Group
TWG	APEC Tourism Working Group

Continued

Acronyms	Full Name
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCSD/Rio+20	United Nations Conference on Sustainable Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNDESA	United Nations Department of Economic and Social Affairs
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
VCs	Voluntary Commitments
VWGMD	APEC Virtual Working Group on Marine Debris
WMO	World Meteorological Organization
WOA	World Ocean Assessment
WSSD	World Summit on Sustainable Development
WWF	World Wildlife Fund

Annex 1 APEC Survey: Economy Experiences on SDGs Implementation

Part 1 Background

AMSD Report: the APEC Marine Sustainable Development Report 2 (hereinafter referred to as AMSD 2) is the second report of AMSD report series which focuses on the status and progress of marine sustainable development in the Asia-Pacific region and promotes experience sharing among member economies in related areas. AMSD 2 is expected to reflect the endeavors of APEC economies in achieving SDGs, in particular SDG 14, and to contribute to the implementation of 2030 Agenda for Sustainable Development in the APEC region. The APEC self-funded project "APEC Marine Sustainable Development Report 2 (OFWG 01 2017S)" was endorsed by the Ocean and Fisheries Working Group for the purpose of developing the report within timeframe of 2017–2019.

The 2030 Agenda and SDG 14: the 2030 Agenda, formally as *Transforming our world: the 2030 Agenda for Sustainable Development* is the outcome document of the United Nations Summit for The Adoption of The Post-2015 Development Agenda convened in September 2015. 17 Sustainable Development Goals and 169 targets are announced to demonstrate the scale and ambition of the 2030 Agenda. Among those goals, Goal 14: Life Below Water aims to "*conserve and sustainably use the oceans, seas and marine resources for sustainable development"* and comprises 10 targets addressing environmental, ecological and socioeconomic concerns such as marine pollution, ecosystem conservation, ocean acidification, sustainable fisheries, marine protected areas, sustainable use of marine resources, scientific knowledge and research capacity, and implementation through international law.

Survey Objective: gather information on the policies and measures taken by member economies on SDGs implementation to understand the progress made so far and existing obstacles in implementing SDGs in the Asia-Pacific region. Questions in five categories, including policies, institutions, information, measures, collaboration and effects are included in the questionnaire below.

Respondent Profile: as the survey covers information related to policies and management issues, and requires knowledge on ocean and coastal management, respondents working in government, public sectors, academia and non-governmental organizations with experience on ocean management are suitable for filling the questionnaire. Personal information contained in the questionnaire will be completely confidential.

Contact Information of Survey Inquires: If any questions arise about this survey, please contact:

Ms. Zhu Xuan E-mail: zhuxuan@cimamnr.org *and*

Mr. Wang Junbo E-mail: wangjunbo@tio.org.cn

Part 2 Respondent information

a. Economy:_____
b. Respondent Name: _____
c. Respondent E-mail: _____
d. Respondent Organization: _____
e. Main Characteristics of Your Role:

Administrative	
Financial	
Operations	
Research	
Project Implementation	
Policy Development	
Other *(describe)*	

Part 3 Questions

1. Policy

1.1 Is there an implementation plan/policy for the 2030 Agenda and SDGs in your economy?

Yes ☐ No ☐ Not sure ☐

1.2 If yes, please choose the scope of the implementation plan/policy for the 2030 Agenda and SDGs in your economy?

Economy level ☐ Provincial level ☐ Local level ☐

1.3 a) If there is an economy-level implementation plan/policy on SDGs, please write down the basic information:

Title of the plan_____

Issued by_____

Issued in_____(Month)_____(Year)

b) If there is a provincial/local-level implementation plan/policy on SDGs, please write down the basic information:

Title of the plan_____

Issued by_____

Issued in_____(Month)_____(Year)

2. Institution

2.1 Is there any effort in institutional framework for implementing the 2030 Agenda and SDGs in your economy?

Yes ☐ No ☐ Not sure ☐

2.2 If yes, please indicate types of institutional framework for implementing the 2030 Agenda and SDGs (multi-choices)?

Establishment of new agency ☐

Strengthened responsibility of existing agencies ☐

Establishment of coordination mechanism such as coordinating commission/council ☐

Other type ☐

2.3 If yes, please describe details of institutional framework for implementing the 2030 Agenda if possible (Max 500 words)

3. Information

3.1 Is there an information collection mechanism for the 2030 Agenda and SDGs implementation in your economy?

Yes ☐ No ☐ Not sure ☐

3.2 If yes, which institutions/groups of people participate in information collection on SDGs implementation in your economy (multi-choices)?

Government departments ☐

Government Commission/ Working Group/Network ☐

Non-governmental organizations ☐

Private sectors ☐ Citizens ☐

Others:___ (please indicate) _____

3.3 Is there an information disclosure mechanism for the 2030 Agenda and SDGs implementation in your economy?

Yes ☐ No ☐ Not sure ☐

3.4 If yes, please indicate types of information disclosure (multi-choices)?

Periodical reporting ☐

Non-periodical reporting ☐

Through a column on government website ☐

Through 2030 Agenda/SDGs portal ☐

Through social media ☐

Others:___ (please indicate) _____

3.5 If yes, please describe details of information collection /disclosure if possible (Max 500 words)

4. Measures

4.1 Which measures are taken in your economy in implementing SDG 14? (multi-choices)

Planning including maritime spatial planning ☐

Integrated management of coastal areas ☐

Marine and coastal ecosystem conservation and restoration ☐

Marine and coastal protected areas ☐

Disaster mitigation and adaption ☐

Pollution control including land-sourced pollution control ☐

Fisheries management including measures to combat overfishing and destructive fishing ☐

Scientific research ☐ International cooperation ☐ Capacity building ☐

Domestic ocean/maritime policy ☐

Climate change mitigation and adaptation ☐

Others:___(please indicate)_____

4.2 Which measures contribute most in implementing SDG 14 in your economy? (Max 3 choices)

Planning including maritime spatial planning ☐

Integrated management of coastal areas ☐

Marine and coastal ecosystem conservation and restoration ☐

Marine and coastal protected areas ☐

Disaster mitigation and adaption ☐

Pollution control including land-sourced pollution control ☐

Fisheries management including measures to combat overfishing and destructive fishing ☐

Scientific research ☐

International cooperation ☐

Capacity building ☐

Domestic ocean/maritime policy ☐

Climate change mitigation and adaptation ☐

Others:___(please indicate)_____

4.3 The SDGs are known to be interrelated. In which SDG areas does your economy take measures that also can contribute to achieving SDG 14? (multi-choices)

SDG 1: No Poverty ☐ SDG 2: Zero Hunger ☐

SDG 3: Good Health and Well-being ☐ SDG 4: Quality Education ☐

SDG 5: Gender Equality ☐ SDG 6: Clean Water and Sanitation ☐

SDG 7: Affordable and Clean Energy ☐ SDG 8: Decent Work and Economic Growth ☐

SDG 9: Industry, Innovation, and Infrastructure ☐ SDG 10: Reduced Inequalities ☐

SDG 11: Sustainable Cities and Communities ☐

SDG 12: Responsible Consumption and Production ☐

SDG 13: Climate Action ☐ SDG 15: Life on Land ☐

SDG 16: Peace, Justice, and Strong Institutions ☐ SDG 17: Partnerships for the Goals ☐

Not sure ☐

4.4 Please describe the major obstacles in achieving SDG 14 in your economy, if any. (Max 500 words)

5. Collaboration with other APEC economies

5.1 Is there any collaborative plan/project/initiative with other APEC economies in implementing SDG 14 and related Goals?

Yes ☐ No ☐ Not sure ☐

5.2 If yes, please write down basic information of the collaborative plan/project/initiatives.

Title _____

Participating economies _____

Time span_____

Major actions or expected outcomes_____

5.3 If yes, please describe in detail the collaborative plan/project/initiatives if possible. (Max 500 words)

6. Effect

6.1 In your opinion, what is the overall effect of SDG 14 implementation in your economy?

Very good ☐ Good ☐ Not sufficient ☐ Not sure ☐

6.2 Which group/groups benefit most from implementing SDG 14 and related SDGs in your economy or the coastal province/city you live in (multi-choices)?

Fisherman □ Tourism operators ☐ Other maritime industries ☐

Coastal communities ☐ Scientific community ☐

Others:___(please indicate)_____

6.3 What are the main benefits gained by implementing SDG 14 and related SDGs in your economy or the province/city you live in (multi - choices)?

Protection and restoration of marine ecosystem including its productivity ☐

Enhancement of the resilience of coastal ecosystems to disasters and other adverse impacts of climate change ☐

Increased economic benefits from sustainable use of marine resources ☐

Increased job opportunities from sustainable use of marine resources ☐

Sustaining culture associated with oceans ☐

Others:___(please indicate)_____

6.4 What do you think are the most important elements for implementing SDG 14 and related SDGs in your economy? (Max 3 choices)

Political will ☐ Provincial and local engagement ☐ Financial resources ☐

Institutional framework ☐ Integrated planning ☐ Public awareness ☐

Coordination among sectors and departments ☐ Scientific knowledge ☐

International and regional cooperation ☐ Capacity building ☐

Policy and institutional coherence ☐ Multi-stakeholder partnership ☐

Others:___(please indicate)_____

6.5 What do you think need to be strengthened (e.g. policies/management actions/capacities) for achieving SDG 14 and related SDGs in your economy? (Max 500 words)

6.6 If you have any recommendations for our survey or the APEC Marine Sustainable Development Report, please describe.

(end)

Thank you for taking the time to complete this questionnaire.

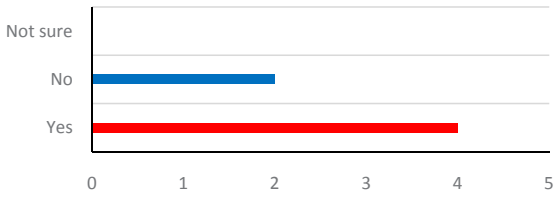
Your participation is highly appreciated.

Annex 2 Brief Analysis of the APEC Survey: Economy Experiences on SDGs Implementation

To gather information on economy experience on SDGs implementation, in particular the policies and measures taken by member economies to draft the AMSD 2 report, this survey was organized in May, 2018 through the APEC secretariat. Until January 2019, feedbacks were received from seven economies: Chile; China; Hong Kong, China; Malaysia; Papua New Guinea (PNG); Chinese Taipei and Thailand. Questions in five categories, including policies, institutions, information, measures, collaboration and effects are included in the survey and responses are analyzed as following:

Policies on implementing the 2030 Agenda and SDGs

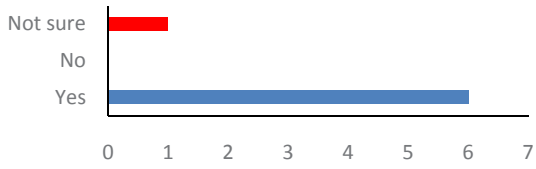
In *Question 1: implementation plan/policy for the 2030 Agenda and SDGs*, four economies (China, Malaysia, PNG, and Chinese Taipei) have implementation plans/policies for the 2030 Agenda and SDGs, all of which are being implemented at the economy level, except for Malaysia who has both economy level and provincial/ local level (Annex Figure 1).



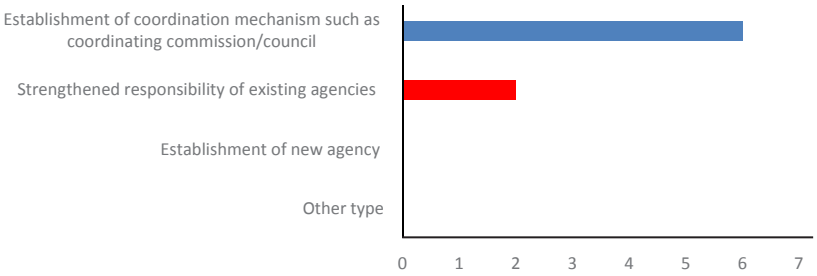
Annex Figure 1 Implementation plan/policy for the 2030 Agenda and SDGs in economies

Institutional framework for implementing the 2030 Agenda and SDGs

In *Question 2: institutional framework for implementing the 2030 Agenda and SDGs,* six economies confirmed their efforts in institutional framework including Chile, China, Hong Kong, China, Malaysia, Chinese Taipei and Thailand (Annex Figure 2). While six economies have established coordination mechanism to implement the 2030 Agenda and SDGs, two economies have made efforts by strengthening responsibility of existing agencies, Malaysia covers both (Annex Figure 3).



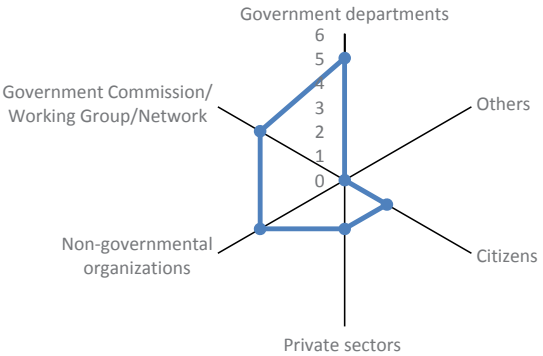
Annex Figure 2 Efforts from economies in institutional framework for implementing the 2030 Agenda and SDGs



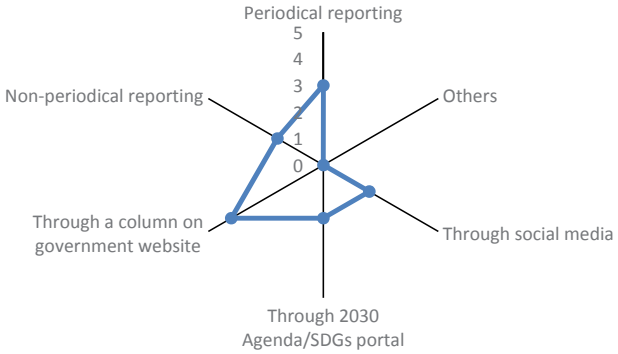
Annex Figure 3 Types of institutional framework for implementing the 2030 Agenda and SDGs

Information mechanism for the 2030 Agenda and SDGs implementation

In *Question 3: information collection mechanism for the 2030 Agenda and SDGs implementation*, six economies (Chile, China, Malaysia, PNG, Chinese Taipei and Thailand) have confirmed having an information collection mechanism for the 2030 Agenda and SDGs. Most of them have Government departments and Non-governmental Organizations participating in collection of information on SDGs implementation compared with the few whose Private sectors and Citizens are the main collectors (Annex Figure 4). With regard to types of information disclosure, economies are making use of various methods, such as periodical reporting, non-periodical reporting, governmental websites, 2030 Agenda/SDGs Portal and social media (Annex Figure 5).



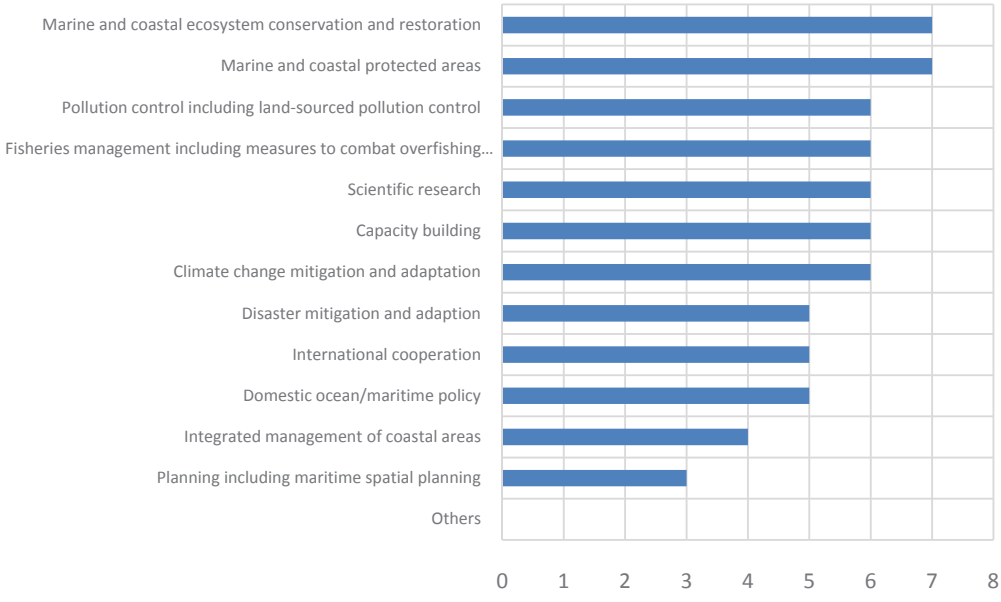
Annex Figure 4 Institutions/ groups of people participate in information collection on SDGs implementation



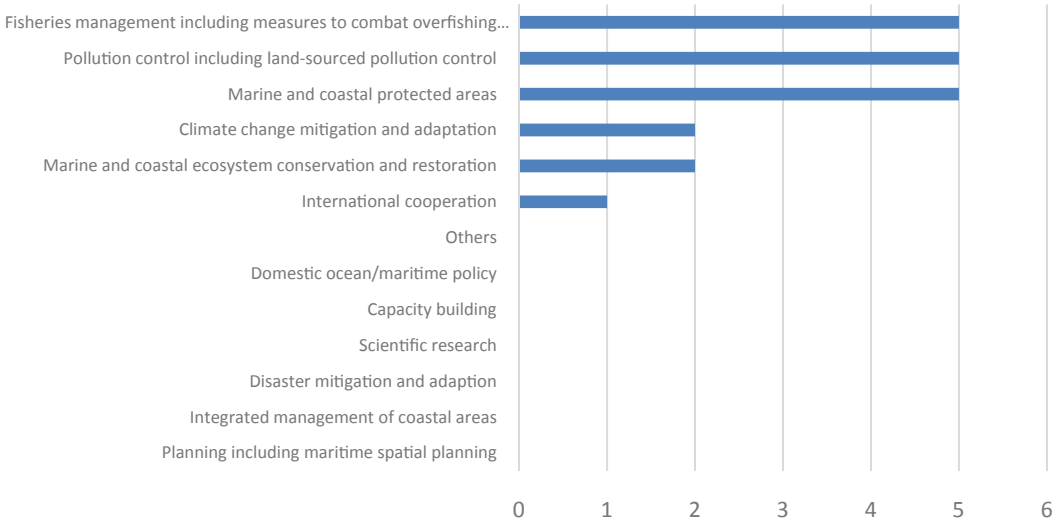
Annex Figure 5 Types of information disclosure

Measures taken in implementing SDG 14

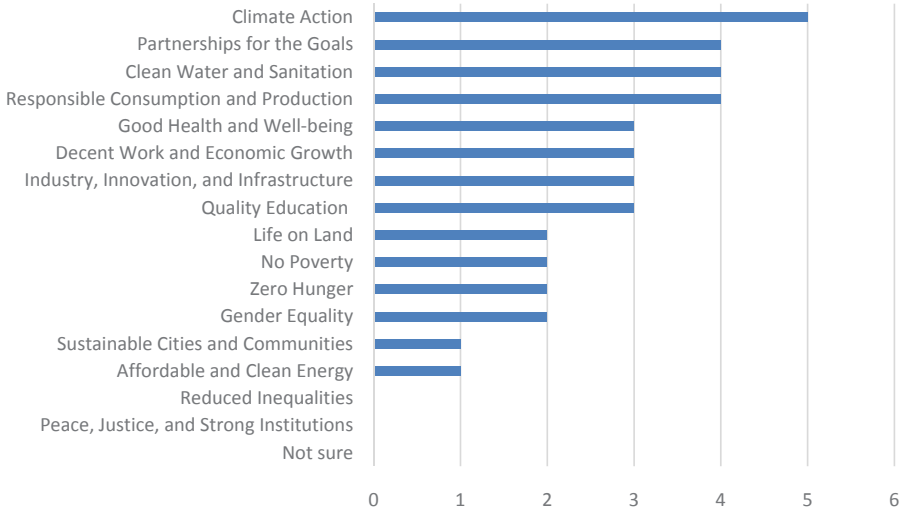
In *Question 4*, economies indicate the types of *measures which have been taken to implement SDG 14*. Among them, marine and coastal ecosystem conservation and restoration, marine and coastal protected areas are most commonly used measures (Annex Figure 6). However, as presented in Annex Figure 7, fisheries management, pollution control, and marine and coastal protected areas are considered as the most effective measures in implementing SDG 14. Economies also take measures in other SDG areas such as SDG 13, SDG 6, SDG 12 and SDG 17, etc., that can contribute to achieve SDG 14 (Annex Figure 8).



Annex Figure 6 Measures are taken in implementing SDG 14



Annex Figure 7 Measures contribute most in implementing SDG 14



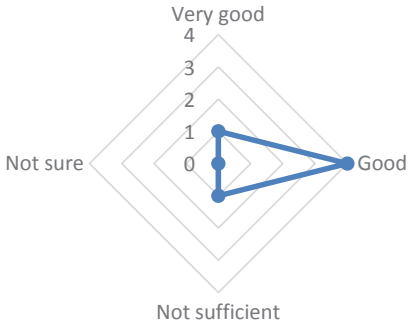
Annex Figure 8 Measures are taken in other SDG areas that contributes to achieving SDG 14

Collaboration among APEC economies

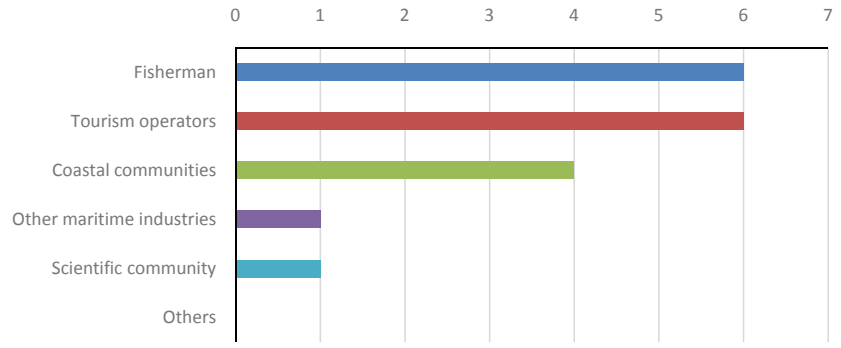
In *Question 5: Collaboration with other APEC economies*, a number of collaborative projects have been mentioned by economies, such as: Agreement between the Ministry of the Environment of Perú and the Ministry of the Environment of Chile for the development of actions in governance, management and conservation of the National Systems of marine-coastal protected areas (Peru and Chile); GEF Humboldt Project Chile-Peru. 2nd Phase "Catalyzing the Implementation of a Strategic Action Program for the Sustainable Management of Shared Living Marine Resources in the Humboldt Current System" (Chile-Peru); Memorandum of Understanding between Ministry of the Environment of Chile, Undersecretariat for Fisheries and Aquaculture of Chile, the national Forest Corporation (CONAF) of Chile and the National Park Service (NPS) and the National Oceanic and Atmospheric Administration (NOAA) of United States (the U.S. and Chile); Marine Harmful Algal Blooms Collaborative Research (China, Hong Kong, China, Japan, Korea, Malaysia, The Philippines, Thailand); Combating Illegal, Unregulated and Unreported Fishing in the Region (Chinese Taipei, Indonesia, Peru, Russia, Singapore, Thailand, Viet Nam, Malaysia); APEC Roundtable Meeting on the Involvement of the Business/Private Sector in the Sustainability of the Marine Environment (APEC economies), among others.

Effect of SDG 14 implementation

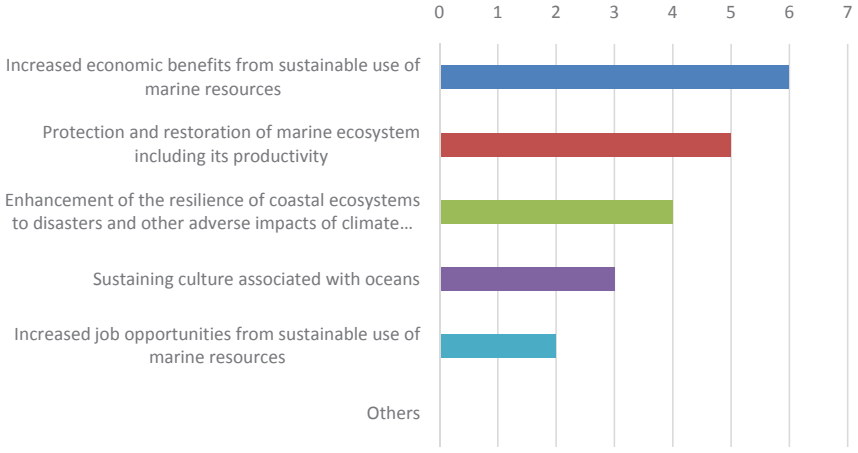
Finally, with respect to *Question 6: the effects of implementing SDG 14*, most economies believe the overall effects are good (Annex Figure 9); fisherman and tourism operators are the groups that benefit the most (Annex Figure 10). Among all the benefits, increased economic benefits from sustainable use of marine resources, as well as the protection and restoration of marine ecosystem, are the most recognized by the economies (Annex Figure 11). Last but not the least, economies also indicate the important elements for implementing SDG 14, among which, political will, coordination among sectors and departments, as well as provincial and local engagement, are considered to be crucial (Annex Figure 12).



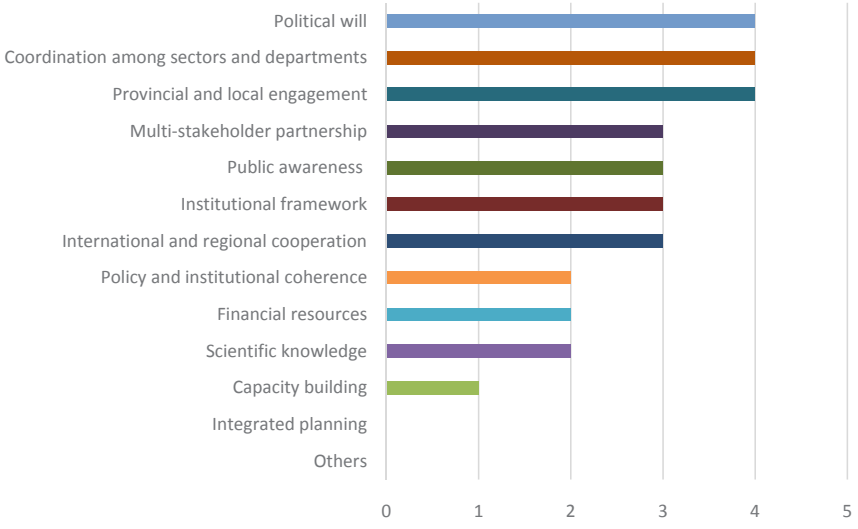
Annex Figure 9 The overall effect of SDG 14 implementation



Annex Figure 10 Groups benefit from implementing SDG 14 and related SDGs



Annex Figure 11 Benefit from implementing SDG 14 and related SDGs



Annex Figure 12 The most important elements for implementing SDG 14 and related SDGs

APEC Project: OFWG 01 2017S

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APEC#219-OF.01.1 ISBN: 978-981-14-4260-5