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Oceans and the law of the sea

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Report of the Secretary-General

Summary

In paragraph 352 of its resolution [74/19](#), the General Assembly decided that the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea would focus its discussions at its twenty-first meeting on the theme “Sea-level rise and its impacts”. The present report was prepared pursuant to paragraph 364 of resolution [74/19](#) with a view to facilitating discussions on the topic of focus. It is being submitted to the Assembly for consideration at its seventy-fifth session and to the States parties to the United Nations Convention on the Law of the Sea, pursuant to article 319 of the Convention.

* [A/75/50](#).



I. Introduction

1. The General Assembly has consistently recognized that the adverse impacts of climate change, including those related to sea-level rise,¹ are one of the greatest challenges at the present time and undermine the ability of all countries to eradicate poverty and food insecurity, as well as to achieve sustainable development (e.g., resolution 74/234, preamble). In addition, the Assembly has expressed deep concern that sea-level rise jeopardizes the integrity of cultural and natural heritage (resolution 74/230, para. 16) and represents the gravest of threats to the survival and viability of many low-lying coastal countries and small island developing States (resolutions 69/15, paras. 11 and 31, and 74/234, preamble). As noted in paragraph 14 of resolution 70/1, entitled “Transforming our world: the 2030 Agenda for Sustainable Development”, sea-level rise and climate change impacts are seriously affecting coastal areas and low-lying coastal countries, including many least developed countries and small island developing States.

2. In recognition of the critical importance of this issue of global concern, the General Assembly decided, in paragraph 352 of its resolution 74/19, that the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea would, at its twenty-first meeting, focus its discussions on the theme “Sea-level rise and its impacts”.

3. To facilitate the discussions of the Informal Consultative Process, the present report draws significantly upon the contributions submitted by States and relevant organizations and bodies at the invitation of the Secretary-General,² as well as upon the *Special Report on the Ocean and Cryosphere in a Changing Climate*, issued by the Intergovernmental Panel on Climate Change in 2019, together with other reports and scientific, technical and policy studies.

II. Sea-level rise: understanding the issue, its causes and impacts

A. Nature and causes of sea-level rise

4. As indicated in the *Special Report*, sea-level rise is a key feature of climate change, and changes in sea level over at least the past 1,500 years have been positively related to global mean temperatures. Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels³ and, according to the Intergovernmental Panel on Climate Change, it is virtually certain that the ocean has warmed unabatedly since 1970 and that 90 per cent of the increase in energy in the climate system has been stored in the ocean. It is also stated in the *Special Report* that there is high confidence that anthropogenic forcing (human-induced impacts) is very likely the dominant cause of observed global mean sea-level rise

¹ The term “sea-level rise” is used in the present report in accordance with the meaning given in Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* (2019), pp. 330 and 696–697 (“Glossary”).

² The full text of the contributions is available from the website of the Division for Ocean Affairs and the Law of the Sea from www.un.org/Depts/los/consultative_process/contribution21.html.

³ Valérie Masson-Delmotte and others, eds., *Global Warming of 1.5°C: An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty* (IPCC, 2018), p. 4.

since 1970 and that the majority of the global sea-level rise is attributable to anthropogenic greenhouse gas emissions.

5. In general, according to the *Special Report*, increasing water temperature causes thermal expansion by lowering water density, contributing to a higher sea level even at a constant ocean mass. Thermal expansion of ocean water and ocean mass gain, primarily owing to a decrease in land ice mass from melting glaciers and ice sheets, are considered the main causes of climate change-induced global mean sea-level rise.

6. In respect of climate change-induced global mean sea-level rise, the global mean sea level rises if water is added to the ocean from other reservoirs in the climate system. It is stated in the *Special Report* that, as the climate warms, snow cover and the extent and thickness of Arctic sea ice decrease, and glaciers and ice sheets lose mass and contribute to sea-level rise. It is very likely that the rate of the loss of mass from the Greenland ice sheet has substantially increased over the period from 1992 to 2011 and likely that it has increased for the Antarctic ice sheet between 2002 and 2011.⁴ The ice sheets on Greenland and Antarctica contain most of the fresh water on the Earth's surface and their melting has the greatest potential to cause changes in sea level. However, the Intergovernmental Panel on Climate Change states that the melting of glaciers outside of these ice sheets also remains an important contributor to sea-level change and, over the past century, has added more mass to the ocean than those two ice sheets combined. There is very high confidence that, together, glacier and ice sheet contributions are now the dominant source of global mean sea-level rise.

7. Other factors contributing to sea-level rise, as indicated in the *Special Report*, include changes in the shape of the ocean basins, changes in the Earth's gravitational and rotational fields and local subsidence or uplift of the land (vertical downward or upward land movement). Regional patterns in sea-level change are also modified from the global average by water temperature and salinity variations, as well as changes in oceanic and atmospheric dynamics, including trends in ocean currents, the redistribution of temperature and salinity and sea water density, buoyancy and atmospheric pressure.

8. According to the Intergovernmental Panel on Climate Change, it is virtually certain that the global mean sea level is rising and there is also high confidence that the rates of the rise are accelerating. The average rate of global mean sea-level rise since 1993 has been 3.2 mm/year; from 2007 to 2016, it was 4 mm per year; and from 2014 to 2019, it amounted to 5 mm per year, a rate substantially higher than the average rate since 1993.⁵ Even if the rise in global temperature slows or reverses, the global mean sea level would continue to rise owing to the effect of lags caused by the long timescale on which such processes operate, as stated in the *Special Report*. In fact, under all emissions scenarios in that report, the global mean sea level is projected to continue to rise beyond 2100. In a high greenhouse gas emissions scenario, the rise is projected to be more than several cm per year, while in a low emissions scenario, it could be limited to around 1 m in 2300. Rising global mean sea levels will also contribute to higher extreme sea levels (caused by storm surges). The Intergovernmental Panel on Climate Changes projects with high confidence that extreme sea levels that are historically rare will become common by 2100 under all emissions scenarios, with many low-lying cities and small islands at low latitudes experiencing such events annually by 2050.

⁴ Rajendra K. Pachauri and others, eds., *Climate Change 2014: Synthesis Report – Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Geneva, IPCC, 2014), p. 42.

⁵ Contribution from World Meteorological Organization (WMO).

9. However, neither sea-level rise nor its rate has been or is likely to be geographically uniform.⁶ Regional differences in sea-level rise show variability of +/- 30 per cent of the global mean sea-level rise. According to the *Special Report*, differences from the global mean can be even greater in areas of rapid vertical land movement, including from local anthropogenic factors. Global sea-level changes are affected by changes in terrestrial reservoirs of liquid water as a result of both climate variability, such as the El Niño Southern Oscillation, and direct human interventions, such as the withdrawal of groundwater or dam construction. Overall, it is stated in the *Special Report* that direct human intervention has reduced land water storage during the past decade, increasing the rate of sea-level rise by 0.15 to 0.24 mm per year.

10. Non-climatic anthropogenic drivers, including recent and historical demographic and settlement trends and anthropogenic subsidence, have played an important role in increasing the exposure and vulnerability of several low-lying communities to sea-level rise and extreme sea-level events, according to the Intergovernmental Panel on Climate Change.

B. Observed and projected environmental, social and economic impacts of sea-level rise at the global, regional and national levels

Observed impacts of sea-level rise

11. It is widely accepted that coastal ecosystems are already affected by the combination of sea-level rise, other climate-related ocean changes and adverse effects of human activities on ocean and land. According to the *Special Report* of the Intergovernmental Panel on Climate Change, attributing specific impacts to sea-level rise remains challenging owing to the influence of other climate-related and non-climatic drivers, such as infrastructure development and human-induced habitat degradation. Similarly, because coastal sea-level change is often small compared with other processes, such as demographic, resource and land use changes and anthropogenic subsidence, it is difficult to isolate and attribute specific observed coastal changes and associated impacts to sea-level rise.

12. However, new literature has shown that extreme water levels at the coast are rising because of mean sea-level rise and that this is having observable impacts on chronic flooding in some regions. The Intergovernmental Panel on Climate Change reports that there are also emerging signs of direct adverse consequences of rising sea levels on shoreline behaviour and on the salinity levels of estuaries. Arctic communities have also been experiencing frequent flooding events, which can be associated with sea-level rise. In addition, a number of States have highlighted observable patterns of irreversible coastal erosion and inundations that they attribute to sea-level rise, as a central cause or exacerbating factor.⁷

Projected impacts of sea-level rise

13. According to the Intergovernmental Panel on Climate Change, rising sea levels are having, and are projected to entail, wide-ranging and significant environmental, economic and social impacts. On the environmental side, rising mean and higher extreme sea levels are projected to increasingly threaten coastal zones through a range of coastal hazards, including the following: permanent submergence of land by higher mean sea levels or mean high tides; more frequent or intense coastal flooding; enhanced recession of shorelines and coastal wetlands through coastal erosion; loss and change of coastal ecosystems; salinization of soils, ground and surface fresh

⁶ IPCC, Pachauri and others, eds., *Climate Change 2014: Synthesis Report*, p. 42.

⁷ Contributions from Gabon, Togo, European Union and its member States.

water; and impeded drainage. Sea-level rise and its physical impacts, such as flooding and salinization, also increase the vulnerability of ecosystems and decrease their ability to support livelihoods and provide services such as coastal protection. In addition, the Intergovernmental Panel on Climate Change not only estimates, with high confidence, that rising sea levels will cause the frequency of extreme sea-level events at most locations to increase, but also, with very high confidence, that the frequency, severity and duration of hazards and related impacts caused by sea-level rise will increase.

14. These environmental impacts of sea-level rise are likely to result in adverse social, cultural and economic ramifications for various communities. For example, according to the Intergovernmental Panel on Climate Change, sea-level rise is projected to affect the availability and quality of drinking water through changes to water table heights, the salinization of surface water and aquifers, contamination of freshwater reserves and disruption of treatment facilities during floods,⁸ posing threats to water security, in particular in regions already vulnerable to water scarcity.⁹ Extreme sea-level events can have both short-term and long-term effects on human health, including drowning, injuries, increased disease transmission and health problems associated with the deterioration of water quality and quantity.¹⁰ Concerns have also been raised about the negative impacts of sea-level rise on food security, which may be aggravated through weaker food production and reduced crop yields, as well as loss of livelihoods and food price shocks, which may decrease market access to food.¹¹ Sea-level rise is projected by the Intergovernmental Panel on Climate Change to affect agriculture mainly through land submergence, the salinization of soil and fresh groundwater resources and land loss owing to permanent coastal erosion. It is also expected to have an indirect effect on fisheries and aquaculture through adverse impacts on habitats, facilities and infrastructure.¹²

15. With a quarter of the world's population estimated to be residing within 100 km distance and 100 m elevation of the coastline, it is projected that losses in land owing to enhanced coastal erosion associated with sea-level rise could lead to the significant displacement of people and loss of life.¹³ The projected number of people affected by sea-level rise ranges greatly; estimates differ on account of the different types of data

⁸ IPCC, Pachauri and others, eds., *Climate Change 2014: Synthesis Report*, pp. 14 and 69; and IPCC, *IPCC Special Report on the Ocean and Cryosphere*.

⁹ Contribution from Barcelona Convention secretariat.

¹⁰ Christopher B. Field and others, eds., *Climate Change 2014: Impacts, Adaptation, and Vulnerability – Part B: Regional Aspects – Working Group II Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (New York, Cambridge University Press, 2014), p. 1624.

¹¹ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; Fields and others, eds., *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, p. 763; Valérie Masson-Delmotte and others, eds., *Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems* (IPCC, 2019), pp. 443 and 514. See also contributions from Singapore and Commonwealth secretariat.

¹² Contribution from Food and Agriculture Organization of the United Nations (FAO).

¹³ IPCC, *IPCC Special Report on the Ocean and Cryosphere*. See also International Organization for Migration (IOM), *IOM Outlook on Migration, Environment and Climate Change* (Geneva, 2014), p. 38; and contribution from Office of the United Nations High Commissioner for Refugees (UNHCR).

used to estimate the number of people who live on land below projected tide increases.¹⁴

16. The inundation of coastal settlements and relevant adaptation strategies could also significantly affect cultural systems and the ways of life of many coastal communities through, for instance, loss of cultural heritage, cultural ties to the coast and unique cultural and spiritual sites, as well as disruptions to sense of place and identity, rights to ancestral lands and cultural practices.¹⁵ According to the Intergovernmental Panel on Climate Change, research is also emerging on the adverse risks of sea-level rise to social values, such as feelings of safety, self-esteem, self-actualization and belongingness.

17. Sea-level rise is projected to negatively affect various economic sectors, including by damaging electrical and telecommunication support facilities and transport infrastructure, and potentially exposing air and sea port infrastructure,¹⁶ as well as their connecting coastal transport networks, to significant damage and disruptions.¹⁷ It is also likely to have significant impacts on a whole range of site-dependent and coastal industries, such as tourism and recreational industries.¹⁸ These impacts could contribute to extensive economic and trade-related losses.¹⁹

18. As indicated in the *Special Report* of the Intergovernmental Panel on Climate Change, sea-level rise and responses may affect States and communities in ways that are not evenly distributed, which can compound vulnerability and inequity. Low-lying islands, coasts and communities are expected, according to the report, to be particularly heavily affected by the direct effects of sea-level rise, as well as by the associated damage and adaptation costs. Small island developing States are expected to face very high impacts, including a higher exposure to the risk of death, injury and disruption to livelihoods, food supplies and drinking water.²⁰ For a number of delta regions, high population densities and the removal of natural vegetation buffers contribute to high exposure rates to incidents such as coastal flooding, erosion and salinization. According to the Intergovernmental Panel on Climate Change, sea-level rise, for instance, increases the risk of saline intrusion, which is already a major problem for traditional agriculture and water quality in deltas, and can trigger land use changes towards brackish or saline aquaculture, such as shrimp or rice-shrimp systems, with impacts on the environment, livelihoods and income stability. In addition, a number of Arctic communities are located on low-lying barrier islands that

¹⁴ For example, in a recent study it was found that approximately 190 million people currently occupy global land below projected high tide lines for 2100 under a low-carbon emissions scenario, while up to 630 million people live on land below projected annual flood levels for 2100 under a high emissions scenario. The estimate of people affected for the low-carbon emissions scenario is three times higher than estimates based on different types of analysis. For more information, see Scott A. Kulp and Benjamin H. Strauss, “New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding”, *Nature Communications*, vol. 10, No. 4844 (2019).

¹⁵ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; see also resolution 74/230, para. 16; and contribution from Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.

¹⁶ See contribution from Bahrain, which estimated that a sea-level rise of 5 m would completely inundate its airport.

¹⁷ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; United Nations Conference on Trade and Development (UNCTAD), *Climate Change Impacts on Coastal Transportation Infrastructure in the Caribbean: Enhancing the Adaptive Capacity of Small Island Developing States (SIDS) – Saint Lucia: A Case Study* (2017); and UNCTAD, *Port Industry Survey on Climate Change Impacts and Adaptation*, UNCTAD Research Paper, No. 18 (2018).

¹⁸ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; UNCTAD, *Climate Change Impacts on Coastal Transportation Infrastructure in the Caribbean*, pp. 38, 97 and 102.

¹⁹ Contribution from UNCTAD.

²⁰ Fields and others, eds., *Climate Change 2014: Impacts, Adaptation, and Vulnerability*.

are highly susceptible to sea-level rise and its associated coastal hazards. Arctic sea-level rise has the potential to substantially contribute to already accelerating permafrost thaw in the Arctic and could, as a result, exacerbate permafrost thaw-induced impacts on overlying urban and rural communication and transportation infrastructure in the Arctic and in high mountain areas.

III. Sustainable development, security, legal, capacity and financial challenges

A. Sustainable development challenges

19. Sea-level rise and related extreme events, such as high tides, storm surges and flooding, and reductions in polar ice have the potential to significantly disrupt efforts to achieve sustainable development in its three dimensions, in particular in low-lying coastal areas, small island developing States and other vulnerable communities, including Arctic communities. In particular, sea-level rise represents for many small island developing States the gravest of threats to their survival, viability and prospects for growth, including, for some, through the loss of territory (see resolution 69/15, paras. 11, 23 and 31). More generally, however, failure to adapt to sea-level rise will, as stated in the *Special Report*, jeopardize the achievement of the Sustainable Development Goals under the 2030 Agenda.

20. The various impacts of sea-level rise directly and adversely affect the implementation of a number of the Goals and their targets. For example, permanent submergence and flooding can put increasing pressure on coastal areas,²¹ which will hamper efforts to make coastal cities and human settlements inclusive, safe, resilient and sustainable (Goal 11). Moreover, coastal erosion and coral degradation may, according to the Intergovernmental Panel on Climate Change, significantly affect policies to promote sustainable tourism (Goals 8, 12 and 14).

21. It is stated in the *Special Report* that coastal flooding and impeded drainage can exacerbate the spread of waterborne diseases, which may upset efforts to end epidemics and substantially reduce the number of deaths and illnesses from water pollution and contamination (Goal 3). It is also likely to test the resilience of coastal infrastructure (Goal 9), such as ports, roads and railways.²² Storm surges, as well as the encroachment of tidal waters into estuaries and river systems, may infringe upon the conservation and sustainable use of marine resources (Goal 14) by bringing land-based pollutants into marine and freshwater systems or by changing the regional distribution of fish stocks.²³

22. The salinization of soils, groundwater and surface water can pose practical challenges to achieving universal and equitable access to safe and affordable drinking

²¹ IPCC, *IPCC Special Report on the Ocean and Cryosphere*. See also contributions from European Union, Gabon, Bahrain, Togo, Morocco, Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States and Barcelona Convention secretariat.

²² Contribution from UNCTAD; UNCTAD, *Port Industry Survey*, pp. 10–11. See also contributions from European Union, Gabon, FAO and Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.

²³ FAO, *FAO's Work on Climate Change: Fisheries and Aquaculture 2019* (Rome, 2019), pp. 14 and 46; contribution from FAO. See also contributions from North Pacific Anadromous Fish Commission and Morocco.

water and adequate and equitable sanitation and hygiene for all (Goal 6).²⁴ Salinization is already affecting agricultural and aquaculture productivity and production in many areas and will cause further problems for the promotion of sustainable agriculture (Goal 2).²⁵ Moreover, the loss and change of coastal ecosystems will adversely affect the ambition to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, halt and reverse land degradation and halt biodiversity loss (Goal 15).²⁶

23. The Intergovernmental Panel on Climate Change states that, cumulatively, the physical impacts of sea-level rise may increase the exposure of the poor and those in vulnerable situations to climate-related extreme events and related economic, social and environmental shocks and disasters (Goal 1), as well as the inequality within and among countries (Goal 10). Moreover, since there is agreement that women face more barriers to adapting to environmental changes than men, sea-level rise is expected to impinge upon efforts to achieve gender equality and to empower women and girls (Goal 5).

24. Finally, in view of the potential indirect effects among interconnected social, governance, economic, ecological and physical systems (see E/2019/68, para. 89), the impacts of sea-level rise could indirectly impede the achievement of other Goals as well.

B. Security challenges

25. Sea-level rise is a threat multiplier that exacerbates challenges related to basic human needs, including water, food, health and livelihoods, with consequential implications for human security.²⁷

26. Displacement resulting from sea-level rise may occur both within States and across borders, as people move away from coastlines towards higher ground within national boundaries and to continental countries.²⁸ Such displacement may be voluntary or forced, and temporary or permanent in nature.²⁹ Displacement has already been shown to contribute to negative effects on housing, economic and health outcomes, transforming initial vulnerabilities into chronic insecurity.³⁰

27. Greater competition for scarce resources may galvanize existing security dilemmas and ignite new ones, especially when combined with increasing population

²⁴ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; United Nations Children's Fund, *Thirsting for a Future: Water and Children in a Changing Climate* (New York, 2017), p. 10. See also contributions from European Union, Bahrain, Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States and Barcelona Convention secretariat.

²⁵ IPCC, *IPCC Special Report on the Ocean and Cryosphere*. See also contributions from European Union, Singapore, Togo and Senegal.

²⁶ IPCC, *IPCC Special Report on the Ocean and Cryosphere*. See also contributions from European Union, Gabon, Bahrain, Indonesia, Senegal, Morocco, Commonwealth secretariat, Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States and Barcelona Convention secretariat.

²⁷ See, generally, IPCC, *IPCC Special Report on the Ocean and Cryosphere*; and resolution 66/290, para. 3 (a). See also contributions from Morocco and European Union.

²⁸ Contributions from UNHCR, Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States and Commonwealth secretariat.

²⁹ Contributions from UNHCR, Commonwealth secretariat, meeting paper entitled "Legal implications of rising sea levels".

³⁰ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; and IOM, *Migration and Climate Change*, IOM Migration and Research Series, No. 31 (Geneva, 2008), p. 34.

density, potentially leading to threats to human security, as well as to international peace and security.³¹

C. International law challenges

28. Several international law instruments, including the United Nations Convention on the Law of the Sea, the United Nations Framework Convention on Climate Change, the Paris Agreement, the Convention on Biological Diversity, other relevant biodiversity, marine pollution and sustainable fisheries instruments and regional instruments, contain provisions relevant to various aspects of sea-level rise and its impacts more generally (see [A/72/70](#), paras. 37–49). Challenges arise in ensuring complementarity and coordination in the implementation of these global and regional frameworks in an effort to implement mutually supportive action and responses to sea-level rise and more generally to achieve the Sustainable Development Goals.³²

29. Sea-level rise may infringe upon the land territory of coastal States, including island States, contributing to their reduction in size or, in extreme cases, to their disappearance altogether (*ibid.*, para. 54). This may have implications with regard to several areas of international law, including the law of the sea, statehood and protection of persons (see [A/73/10](#), annex B, para. 12), matters that are currently under consideration by the International Law Commission (see [A/73/10](#), annex B).

30. The Convention contains provisions on the establishment of maritime zones over which coastal States may exercise sovereignty, sovereign rights or jurisdiction,³³ the baselines from which those maritime zones are measured, with the normal baseline being the low-water line along the coast as marked on large-scale charts officially recognized by the coastal State,³⁴ and on the delimitation of maritime boundaries.³⁵ Coastal States are required to give due publicity to, and deposit with the Secretary-General, charts or lists of geographical coordinates of points concerning certain baselines and the outer limits of maritime zones,³⁶ as well as lines of delimitation.³⁷ However, these lines and limits, as well as associated deposits of such information, may reflect the configuration of a coastline prior to sea-level rise (see [A/72/70](#), para. 54).

31. Neither the Convention nor customary international law addresses the impact on baselines or maritime limits of loss of land territory resulting from sea-level rise. The Convention contains no provisions dealing with variations in coastal geography, except for providing that straight baselines on highly unstable coastlines should remain effective until changed by the coastal States (see [A/72/70](#), para. 54).³⁸ Shifting of the low-water line landward and variations of other features used to draw baselines could affect the area over which States have maritime entitlements, as well as the

³¹ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; IOM, *Migration and Climate Change*, p. 33; and contribution from Gabon. See also António Guterres, Secretary-General of the United Nations, remarks at the Pacific Islands Forum, 14 May 2019.

³² Contribution from United Nations Framework Convention on Climate Change secretariat.

³³ United Nations Convention on the Law of the Sea, arts. 3, 33, 57 and 76.

³⁴ *Ibid.*, art. 5. See also arts. 6, 7, 9, 10, 11, 13 and 47; Commonwealth secretariat, “Legal implications of rising sea levels”.

³⁵ United Nations Convention on the Law of the Sea, arts. 15, 74 and 83.

³⁶ *Ibid.*, arts. 16, 75 and 84. The obligation concerning due publicity and depositing also relates to archipelagic baselines, see art. 47 (8)–(9).

³⁷ United Nations Convention on the Law of the Sea, arts. 16, 75 and 84.

³⁸ *Ibid.*, art. 7 (2).

basis on which existing maritime boundaries were delimited.³⁹ This has potential consequences for coastal States' sovereign rights and jurisdiction in those areas, including sovereign rights to explore, exploit and conserve living and non-living resources, as well as on the rights and freedoms of other States therein (see A/73/10, annex B, para. 15). In that regard, there has been some practice by States in the Pacific region aimed at establishing permanent baselines.⁴⁰

32. The hypothetical scenario in which a State's territory is completely covered by the sea or becomes uninhabitable because of sea-level rise raises legal questions regarding the continuity or potential loss of statehood, whether States could retain maritime entitlements and what actions may be taken by such States to preserve territory and statehood (see A/73/10, annex B, para. 16).⁴¹

33. In terms of the protection of persons, sea-level rise is anticipated, through the submergence of territory, to make certain areas uninhabitable (see A/73/10, annex B, para. 3)⁴² and to result in widespread forced displacement or relocation.⁴³ These consequences raise legal questions regarding assistance for populations in situ, the relocation and migration of displaced persons, the application of human rights protections to affected populations and, in the potential case of loss of statehood, the need to avoid statelessness (see A/73/10, annex B, para. 17; and CCPR/C/127/D/2728/2016). International refugee law may also be relevant where displaced persons engage the requirements for international legal protection.⁴⁴

D. Capacity and financial challenges

34. Sea-level rise presents unique capacity challenges. Low-lying communities, such as those in coral reef environments, urban atoll islands and deltas, including in small island developing States and the least developed countries, as well as Arctic communities, are particularly vulnerable to the consequences of sea-level rise, yet often have the lowest capacity to adapt.⁴⁵ Rural and poorer areas in particular may lack the resources and expertise for effective coastal protection,⁴⁶ with barriers to adaptation including a lack of human resources, technical expertise, technology, research and governance.⁴⁷ As stated in the *Special Report* of the Intergovernmental Panel on Climate Change, sea levels continue to rise, economic, financial and social

³⁹ See A/73/10, annex B, para. 15; Davor Vidas, David Freestone and Jane McAdam, eds., *International Law and Sea Level Rise: Report of the International Law Association Committee on International Law and Sea Level Rise* (Brill, 2018), pp. 16–18, 20 and 33–41 (International Law Association report); contributions from Commonwealth secretariat, “Legal implications of rising sea levels”, Indonesia, Gabon and Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.

⁴⁰ Contributions from Commonwealth secretariat, “Legal implications of rising sea levels”, and International Law Association report, pp. 2–30.

⁴¹ International Law Association report, pp. 18 and 41–42; and contribution from Commonwealth secretariat, “Legal implications of rising sea levels”.

⁴² Contribution from UNHCR.

⁴³ Contributions from UNHCR, Indonesia and Commonwealth secretariat, “Legal implications of rising sea levels”.

⁴⁴ Contribution from UNHCR. See also CCPR/C/127/D/2728/2016; and contribution from Commonwealth secretariat, “Legal implications of rising sea levels”.

⁴⁵ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; contributions from UNCTAD and Commonwealth secretariat.

⁴⁶ IPCC, *IPCC Special Report on the Ocean and Cryosphere*, pp. 27, 31, and 376–377.

⁴⁷ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; Pachauri and others, eds., *Climate Change 2014: Synthesis Report*, p. 19. See also contribution from United Nations Framework Convention on Climate Change secretariat.

limits to adaptation, rather than technical limits, may pose the greatest challenges to coastal protection.

35. Moreover, longer temporal scales of climate change impacts, including sea-level rise, and the uncertainty of their consequences, challenge the ability of societies to adequately prepare for, and respond to, long-term changes, including shifts in the frequency and intensity of extreme events. The complexity and pace of sea-level rise, according to the *Special Report*, may exceed the capacities of local governments and communities to adequately understand and respond to its impacts, requiring increased coordination across administrative boundaries and sectors.

36. Differences in capacity to respond or adapt to sea-level rise between societal groups may exacerbate social vulnerabilities and inequalities. Similarly, according to the Intergovernmental Panel on Climate Change, disagreements about policy priorities, including trade-offs between public and private interests, short-term and long-term concerns and security and conservation goals, are likely to contribute to social conflict that may place stress on the institutional and legal capacities of communities to respond to them.

37. The relative costs and benefits of coastal adaptation are also distributed unevenly across countries and regions. By some estimates, the annual costs of protecting existing development and infrastructure from a 1 m rise in sea levels could reach 20 per cent of the total gross national product for some countries.⁴⁸ The increased costs of reconstruction, rehabilitation and maintenance, as well as costs associated with adaptation, could be debilitating for many small island and low-lying developing States.⁴⁹

38. A major challenge results from the limited financial assistance available for small island developing States and the least developed countries to build their capacities to understand the impacts of sea-level rise and develop response measures, including adaptation plans.⁵⁰ Improving access to sufficient and affordable climate finance and strengthening innovative financing instruments and mechanisms, long-term climate finance, blended finance approaches and microfinancing is a challenge that must be met to assist those States in building resilience.⁵¹

IV. Opportunities in responding to identified challenges, including through cooperation and coordination at all levels

39. Problems of ocean space, including sea-level rise, are closely interrelated and need to be considered as a whole, through integrated, interdisciplinary and intersectoral approaches.⁵²

40. With many stakeholders, organizations and bodies addressing aspects of sea-level rise, opportunities exist for effective cooperation, collaboration and coordination, including through partnerships and synergies among existing initiatives.

⁴⁸ IPCC, *IPCC Special Report on the Ocean and Cryosphere*; Fields and others, eds., *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, pp. 16 and 68.

⁴⁹ UNCTAD, *Port Industry Survey*, p. 82.

⁵⁰ Contribution from Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.

⁵¹ Contributions from the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States and United Nations Framework Convention on Climate Change secretariat.

⁵² Resolution 74/19, preamble; A/74/350, para. 89. See also United Nations Convention on the Law of the Sea, preamble.

A. Legal, policy and management frameworks

41. The impacts of sea-level rise necessitate effective and integrated legal and policy frameworks underpinning the implementation of adequate mitigation, resilience-building and adaptation responses.⁵³ Issues of climate change, including sea-level rise, must be mainstreamed into efforts aimed at conserving and sustainably using the oceans, seas and marine resources at all levels (national, regional and global) and vice versa.⁵⁴ Complementarity and coordination of work under relevant global and regional instruments and frameworks is increasingly being addressed, including under the United Nations Convention on the Law of the Sea, the United Nations Framework Convention on Climate Change, the Paris Agreement, the 2030 Agenda, the Convention on Biological Diversity and other relevant biodiversity instruments, relevant instruments addressing sustainable fisheries and the various regional seas conventions and action plans.⁵⁵ UN-Oceans has and will continue to support the work of States in that regard.

42. The General Assembly, as the global body with a comprehensive, cross-sectoral overview of oceans and the law of the sea (see [A/74/70](#), para. 79), is playing an important role through its establishment and oversight of various processes and opportunities for discussion. These include the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects (resolution [57/141](#), para. 45), which is aimed at enhancing the scientific basis for policymaking,⁵⁶ and has considered questions of climate change, including sea-level rise;⁵⁷ the International Law Commission (resolution 174(II)), which is currently considering the legal implications of sea-level rise in various fields of international law; the 2017 and 2020 United Nations Conferences to Support the Implementation of Sustainable Development Goal 14 to support the conservation and sustainable use of the oceans, seas and marine resources, including consideration of climate change-related issues (see para. 44; see resolutions [70/226](#) and [73/292](#)); the United Nations Decade of Ocean Science for Sustainable Development to stimulate cooperation in ocean science, including in the context of climate change (see para. 50); and the twenty-first meeting of the Informal Consultative Process (resolution [54/33](#), para. 2).

43. Under the Paris Agreement, the process of preparing, communicating, maintaining and adjusting nationally determined contributions provides parties with an opportunity to highlight challenges, including in relation to sea-level rise, and to identify response plans, including through cooperative approaches. The national adaptation plan process similarly allows parties to identify adaptation needs, develop and implement strategies to address those needs and achieve coherence in their actions to implement the Paris Agreement and other global, regional and national frameworks related to oceans and seas.⁵⁸

44. Recognizing the importance of linking issues of climate change, including sea-level rise, and the ocean,⁵⁹ the twenty-fifth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Madrid from 2 to 13 December 2019, highlighted the importance of the ocean as an integral part

⁵³ See contributions from UNCTAD, Barcelona Convention secretariat and United Nations Framework Convention on Climate Change secretariat.

⁵⁴ Contribution from United Nations Framework Convention on Climate Change secretariat.

⁵⁵ See also *ibid.*

⁵⁶ See https://www.un.org/depts/los/global_reporting/Background_to_the_Regular_Process.pdf.

⁵⁷ See Group of Experts of the Regular Process, *The First Global Integrated Marine Assessment: World Ocean Assessment I* (2016), pp. 16 and 18.

⁵⁸ Contribution from United Nations Framework Convention on Climate Change secretariat.

⁵⁹ *Ibid.*

of the Earth's climate system and of ensuring the integrity of ocean and coastal ecosystems in the context of climate change. As a result, a dialogue on the ocean and climate change will be held at the fifty-second session of the Subsidiary Body for Scientific and Technological Advice in June 2020 to consider how to strengthen mitigation and adaptation action in this context.⁶⁰

45. The 2030 Agenda, and the Sustainable Development Goals thereunder, reflect a global policy commitment to strengthen resilience and adaptive capacity to climate-related hazards, including sea-level rise (see target 13.1). The 2020 United Nations Conference to Support the Implementation of Sustainable Development Goal 14 will provide an opportunity to address the integration of climate change impacts into discussions on the implementation of Goal 14, with one of the interactive dialogues focusing on the theme "Minimizing and addressing ocean acidification, deoxygenation and ocean warming" and another on the theme "Leveraging interlinkages between Goal 14 and other Goals towards the implementation of the 2030 Agenda".

46. Through various multilateral processes, such as the Programme of Action for the Sustainable Development of Small Island Developing States (1994), the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (2005) and the SIDS Accelerated Modalities of Action (SAMOA) Pathway (2014), States have reiterated that sea-level rise poses significant threats to small island developing States and have laid out programmes of international, regional and national action and measures, including to enhance their resilience and adaptive capacity.⁶¹ The high-level meeting to review progress made in addressing the priorities of such States through the implementation of the SAMOA Pathway, held in 2019, resulted in, inter alia, a call for urgent action to address the adverse impacts of climate change, including those related to sea-level rise and extreme weather events (General Assembly resolution 74/3, para. 30 (u)).

47. According to the Intergovernmental Panel on Climate Change, intensifying cooperation and coordination among institutional frameworks across regions, jurisdictions, sectors, policy domains and planning horizons can enable effective responses to sea-level rise. At the regional level, actions have been taken to create coastal buffer zones and introduce integrated coastal zone management and marine spatial planning as responses to current challenges,⁶² as well as to integrate vulnerabilities into the environmental impact assessment process.⁶³ Regional mechanisms have been created with the mandate to cooperate to address the negative impacts of climate change, including sea-level rise,⁶⁴ as well as research projects into climate change impacts.⁶⁵

48. In other forums, the Commonwealth Blue Charter, adopted by Commonwealth leaders in 2018, allows members to work together to translate high-level commitments into on-the-water actions to collectively increase action towards achieving Goal 14,⁶⁶ while the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States has provided support for the Alliance of Small Island States in

⁶⁰ Ibid.

⁶¹ Contribution from Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States; [A/CONF.167/9](#), pp. 10–13; [A/CONF.207/11](#), paras. 16–20; and resolution [69/15](#), paras. 31–46.

⁶² Contributions from Barcelona Convention secretariat and China.

⁶³ Contribution from UNCTAD.

⁶⁴ Contribution from Indonesia.

⁶⁵ Contribution from European Union.

⁶⁶ Contribution from Commonwealth secretariat.

advocating and raising awareness regarding the need to address climate change and sea-level rise.⁶⁷

49. At the national level, various projects address the impacts of sea-level rise and possible adaptation responses.⁶⁸ Recognition has been given to the need to strengthen cooperation and coordination between government agencies, policy areas and planning levels,⁶⁹ including to implement international commitments at the local level.⁷⁰ In that regard, national bodies and strategies have been set up to respond to sea-level rise.⁷¹

B. Scientific, technical and technological measures

50. To address rising sea levels, States need to adopt, adapt and implement a range of mitigation and adaptation responses based on the best available science, as well as technical and technological solutions. This will entail enhancing domestic capacities and improving access to finance and technology, taking into account national and local circumstances and needs.⁷²

51. In that regard, in 2017, the General Assembly proclaimed the United Nations Decade of Ocean Science for Sustainable Development (2021–2030) and mandated the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization to prepare an implementation plan in consultation with Member States, United Nations partners and other relevant stakeholders (resolution [72/73](#), para. 292). The preliminary objectives of the Decade are, inter alia, to stimulate international cooperation regarding marine science requirements needed to support implementation of the 2030 Agenda and to share knowledge and enhance interdisciplinary marine research capacities, contributing to benefits for all Member States, in particular small island developing States and the least developed countries.⁷³ The Decade provides an opportunity to address gaps, design innovative strategies and partnerships and strengthen the science-policy interface, including in relation to ocean science and observation in the context of climate change.⁷⁴

52. The Intergovernmental Oceanographic Commission, through its Global Sea Level Observing System programme, has developed a global network of tide gauges to serve the needs of client scientists and geodesists, with the programme also supporting, inter alia, satellite altimetry.⁷⁵ The programme is a component of the Global Ocean Observing System, which itself falls under the Global Climate Observing System co-sponsored by the Commission, the World Meteorological

⁶⁷ Contribution from Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.

⁶⁸ See contributions from Bahrain, European Union, Togo, Singapore, Morocco and Senegal.

⁶⁹ Contribution from China.

⁷⁰ Contribution from Barcelona Convention secretariat.

⁷¹ See contributions from UNCTAD, United Nations Framework Convention on Climate Change secretariat, European Union, Singapore, Gabon, Togo and Bahrain.

⁷² Masson-Delmotte and others, eds., *Global Warming of 1.5°C*, p. 23; contributions from China, Togo, Indonesia and Gabon.

⁷³ Intergovernmental Oceanographic Commission-United Nations Educational, Scientific and Cultural Organization (UNESCO) resolution XXIX-1.

⁷⁴ Contributions from Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States and Barcelona Convention secretariat. See also [A/74/119](#).

⁷⁵ Contributions from Intergovernmental Oceanographic Commission-United Nations Educational, Scientific and Cultural Organization (UNESCO); United Nations Framework Convention on Climate Change secretariat and WMO. See generally, on tide gauges, IPCC, *IPCC Special Report on the Ocean and Cryosphere*.

Organization (WMO), the United Nations Environment Programme and the International Science Council and is used to support observations that underpin climate services and adaptation measures, including in relation to sea-level rise.⁷⁶

53. WMO maintains the Global Cryosphere Watch, which provides inputs for estimating projected rates of sea-level rise and resulting impacts. Through its Coastal Inundation Forecasting Demonstration Project, WMO has also, since 2013, facilitated the development of early warning systems to protect against coastal inundation. In addition, WMO and the Intergovernmental Oceanographic Commission have, through the Joint Technical Commission for Oceanography and Marine Meteorology and its Observations Programme Support Centre, combined their expertise and technological capabilities to monitor, coordinate and integrate global marine meteorological and oceanographic observations. WMO engages in additional research activities relevant to sea-level rise under the World Climate Research Programme, including through the research effort known as the grand challenge on regional sea-level change and coastal impacts. In 2019, it engaged in a joint symposium with the International Maritime Organization, which identified, among other issues, the need for further information concerning the impacts of weather on infrastructure and vessels at berth in relation to ports and harbours, especially in the face of a changing climate with rising sea levels.⁷⁷

54. The International Atomic Energy Agency has the technical expertise and instrumentation to measure naturally occurring radioisotopes, which can contribute to assessments of sea-level rise and its impacts by measuring the exchange of fresh water and seawater, as well as establishing sea-level rise baselines from which associated coastal vulnerability projections can be drawn.⁷⁸

55. United Nations Framework Convention on Climate Change processes are supported with research and systematic observation by its Subsidiary Body for Scientific and Technological Advice, which uses the Global Climate Observing System as the basis for collecting long-term data sets. The Convention's secretariat also promotes cooperation through regular research dialogues and through its Nairobi work programme on impacts, vulnerability and adaptation to climate change.⁷⁹ The Warsaw International Mechanism for Loss and Damage Associated with Climate Change Impacts assists countries in implementing approaches to avert, minimize and address the risks associated with sea-level rise, including by encouraging coordination among relevant stakeholders.⁸⁰ In the past year, the Executive Committee of the Mechanism and the Technology Executive Committee of the Convention collaborated on an expert dialogue on technologies for averting, minimizing and addressing loss and damage in coastal zones.⁸¹

C. Financial measures

56. States, in particular small island developing States, the least developed countries and other developing States, face many barriers to adapting to the effects of sea-level rise, among them financial challenges (see paras. 34–38).

57. However, there are a number of existing opportunities to access international financing. At the global level, pursuant to the Paris Agreement, developed country

⁷⁶ Contribution from WMO.

⁷⁷ Ibid.

⁷⁸ Contribution from International Atomic Energy Agency.

⁷⁹ Contribution from United Nations Framework Convention on Climate Change secretariat.

⁸⁰ Ibid.; and Conference of the Parties to the United Nations Framework Convention on Climate Change decision 2/CP.19.

⁸¹ Contribution from United Nations Framework Convention on Climate Change secretariat.

parties are required to provide financial resources to assist developing country parties.⁸² At the twenty-fifth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, parties invited the Green Climate Fund to continue to provide financial resources for activities relevant to averting, minimizing and addressing loss and damage in developing country parties, with a view to enabling them to have better access to finance the implementation of relevant approaches taking into account the strategic workstreams of the Warsaw International Mechanism, one of which is slow-onset events.⁸³

58. Funds established under the United Nations Framework Convention on Climate Change, including the Green Climate Fund and the Adaptation Fund, support a wide range of mitigation and adaptation projects, including those related to sea-level rise.⁸⁴ The Food and Agriculture Organization of the United Nations (FAO) supports several adaptation projects financed through such funds and provides direct assistance to States through its Technical Cooperation Programme and projects funded from the regular programme.⁸⁵ Other funds may, for instance, be available through the World Bank Group,⁸⁶ multi-stakeholder collaborations and national agencies.⁸⁷ The Commonwealth Climate Finance Access Hub helps small and other climate-vulnerable States in the Commonwealth to have access to international climate finance funds, enabling them to integrate climate change concerns into national institutional architecture and enact and implement environmental laws.⁸⁸

59. Opportunities to channel private finance for climate change mitigation and adaptation, in line with the objectives of the Paris Agreement, are also increasingly recognized.⁸⁹ For example, at the Climate Action Summit, Governments and the private sector made encouraging pledges to decarbonize investment portfolios and systematically include environmental impacts in investment decision-making.⁹⁰ More generally, consideration should be given to generating innovative and sustainable financial flows and value chains, including through collective organizations and citizen-led innovations in the sustainable agriculture, aquaculture, fisheries and ecotourism sectors, creating jobs and diversifying the economy.⁹¹

D. Capacity-building

60. The magnitude of sea-level rise is dependent on future greenhouse gas emissions.⁹² As a result, the Intergovernmental Panel on Climate Change states that an immediate and ambitious reduction in greenhouse gas emissions is necessary to

⁸² Paris Agreement, art. 9. See also United Nations Framework Convention on Climate Change, art. 4 (3).

⁸³ Contribution from United Nations Framework Convention on Climate Change secretariat.

⁸⁴ See <https://unfccc.int/topics/climate-finance/the-big-picture/introduction-to-climate-finance>; <https://unfccc.int/Adaptation-Fund>; www.greenclimate.fund/. See also contribution from Morocco.

⁸⁵ Contribution from FAO.

⁸⁶ See <https://www.worldbank.org/en/topic/climatefinance#2>.

⁸⁷ See contribution from European Union.

⁸⁸ Contribution from Commonwealth secretariat.

⁸⁹ Ottmar Edenhofer and others, eds., *Climate Change 2014: Mitigation of Climate Change – Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (New York, Cambridge University Press, 2014), pp. 1214–1215 and 1223–1236; United Nations Framework Convention on Climate Change, *FCCC/TP/2008/7*, pp. 5–6, 61–68 and 104–107; and United Nations Environment Programme, *The Adaptation Gap Report* (Nairobi, 2018), pp. 24–27.

⁹⁰ United Nations, “Report of the Secretary-General on the 2019 Climate Action Summit and the way forward in 2020” (11 December 2019), p. 6.

⁹¹ Contributions from Barcelona Convention secretariat and Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.

⁹² Pachauri and others, eds., *Climate Change 2014: Synthesis Report*, p. 16.

contain the rate and magnitude of sea-level rise and, consequently, adaptation prospects. In that regard, strengthening the capacities for climate action of national and subnational authorities, civil society, the private sector, indigenous peoples and local communities can support the implementation of ambitious mitigation actions.⁹³ Enhanced support for adaptation is also urgently required to build resilience to sea-level rise.⁹⁴ The General Assembly has called for enhanced efforts to address the challenges of sea-level rise and emphasized the need for building the capacity of States to benefit from the sustainable development of the oceans and seas (resolution 74/19, paras. 11 and 202).

61. Recognition is being given to the importance of improving knowledge of sea-level rise and adaption responses,⁹⁵ with investments in education and capacity-building at various levels and scales facilitating social learning and long-term capability for context-specific responses to reduce risk and enhance resilience.⁹⁶

62. A number of capacity-building initiatives have been taken at the global, regional and national levels with the objective of assisting developing States in designing and implementing responses to sea-level rise.

63. For example, the United Nations Framework Convention on Climate Change secretariat established the Paris Committee on Capacity-building in 2015 to identify and address capacity gaps, needs and potential solutions, including enhancing the coherence and coordination of climate change-related capacity-building efforts. The Committee fosters collaboration at all levels and, through its platform for capacity-building guidance and its communication tools, facilitates access to information and knowledge for enhancing climate action in developing countries and for measuring progress on capacity-building. The Convention secretariat also facilitated the sharing of best practices in legislation, including that addressing sea-level rise, while the Santiago Network for Averting, Minimizing and Addressing Loss and Damage is to be launched in 2020 to facilitate the provision of technical assistance to developing countries, including in addressing loss and damage through sea-level rise.⁹⁷

64. The law and climate change toolkit, currently under development through a partnership involving the United Nations Framework Convention on Climate Change secretariat, the United Nations Environment Programme, the Commonwealth secretariat and partner countries, organizations and research institutions, is an online database aimed at assisting countries with the legal frameworks necessary for effective implementation of the Paris Agreement and nationally determined contributions. The Commonwealth secretariat's ocean governance and natural resources programme assists member countries in the management of ocean resources, including in the development of legal and regulatory frameworks, such as ocean policies and strategies, and with regard to maritime boundaries.⁹⁸

65. FAO initiatives include its climate-smart agriculture programme, climate action for sustainable development initiative and water scarcity and management programme, as well as a range of country-specific programmes to promote the economic empowerment of rural women and enhance climate change resilience, many in line with proposed actions under the Paris Committee on Capacity-Building and the gender action plan of the United Nations Framework Convention on Climate Change. FAO has also developed an adaptation toolbox to identify adaptation

⁹³ Masson-Delmotte and others, eds., *Global Warming of 1.5°C*, p. 23.

⁹⁴ Contribution from United Nations Framework Convention on Climate Change secretariat.

⁹⁵ See contribution from China.

⁹⁶ IPCC, *IPCC Special Report on the Ocean and Cryosphere*.

⁹⁷ Contribution from United Nations Framework Convention on Climate Change secretariat.

⁹⁸ Contribution from Commonwealth secretariat.

responses and supports the implementation of such responses, together with partners, at the global, regional and country levels.⁹⁹

66. The United Nations High Commissioner for Refugees provides technical advice to support States in planned relocation due to sea-level rise, as well as with the protection and assistance needs of displaced persons. It has, with partners, developed guidelines on planned relocation and a toolbox for States. It is also, inter alia, a member of the Task Force on Displacement of the United Nations Framework Convention on Climate Change, which has developed recommendations to avert, minimize and address disaster displacement.¹⁰⁰

67. The United Nations Conference on Trade and Development recently published a compilation of policies and practices of relevance to sea-level rise and adaptation for coastal transport infrastructure¹⁰¹ to assist in the development of effective adaptation policies and response measures.¹⁰² Other standards and policies include International Organization for Standardization (ISO) standard 14090 (adaptation to climate change: principles, requirements and guidelines, 2019), which provides a framework to enable organizations to prioritize and develop effective, efficient and deliverable adaptation tailored to the specific climate change challenges that they face, including sea-level rise.¹⁰³

68. The Division for Ocean Affairs and the Law of the Sea provides information, advice and assistance to States, intergovernmental organizations and other stakeholders on the uniform and consistent application of the United Nations Convention on the Law of the Sea and related instruments. The various capacity-building programmes implemented by the Division, including the United Nations-Nippon Foundation and Hamilton Shirley Amerasinghe fellowship programmes, assist States in developing their capacity, in particular human capacity, to establish or enhance integrated and cross-sectoral ocean governance frameworks, such as by raising awareness of the need for coordinated action in addressing ocean and climate challenges, including those related to sea-level rise.

V. Conclusions

69. Sea-level rise is a global challenge affecting a significant portion of the international community, with potential consequences for both present and future generations. In view of the long timescale on which this physical process operates and its relationship with anthropogenic climate change, sea-level rise and its impacts are projected to continue beyond 2100, at a scale proportional to various greenhouse gas emission scenarios.

70. As a threat multiplier, sea level rise is projected, in combination with other climate-related ocean changes, extreme events and adverse effects from human activities on ocean and land, to have significant environmental, economic and social ramifications. In particular, it is projected to cause the displacement of coastal communities within and across countries, exacerbate existing vulnerabilities regarding water, food, health and livelihoods and potentially fuel social and international conflict. Low-lying communities, including those in coral reef environments, urban atoll islands and deltas, and Arctic communities, as well as small

⁹⁹ Contribution from FAO.

¹⁰⁰ Contribution from UNHCR.

¹⁰¹ *Climate Change Impacts and Adaptation for Coastal Transport Infrastructure: A Compilation of Policies and Practices* (United Nations publication, Sales No. E.20.II.D.10).

¹⁰² Contribution from UNCTAD.

¹⁰³ Ibid.

island developing States and the least developed countries, are particularly vulnerable, with some facing threats to their very survival.

71. These impacts will, directly or indirectly, impede the timely and effective achievement of all the Sustainable Development Goals. They are also projected to pose significant challenges for security and the stability of international legal frameworks, as well as in terms of the capacity of communities, in particular the most vulnerable, to adapt.

72. Current frameworks and processes do, however, provide opportunities for concerted and coordinated action to minimize the projected impacts of sea-level rise.

73. An effective response to sea-level rise requires the planning and implementation of successful legal, policy and management responses at the regional, national and local levels. With ambitious emissions reductions and extensive adaptation initiatives deemed essential,¹⁰⁴ the international climate change regime reflected in the United Nations Framework Convention on Climate Change and the Paris Agreement offers significant opportunities for States to act in a coordinated fashion to tackle this global challenge.

74. Charting climate-resilient development pathways depends on how well such measures can be combined with other sustainable development efforts, including by taking account of synergies between the Goals.¹⁰⁵ It is essential not only to mainstream climate change considerations into ocean-related processes and vice versa, but also to ensure that actions taken under these processes are mutually supportive and effectively address coordinated goals. The 2020 United Nations Conference to Support the Implementation of Sustainable Development Goal 14 and other oceans processes led by the General Assembly provide an opportunity to address these issues on a global scale. In addition, lessons may be learned from activities already under way to address policy solutions in an integrated fashion across various governance levels, with a view to enhancing coordination in the implementation of relevant and mutually reinforcing legal and policy instruments.

75. Additional integrated research, observation and assessments, including through the use of multiple sources of data to inform real-time and projected information, are necessary to better understand the impacts of sea-level rise. Assessments of technical solutions, responses and capacity limitations must be addressed through scientific, technical and technological cooperation and collaboration. The United Nations Decade of Ocean Science for Sustainable Development (2021–2030) will provide many opportunities to that end.

76. As communities in low-lying areas, in particular small island developing States and the least developed countries, face significant capacity challenges in responding to the impacts of sea-level rise, cooperation across relevant capacity-building programmes needs to be enhanced to ensure that those programmes are implemented and strengthened in mutually supportive and coordinated ways. This includes ensuring access to sustained funding to support ocean-related activities. Opportunities to use capacity-building and funding mechanisms, including climate finance, to promote both the sustainable development of oceans and seas and ocean-based adaptation and mitigation objectives should be further explored.

¹⁰⁴ IPCC, *IPCC Special Report on the Ocean and Cryosphere*.

¹⁰⁵ *Ibid.*; and [E/2019/68](#), para. 84.