Seventy-first session
Item 73 (a) of the preliminary list*
Oceans and the law of the sea

Oceans and the law of the sea

Report of the Secretary-General

Summary

The present report has been prepared pursuant to paragraph 324 of General Assembly resolution 70/235 of 23 December 2015, with a view to facilitating discussions on the topic of focus at the seventeenth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, on the theme entitled "marine debris, plastics and microplastics". It constitutes the first part of the report of the Secretary-General on developments and issues relating to ocean affairs and the law of the sea for consideration by the Assembly at its seventy-first session. The report is also being submitted to the States parties to the United Nations Convention on the Law of the Sea, pursuant to article 319 of the Convention.

In the light of the multifaceted nature of the topic and the page limitations established by the General Assembly, the report does not purport to provide an exhaustive synthesis of available information. It builds on the information reported in 2005 by the Secretary-General on marine debris and takes into account the contributions received from States and intergovernmental organizations.

* A/71/50.

Contents

I. Introduction

1. Marine debris, including plastics and microplastics (MDPMs), is considered "a global concern affecting all the oceans of the world."[1] It has been observed everywhere:[2] from coastal areas to remote areas far from any anthropogenic pollution sources; from surface waters throughout the water column to the deep water and ocean sediments; and from the equator to the poles, including trapped in sea-ice.[3]

2. In 2004 the General Assembly of the United Nations addressed the issue of "marine debris" by selecting it as one of the topics of focus for the sixth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (Informal Consultative Process) in 2005.[4] Since then, the issue of marine debris, or marine litter as it is also referred to, has been addressed annually by the General Assembly in its resolutions on oceans and the law of the sea, and on sustainable fisheries, with an emphasis on the role of plastics[5] added from 2012 onwards to mirror the approach taken in the "The future we want",[6] the outcome document of the United Nations Conference on Sustainable Development, held in Rio de Janeiro, Brazil, in 2012 (Rio+20).

3. In the intervening years, however, marine debris has not only increased exponentially, but has also become characterized by the growing presence, and now prevalence, of non-organic and non bio-degradable components, in particular plastics. An estimated minimum of 5.25 trillion plastic particles weighing 268,940 tons are currently floating in the world's oceans.[7] These figures do not include plastics accumulating on beaches or the sea floor, trapped in sea ice or ingested by organisms, all of which may partly explain the tremendous loss of microplastics observed from the sea surface compared to expected rates of fragmentation.[8] Moreover, the amount of such plastics in the marine environment is expected to further increase in view of their durability and resistance to natural biodegradation, as well as the continuously growing global plastics production, also as a result of the emergence of new markets. While marine debris in general continues to present a considerable challenge, plastics and microplastics have gained prominence,[9] and increased attention from the scientific community has brought to the fore the real scale of their environmental, social and economic impacts. According to some estimates, by 2050 plastics in the ocean will outweigh fish.[10]

---

[1] UNEP (2009). *Marine Litter: A Global Challenge*, p. 5.

[2] UNEP (2003). *Marine Litter - Trash That Kill* - www.unep.org/regionaLseas/marinelitter/publications/docs/trash_that_kills.pdf.

[3] Galgani, F., et al., "Global Distribution, Composition and Abundance of Marine Litter. In Bergmann M., et al. (eds.), *Marine Anthropogenic Litter* 2015, pp. 29-56 - http://link.springer.com/book/10.1007%2F978-3-319-16510-3.

[4] A/RES/59/24, para. 92 b.

[5] A/RES/67/78, para. 142.

[6] A/RES/66/288, para. 163.

[7] Eriksen et al. (2014). "Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea". *PLoS ONE* 9(12): e111913. doi:10.1371/journal.pone.0111913.

[8] Ibid.

[9] The First Global Integrated Marine Assessment - World Ocean Assessment I (2016) (WOA): *Chapter 25 – Marine Debris*, available at www.un.org/depts/los/global_reporting/WOA_RPROC/Chapter_25.pdf, estimates plastics to represent between 60 and 80 per cent of the total marine debris. See p. 12.

[10] World Economic Forum (2016), note 9.

4. Despite the acknowledged gaps in the understanding of the problem posed by MDPMs, it has become clear that immediate and resolute action is necessary, as also recognized most recently in the commitment to take action by 2025 reflected in Goal 14 of the 2030 Agenda for Sustainable Development.[11] One of the central means to realize this and other commitments remains the effective implementation of the United Nations Convention on the Law of the Sea (UNCLOS), underscored in Goal 14. UNCLOS provides the legal framework within which all activities in the oceans and seas must be carried out and is, in turn, complemented by many other legal instruments the effective implementation of which is also critical in addressing MDPMs.

5. Against that background, the Informal Consultative Process has been mandated by the General Assembly to address the theme of "marine debris, plastics and microplastics" at its seventeenth meeting (13-17 June 2016).[12] In order to facilitate the discussions on the topic of focus of the seventeenth meeting of the Informal Consultative Process, the present report builds on the overview of the issue of marine debris prepared by the Secretary-General in advance of the sixth meeting of the Informal Consultative Process,[13] and the extensive range of reports and scientific, technical and policy studies on this matter which have been published since then, including in the context of the recent First Global Integrated Marine Assessment.[9]

6. To that end, the present report complements the above-mentioned reports and literature, by focusing on the actions undertaken by governments and international organizations to implement the relevant provisions contained in the resolutions of the General Assembly, as well as on further action necessary to prevent and significantly reduce MDPMs. For that purpose, the Secretary-General invited governments and relevant organizations and bodies to submit contributions for this report. The Secretary-General wishes to express his appreciation for the contributions submitted by the Governments of Australia, New Zealand, Peru, Principality of Monaco, Republic of the Congo, Viet Nam and by the European Union, which included separate contributions from Belgium, France, Germany and Sweden. The Secretary-General also wishes to express his appreciation for the contributions submitted by the secretariats of the following intergovernmental organizations: Baltic Marine Environment Protection Commission (Helsinki Commission); Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR); Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR); Convention on Biological Diversity (CBD); Convention on the Conservation of Migratory Species of Wild Animals (CMS); Food and Agriculture Organization of the United Nations (FAO); Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC); International Atomic Energy Agency (IAEA); International Maritime Organization (IMO); International Whaling Commission (IWC); North Atlantic Salmon Conservation Organization; North East Atlantic Fisheries Commission (NEAFC); Northwest Atlantic Fisheries Organization (NAFO); North Pacific Anadromous Fish Commission (NPAFC); Pacific Community; Pacific Islands Forum; Pacific Regional Environment Programme (SPREP); South East Atlantic Fisheries Organisation (SEAFO); Western and Central Pacific Fisheries Commission (WCPFC); World Meteorological Organization (WMO). The Department of Economic and Social Affairs of the Secretariat (DESA) and the United Nations Environment Programme (UNEP) also made contributions.[14]

---

[11] A/RES70/1.

[12] A/69/245, para. 298 and A/70/235, para. 312.

[13] A/60/63, Section X-B.

[14] Contributions authorized by the authors to be posted online are available at www.un.org/Depts/los/general_assembly/general_assembly_reports.htm. These contributions are identified in the footnotes with the name of Government or international organization that has submitted them.

II. Sources and pathways of MDPMs

7. Marine debris is defined as "any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment".[15] It consists of a variety of different materials and sizes reflecting its various origins and sources, and its composition and abundance therefore vary regionally. Material types of marine debris that can be found across the oceans include plastics, metal, glass, processed timber, paper/cardboard, rubber, and clothing/textiles,[16] with plastics being by far the major constituent of all marine debris.[17]

8. Depending on its size, plastic debris in the oceans is referred to as macroplastics (above 5 mm), microplastics (less than 5 mm) and nanoplastics (less than 100 nm). Primary microplastics are plastic particles that were initially produced in that small size, while secondary microplastics result from the continued fragmentation of larger plastics which occurs by design or through weathering degradation, mainly caused by solar UV radiation and physical abrasion by wind and waves.[18]

9. The origins of marine debris, including plastic litter, are diverse and include a variety of land-based and sea-based sources. Around 80 per cent of marine debris is considered to enter the oceans from land with an estimated input of 4.8 to 12.7 million metric tons per year,[19] which underlines the need for increased efforts to reduce impacts on the marine environment from land-based activities.[20]

10. Sources and pathways of marine debris are examined in the Secretary-General's report prepared in advance of the sixth meeting of the Informal Consultative Process,[13] as well as in the existing scientific literature and reports,[21] including the First Global Integrated Marine Assessment,[9] a study by the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP),[17] and the report of the Executive Director of UNEP to the

---

[15] UNEP (2005). *Marine Litter, an Analytical Overview*.

[16] WOA, note 9.

[17] Global Environment Facility (2011). *Marine Debris as a Global Environmental Problem: Introducing a Solutions Based framework Focused on Plastic*.

[18] See e.g. GESAMP (2015). *Sources, Fate and Effects of Microplastics in the Marine Environment: a Global Assessment* (Kershaw, P. J., ed.). (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP/UNDP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 90, 96 p. - www.gesamp.org/data/gesamp/files/media/Publications/Reports_and_studies_90/gallery_2230/object_2500_large.pdf.

[19] Jambeck et al. (2015). "Plastic Waste Inputs from Land into the Ocean". *Science*, Vol. 347 (6223), pp. 768-771.

[20] GESAMP (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) and Advisory Committee on Protection of the Sea (2001). *Protecting the Oceans from Land-Based Activities - Land-Based Sources and Activities Affecting the Quality and Uses of the Marine, Coastal and Associated Freshwater Environment*. Rep. Stud. GESAMP No. 71, 162 pp - www.jodc.go.jp/info/ioc_doc/GESAMP/report71.pdf; and McKinsey & Company and Ocean Conservancy (2015). *Stemming the Tide – Land-based Strategies for a Plastic-free Ocean* - www.oceanconservancy.org/our-work/marine-debris/mckinsey-report-files/full-report-stemming-the.pdf.

[21] Browne M.A. (2015). "Sources and Pathways of Microplastics to Habitats." In Bergmann, M. et al., note 3, (pp. 29-56); GESAMP (2001), note 20; McKinsey & Company and Ocean Conservancy (2015), note 20; Jambeck et al. (2015), note 19.

second meeting of the United Nations Environment Assembly (UNEA).[22] For the purposes of this overview it may suffice to note that the sources of MDPMs are both land-based (e.g. waste from unprotected and poorly managed landfills and dumps; horti- and agriculture materials; industrial sites; harbours; decommissioning of ships and oil rigs; painting and maintenance of buildings, constructions and roads; coastal tourism and general public litter; as well as the use of plastic products shedding smaller plastic particles; and discharges or overflow of un- or insufficiently treated sewage and storm water into rivers or directly into the sea) and sea-based (e.g. commercial shipping; ferries and cruise liners; fishing vessels, especially through abandoned, lost or discarded fishing gear (ALDFG); naval and research vessels; recreational boating; offshore installations and aquaculture sites; synthetic polymers from ship coatings[23]).

11. With regard to microplastics, it should be noted that, since the sixth meeting of the Informal Consultative Process, the use of primary microplastics in different industries, including industrial "scrubbers", micro-beads in cosmetics or microplastics used in medicines,[24] has attracted increased attention,[25] as many of these smaller plastic particles end up in the sea even though they passed through wastewater treatment plants.

12. As noted above, MDPMs can be found everywhere. They are transported from land to the marine environment along shorelines, by rivers and industrial discharges and run-offs or are being blown into the oceans by winds. Extreme events like hurricanes, flooding events and tsunamis also transport significant amounts of debris into the sea, a problem which will become more prevalent with the increasing intensity of extreme weather events. In the oceans, floating marine debris can be transported over large distances through major ocean currents until it is washed ashore,[26] sinks to the bottom or accumulates in the major ocean circulation gyres,[3] where concentrations of marine debris can be even higher than in coastal areas close to the sources. Microplastic, in the form of fibres, has been found up to four orders of magnitude more abundant in deep-sea sediments than in contaminated sea surface waters, making them a likely sink for microplastics.[27] Another pathway for plastics and microplastics is through marine organisms, which can take up and retain particles for varying periods and can potentially transport them over significant distances. In the case of seabirds and seals, microplastics can even be carried back onto land.[17]

III. Environmental, economic and social impacts

13. The environmental, economic and social impacts of MDPMs have received increasing attention over the past decade in terms of research[28] and commitments from the international community to address

---

[22] UNEP, 2016: *Marine plastic debris and microplastics – Global lessons and research to inspire action and guide policy change*. United Nations Environment Programme, Nairobi (to be published).

[23] Song et al. (2014). "Large Accumulation of Micro-sized Synthetic Polymer Particles in the Sea Surface Microlayer." *Environ.* Sci. *Technol.*, 48 (16), pp 9014–9021, DOI**:** 10.1021/es501757s.

[24] See GESAMP (2015), note 18; Browne, M.A. (2015), note 21.

[25] See e.g. UNEP (2015) *Plastic in Cosmetics*, p. 7; Duis, K. and Coors, A. (2016). "Microplastics in the Aquatic and Terrestrial Environment: Sources (with a Specific Focus on Personal Care Products), Fate and Effects". *Environmental Sciences Europe* 28:2, DOI 10.1186/s12302-015-0069-y.

[26] In particular, mid-ocean islands, which are generally characterized as having a low generation of waste compared with many mainland centres, receive a disproportionate burden of plastic marine litter as a result of long distance transport by surface currents; see UNEP, note 22.

[27] Woodall et al. (2014). "The Deep Sea Is a Major Sink for Microplastic Debris." *R. Soc. open sci.* 1: 140317. http://dx.doi.org/10.1098/rsos.140317. See also Pham et al. (2014) "Marine Litter Distribution and Density in European Seas, from the Shelves to Deep Basins*". PLoS ONE* 9(4): e95839.doi:10.1371/journal.pone.0095839.

[28] See WOA, note 9; and the compilation contained in Bergmann et al., note 3.

those impacts (see section II). This section will present a review of the main environmental, economic and social impacts of MDPMs.

A. Environmental impacts

14. Environmental effects of MDPMs, have been documented in various studies and reports,[29] and with growing research, more and more species are found to be negatively affected. Adverse effects have been reported for 663 species,[30] including more than half of the marine mammal species listed on the IUCN Red List.[31] Since 1997, the number of species affected by entanglement or ingestion of plastic debris has increased from 267 to 557 species among all groups of wildlife.[32]

15. Entanglement represents the most visible effect of plastic pollution on marine organisms, affecting a high percentage of species, e.g., 100 per cent of species of marine turtles, 67 per cent of seals, 31 per cent of whales and 25 per cent of seabirds.[33] This is often caused by ALDFG, resulting in so called "ghost fishing".[34] Entangled biota can drown immediately, be injured or hindered in their ability to move, feed and breathe.[9]

16. Intentional or accidental ingestion of MDPMs by marine organisms, which mistake it for food, occurs throughout the food web. It has been documented for 100 per cent of species of marine turtles, 59 per cent of whales, 36 per cent of seals, and 40 per cent of seabirds. Studies on the ingestion of plastics by fish and invertebrates are a recent development.[32] An estimate of the threat of plastic pollution to seabirds predicts that plastics ingestion will reach 99 per cent of all species by 2050.[35] There is evidence of microplastic ingestion by marine zooplankton which indicates that species at lower trophic levels of the marine food web also mistake plastic for food, posing potential risks to higher trophic level species.[36] An unintentional form of plastic ingestion is that of secondary ingestion, which occurs when animals feed on prey, which had already ingested debris. This raises concerns also for human health since plastic debris and fibers from textiles have also been found in fish and bivalves sold for human consumption

---

[29] For a more comprehensive discussion of impacts of MDPMs, see GESAMP (2015), note 18, pp. 30-53; Thevenon, F., et al. (eds.) (2014). *Plastic Debris in the Ocean: The Characterization of Marine Plastics and their Environmental Impacts, Situation Analysis Report.* Gland, Switzerland: IUCN. 52 pp. - https://portals.iucn.org/library/sites/library/files/documents/2014-067.pdf; Secretariat of the Convention on Biological Diversity and the Scientific and Technical Advisory Panel—GEF (2012). *Impacts of Marine Debris on Biodiversity: Current Status and Potential Solutions,* Montreal, Technical Series No. 67, 61 pages - www.cbd.int/doc/publications/cbd-ts-67-en.pdf; various chapters contained in Bergmann M. et al., note 3; Gregory, M.R., (2009). "Environmental implications of plastic debris in marine settings - entanglement, ingestion, smothering, hangers-on, hitch-hiking and alien invasions." *Phil. Trans. R. Soc.* B, 364, 2013–2025, doi:10.1098/rstb.2008.0265; UNEP (2016), note 22.

[30] CBD-STAP – GEF (2012), note 33.

[31] Global Environment Facility (2011), note 16.

[32] Kühn et al. (2015). "Deleterious Effects of Litter on Marine Life." In Bergmann, M. et al., note 3, p. 75-116.

[33] Idem.

[34] Macfadyen, G. et al (2009). *Abandoned, Lost or Otherwise Discarded Fishing Gear.* UNEP Regional Seas Reports and Studies, No. 185; FAO Fisheries and Aquaculture Technical Paper, No. 523. Rome, UNEP/FAO. 2009. 115p.

[35] Wilcox et al. (2015). "Threat of Plastic Pollution to Seabirds Is Global, Pervasive, and Increasing". *PNAS*, vol. 112 (38), 11899–11904.

[36] Desforges et al. (2015). "Ingestion of Microplastics by Zooplankton in the Northeast Pacific Ocean." *Archives of Environmental Contamination and Toxicology*, Vol. 69 (3), pp. 320-330.

(see para. 24).[37] However, although levels of microplastics have been detected, the impacts on fish species used for human consumption are not very well known.[38] Plastic ingestion by marine species may directly cause mortality, limit optimal food intake or contribute to dehydration. Experimental studies indicate that eating plastic reduces an individual's body condition, which will translate into negative effects on average survival and reproductive success in populations.[32] By ingesting plastics, marine biota, in particular seabirds, facilitate and catalyze the global distribution of plastic through bio-transportation.

17. Introduction and spread of invasive "alien species" that can out-compete original ecosystem components can occur when organisms colonize floating marine debris and are transported by the currents and winds to a new habitat. Oceanic plastics can also provide new or increased habitat opportunities.[39] Microplastics have been observed to also carry microbes and pathogen bacteria raising concerns that the masses of microplastics accumulating and circulating in the oceans might promote harmful algal blooms and the spread of diseases.[9]

18. Smothering and habitat destruction occurs when marine debris, including plastics and microplastics, sinks to the seafloor. For example, ALDFG may drag along the seafloor and damage sensitive environments like coral reefs. A plastic cover in shallow depths can inhibit the ability of plants to photosynthesize and may, at greater depths, limit the exchange of oxygen between water and sediments, thus hampering the life of bottom-dwellers.[32]

19. Another form of habitat destruction may result from some forms of mechanical cleaning of littered beaches, for example by raking and the use of heavy vehicles, which may cause disturbances and stress to animals living in coastal zones.[2]

20. Accumulation of toxic chemical substances on marine debris and the presence of persistent organic pollutants (POPs) are an additional source of concern in terms of sublethal effects. This refers to chemical substances added during manufacture, as well as to the adsorption of organic pollutants by plastics at sea. Due to their large surface-to-volume ratio, microplastics have a high capacity to facilitate the transport of contaminants.[9] Nanoplastics may potentially be the most hazardous, but they are currently still the least researched.[40]

B. Economic and social impacts

21. While environmental impacts have been generally well documented, there is much less research and data available about the economic and social impacts of marine debris, which include impacts on health, safety, navigation, fisheries, tourism and agriculture, as well as consequential loss of income and jobs[41] (see also paras. 23 and 28-30). In addition, as the available information is mostly gathered in developed States, there is a paucity of information with respect to developing States.[42]

---

[37] Rochman et al. (2015). "Anthropogenic Debris in Seafood: Plastic Debris and Fibers from Textiles in Fish and Bivalves Sold for Human Consumption". *Sci. Rep.* 5, 14340; doi: 10.1038/srep14340.

[38] FAO.

[39] Kiessling et al. (2015). "Marine Litter as a Habitat and Dispersal Vector." In Bergmann, M. et al., note 3, (pp. 141–181).

[40] Koelmans et al. (2015). "Nanoplastics in the Aquatic Environment". In Bergmann, M. et al., note 3, (pp. 329-344).

[41] See UNEP (2016), note 22, pp. 57-62.

[42] CBD-STAP-GEF (2012), note 29, at 61.

22. In particular, while the social and economic impacts of plastics in the oceans are only just being assessed, initial findings indicate that plastics and microplastics will have profoundly negative effects not only on marine ecosystems, but also on the economic activities that depend on them.

23. MDPMs degrade marine and coastal ecosystem services and biodiversity and adversely affect activities, such as fisheries and aquaculture, maritime transportation and tourism. There is a cyclical nature to these impacts, as some sectors which are a main source of marine debris are then also negatively affected by it. For example, coastal communities that rely on tourism and fishing may also bear increased expenditures for beach cleaning, public health and waste disposal, as well as bear the loss of income with regard to the same tourism and fishing activities which generated marine debris.

24. Impacts on food security and human health are witnessed primarily through the consumption of fish and seafood. Fish play an important role in food security by providing a supply of protein, micronutrients and lipids.[43] Fish and seafood consumption generates concerns relating to human health caused by the ingestion of microparticles of plastic found in fish and seafood, potentially causing allergic reactions, endocrine disruption and diseases.[44] Another area of concern is toxic poisoning caused by marine debris, including as a result of ingestion of microplastics and associated additives used in their production, which may have toxic effects.[45]

25. Fisheries can also be economically impacted, for example, by ALDFG and other debris resulting in damaged nets and other fishing gear as well as in contaminated, reduced and lost fish catch. These impacts have not been estimated systematically, but include incremental costs associated with fishing operations, compliance, accidents at sea, search and rescue and recovery.[46] According to the European Union, the cost to the fishing industry could amount to almost Euros 60 million annually, which would represent approximately 1 per cent of total revenues of its fishing fleet.[47] A study of the fishing industry conducted in Scotland estimated that marine litter cost 5 per cent of the fishing fleets' total annual income.[48] An experimental study on ghost fishing of monkfish from lost nets in the Cantabrian Sea, northern Spain, estimated that 18.1 tonnes of monkfish are captured annually by abandoned nets, representing 1.46 per cent of the commercial landings of monkfish in the Cantabrian Sea. While in the United States of America it was estimated that USD 250 million of marketable lobster is lost annually to ghost fishing.[49] However, the true cost may be difficult to assess due to the fact that most incidences involving marine debris and vessels are not reported. [50]

26. Although considered to be less affected by marine debris than fisheries or agriculture,[51] aquaculture, which provides the majority of the world's supply of fish,[52] is also affected by costs arising from the entanglement of propellers, clogging of intake pipes, and disposal of marine debris.

---

[43] A/69/71,paras 11–15.
[44] GESAMP (2001), note 20, at pp. 49 to 54 and 71.
[45] GESAMP (2015), note 22, p. 52.
[46] FAO.
[47] European Union.
[48] Bergman M. et al (2015), note 3, p. 373.
[49] Greenpeace (2006). *Plastic Debris in the World´s Oceans*, www.greenpeace.org/international/en/publications/reports/plastic_ocean_report.
[50] See UNEP (2009). *Guidelines on the Use of Market-based Instruments to Address the Problem of Marine Litter*, p. 6.
[51] Bergman M. et al (2015), note 3, pp. 374-375.
[52] A/69/71, paras. 19-24.

27. Shipping and yachting industries also experience economic impacts as a result of marine debris. The main impact on navigation arises from collisions with marine debris and the entanglement of propellers, which pose a particular danger to smaller vessels, such as fishing vessels, and during dangerous weather conditions or other critical circumstances.[22] Harbours and marinas incur the cost of removing marine debris from their facilities.[53] Clean-up may be costly. For example, marine debris removal in the United Kingdom from ports and harbours costs approximately Euros 2.4 million annually.[54] Additional main costs for vessels are associated with the accidental loss of cargos, and indirect costs relating to operational costs and disruption of service. One estimate placed the total value of marine debris damage to shipping at USD 279 million per year.[22] If rescue services are required, costs increase dramatically.[55]

28. Loss of income due to the impacts of marine debris on various economic sectors also has a social cost and affects individuals and communities. In particular, fishing communities and their way of life are impacted by damage to and loss of boats and fishing gear caused by encounters with marine debris, with consequent loss of earnings due to time diverted to deal with the problems and cost of repairs.

29. Tourism is also affected as marine debris detracts from the physical beauty of a location, resulting in fewer visitors and necessitating expensive clean-up.[56] Areas with reefs are particularly vulnerable, as a variety of activities, such as sport fishing, submarine tours, turtle and whale watching trips, snorkelling, scuba diving and spear fishing depend upon the presence of healthy reefs.[57] These impacts can be quite significant where local economies are heavily dependent on tourism, for example small islands developing States (SIDS).[22]

30. Declining tourism leads to local communities suffering from the loss of revenues and jobs and potentially creates the need for alternative livelihoods.

31. Human safety is equally put at risk by the presence of marine debris in coastal areas, especially where tourists are present. Swimmers can get caught up in nets and lines, with resulting injury or death. On shore, marine debris can cause cuts and punctures which may be particularly serious in the case of medical and sanitary debris.

32. While agriculture, similarly to other sectors, is more frequently seen as a source of marine debris, it is also affected as such debris is found on farmland near the coast. This causes damage to property and equipment and presents a risk to livestock through ingestion and entanglement.[58]

IV. Action undertaken at the global, regional and national levels to prevent and significantly reduce MDPMs

33. Following the discussion on marine debris at the sixth meeting of the Informal Consultative Process,[59] the General Assembly included a number of calls for action in its annual resolutions on oceans

---

[53] Bergman M. et al (2015), note 3, pp. 371 and 372.
[54] Idem, p. 372.
[55] Idem, pp. 371 and 372.
[56] United Nations Environment Programme (UNEP) and National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program (2011) *The Honolulu Strategy. A Global Framework for Prevention and Management of Marine Debris*, p. 10.
[57] CBD-STAP – GEF (2012), note 29, p. 25.
[58] Bergman M. et al (2015), note 3, at. 14.
[59] A/60/99.

and the law of the sea[60] and on sustainable fisheries.[61] In particular, the Assembly urged States to integrate marine debris into national strategies dealing with waste management in the coastal zone, ports and maritime industries, to encourage the development of appropriate economic incentives and to cooperate regionally and subregionally to develop and implement joint prevention and recovery programmes. The Assembly underscored the need to build the capacity of developing States, noting the particular vulnerability of SIDS, and the need for further studies on the extent and nature of the problem, and for the development of partnerships between States, industry and civil society.[62]

34. The Assembly also called for various actions by States, intergovernmental organizations and civil society, including the reduction or elimination of catch by lost or abandoned gear; data collection; close cooperation and coordination; raising awareness within the fishing sector and regional fisheries management organizations and arrangements (RFMO/As) of the issue of derelict fishing gear and related marine debris; and identifying options for action.[63] The Assembly has reaffirmed the importance of and urged accelerated progress by States and RFMO/As in the implementation of these provisions.[64]

35. In "The future we want", States committed to take action, by 2025, based on collected scientific data, to achieve significant reductions in marine debris to prevent harm to the coastal and marine environment.[6] This was reiterated in the 2030 Agenda for Sustainable Development, in which States, under Sustainable Development Goal 14 "Conserve and sustainably use the oceans, seas and marine resources for sustainable development", committed, by 2025, to prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris.[11] The General Assembly in its most recent resolutions recalled the commitments to take action to reduce the incidence and impacts of pollution, including marine debris, especially plastic, on marine ecosystems, including through the effective implementation of relevant legal and policy instruments; and to take action, by 2025, to achieve significant reductions in marine debris to prevent harm to the coastal and marine environment. The importance of further increasing the understanding of the sources, amounts, pathways, distribution, trends, nature and impacts of marine debris, especially plastic, and to examine possible measures and best available techniques and environmental practices to prevent its accumulation and minimize its levels in the marine environment was also reiterated.[65]

36. Preventing and significantly reducing marine debris by 2025[11] requires an adequate enabling framework which tackles the issue both upstream at the source, as well as downstream to deal with existing marine debris. The present section provides an overview of such enabling framework, as well as examples of action taken by States, intergovernmental organizations and civil society following-up on the abovementioned calls for action. Indeed, it has been recognized that sharing best practices, especially with developing countries, and encouraging similar calls for action in relevant international forums is beneficial.[66]

---

[60] A/RES/60/30 and subsequent resolutions.
[61] A/RES/60/31 and subsequent resolutions.
[62] A/RES/60/30, paras. 12, 65, 66.
[63] A/RES/60/31, paras. 51 and 77-81.
[64] A/RES/61/105, para. 94, and subsequent resolutions.
[65] A/RES/70/235, paras. 170, 171, 188, 189, 191, 192.
[66] European Union (see section by France). See also the G7 Action Plan to combat Marine Litter, Annex to the G-7 Leaders' Declaration, available at www.g7germany.de/Content/EN/_Anlagen/G7/2015-06-08-g7-abschluss-annex-eng_en.html?nn=1282190.

A. Best available scientific information

37. Recent efforts to enhance knowledge, most recently in the context of the First Global Integrated Marine Assessment,[9] have focused on marine debris,[67] including its impact on migratory species,[68] ALDFG,[34] and plastic and microplastics.[69] The limited knowledge base related to MDPMs, including as regards the pathways, scale, distribution and impacts of the problem, in particular economic and social impacts, presents challenges for the development of appropriate responses and management measures.[70]

38. Examples on how to redress the situation were provided in the contributions to this report. The G7 science ministers agreed upon a common interdisciplinary research and education programme. Based on existing initiatives, they intend to strengthen additional research efforts to better understand the extent and impacts of plastic waste in the oceans and seas.[71] France supports several research or studies programmes to improve knowledge in this area. For example, the project "MICROPLASTIC" aims at funding research to define and draw up tools for microplastic pollution detection, risk management and recycling in the land-sea interface.[72]

B. Targeted policies and legislation

39. Measures to prevent or reduce marine debris in the marine and coastal environment have to be taken in many areas, with regard to many activities and by many actors. For example, in addition to the management of human activities at sea, activities and practices on land, including waste management, recycling and packaging strategies, also need to be taken into account.[73]

40. At the international level, while MDPMs are not always specifically mentioned in the various international instruments, a number of legally binding and soft law instruments provide a framework for the development of the required policies and legislation at the national level. For example, when these instruments call for integrated management,[74] or include requirements to decrease or eliminate the discharge of ship-generated waste, measures to stop the discharge of solid waste from land-based sources, or action to prevent or reduce the loss or abandonment of fishing gear from fishing vessels, some aspects of the issue of marine debris are indirectly covered.

41. *Legal framework and developments*. A previous report of the Secretary-General provided information on a number of international instruments applicable to marine debris,[75] including UNCLOS and various sectoral instruments such as the International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL), the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, (London Convention) and its 1996 Protocol, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, the Convention on Biological Diversity (CBD), the Agreement on the Conservation of

[67] UNEP (2009), note 1; CBD-STAP—GEF (2012), note 29.
[68] CMS. See also CMS, *Report I: Migratory Species, Marine Debris and its Management*, UNEP/CMS/COP11/Inf.27 - www.cms.int/sites/default/files/document/COP11_Inf_27_Report_I_Marine_Debris_Management_Eonly.pdf.
[69] GESAMP (2015), note 20; UNEP, 2016, note 22.
[70] New Zealand.
[71] European Union (see section by Germany).
[72] European Union (see section by France).
[73] See, A/60/99.
[74] See A/70/74.
[75] A/60/63, paras. 252-267.

Albatrosses and Petrels, as well as soft law instruments, such as the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, and regional instruments. In addition, given that plastic tends to absorb organic contaminants, and that POPs are found in plastic particles, the relevance of the Stockholm Convention on Persistent Organic Pollutants, which aims to protect human health and the environment from POPs through prohibitions and restrictions on the production and release of certain POPs, cannot be underestimated.

42. The specific problem of lost or abandoned fishing gear and related marine debris has been addressed through international fisheries-related instruments, for example the FAO Code of Conduct for Responsible Fisheries and the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (the United Nations Fish Stocks Agreement). In particular, the Agreement requires States to minimize pollution and catch by lost or abandoned gear, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost-effective fishing gear and techniques.[76] It also requires flag States to take measures concerning marking of fishing gear for identification in accordance with uniform and internationally recognizable vessel and gear marking systems.[77]

43. In response to the invitation of the General Assembly, IMO reviewed and revised MARPOL Annex V,[78] to prohibit the discharge of all garbage, including all plastics,[79] into the sea, except as provided otherwise in regulations 4, 5, and 6 of the Annex. Guidelines for the implementation of MARPOL Annex V and Guidelines for the development of garbage management plans were also adopted.[80]

44. At the regional level, the conventions on the protection and preservation of the marine and coastal environment adopted under the UNEP Regional Seas Programme and partner programmes regulate various sources of pollution and thus generally support the prevention and reduction of marine debris, even when the issue is not specifically addressed. Some regions have gone further and adopted specific protocols on the protection of the marine environment against pollution from land-based sources or by dumping, for example, the States bordering the Atlantic coast of the western, central and southern African region and the western Indian Ocean.[81]

45. The European Union's Marine Strategy Framework Directive provides for the assessment and monitoring of, and setting targets for reaching good environmental status by 2020, including in relation to marine litter. The European Union's waste management legislation includes preventive measures and recycling targets for plastics, as well as measures for the reduction of consumption of plastic bags. The Port Reception Facility Directive has contributed to the delivery of higher volumes of ship-generated waste and cargo residues to port reception facilities in European Union ports, as well as the management of the waste from ships in these facilities.[82]

---

[76] Article 5(f).

[77] Article 18(3)(d).

[78] See resolution MEPC.201(62).

[79] Garbage under Annex V includes all kinds of food, domestic and operational waste, all plastics, cargo residues, incinerator ashes, cooking oil, fishing gear, and animal carcasses generated during the normal operation of the ship and liable to be disposed of continuously or periodically.

[80] See resolutions MEPC.219(63) and MEPC.220(63).

[81] UNEP.

[82] European Union.

46. The problem of ALDFG and related debris has been widely addressed by RFMOs,[83] through measures concerning data collection,[84] gear marking,[85] reporting[86] and retrieval of ALDFG,[87] and restrictions on the use of particular types of gear.[88] Furthermore, NEAFC contracting parties which retrieve gear that has not been reported lost, may recover the cost from the master of the vessel that had lost the gear and have the right to remove and dispose of fixed gear that was not marked in accordance with the rules or which in any other way contravenes other recommendations adopted by NEAFC, as well as fish that was found in the gear.[89] The link between ghost fishing and illegal, unreported and unregulated (IUU) fishing was also highlighted.[90]

47. Several regional bodies shared concerns over the entanglements of marine species.[91] For example, CCAMLR has taken specific measures to address the risk associated with entanglement of marine mammals in plastic packaging bands used to secure bait boxes and the injury to seabirds caused by the discharge of hooks in offal.[92]

48. The contributions to this report indicate that at the national level, legislations span a wide range of issues and sectors, from waste management to packaging and energy, as well as freshwater management and the protection and preservation of the marine environment,[93] and thus are not specifically dedicated to the issue of MDPMs. For example, France's "Energy Transition Law for a Green Growth" of 2015 provides for time-bound bans on a variety of plastic packaging in use in various sectors.[94] The New Zealand Waste Minimization Act of 2008 provides for, inter alia, a levy on all waste disposed of in municipal landfills; product stewardship schemes; and the development of waste management and minimization plans. The Republic of the Congo enhanced sea-based removal or collection systems for operational debris and/or cargo residue from ships, platforms or other residue and/or the pollution of the sea, resulting from the discharge of hydrocarbons and other debris into areas under its national jurisdiction.[95] Its General Inspectorate of Maritime and Harbour Affairs and the General Inspectorate of Environmental Affairs were established in 2008 and 2013, respectively, to tackle pollution in all its forms. In 2014, Viet Nam passed the Law of Environment Protection providing for the control of wastes[96] and in 2015, the Law on Marine Resources and Environment and Islands.

49. *Policy framework and developments*. A number of decisions and resolutions on marine debris were also adopted at the global level by the United Nations Environment Assembly (UNEA)[97] and in the

---

[83] CCAMLR, NAFO, NEAFC. SEAFO reported that it had no measure in place for marine litter.
[84] CCAMLR, WCPFC.
[85] NEAFC.
[86] CCAMLR, NAFO, NEAFC.
[87] NAFO, NEAFC.
[88] CCAMLR, NEAFC, WCPFC.
[89] NEAFC.
[90] FAO, NPAFC.
[91] CCAMLR, PIFS-SPC, WCPFC. WCPFC noted that in the Pacific purse seine fishery the challenge posed by marine debris and plastics arose from the use of fish aggregating devices (FADs) as FADs may be constructed of synthetic materials, which may have an impact on the marine environment if lost or abandoned.
[92] CCAMLR.
[93] See, e.g, European Union (including annex for France), New Zealand, Viet Nam. See also UNEP (2005), note 15.
[94] European Union (see section by France).
[95] Order No. 19031 of 31 December 2013.
[96] Decree No. 38/2015/NĐ-CP.
[97] Resolution 1/6. See UNEP.

context of the CBD[98] and CMS.[99] The second meeting of the UNEA in May 2016 will discuss marine plastic debris and microplastics and will have before it a report of the Executive Director on the subject.[22] Marine debris is also a focal area of the Global Partnership on Waste Management launched by UNEP in 2010.

50. The Review Conference on the United Nations Fish Stocks Agreement in 2006 recommended States individually and collectively through RFMOs to, inter alia, enhance efforts to address and mitigate the incidence and impacts of ALDFG, establish mechanisms for the regular retrieval of derelict gear and adopt mechanisms to monitor and reduce discards.[100] States and RFMO/As have taken action in response.[101]

51. The FAO Committee on Fisheries in 2014 expressed concern over the issue of ghost fishing caused by ALDFG and noted that greater attention should be paid by members and regional fisheries bodies to mitigate ALDFG impacts.[102] The development of international standards/guidelines was suggested by the CBD Expert Workshop in 2014 and by the Third Session of the Joint FAO/IMO Ad Hoc Working Group on IUU Fishing and Related Matters, in 2015.[103] In response, FAO will convene a Second Expert Consultation on the Marking of Fishing Gear in April 2016, to clarify the purpose and necessity of a system for the marking of fishing gear to develop best practice (standard) technical guidelines to gear marking.[104]

52. The Parties to the London Convention and its 1996 Protocol have noted that source control and best practices are important elements to reduce abandoned or drifting fish aggregating devices (FADs), as well as polystyrene and styrofoam buoys used in aquaculture.[105]

53. With the support of UNEP's Global Partnership on Marine Litter (GPML – see para. 75), for which the Honolulu Strategy[56] provides a framework, some regional seas conventions have developed specific regional action plans on marine litter, some of which address the issue of plastics and microplastics.[106] For example, Regional Action Plans on Marine Litter were developed in recent years in the Mediterranean, in the Wider Caribbean Region, in East Asia and in the Northwest Pacific.[107] Amongst activities to address the negative effects of marine debris implemented under these Regional Plans, international coastal clean-up activities are being promoted.[108]

54. Examples of comprehensive measures include those developed for the Mediterranean that aim at developing and implementing solid waste and sewer system management plans. These measures incorporate marine litter prevention and reduction measures; raise awareness through education programmes; and ensure institutional coordination and close coordination and collaboration between national, regional, and local authorities; as well as key prevention measures for land-based and sea-based sources. Other measures include those encouraging a fee system for port reception facilities; requiring

---

[98] Decision XI/18. See CBD.
[99] Resolutions 10.4 and 11.30. See CMS.
[100] A/CONF.210/2006/15, Annex, para. 18(h).
[101] A/CONF.210/2010/1, paras. 124-129; and the Report of the Secretary-General to the resumed Review Conference to be held from 23 to 27 May 2016, A/CONF.210/2016/1.
[102] FAO.
[103] FAO.
[104] FAO.
[105] IMO.
[106] UNEP.
[107] UNEP.
[108] UNEP. See in particular information on the Wider Caribbean and in the Northwest Pacific regions.

manufacturers, brand owners and first importers to enhance their responsibility for the entire life-cycle of the product; requiring prevention of any marine littering from dredging activities by 2020; and enforcement measures to combat illegal dumping, including littering on the beach, illegal sewage disposal in the sea, the coastal zone, and rivers in the area of the application of the Plan.[109]

55. Other relevant regional programmes and action plans include the 2014 OSPAR Regional Action Plan, which sets out the policy context for OSPAR's work on marine litter in support of the 2010-2020 Strategy for the Protection of the Marine Environment in the North-East Atlantic;[110] the CPPS Regional Programme for the Integrated Management of Marine Litter in the Southeast Pacific, which includes regional and national actions for minimizing the discharge of persistent solid waste from land- and ocean-based sources;[111] and the 2015 Baltic Litter Action Plan, which aims to significantly reduce marine litter by 2025, compared to 2015, and to prevent harm to the coastal and marine environment.[112] In addition, the MARELITT BALTIC project addresses derelict fishing gear in the Baltic Sea and the BLASTIC project aims at identifying and prioritizing measures on how to reduce litter streams from land into the Baltic Sea.[113]

56. In response to the requirement to establish a European Union-wide quantitative reduction target for marine litter, the European Commission announced in 2015 that it will take action to fulfil the objective of significantly reducing marine litter, thus also implementing relevant targets under the 2030 Agenda for Sustainable Development.[114]

57. At the national level, a series of instruments, are employed to support the implementation of relevant legislation, such as policies, codes of conduct, economic incentives and social tools. The following States highlighted in their contribution to the report the measures they have taken.

58. Australia has been implementing the Threat Abatement Plan for the Impacts of Marine Debris on Vertebrate Marine Life (2009). A revised plan is due to be completed in 2016 and will incorporate emerging issues, including microplastics. Australia committed to a range of activities to support local communities to reduce the volume of debris generated or entering the marine environment. Data collected from annual Great Barrier Reef clean-ups is entered into the Australian Marine Debris database to advise future management and reduction plans.[115]

59. In the context of the implementation of the European Union Marine Strategy Framework Directive, Belgium has implemented activities, such as awareness-raising campaigns, Clean Beach Actions, waste management plans, monitoring activities and Fishing for Litter. France established an action plan for the prevention of waste for the period 2014-2020 and specific measures for the marine environment. France is encouraging companies to develop new markets and enhance innovative products, such as eco-designs. Sweden has developed a strategy to achieve good environmental status of its marine areas by 2020, which includes measures addressing marine debris, such as promoting efficient and sustainable collection and reception of lost fishing gears and preventing the loss of new gear; developing a national public awareness campaign; supporting initiatives for beach cleaning; reducing marine debris in municipal waste management plans; and developing waste preventing programmes, including

[109] UNEP.
[110] OSPAR.
[111] Peru.
[112] HELCOM Recommendation 36/1 (Annex 2 of the Outcome of HELCOM 36-2015).
[113] European Union (see section by Sweden).
[114] European Union.
[115] Australia.

investigations of material flows of plastic. Further, Sweden will identify and reduce significant sources of plastics and microplastics in the marine environment and develop new measures for reducing waste both at the source and in the disbursal pathways. The Swedish Chemicals Agency has been commissioned to propose national measures to restrict the use of microplastics in cosmetic products and to ban the sale of cosmetic products in Sweden, that are rinsed and that contain plastic microbeads.[116]

60. In Monaco, the Association Monégasque pour la Protection de la Nature regularly organizes clean-up campaigns for the seabed area on the shore.[117] Viet Nam has launched shorelines clean-up operations in coastal areas and propagated information to local residents and tourists to raise the public awareness of such activities.[118]

C. Adequate infrastructure

61. Inadequate management and disposal of plastic debris is a global challenge. While some progress has been made, two billion people still lack access to solid waste collection while three billion people lack access to controlled waste disposal facilities.[119] The provision of adequate infrastructure is a critical element in the prevention and reduction of marine debris. This includes waste management infrastructure for land-generated waste, such as disposal, collection, waste water treatment and recycling facilities, a particular challenge for some SIDS.[120] It also includes reception facilities in all ports, including marinas and fishing harbours, for the mandatory discharge of ship-generated wastes. Indeed, the major obstacle to the implementation of MARPOL, in particular its Annex V, has been the lack or insufficient number of reception facilities in many ports worldwide, which, in some cases, has prevented the Special Area requirements from taking effect.[121] IMO adopted an Action Plan and developed a comprehensive manual and guidance for ensuring the adequacy of reception facilities. Notably, port reception facilities are a particularly acute problem for SIDS,[122] whose ports are frequently visited by cruise ships of a capacity larger than their facilities can handle. As a result, the IMO revised Annex V in 2012 to enable SIDS to satisfy the relevant requirements of reception facilities through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy the Action Plan's requirements.[123]

62. Where adequate port waste reception facilities exist, high costs, complicated procedures, delays in ports, unnecessary paperwork, excessive sanitary and customs regulations or other factors have sometimes acted as a deterrent for ships to discharge waste to port reception facilities (see paras. 91-92).

D. Awareness-raising, education and capacity-building

63. Marine debris is not only an environmental issue but also a socio-economic one. Where harmful practices are entrenched, legislative or policy interventions alone are inefficient[124] unless accompanied

---

[116] European Union (see annexes for Belgium, France, Sweden).
[117] Principality of Monaco.
[118] Viet Nam.
[119] UNEP (2015). *Global Waste Management Outlook* - http://unep.org/ietc/Portals/136/Publications/Waste%20Management/GWMO%20report/GWMO_report.pdf.
[120] See e.g., Samoa Pathway, paras. 70, 71.
[121] A list of Special Areas is available at www.imo.org. The Special Area requirements for the Black Sea and the Red Sea have not yet taken effect because of lack of notifications from MARPOL Parties whose coastlines border these Special Areas on the existence of adequate reception facilities.
[122] See SPREP.
[123] Resolution MEPC.216(63).
[124] GESAMP (2015).

by punitive measures. Instead, preventive awareness-raising and incentives to change individual behaviours and industry practices are suggested as an essential first step. Interventions will be most successful where people and businesses subscribe to the goals and objectives of the measures, and understand the costs of continuing harmful practices.

64. A core component of prevention and reduction efforts is therefore the undertaking of education and awareness-raising programmes to discourage harmful practices and promote best practices and changes in production and consumption patterns. Policies and legislation can promote targeted education and awareness-raising (see para 96).[125]

65. In their contributions to the report, States and intergovernmental organizations provided information on the activities they are undertaking in that regard. For example, Peru launched the campaign, REEDUCA-Océanos, which highlights the importance of proper solid waste management on the beaches. A private-sector female-led initiative by a Peruvian social enterprise called "Life Out of Plastic" has been organizing educational activities to raise awareness of the negative impacts of plastic pollution, especially in marine and coastal ecosystems, and to demonstrate the social, environmental and economic benefits of recycling.[126]

66. The European Union promoted a variety of activities for the prevention, reduction and removal of marine debris and awareness-raising campaigns, such as training for fishermen and beach clean-up initiatives which raise awareness and engage local communities. It also put in the place the Marine LitterWatch, a citizen science-based tool that can help fill data gaps relevant for policy-making.[127]

67. The IWC entanglement programme was established in 2011 to build a global network of professionally trained and equipped entanglement responders. The training curriculum includes techniques and methodologies for investigating the causes, scope and impact of large whale entanglements, including marine debris, as well as information on attempts to prevent it. Capacity-building is undertaken in partnership with countries and regional intergovernmental organizations[128]

68. CCAMLR has also implemented initiatives to educate fishers and fishing vessel operators, such as the production of posters in multiple languages for fishing vessels.[129]

69. SPREP's awareness-raising activities include submission of its analysis on ocean-based marine pollution from fishing vessels to the WCPFC.[130]

70. In the context of the Cartagena Convention, educational material was developed and disseminated, including an online interactive game on marine litter.[131] Additionally, a regional capacity-building workshop was organized in support of the implementation of MARPOL Annex V.[132]

---

[125] See, e.g, European Commission Decision 2014/893/EU of 9 December 2014 establishing the ecological criteria for the award of the EU Ecolabel for rinse-off cosmetic products. See also IWC.
[126] Peru.
[127] European Union.
[128] IWC.
[129] CCAMLR.
[130] PIFS-SPC.
[131] www.cep.unep.org/kids-corner.
[132] UNEP.

71. The need to build the capacity of SIDS to address marine debris, including plastics and microplastics has been widely recognized. For example, Australia provided technical support in the Asia-Pacific and Indian Ocean regions to encourage consistent implementation of international conventions related to shipping, including MARPOL Annex V. It also assisted SPREP in the development of a Regional Reception Facilities Plan for the SIDS in the Pacific region and supported the update the Pacific Ocean Pollution Prevention Programme strategy. Additionally, Australia provided financial support for the implementation of CMS resolutions 10.4 and 11.30 on marine debris.[133]

72. Sweden supported the Regional Programme for the Integrated Management of Marine Litter in the South-East Pacific to propose regional and national actions for minimizing the discharge of persistent solid waste from land- and sea-based sources.[134]

73. A number of civil society organizations are also actively engaged in awareness-raising and education at the international level, including the Ocean Conservancy,[135] in particular through its Trash Free Sea Alliance,[136] as well as Race for Water,[137] Sustainable Coastlines,[138] and the World Animal Protection.[139]

E. Cooperation and coordination

74. Given the multiplicity of pathways and sources of MDPMs, the multi-dimensional and transboundary nature of the problem, as well as the wide range of sectoral policies, legislation and regulations which are relevant, cooperation and coordination are essential in facilitating an integrated management of the problem.[140]

75. Coordination among the relevant measures at local, national, regional and global levels is also an important aspect of effectively addressing the issue,[141] as is the need to ensure a mutually supportive approach between the public and private sectors.[142] A good example is the GPML, a global multi stakeholder partnership gathering Governments, international agencies, non-governmental organizations, academia, the private sector, civil society and individuals. It was launched at Rio + 20 to protect human health and the environment by promoting the reduction and management of marine litter. Participants contribute in the form of financial support, in-kind contributions and/or technical expertise to the development and implementation of GPML activities.

76. Intergovernmental meetings or workshops can also provide an opportunity for coordination. For example, IWC expert workshops on marine debris provided opportunities for the IWC to work with other secretariats, including those of RFMOs, FAO, IMO and biodiversity-related multilateral environmental agreements.[143]

---

[133] Australia.
[134] European Union (see section by Sweden).
[135] www.oceanconservancy.org. See the International Coastal Cleanup Programme.
[136] www.oceanconservancy.org/our-work/trash-free-seas-alliance.
[137] www.raceforwater.coms.
[138] http://sustainablecoastlines.org/.
[139] www.worldanimalprotection.org/sea-change-map.
[140] IWC.
[141] Peru.
[142] New Zealand, UNEP.
[143] IWC.

77. Examples of regional cooperation include the Trash Free Partnership established under the Cartagena Convention in 2015, as a partnership between the Governments of Jamaica, Panama, the United States of America and the Peace Corps.[144]

78. OSPAR's Regional Action Plan on Marine Litter is being implemented in close cooperation with other relevant regional and global organizations and initiatives, including UNEP and other Regional Seas Conventions, IMO, CBD, the European Union, Fisheries Regional Advisory Councils, NEAFC and River Basin Commissions. Partnerships with the private sector and with non-governmental organisations are also a part of the working approach.[145] Furthermore, NEAFC's 2014 marine litter initiative was aimed at gathering fisheries-related information that was then submitted to OSPAR to enhance the overall effort in this context.[146]

79. The European Union's Joint Programming Initiative Healthy and Productive Seas and Oceans is a coordinating and integrating strategic platform focused on harmonising methods for monitoring, extracting and analysing microplastic particles with a focus on the ecotoxicological effects of the particles on marine life.[147]

80. In 2015, in order to reduce the amount of microbeads in "rinse-off" products reaching the marine environment, Australia secured a voluntary agreement from the personal care industry to phase them out no later than 1 July 2018. Some major Australian supermarkets have committed to stop using microbeads in their own products from 2017. The Australian Government is also supporting the national phase-out of light-weight plastic bags through an industry-government partnership that seeks to change the culture of business to design more sustainable packaging, increase recycling rates and reduce packaging litter.[148]

81. Monaco's project, "Engaged commerce" promotes, through a public-private partnership, the reduction of packaging, waste and greenhouse gas consumption. As a result, single-use plastic bags were prohibited starting 2016 and disposable kitchen utensils will be prohibited starting in 2020.[149]

82. New Zealand's "Plastics New Zealand's Operation Clean Sweep" assists plastics manufacturers and distributors in preventing plastic pellets, manufactured or used in operations, from getting into waterways that eventually lead to the sea.[150]

V. Further action necessary to prevent and significantly reduce MDPMs

83. Notwithstanding the examples of actions described above, much remains to be accomplished to strengthen enabling frameworks to prevent and significantly reduce MDPMS. This section highlights what further action could sup ort on-going efforts.

---

[144] UNEP.
[145] OSPAR.
[146] NEAFC. In 2016, NEAFC's Permanent Committee on Management and Science will make proposals for the next steps regarding its work on marine litter, including the form of continued cooperation with OSPAR.
[147] Sweden.
[148] Australia.
[149] Monaco.
[150] New Zealand.

A. Data and knowledge gaps

84. The breadth and depth of knowledge regarding MDPMs, has increased in recent years. However, as noted in the First Global Integrated Marine Assessment, significant gaps remain[151] in knowledge and data which require research in *inter alia*: sources, distribution, pathways and destinations; impacts on biota including with regard to fisheries and aquaculture; wider social and economic impacts; as well as the economic aspects of actions moving forward and assessments of risk if action is not taken.[152] There is also a gap in knowledge about nanoparticles.

85. Data and knowledge gaps exist in all aspects of the life cycle of MDPMs, in particular whether alterations can be made to create environmentally less damaging products, through understanding their effects once in the environment. Research and development is also required to encourage the reuse and recycling of plastics,[153] and to create commercially viable options to convert plastic waste into other materials or energy.[154]

86. A lack of reliable, consistent and long-term monitoring data[155] and the need for standardised protocols to ensure comparability of representativeness of data has also been identified.[156] Modelled estimates of the concentration of plastics are also imperfect requiring additional data on sources[157] and quantities,[158] including on ALDFGs.[159] Improved understanding on ocean currents and circulation can also assist such modelling, help identify migrating or local fish stocks which might be affected,[160] and even help direct clean-up operations.

87. Research has been conducted on the impacts of larger marine debris, including ALDFGs on marine life more generally[161] and on specific species in specific areas, for example odontocetes in coastal waters of Maui,[162] salmon and steelhead in the North Pacific,[163] fin whales in the Mediterranean,[164] and four fish species in Samoa.[165] Nevertheless, there is a lack of systematic research.[166] Additional research is also needed on the impacts of MDPMs on habitats in particular sensitive areas, such as coral reefs and seagrasses.[167]

88. Very little is known on the effects of microplastics on marine life,[168] although it is suspected that the ingestion of microplastics is a pathway for the transport of harmful chemicals and organic pollutants

---

151 WOA, note 9. See also A/60/63 para. 282.
152 WOA, note 9, GESAMP (2015), note 20, IOC-UNESCO, FAO, Australia, New Zealand.
153 Australia, New Zealand.
154 Australia, Ocean Conservancy (2015), note 20.
155 WOA, note 9. New Zealand, DESA, IOC-UNESCO.
156 WOA, note 9, FAO, HELCOM, UNEP, UNEP/CMS/COP11/Inf.27 section E.2.
157 IOC-UNESCO.
158 European Union.
159 FAO.
160 WMO.
161 IOC-UNESO contribution, SPC contribution, IWC contribution, New Zealand contribution
162 PWF: "Quantifying the risk that marine debris poses to odontocetes in coastal waters of the 4-island region of Maui".
163 NPFAC.
164 IWC.
165 SPREP.
166 FAO.
167 New Zealand, IWC.
168 European Union, Peru, IOC-UNESO, IWC, SPC.

into the food web, as well as potentially acting as a vector for pathogens (see para. 24).[169] The impacts of microplastics on species providing a source of food are not well known and similarly, there is a limited understanding on the effects of microplastics on human health and risk assessments in this regard have not been carried out.[170]

89. It has also been noted that, in addition to specific research needs noted above, research on the cumulative effects of different environmental threats[171] on biota is required.

90. With regard to other uses of the oceans and seas, an apparent increase in the number of collisions between vessels and unknown objects, suspected to be lost shipping containers, requires further study.[172] The interaction between exploitation activities in the deep-sea and settled microplastics has not been studied as those activities have not commenced yet. However, that interaction will represent an important aspect to study as those activities will commence in the near future.[173] There are also limited studies on the biological effects of microplastics in deep-sea sediments. [174]

B. Regulatory, implementation and enforcement gaps

91. While some aspects of MDPMs are covered by several global, regional and national instruments, none, other than some regional action plans on marine litter, are specifically dedicated to MDPMs (see paras. 41-48). While UNCLOS includes provisions to address pollution from the various sources that are also the cause of MDPMs, some of the international rules and standards that it calls for remain of a non-legally binding nature, such as in the case of land-based sources of pollution for which the GPA is the only global instrument to date. In addition, the multiplicity of partial regulations has the potential not only to create overlaps but also gaps in the global regulation of the problem, both from a substantive and geographic point of view. To facilitate implementation, synergies between international legal and policy instruments could be identified, as well as gaps.[175] While most coastal States are parties to UNCLOS and/or a regional sea convention, few land-locked States are parties to those instruments, which is a challenge given the significant input of MDPMs from land, including through riverine pollution. In addition, participation in other relevant legally-binding instruments is sometimes limited, such as in the case of the London Convention and its 1996 Protocol.

92. It is generally recognized that the implementation of existing applicable instruments needs to be strengthened to effectively prevent, reduce and control pollution of the marine environment by MDPMs.[176] However, this remains a challenge for a number of States, owing, inter alia, to inadequate enforcement capacity, lack of incentives for compliance and inadequate infrastructure and management practices.[177] For example, the effectiveness of the discharge requirements under MARPOL Annex V largely depends upon the availability of adequate port reception facilities (see paras. 61-62).[178] In some cases, the development of guidance on the provisions of existing instruments can assist States in their

---

[169] New Zealand, Viet Nam, IAEA, FAO, OSPAR.
[170] European Union, New Zealand, FAO.
[171] IWC.
[172] SPC.
[173] A/70/74 para. 41, SPC.
[174] SPC.
[175] IWC.
[176] DESA, European Union, UNEP. See also *Manila Declaration on Furthering the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities*, UNEP/GPA/IGR.3/5.
[177] IWC.
[178] IMO.

implementation. For example, it has been suggested that a review of the scope of MARPOL Annex V might be useful for determining preventive measures, in particular, the definition of what "reasonable precautions" would entail under Annex V in cases of accidental loss constituting exceptions to the discharge prohibitions.[179] In the context of fisheries, in spite of the obligations contained in the United Nations Fish Stocks Agreement and commitments under other global and regional instruments, the marking of fishing gear calls for further action at the global and regional levels, including the possible development of international guidelines.[180]

93. Significant challenges exist in compliance and monitoring compliance. It has been noted, for example, that, in the context of MARPOL Annex V, as a result of tonnage limits, 99 per cent of the global fishing fleet is excluded from the requirement to have a garbage record book or garbage management plan. There is, therefore, no mechanism by which to monitor compliance in that regard. Enforcement authorities have highlighted that violations are almost impossible to detect and prosecute successfully and that fines are often low compared to the potential cost saving generated by discarding waste illegally.[181] The variation in adequacy and cost of port waste reception facilities has been highlighted as a particular disincentive to compliance.[182] In that regard, implementation of a no-special-fee system, where the costs of offloading waste are included in general port fees, may remove any incentive to dump waste illegally.[183] While UNCLOS and a number of protocols on land-based activities in the context of the regional seas conventions include compliance and enforcement measures or mechanisms, these mechanisms are often not operational or too weak.[184] While non-legally binding approaches, such as the GPA, give flexibility, they do not provide a mechanism to follow-up on actions and ensure that measures are taken.

C. Development of measures, best practices and best available techniques

1. Integrated management

94. The effectiveness of interventions to address MDPMs depends on an integrated approach to the management of activities on land and at sea covering the different pathways through which MDPMs reach the oceans,[185] the integration of the economic, social and environmental dimensions,[186] coordinated actions among the various competent sectoral authorities at the national and international levels,[187] compatibility between the responses at the various levels,[188] and the involvement of all relevant stakeholders.[189] The full life cycle of products and materials would also need to be embraced.[190]

---

[179] Peru.
[180] European Union, FAO, PIFS-SPC.
[181] IWC document SC/65a/Rep06.
[182] IWC document SC/65a/Rep06.
[183] IWC/65/CCRep04.
[184] UNEP/GPA (2006), *Protecting Coastal and Marine Environments from Land-based Activities - A Guide for National Action - http://coralreef.noaa.gov/aboutcrcp/strategy/reprioritization/wgroups/resources/lbsp/resources/06gpa_handbook.pdf.*
[185] Idem.
[186] A/70/74 and A/70/78.
[187] UNEP.
[188] Peru.
[189] New Zealand.
[190] CBD-STAP – GEF (2012), note 29.

95. Integrated assessments such as the First Global Integrated Marine Assessment[9] can assist in identifying linkages among the different dimensions of the issue.[184] Best available scientific information and information-sharing can also support integrated management. Continuous monitoring and assessments provide the necessary knowledge base, including lessons learned, to ensure adaptive management.

2. Addressing such materials at source

i. "Cultural" measures

96. Public awareness-raising of plastic pollution and its negative impacts is essential to promote responsible plastic consumption and to demonstrate the social, environmental and economic benefits of recycling.[191] In particular, awareness-raising among manufacturers, distributors, consumers and others, coupled with the promotion of investment in infrastructure development to control, produce statistics on, categorize marine debris and land-based wastes and to build waste processing and recycling systems is also crucial.[192] There is also a need to educate fishers and fishing vessel operators.[193] An overall need to enhance public-private partnerships has also been identified.[194] States have been encouraged to further develop partnerships with industry and civil society to raise awareness of the extent of the impact of marine debris on the health and productivity of the marine environment and consequent economic loss.[195]

97. Further action is also necessary to promote more responsible consumer behaviour, a critical factor in addressing MDPMs,[196] for example by decreasing or eliminating single-use plastic bags, further bans on non-biodegradable, non-compostable plastic packaging, and ending the availability of disposable plastic plates and glasses except bio-based ones.[197] Consumers can also be further sensitized through apps for mobile devices and other easily-accessible sources of information to help them make better choices.[198]

ii. Economic or market-based measures

98. Also of central importance is the need to encourage producers to take into account, during the design phase, the potential impacts on the natural environment of the ingredients/components contained in their products; to redesign products that are more environmentally friendly, less plastic intensive and use safer chemicals,[199] for example radiation technologies for the preparation of novel biodegradable polymers for packaging materials.[200] Support has also been expressed for initiatives with time-bound targets that restrict or ban certain unsustainable uses of plastic materials,[201] such as single use plastics,

---

[191] Peru.
[192] Viet Nam.
[193] CCAMLR.
[194] UNEP.
[195] SEAFO.
[196] HELCOM. It is estimated that 48 per cent of marine litter in the Baltic Sea originates from household-related waste, while waste generated by recreational or tourism activities would add up to 33 per cent.
[197] The "Energy Transition Law for a Green growth" adopted by France in 2015 addresses this problem.
[198] European Union. The "Beat the Microbead" App allows users to check whether personal care products contain microbeads by scanning a product's barcode. The App, which is available in seven languages has been very popular, convincing a number of large multinationals such as Unilever, Johnson & Johnson and the Body Shop to announce their intent to stop using microbeads.
[199] UNEP (2015) *Plastic in Cosmetics*, p. 7.
[200] IAEA.
[201] Australia, European Union, FAO.

non-biodegradable or compostable plastics, and the microbeads in "rinse-off" products (see paras. 48, 59, and 80);[202] industry-driven voluntary compliance mechanisms (see paras. 80-82); investment in eco-design of products (see para. 59);[203] and sharing of best practices on waste management.

99. Appropriate actions for food production systems could entail the development of guidelines or codes of practice for the use of plastic and the inclusion of considerations regarding microplastics in guidelines and international standards dealing with food safety together with setting microplastics limits in food.[204] In the fisheries sector, fishing for litter/nets schemes, low-cost loans to replace gear more regularly, involvement of the seafood retail sector in meeting some of the costs of mitigation measures, and net deposit/net buy-back schemes and training for fishers in how to release entangled animals could be considered.[205]

100. It is also important to find ways to capture the economic value of plastic wastes in order to incentivise plastic waste treatments, such as conversion to materials or energy.[206] The commercial viability of existing technologies for the conversion of plastics into materials and energy also requires improvement.[207] It has been reported that 95 per cent of the value of plastic packaging material, almost exclusively destined to single-use, or USD 80– 120 billion annually, is lost to the economy. In addition, only 14 per cent of plastic packaging is collected for recycling. The recycling rate of other plastics is even lower than for plastic packaging, and both are far below the global recycling rates for paper (58 per cent) and iron and steel (70–90 per cent).[208] The recycling of plastic reportedly saves consumer goods companies USD 4 billion a year, with over a quarter of these savings generated through initiatives in the food sector and 17 per cent in the soft drinks sector.[209] In order to facilitate industry accountability,[210] companies could increase and improve the measurement, management and disclosure of their "plastic footprint".[211] Incentives to do this include the desire to protect brand reputation, cutting the costs of excessive packaging and turning plastic waste into a useful resource,[212] e.g., using recycled plastic for clothing; development of biodegradable plastic and of end of life management plans for all plastic

---

[202] European Union (see section by Sweden). See also UNEP (2015), note 199, at p .6.

[203] European Union (see section by France).

[204] FAO.

[205] IWC.

[206] Australia; CBD. The CBD reported that its Expert Workshop to Prepare Practical Guidance on Preventing and Mitigating the Significant Adverse Impacts of Marine Debris on Marine and Coastal Biodiversity and Habitats in 2014, addressed measures related to waste prevention, including potential redesign of products, reduction, reuse and recycling, as well as other waste management measures and private sector engagement and producer responsibility.

[207] Australia; Ocean Conservancy (2015), note 20; Future Market Insights (2016). *Plastic-to-fuel Market: U.S. Industry Analysis and Opportunity Assessment 2015 - 2020* - www.futuremarketinsights.com/reports/us-plastic-to-fuel-market.

[208] World Economic Forum, note 9, p. 7.

[209] See UNEP (2014). *Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry*, p. 13.

[210] Toy manufacturers reportedly have the highest plastic intensity in the consumer goods sector, at 48 tonnes of CO_2 equivalents per USD 1 million revenue, due to their use of plastic in products. As a result, they have the highest value at risk at 3.9 per cent of annual revenue. This would wipe out the profits of several companies if they had to pay the full cost of environmental damage caused by plastic. See GPA report, UNEP, p. 9.

[211] See UNEP (2014). *Valuing plastic- The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry*, p. 17.

[212] Ibid.

products.[213] Other incentives could be the imposition of levies on all waste disposed of in municipal landfills to generate funding to help local government, communities and businesses minimize waste.[214]

101. Guidance on communication of potential hazards of microplastics contamination to seafood consumers and the general public could be developed through Government and industry partnerships. Source control and best practices are important to reduce abandoned or drifting FADs, as well as polystyrene and styrofoam buoys used in aquaculture.[215] Engaging industry leaders at the highest level in discussions to influence thinking and culture towards marine litter and its impacts could also be effective.

3. Improved waste management practices

102. When waste is not properly managed, it can enter the ocean via inland waterways and wastewater outflows, and be transported by wind or tides.[216] Of the leakage that comes from land-based sources, 75 per cent comes from uncollected waste, while the remaining 25 per cent leaks from within the waste-management system; post collection leakage can be caused by improper disposal, as well as formal and informal dump sites that are inappropriately located or lack proper controls.[217] Two billion people are without access to solid waste collection, and three billion people lack access to controlled waste disposal facilities.[218] The World Bank estimates that developing economies spend USD 46 billion a year on waste management, whereas around double this amount is needed.[219]

103. The General Assembly and several intergovernmental organizations have advocated for improvement of waste management and prevention, including through the development of economic opportunities and incentives (see para. 33),[220] such as the use of waste as a resource, plastic recycling,[221] and cost recovery systems to promote the use of port reception facilities and discourage ships from discharging marine debris at sea.[222] UNEP has called for public awareness campaigns on the negative impacts of improper waste disposal on oceans, targeting street litter, illegal dumping of rubbish and poorly-managed waste dumps.[223] SEAFO has urged States to further integrate the issue of marine debris into national and regional strategies dealing with waste management, especially in coastal zones, ports and maritime industries.[224] The Pacific Community suggested locating rubbish dumps away from the coast, and having fences around them to reduce dispersal.[225] Australia recommended exploring taxation and other levies to establish a Global Marine Responsibility Fund to build waste management capacity.

104. Innovation will be key, including changing or adapting products for environmental benefits, improving recovery and treatment technologies in the plastic life-cycle, and developing sustainable packaging.[226] Some options include using a variety of waste-to-fuel (e.g., gasification) or

---

[213] See Idem at pp. 41-47.
[214] New Zealand.
[215] FAO.
[216] SPC. See also: Jambeck, J., note 19, at pp. 768-771.
[217] Ocean Conservancy (2015), note 20.
[218] European Union.
[219] International Solid Waste Association (2013). *Sustainable Solid Waste Management and the Green Economy*," - www.iswa.org/index.php?eID=tx_iswaknowledgebase_download&documentUid=3217.
[220] FAO, OPSAR, SEAFO, UNEP.
[221] UNEP.
[222] SEAFO.
[223] See http://waste-management-world.com/a/waste-management-key-to-cleaning-up-oceans.
[224] SEAFO.
[225] SPC.
[226] Australia, OSPAR.

waste-to-energy (e.g., incineration with energy recovery) technologies to treat waste in areas with high waste density.[227] In areas with low waste density, manually sorting high-value plastic waste and converting much of the remainder to refuse-derived fuel for use in the cement industry is an option.[228] In areas where formal recycling systems still do not exist, individuals who collect materials from waste and then sell those materials to recyclers face many health risks and are often part of vulnerable communities, and their inclusion and empowerment, along with long-term plans to upgrade their working conditions, may be a necessary component of any solution.[229]

4. Cleaning-up existing marine debris

105. Efforts at reducing, or eliminating MDPMs from entering the marine environment need also to be complemented by efforts to clean up existing marine debris. UNCLOS requires States to, inter alia, take all measures that are necessary to prevent, reduce and control pollution of the marine environment from any source, using the best practicable means at their disposal and in accordance with their capabilities. Regional action plans include objectives to remove litter from the marine environment,[230] and a number of RFMOs have rules in place to encourage the retrieval, or alternatively reporting, of lost gear.[231] A global online portal to compile information on such gear is under consideration.[232]

106. As opposed to many other issues facing the marine environment, marine debris is a problem which has seen a significant amount of community involvement in clean-up events throughout the world.[233] Similarly there are many individually-championed ideas aimed at exploring larger-scale cleaning-up operations.[234] These efforts will need to be further tested and supported before they can be mainstreamed.

5. Coordination and cooperation

(a) Cross-sectoral cooperation

107. Strengthening international cooperation and knowledge and information-sharing on transboundary issues of marine debris pollution has been identified as central to the solution to marine debris. Cross-sectoral cooperation can foster multidisciplinary research and greater exchange of information on the various aspects of the issue, as well as on best practices and environmental technologies. Such cooperation benefits monitoring and assessment efforts, in particular with a view to better assessing the cumulative and synergistic impacts of various sources of MDPMs. Cross-sectoral coordination also facilitates remedying any possible gaps in regulations and implementation (see Part III-B) and avoiding overlaps.

108. Furthermore, considering that marine debris originates from a wide range of anthropogenic sources (see section II), coordinated action involving central and local

---

[227] Ocean Conservancy (2015), note 20.
[228] Idem.
[229] Idem.
[230] OSPAR, UNEP.
[231] CCAMLR, NAFO, NEAFC, SEAFO, WCPFC.
[232] FAO.
[233] European Union, Viet Nam, SPREP. See e.g. the annual International Coastal Cleanup events organised by Ocean Conservancy, www.oceanconservancy.org.
[234] See e.g. the Ocean Cleanup, www.theoceancleanup.com, aimed at extracting plastics from the ocean; and the Seabin Project, www.seabinproject.com, aimed at removing rubbish, oil, fuel and detergents.

governments, the private sector and civil society is needed to change behaviours.[235] At the international level, collaboration, including through the GPML, can ensure consistency of approach, synergy of efforts and exchange of information.[236] A multidimensional approach can also facilitate the consideration of multi-sectoral issues, including effective capacity-building to keep pace with the state of science, and technological innovations.

(b) Capacity-building

109. The General Assembly recognized on numerous occasions the need to build the capacity of developing States to raise awareness of and support the implementation of improved waste management practices, noting the particular vulnerability of SIDS to the impact of marine pollution from land-based sources and marine debris. Building the capacity in relation to the prevention, control and elimination of this form of pollution is a multifaceted process requiring a continued strengthening of cooperation and partnerships among States, United Nations bodies and organizations, industry and civil society. Capacity building efforts should be based on a better understanding of the extent of the impact of marine debris on the health and productivity of the marine environment and resulting economic loss. They are most efficient if integrated into national strategies dealing with oceans and coastal zone, marine and land-based sources of marine pollution, including shipping and land run-off, with waste management in the coastal zones, ports and maritime industries and if carried out in conjunction with the development and implementation of prevention and recovery programmes for marine debris.

110. Issues that need to be addressed in the context of capacity-building activities include insufficient awareness about the impact of MDPMs on the marine environment and on how this form of pollution affects sustainable development, inadequate research capacities, facilities and scientific and technical know-how, inadequate policies, rules, regulations and standards at the national level, inadequate mechanism for promotion and implementation of existing global and regional commitments, inadequate mechanisms for prevention and control of marine pollution, including from MDPMs, inadequate enforcement capacities, and limited access to technologies. These challenges are frequently compounded by limited trained personnel. Some targeted capacity-building activities are already underway (see paras. 63-73).

111. It has also been emphasized that the global efforts at prevention and reduction of MDPMs should be supplemented by the organization of workshops in various parts of the world with a view to promoting a better understanding of the causes and impacts of marine pollution, exploring new approaches and identifying effective solutions.

112. At both regional and national levels, expectations in respect of capacity-building efforts are high. Given the dominant role of land-based sources of pollution, it appears that a significant part of these efforts needs to address the waste management on land and at sea, including recycling of materials. Capacity-building efforts are also required to assist developing States with the development of relevant legal and policy frameworks and infrastructure, taking into account their specific challenges and need for low-cost targeted and effective responses. This is needed to deal with the lack of targeted, comprehensive and integrated strategies to reduce the amount of waste entering the marine environment combined with the lack of reliable and accurate data on the amount, type and source of marine debris, including plastics and microplastics.

---

[235] New Zealand.
[236] IWC.

113. Furthermore, there is a need to promote the development and transfer of environmentally sound, and economically sustainable technologies and know-how. This is particularly pertinent in the case of SIDS for which waste management represent a significant challenge and which could benefit, for example, from technologies for the conversion of plastic waste into other materials or energy.

VI. Conclusions

114. The present report provides an alarming assessment of how marine debris, including plastics and microplastics, are affecting the world oceans and hindering sustainable development. Their continued and growing accumulation is tarnishing the oceanscape and causing a major threat to marine life. This form of pollution also presents a direct threat to food security and to the health, safety and livelihoods of human populations. It also interferes with various activities at sea, such as fishing and navigation.

115. Thus, the alarming assessments of the impacts of marine debris already made at the sixth meeting of the Informal Consultative Process in 2005 not only continue to be valid, but recent studies demonstrate a further exacerbation of these impacts. In 2005, such assessments led the General Assembly, in its annual resolutions on oceans and the law of the sea and on sustainable fisheries, to call for a number of actions to address marine debris. This appeal for action has even greater weight today, as the amount of marine debris, plastics and microplastics in the oceans continues to grow, including as a result of the increased durability of the material and continued increase in global plastics production. It will therefore be of critical importance to step up efforts if internationally-agreed commitments are to be achieved, including those reflected in Goal 14 of the 2030 Agenda for Sustainable Development, namely to prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris, by 2025, and in other ocean-related goals.

116. Not only are MDPMs exogenous, ubiquitous and transboundary, but their sources are mostly land-based. Urgent action is thus required to address activities and patterns of behaviour on land, including harmful production and consumption patterns. In particular, the improvement of product life-cycle management, the development of cleaner technologies and waste management infrastructures, require attention. There is also a considerable need for greater awareness-raising efforts among populations living near and far from the coast, with a view to curbing activities which have a potential to pollute the marine environment through riverine runoffs and debris-carrying winds.

117. A number of legal and policy instruments at the global, regional and national levels address various aspects of this issue. Implementation of these instruments, in particular UNCLOS, needs to be strengthened to effectively prevent, reduce and control marine debris, including plastics and microplastics. This presents numerous challenges for a number of States, owing, inter alia, to inadequate human and institutional capacity, technology and infrastructure.

118. However, these challenges can be overcome if adequate enabling measures are put in place and the appropriate resources are dedicated to addressing the problem. While data and knowledge gaps exist, the lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to address the issue, in line with the precautionary approach. The present report illustrates the wide range of enabling measures which already exist, as well as further action which may assist in tackling the issue at its root causes, while dealing with existing marine debris. In that regard, the challenges also present opportunities.

119. In particular, the urgency of action to address this issue could provide a renewed focus on strengthening implementation of applicable instruments. The multifaceted nature of the problem also provides an opportunity for increased cross-sectoral cooperation and coordination, integrated management as well as fostering greater producer and consumer responsibility, including through fiscal and market-based incentives, participative approaches, education and awareness-raising. Innovative reuse and recycling initiatives also provide for new economic opportunities.

120. The cumulative impacts of marine pollution, including marine debris, plastics and microplastics, can no longer be ignored, given the fact that they hinder the achievement of sustainable development goals.

121. It is the collective responsibility of all stakeholders, whether governments, industry or consumers, to act promptly and resolutely to ensure that activities and behaviours both at sea and on land do not result in pollution of the oceans and seas and do not poison the marine environment and the food-chain. All efforts should be directed at strengthening the resilience of ocean ecosystems as we try to face some of the defining challenges of our times, such as climate change. Oceans are, and must continue to be, an essential asset in the sustainable development of present and future generations.