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**2022 United Nations Conference to Support the  
Implementation of Sustainable Development Goal 14:  
Conserve and sustainably use the oceans, seas and  
marine resources for sustainable development**

Lisbon, 27 June–1 July 2022

Item 9 of the provisional agenda\*

**Interactive dialogues**

**Interactive dialogue 1: Addressing marine pollution**

**Concept paper prepared by the Secretariat**

*Summary*

The present concept paper was prepared pursuant to paragraph 23 of General Assembly resolution [73/292](#), in which the Assembly requested the Secretary-General of the 2022 United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development to prepare concept papers on each of the themes of the interactive dialogues, taking into account the relevant ocean-related processes of the Assembly and other possible contributions. The present paper relates to interactive dialogue 1, entitled “Addressing marine pollution”. In the paper, the status, trends, challenges and opportunities for the achievement of relevant targets of Sustainable Development Goal 14 are set out, under the overarching theme of the Conference: “Scaling up ocean action based on science and innovation for the implementation of Goal 14: stocktaking, partnerships and solutions”.

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\* [A/CONF.230/2022/1](#).



## I. Introduction

1. Pollution affects every part of the planet: air, soil, and freshwater, marine and coastal environments. It contributes significantly to climate change, biodiversity loss and ecosystem degradation. Its impacts often derive from the combined effects of several pollutants. Pollution takes many forms, visible and invisible. Among other sources, it may result from energy production and consumption. Pollution due to human activities is found everywhere in the oceans – at the surface, in the ocean depths and in marine organisms. Rivers carry solid and liquid waste generated by land-based activities, and other potentially harmful substances, from source to sea. Yet, healthy oceans are essential to the health and well-being of everyone.

2. The coronavirus disease (COVID-19) pandemic introduced new and evolving challenges related to waste and pollution. While it is too early to understand all the lessons of the pandemic, it has presented an opportunity to address the causes of pollution.

3. Sea-based pollution, including discharges and spills from vessels and the presence of abandoned, lost or otherwise discarded fishing gear, continues to be of concern. Plastics and microplastics<sup>1</sup> from numerous sources, untreated wastewater and nutrient run-off still pollute the oceans. The consequences of anthropogenic activities, combined with a lack of global governance, adequate financing, capacity, oversight and accountability, have increased the adverse impact of human activities on living and non-living ocean resources to an unprecedented level. Although considerable progress has been made in limiting some forms of marine pollution, others such as wastewater pollution, nutrient run-off and eutrophication persist.

4. Reflecting widespread global concerns, marine pollution has moved to the forefront of the international environmental agenda in recent years. A number of global actions have resulted. During the fifth session of the United Nations Environment Assembly, several resolutions addressing pollution were adopted. In its resolution 5/14, the Assembly calls for the establishment of an intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment. With its resolution 5/2, on sustainable nitrogen management, the Assembly intends to accelerate actions to significantly reduce nitrogen waste from all sources, including agricultural practices. Furthermore, the United Nations Decade of Ocean Science for Sustainable Development addresses marine pollution as one of its key challenges.<sup>2</sup>

5. This global momentum shows that there is an international commitment to combat pollution, including marine pollution. It also indicates the urgency of the pollution crisis, which cuts across several sectors and is strongly interconnected with the other two planetary crises – climate change and biodiversity loss.<sup>3</sup>

6. These pollution challenges require national and regional cooperation and knowledge-sharing among diverse stakeholders. There is a need for robust and sustainable global actions, informed by science and based on inclusive consultations with diverse stakeholders. Use of alternative, low-cost and innovative technologies that consider the full life cycle of products should be encouraged. Creative partnership approaches should also be considered, including engagement of the private sector and

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<sup>1</sup> Microplastics are small pieces of plastic less than 5 mm in diameter.

<sup>2</sup> See “Challenge 1: understand and beat marine pollution”, available at [www.oceandecade.org/challenges/](http://www.oceandecade.org/challenges/).

<sup>3</sup> United Nations Environment Programme (UNEP), “Planetary action: climate, nature, chemicals and pollution”, 2022.

development of innovative financial mechanisms to support a sustainable transition that addresses and prevents marine pollution from source to sea.

## II. Status and trends

7. Anthropogenic activities cause increasing amounts of pollution. Not only is pollution a major environmental risk to human health worldwide, but it also has social costs that significantly affect the formal economy and livelihoods. These costs are due to adverse human health effects and damage to ecosystems, fisheries, agricultural productivity and cultural sites. Target 14.1 of the Sustainable Development Goals calls for the prevention and considerable reduction of marine pollution of all kinds, including marine debris and nutrient pollution, particularly from land-based activities. Despite the many efforts already undertaken globally to prevent and reduce pollution and the progress achieved, pollution continues to be pervasive and persistent.<sup>4</sup> This has been further recognized through the United Nations Decade of Ocean Science for Sustainable Development 2021–2030, which emphasizes the need to understand and map land and sea-based sources of pollutants and contaminants and their potential impacts on human health and ocean ecosystems, so as to develop solutions in order to remove or mitigate them.

8. The United Nations Convention on the Law of the Sea defines “pollution of the marine environment” as “the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities”.<sup>5</sup> This includes both point source pollution from any single identifiable source and non-point pollution that is diffused without a single point of origin. The harm caused by specific pollutants depends not only on the environment in which they are found, but also on the other pollutants present and on exposure. Nutrient run-off (e.g. run-off of nitrogen and phosphorus) affects oxygen levels in the ocean, threatening many marine species, especially closer to coasts. Rivers are a major pathway by which nitrogen and phosphorus run-off enters coastal waters, while atmospheric deposition is the primary mechanism by which land-based nutrients reach the open ocean.<sup>6</sup> Recently, climate change threats have exacerbated this issue, as warmer waters hold less oxygen.<sup>7</sup> Close to 500 dead zones – areas where there is too little oxygen to support marine organisms (including commercial species) – have been identified in coastal areas around the world.

9. More than 3.5 billion people depend on oceans as their primary source of food,<sup>8</sup> yet waste and wastewater continue to be dumped into them, with most of it originating from land-based sources.<sup>9</sup> This pollution emanates from sources including

<sup>4</sup> UNEP, *Global Chemicals Outlook II: From Legacies to Innovative Solutions – Implementing the 2030 Agenda for Sustainable Development* (Nairobi, 2019).

<sup>5</sup> United Nations Convention on the Law of the Sea, art. 1 (4).

<sup>6</sup> Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, *The Magnitude and Impacts of Anthropogenic Atmospheric Nitrogen Inputs to the Ocean* (Geneva, World Meteorological Organization (WMO), 2018). In the aforementioned report, the Joint Group of Experts concludes that current best estimates of nitrogen inputs to the ocean from the atmosphere (39 TgN per year) are comparable with inputs from rivers (34 TgN per year) (1 Tg = 10<sup>12</sup> g or 10<sup>6</sup> tons).

<sup>7</sup> Atmospheric heat due to the greenhouse effect is absorbed by the oceans.

<sup>8</sup> UNEP, *Towards a Pollution-Free Planet: Background Report* (Nairobi, 2017).

<sup>9</sup> There is also sea-based pollution, which may include, inter alia, oil spills, lost or abandoned fishing gear, and chemicals from ships.

agricultural run-off, untreated sewage and wastewater, oils, heavy metals, pesticides, radioactive waste, nutrients, and marine litter, including plastics. Agricultural practices, coastal tourism, port and harbour development, the damming of rivers, urban development and construction, and mining and manufacturing are examples of activities that create the pollution that threatens coastal and marine habitats, economies, and human health and well-being. Agricultural nutrient run-offs into marine and freshwater ecosystems can result in toxic algal blooms, affecting tourism and rendering some sea-sourced foods inedible, among other impacts. The economic costs to fisheries, tourism and other coastal livelihoods can be heavy.

10. Population increases, changes in consumption patterns and other types of behaviour, and greater market accessibility lead to higher waste generation, while the resources and technical capacity for sound waste management are limited in some countries.<sup>10</sup> In 2020, 2.24 billion tons of municipal solid waste were generated globally. This is expected to increase to 3.88 billion tons by 2050 under a business-as-usual scenario.<sup>11</sup> Waste generation patterns differ dramatically across income levels and regions. In 2020, high-income countries were estimated to generate 1.60 kg per person per day of waste on average, compared to only 0.41 kg per person per day in low-income countries.<sup>12</sup> The waste collection rate in high-income countries is estimated to be about 96 per cent, compared with some 39 per cent in low-income countries.<sup>13</sup> At least 2.7 billion people do not have access to regular waste collection.<sup>14</sup> A large portion of uncollected waste ends up in waterways and in the ocean, where it becomes marine litter.

11. Plastics are by far the most prevalent and visible types of marine litter, accounting for at least 85 per cent globally with some regional variations.<sup>15</sup> Electronic waste contributes to the overall plastics issue; of the 53.6 million tons of e-waste generated in 2019, 17.4 per cent was properly collected and recycled, while 7–20 per cent was exported as second-hand products and 8 per cent was discarded in household bins in high-income countries.<sup>16</sup>

12. During the COVID-19 pandemic, many countries relaxed their plastic waste management regulations. Adding to the stream of conventional single-use plastics and plastic packaging (e.g. for take-out meals and home deliveries), personal protective equipment and other health-care-related tools have become prevalent waste items during the pandemic. Mobility restrictions due to lockdown measures and the economic impact of the pandemic have affected waste management and further strained current infrastructure, including landfills. These developments threaten to reverse the progress made in the fight against plastic pollution.

13. The impacts of marine plastics – in addition to entanglement by and ingestion of marine litter by marine animals – include mechanical damage to ecosystems such as coral reefs and adverse effects on maritime safety, as well as on coastal economies through loss of revenue (e.g. from tourism or fisheries). More than 800 animal species

<sup>10</sup> UNEP, *From Pollution to Solution: A Global Assessment of Marine Litter and Plastic Pollution* (Nairobi, 2021).

<sup>11</sup> Silpa Kaza, Siddarth Shrikanth and Sarur Chaudhary, *More Growth, Less Garbage*, Urban Development Series (Washington, D.C., World Bank, 2021).

<sup>12</sup> Ibid.

<sup>13</sup> Silpa Kaza, Siddarth Shrikanth and Sarur Chaudhary, *What a Waste 2.0*, Urban Development Series (Washington, D.C., World Bank, 2018).

<sup>14</sup> UNEP and International Solid Waste and Public Cleansing Association, *Global Waste Management Outlook 2* (forthcoming).

<sup>15</sup> UNEP, *From Pollution to Solution*.

<sup>16</sup> Vanessa Forti and others, *The Global E-waste Monitor 2020: Quantities, Flows, and the Circular Economy Potential* (Bonn, Geneva and Rotterdam, United Nations University, United Nations Institute for Training and Research and International Telecommunication Union, 2020).

are adversely affected by marine plastics, with research suggesting that by 2050 almost all seabird species will be found to have ingested plastics.<sup>17</sup> In 2017, the United Nations Environment Assembly stressed the importance of a zero vision, that is, long-term elimination of discharges of litter and microplastics to the oceans and avoidance of detriment to marine ecosystems and the human activities dependent on them from marine litter and microplastics. Under the recent United Nations Environment Assembly resolution establishing an intergovernmental negotiating committee to develop a legally binding instrument on plastic pollution, including in the marine environment, the negotiating committee will aim to conclude its work by the end of 2024.

14. Nearly all human activities result in the production of wastewater. It is estimated that 80 per cent of the world's municipal and industrial wastewater is released to the environment without treatment.<sup>18</sup> Aging wastewater treatment infrastructure, lack of expertise and knowledge in wastewater management, poor governance, limited funding, weak enforcement of existing legislation, institutional gaps, and lack of coordination among stakeholders have all contributed to the increasing risks posed to the marine environment by wastewater, with consequences for economic productivity. Plastic pollution and other debris not only contaminate water but can also block drains. Polluted water is more likely to host disease-causing organisms, such as cholera-causing *Vibrio cholerae* and the parasitic worm transmitting schistosomiasis, also known as bilharzia. The increasing presence in aquatic ecosystems of chemicals, pharmaceuticals, antimicrobials and new micropollutants is of concern, because they can lead to antimicrobial resistance, hormonal disruption and other negative health effects.<sup>19</sup>

### III. Challenges and opportunities

15. Pollution can have varying impacts on ecosystems and on human well-being. In addition to health costs, pollution has negative impacts on the formal and informal economies and on livelihoods. It can exacerbate inequality and poverty.<sup>20</sup>

16. Pollution poses a threat to the achievement of the Sustainable Development Goals, with Governments and local authorities facing major challenges in addressing the issue. However, the transboundary effects of pollution make it a global challenge and encourage coordination beyond national borders. Owing to pollution's cross-border nature – along with impediments such as limited available knowledge, technical capacities and funding – Governments are encouraged to take a more holistic approach to tackling pollution in all its forms. Since pollution is a global issue, addressing it effectively requires international and regional instruments.

17. Multilateral environmental agreements provide governance frameworks for targeted and time-bound actions. Some such agreements include compliance-related actions, monitoring and reporting. Several address different types of pollution, including in the areas of chemicals and waste, long-range transboundary pollution, and areas closely associated with pollution, including biodiversity and climate

<sup>17</sup> Chris Wilcox, Erik van Sebille and Britta Denise Hardesty, "Threat of plastic pollution to seabirds is global, pervasive and increasing", *Proceedings of the National Academy of Sciences*, vol. 112, No. 38 (2015).

<sup>18</sup> World Water Assessment Programme, *The United Nations World Water Development Report 2017: Wastewater – The Untapped Resource* (Paris, United Nations Educational, Scientific and Cultural Organization, 2017).

<sup>19</sup> African Development Bank, UNEP and GRID-Arendal, *Sanitation and Wastewater Atlas of Africa* (Abidjan, Nairobi and Arendal, 2020).

<sup>20</sup> UNEP, *Neglected: Environmental Justice Impacts of Marine Litter and Plastic Pollution* (Nairobi, 2021).

agreements. There are reasons to remain optimistic, as solutions that help prevent and control pollution exist and are being successfully implemented globally. The 2030 Agenda for Sustainable Development includes goals and targets aimed at reducing pollution. Several countries have started to incorporate the Sustainable Development Goals into national development plans and strategies. In 2022, the United Nations Environment Assembly put pollution at the centre of the international environmental agenda.

18. During its third session in 2017, the Environment Assembly adopted a ministerial declaration highlighting the need for rapid, large-scale and coordinated action to combat pollution for a transition to a pollution-free planet. A pollution-free planet is a basis for maintaining and improving biodiversity and the health of ecosystems, promoting human health, and reducing poverty, inequalities and vulnerability. The aim of the 2030 Agenda is to “leave no one behind”; this goal is of fundamental importance in the context of pollution, as pollution often has adverse effects on the poor, and on the more vulnerable and marginalized in particular. The publication entitled *Towards a Pollution-Free Planet: Background Report*, in which UNEP sets out the challenges presented by global pollution and suggests 50 actions to tackle the problem, was prepared for the United Nations Environment Assembly in 2017.

19. The United Nations Convention on the Law of the Sea sets out the legal framework under which all activities on the oceans and seas must be carried out. Pursuant to part XII of the Convention, States have a general obligation to protect and preserve the marine environment,<sup>21</sup> as well as specific obligations to take, individually or jointly as appropriate, all measures consistent with the Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities.<sup>22</sup> States are also required to, inter alia, take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment.<sup>23</sup> The United Nations Convention on the Law of the Sea sets out specific rights and duties of States to address pollution from land-based sources, seabed activities, dumping, vessels, and from or through the atmosphere. A broad definition of pollution of the marine environment is contained in article 1 (4) of the Convention.

20. In its resolution [72/249](#) of 24 December 2017, the General Assembly decided to convene an intergovernmental conference, under the auspices of the United Nations, to consider the recommendations of the preparatory committee established by resolution [69/292](#) of 19 June 2015 and to elaborate the text of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, with a view to developing the instrument as soon as possible. Negotiations are addressing four topics, some of which have potential relevance to the issue of marine pollution, including measures such as area-based management tools, including marine protected areas, and capacity-building and the transfer of marine technology. The General Assembly continued to consider the protection and preservation of the marine environment, including issues of marine pollution, through its annual resolutions on ocean affairs and the law of the sea.

21. The Group of Seven (G7) adopted the Action Plan to Combat Marine Litter in 2015 and the Tsukuba Communiqué on the Future of the Seas and Oceans in 2016, followed by the Bologna G7 Road Map, the Charlevoix Blueprint for Healthy Oceans,

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<sup>21</sup> United Nations Convention on the Law of the Sea, art. 192.

<sup>22</sup> *Ibid.*, art. 194 (1).

<sup>23</sup> *Ibid.*, art. 194 (2).

Seas and Resilient Coastal Communities, the G7 Biarritz Chair's Summary on Climate, Biodiversity and Oceans, and the Ocean Plastics Charter. The more recent G7 Navigation Plan marks the beginning of targeted G7 collaboration on ocean science and action in support of the United Nations Decade of Ocean Science for Sustainable Development and its societal outcomes.

22. The Group of 20 (G20) adopted the Action Plan on Marine Litter in 2017, followed by the G20 Implementation Framework for Actions on Marine Plastic Litter in 2019, which encouraged information-sharing on measures taken in countries to combat marine litter while promoting effective actions. Since 2019, the *G20 Report on Actions against Marine Plastic Litter* has been expanded to include policies and measures in non-G20 countries, providing opportunities for further collaborative efforts.<sup>24</sup>

23. The projected doubling of the global chemicals market between 2017 and 2030 will increase global chemical releases, exposures, concentrations, and adverse health and environmental impacts unless sound management of chemicals and waste is achieved globally.<sup>25</sup> The direct environmental effects of chemicals include eutrophication and algal blooms due to nutrient run-off and the accumulation of persistent organic pollutants and heavy metals throughout the food chain, resulting in toxicity build-up in marine animals and marine organisms consumed as food. Relatively few of the tens of thousands of chemicals currently on the market have been thoroughly evaluated to determine whether they might cause adverse effects to human health and the environment, and this is complicated by the fact that the toxicity of mixtures is almost impossible to understand or measure.<sup>26</sup> Waste generation has greatly increased in recent decades. A significant portion of this waste is not managed in an environmentally safe manner. There needs to be a long-term focus on waste reduction at source globally as a basis for prevention, reuse, recycling and recovery. There is also a need to shift from current production and consumption models towards a non-toxic, circular economy-based approach that decouples economic growth from environmental impacts.

24. Ship-source oil pollution may be of particular concern in vulnerable developing countries, including small island developing States whose economies rely heavily on fisheries, aquaculture and tourism. These countries may be faced with the consequences of oil spills from vessels in their ports or near their coasts, where spills can have significant effects. The need to ensure that adequate compensation is available may deserve renewed attention as part of collective regulatory efforts to implement the overall objectives of the 2030 Agenda for Sustainable Development, particularly Sustainable Development Goal 14, and related international agreements.

25. There is also increasing concern about, inter alia, the potential social, economic and environmental impacts of anthropogenic underwater noise due to the growth of ocean-related human activities. In view of continuing knowledge gaps and a lack of data in the area of "noise pollution", there is an urgent need for further research and international cooperation to assess and address the potential effects of anthropogenic underwater noise in all ocean areas.

26. Lack of knowledge about sustainable marine pollution prevention measures is a major concern in policy decision-making. Understanding the sources of marine pollution and the role of atmospheric pathways requires observations of substances over both land and water. Currently, such observations are extremely limited. Quantitative estimates of pollution sources, monitoring of marine debris, and

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<sup>24</sup> Japan, Ministry of the Environment, *G20 Report on Actions against Marine Plastic Litter: Third Information Sharing Based on the G20 Implementation Framework 2021* (2021).

<sup>25</sup> UNEP, *Global Chemicals Outlook II*.

<sup>26</sup> Ibid.

assessments of the social, environmental and economic costs of pollution are also limited. In regard to monitoring marine litter and plastic pollution, additional innovation and scientific research are required to obtain crucial data with which to determine hotspot areas and identify areas for priority interventions while evaluating the long-term effectiveness of such interventions. Additionally, public and private data need to be better coordinated and shared among users to fill knowledge gaps. The United Nations Conference to Support the Implementation of Sustainable Development Goal 14 could provide an opportunity to discuss how to build national monitoring capacities globally and promote regional cooperation and information-sharing. A gap also exists with respect to research to assess the diverse impacts of microplastics. Further risk analysis should consider the environmental, social and economic dimensions of such impacts.

27. While significant attention has been given to reducing marine plastic pollution, and a range of concrete actions have been taken, much remains to be done in order to arrive at a truly comprehensive global approach to turn the tide on this type of pollution. At the same time, greater progress in reducing ocean pollution from land-based sources, including from nutrient run-off and wastewater, is needed. The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, through its three global partnerships on marine litter, nutrient management and wastewater, is aimed at implementing the source-to-sea approach. This approach addresses land-based pollution by linking freshwater, terrestrial and coastal ecosystems. For example, it is possible to link the impacts of excessive nutrients in drinking water to blue baby syndrome.<sup>27</sup>

28. There is also immense potential for wastewater reuse and the recovery of nutrients necessary for food production. It is of key importance to encourage closed-loop systems with safer circular plastic production cycles in line with the waste hierarchy, with a focus on reducing unnecessary, avoidable and problematic products or polymers encountered in the marine environment. Moreover, there is a need to redesign markets, develop alternative materials, enact extended producer responsibility policies, improve recycling and reuse practices, and develop and implement integrated waste management policies. At the same time, rehabilitation and restoration of affected natural areas needs to take place, while also ensuring that waste management infrastructure is indeed operating effectively, minimizing leakage of waste and further ecosystem degradation.

29. The intergovernmental negotiating committee that is to be established by the end of 2022 and complete its work by 2024 represents an opportunity to scale up sustainable solutions to the problem of plastic pollution, especially through the development of an instrument that would be legally binding on States Members of the United Nations. In addition, the United Nations Environment Assembly resolution supporting the establishment of a science-policy panel on the sound management of chemicals and waste provides an occasion to address environmental concerns related to pollution, which would not be limited to plastics.

30. The entanglement of marine life, among other hazards of abandoned, lost and otherwise discarded fishing gear, is another area that must be addressed. The entire life cycle of fishing gear, including its design, manufacturing, use, recycling and disposal, should be taken into consideration. Effective and sustainable solutions to the problems it causes should be proposed. Further data collection with respect to this issue is necessary to obtain a better understanding of the extent of these problems in terms of sources, amounts, fates and impacts. Furthermore, the Voluntary Guidelines

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<sup>27</sup> Blue baby syndrome is the decreased ability of blood to carry oxygen, resulting in oxygen deficiency in different body parts (methemoglobinemia). See, for example, Deepanjan Majumdar, "The blue baby syndrome: nitrate poisoning in humans", *Resonance*, vol. 8, No. 10 (October 2003).

on the Marking of Fishing Gear developed by the Food and Agriculture Organization of the United Nations (FAO)<sup>28</sup> and the development of a global strategy to address abandoned, lost and otherwise discarded fishing gear should be further discussed, including at and beyond the United Nations Conference to Support the Implementation of Sustainable Development Goal 14.

31. Additional political dialogue could be facilitated among small island developing States and least developed countries, which often have numerous vessels within their exclusive economic zones and large coastal populations, but with little in the way of national mechanisms with which to respond to serious accidents and disasters as well as everyday pollution (much of which, in the case of marine litter, is not generated by these countries but transported via ocean currents from others). Impacts of pollution and waste on small island developing States and least developed countries are often substantial. The challenges they face in regard to pollution are intense and, in many ways, unique. These challenges are exacerbated by some countries' inability to meet their own needs, leading to high levels of importation of goods packaged in plastics. Further, countries whose production is limited have little influence on the design of products and limited access to information on the content of those products they import.

32. Proven pollution reduction tools such as pollution taxes, tradable emissions permits, and financial and other incentives for investments in upstream pollution reduction actions and infrastructure need to be piloted, replicated and scaled up together with the promotion and use of existing tools, such as the United Nations Environment Programme (UNEP) Ecosystems Health Report Card and the Wastewater Technology Matrix.

33. Since climate change scenarios predict an increasing frequency and intensity of extreme maritime weather worldwide, vessels at sea will become more vulnerable to accidents, and therefore the risk of pollution from oil and chemical spills and of marine litter will also increase. With more than 90 per cent of the world's traded goods carried by sea and an expected increase in the number of vessels and shipping traffic, especially in environmentally sensitive areas such as the polar regions (where traditionally frozen areas are melting, allowing vessel movement and releasing trapped pollutants such as microplastics), the challenge of further minimizing marine pollution from sea-borne vessels is a major one. The International Maritime Organization (IMO) International Code for Ships Operating in Polar Waters is mandatory under both the International Convention for the Safety of Life at Sea, 1974, and the International Convention for the Prevention of Pollution from Ships, 1973. The Polar Code, which entered into force on 1 January 2017, covers design, construction, equipment, operational, training, search and rescue, and environmental protection matters relevant to ships operating in waters surrounding the two poles. In regard to increasing maritime traffic, several initiatives have been put in place to address the issue of biofouling and the transfer of invasive aquatic species, together with measures against sea-based pollution, including discharges of sewage and plastic litter from ships. Anthropogenic underwater noise pollution has also become an area of environmental concern and requires future actions.<sup>29</sup>

34. The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection has a correspondence group that updates information on sources of the main pollutants that have impacts on the global marine environment and explores ways to gather more accurate and more pertinent information on pollutants. To

<sup>28</sup> Food and Agriculture Organization of the United Nations, *Voluntary Guidelines on the Marking of Fishing Gear* (Rome, 2019).

<sup>29</sup> See, for example, Nicola Jones, "Ocean uproar: Saving marine life from a barrage of noise", *Nature*, 10 April 2019.

complement ocean observation, more information is also clearly needed on land-based sources, particularly levels of nutrient discharges and their origins, as well as access to information, open data and reporting from industries on, for example, contents and additives.

35. Concerning the impacts of pollution on marine and coastal ecosystems, there is a need for comprehensive knowledge development through research, education and training of different stakeholders (such as government, industry, certification societies, civil society and academic institutions). This will involve developing scientifically and statistically robust monitoring programmes and methodologies to assess the potential risk that activities in an area may interfere with the ecological balance of the marine environment, as well as monitoring pollution and other hazards to the marine environment from seabed activities undertaken in the area through cooperation with International Seabed Authority contractors, sponsoring States and other stakeholders.

36. Determining source inventory methods to identify sources of pollution and responding accordingly will require an internationally coordinated effort, especially to support countries that need assistance. Improved ocean observations can help improve the understanding of the sources and fates of marine pollution. This would require better coordination between agencies involved in the ocean observations and further scaling up from a national or regional to a global approach. For example, when addressing ocean nutrient pollution and coastal hypoxia (low oxygen levels), much more attention needs to be directed to source-to-sea partnerships between upstream river basin organizations and downstream (affected) coastal communities, at both large and small scales. When addressing marine plastics, identification of the most problematic products or polymers could guide priority interventions ranging from legislation to market-based instruments.

37. Innovation is key to addressing challenges related to the monitoring of pollution. For example, research and the use of satellite monitoring sensors, such as is being explored through the Closing the Circle Programme of the Nippon Foundation and the World Maritime University-Sasakawa Global Ocean Institute, are useful for identifying challenges and fostering potential solutions to marine debris, including with regard to sargassum threats in small island developing States (with a particular focus on the Eastern Caribbean region). UNEP is also coordinating the development of the Global Partnership on Marine Litter Digital Platform, the purpose of which is to facilitate access to curated data and resources and connect stakeholders so as to better coordinate action. Facilitating the sharing of lessons and best practices from various activities through different platforms, including the Global Environmental Facility's International Waters Learning Exchange and Resource Network, provides opportunities for replication and scaling up. At the same time, when rules, regulations and procedures governing ocean activities are kept under review, as is the case, for example, with the strategic action programmes of the large marine ecosystems and the programmes of work of the regional seas conventions and action plans, this could promote best practices for environmentally responsible management that are also adaptive and responsive to new technology, information and knowledge.

38. Article 200 of the United Nations Convention on the Law of the Sea requires States to cooperate directly or through competent international organizations for the purpose of promoting studies, undertaking programmes of scientific research and encouraging the exchange of information and data acquired about pollution of the marine environment. States are to cooperate, directly or through competent international organizations, in establishing appropriate scientific criteria for the formulation and elaboration of rules, standards and recommended practices and procedures for the prevention, reduction and control of pollution of the marine

environment (art. 201). They are also required to promote, directly or through competent international organizations, programmes of scientific, educational, technical and other assistance to developing States for the protection and preservation of the marine environment and the prevention, reduction and control of marine pollution (art. 202).

#### IV. Existing partnerships

39. Addressing marine pollution will require international, regional and national efforts. It will also require partnerships among Governments, the private sector and civil society.

40. Marine pollution is addressed by a range of partnerships. A well-known example is the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities with its three partnerships – the Global Partnership on Nutrient Management, the Global Partnership on Marine Litter and the Global Wastewater Initiative. The partnerships under the Global Programme of Action are well established, with defined governance structures. It is recognized that they bring together a wide range of stakeholders engaged in tackling land-based pollution while providing opportunities for the exchange of knowledge and best practices. A key success factor is the composition of the partnerships, in which there is broad stakeholder representation. The Global Programme of Action is also one of the founding members of the Action Platform for Source-to-Sea Management, which promotes the application of the source-to-sea approach linking freshwater, terrestrial and coastal ecosystems to tackle pollution caused by marine litter, wastewater and excessive nutrients. While not intended solely to address marine pollution, the New Plastics Economy Global Commitment, led by the Ellen MacArthur Foundation in collaboration with UNEP, promotes concerted action across the full life cycle of plastic products to ensure that these stay in the economy and hence do not pollute the environment.<sup>30</sup>

41. UNEP, along with the Intergovernmental Oceanographic Commission, is a custodian agency for the indicators associated with targets 6.3 and 14.1 of the Sustainable Development Goals. Indicator 6.3.2 is the proportion of bodies of water with good ambient water quality. Indicator 14.1.1 is the index of coastal eutrophication and floating plastic debris density. Both of these indicators are based on measuring pollution from land-based activities. A key element of this work is to support monitoring and assessment for the indicators. Signatory countries of several regional seas conventions and action plans, which are key platforms at the regional level, have already developed monitoring protocols and guidelines to assess the state of the marine environment they share, which can contribute to the development of methodologies and the adoption of the indicators to report on progress in meeting Sustainable Development Goal 14. These signatory countries are also very active in supporting institutional and policy change through joint activities and collaboration. Some are also co-hosting regional nodes of the global partnerships on marine litter, nutrient management and wastewater.

42. As already indicated, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection is an example of a mechanism for coordination and collaboration among United Nations organizations with responsibilities relating to the

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<sup>30</sup> The progress made through such actions is reported on annually by all signatory members, which include over 500 institutions from across the plastics value chain – such as plastic manufacturers, packaging producers, waste collectors and Governments at all levels.

marine environment. It currently has several working groups directly addressing marine pollution.

43. IMO is the United Nations specialized agency responsible for developing and adopting measures to improve the safety and security of international shipping and to prevent marine and atmospheric pollution from ships. The International Convention for the Prevention of Pollution from Ships, 1973 is the main international convention covering the prevention of pollution of the marine and atmospheric environment by ships from operational or accidental causes. IMO also addresses other environmental challenges, including the prevention of pollution from the dumping of waste at sea (the London Convention and the London Protocol), ship recycling (the Hong Kong Convention) and the control of harmful anti-fouling systems. Responding to the threat posed by plastics in the oceans, IMO has adopted an action plan to address marine plastic litter from ships. In 2020, IMO and FAO launched the GloLitter Partnerships Project, which is aimed at building partnerships to assist developing countries in addressing the issue of marine litter from sea-based sources and is funded by the Government of Norway for three and a half years. It builds on work to address marine plastic litter in the two sectors of fisheries and shipping. The International Seabed Authority and IMO have a cooperation agreement in place and work in close collaboration on the development of the exploitation regulations for seabed mining to ensure that maritime transport provisions are included.

44. In 2019, the Ocean Conservancy became the host of the Global Ghost Gear Initiative, a cross-sectoral alliance dedicated to solving the problem of ghost fishing gear at a global scale. The Initiative brings together civil society, the private sector, Governments, academia, non-governmental organizations and other key stakeholders from across the fishing industry to address this issue. The Ocean Conservancy has been working on the ground with a global network of coordinators and volunteers for more than three decades to collect, track and analyse marine debris. Volunteers in more than 150 countries come together each year to participate in an International Coastal Cleanup event near them. In 2012, the Ocean Conservancy launched the Trash Free Seas Alliance, which unites industry, science and conservation leaders who share a common goal of having a healthy ocean free of trash.

45. The World Wide Fund for Nature has launched a global initiative called No Plastic in Nature. Work under this initiative is focused on three pillars: (a) global policy work, developing and advocating for global policy solutions to stop plastic pollution, translating experience from work in the field and academic research into policy advice; (b) Plastic Smart Cities – city-level action at the local level with a focus on Southeast Asia and through the global platform; and (c) engagement with businesses through partnerships in different regions.

46. The United Nations Development Programme (UNDP) supports efforts to reduce marine pollution through its large marine ecosystems portfolio, working in 10 such ecosystems covering about 80 countries. Projects help to advance policy, regulatory and institutional reforms that address point and non-point source coastal pollution and to demonstrate or pilot local approaches to pollution control that promote learning from experience, replication and upscaling. Land-based sources, including the world's major rivers, are a major component of the flows of many pollutants to coastal areas. Through its transboundary waters programme, UNDP supports the cross-sectoral, integrated management of about 20 shared river basins, including efforts to reduce pollutant loads and their associated impacts on coastal ecosystems. UNDP is also one of the founding members of the Source-to-Sea Platform.

47. The Intergovernmental Oceanographic Commission supports efforts to reduce marine pollution through its ocean science portfolio. Activities include an expert

group on integrated coastal research that fosters research to deliver improved tools for the management of nutrient loading to the marine environment. The work of the Commission includes finalizing the index of coastal eutrophication as the eventual indicator 14.1.1 of the Sustainable Development Goals. The Commission's work on marine pollution also includes the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection Working Group 40 on the sources, fates and effects of plastics and microplastics in the marine environment, where the Commission is the lead agency together with UNEP.

48. The World Meteorological Organization (WMO) is implementing several activities that contribute to improved understanding of marine pollution and hence can drive policy actions and guide good practices related to ocean management. With respect to inland pollution sources, atmospheric transport and deposition, the WMO Global Atmosphere Watch Programme addresses atmospheric chemical composition from a global to an urban scale, with a particular focus on aerosols, reactive gases, greenhouse gases, stratospheric ozone, solar ultraviolet radiation and total atmospheric deposition. For marine environmental emergency response, WMO supports its members in responding to marine environmental emergencies (e.g. in response to oil spills and nuclear fallout), especially through the Global Data-processing and Forecast System. This includes supporting responsible centres in extending their technical capabilities, exchanging diagnostic and forecast data, and providing enhanced coordination for the provision of services and information in a way that meets requirements as defined by the International Atomic Energy Agency (IAEA) and IMO.

49. The International Seabed Authority is mandated by the United Nations Convention on the Law of the Sea to adopt rules, regulations and procedures covering all phases of deep-sea mineral exploration and exploitation on the basis of the best available information and in line with the policies, criteria, principles and provisions set out in the Convention and in the 1994 Agreement.<sup>31</sup> Thus far, the Authority has adopted three sets of exploration regulations in respect of the three main types of minerals (polymetallic nodules, polymetallic sulphides and cobalt-rich ferromanganese crusts) found in the seabed and subsoil beyond the limits of national jurisdiction, defined by the United Nations Convention on the Law of the Sea as "the Area". The International Seabed Authority currently develops and keeps under review appropriate regulations, procedures, monitoring programmes and methodologies to prevent, reduce and control pollution and other hazards to the marine environment that may arise from activities in the Area.

50. The momentum generated in recent years towards addressing marine pollution has also yielded a variety of partnerships, including with international financial institutions and philanthropic actors, for upscaling finance and fostering innovation. Members of the private sector have also taken notice and are joining the conversation through, for example, their membership with the United Nations Global Compact.

## V. Possible areas for new partnerships

51. Marine pollution, like all environmental problems, is complex. Addressing it requires a systems approach with coherent action and the fostering of innovation.

52. In addition to solid waste and wastewater management, other areas identified for further research and policy development are: emerging pollutants, such as

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<sup>31</sup> At the core of the Authority's responsibilities is ensuring effective protection for the marine environment from harmful effects which may arise from seabed activities (United Nations Convention on the Law of the Sea, art. 145).

microplastics; harmful algal blooms; and sargassum seaweed. Noise pollution is also a key area that must not be left behind. During the nineteenth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea in June 2018, delegations expressed their concern about noise pollution and called for increased international cooperation and partnerships on the matter.<sup>32</sup>

53. Proposals for new partnerships include:

(a) Creating commercial opportunities from research through partnerships and sponsorships between universities and industries;

(b) Raising awareness among citizens, but also promoting research on marine pollution, *inter alia*. For marine litter and plastic pollution, the Clean Seas Campaign may offer an existing initiative led by UNEP. On nitrogen, UNEP is developing the #BeatNitrogenPollution campaign;

(c) Providing capacity-building programmes to support different countries in oil contingency planning and coastal assessment;

(d) Promoting partnerships among the scientific, management and socioeconomic communities. Cooperation among United Nations agencies is also critical, one such example being the work carried out through the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, including a forthcoming stakeholder workshop linking science and management, which is drawing support from IAEA, the Intergovernmental Oceanographic Commission and WHO, as well as the International Science Council's Scientific Committee on Oceanic Research and Future Earth's Surface Ocean-Lower Atmosphere Study;

(e) Identifying opportunities to raise awareness in countries about the various sources of marine pollution. The role of WMO and other United Nations agencies such as IAEA, IMO and the Intergovernmental Oceanographic Commission will be critical to international efforts to support responses by countries, especially small island developing States and least developed countries, to marine pollution. International coordination is critical to ensure marine pollution response in international waters;

(f) Continuing collaboration with national agencies, such as national meteorological and hydrological services responsible for maritime safety, civil protection and emergency management response;

(g) Continuing collaboration among international and regional partners, including:

(i) WMO, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection and IMO (the Sub-Committee on Navigation, Communication and Search and Rescue, and the Marine Environment Protection Committee) on matters including marine pollution and a blue economy.<sup>33</sup> Further collaboration between WMO and IMO is needed to facilitate the reduction of climate change-induced risks;

(ii) IAEA (on nuclear emergency response modelling);

(iii) The Intergovernmental Oceanographic Commission (the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, on harmful algal blooms);

<sup>32</sup> See [A/73/68](#), [A/73/124](#) and General Assembly resolution [74/19](#), para. 280.

<sup>33</sup> See WMO and International Maritime Organization (IMO), "Report of the WMO/IMO international symposium 'Extreme Maritime Weather: Towards Safety of Life at Sea and a Sustainable Blue Economy'", 2020.

- (iv) The Arctic Council working groups for emergency prevention, preparedness and response and protection of the arctic marine environment;
- (v) The Committee for Environmental Protection of the Antarctic Treaty;
- (vi) Strengthened partnerships with agencies such as Mercator International, Copernicus Marine Environmental Modelling Services and the Euro Mediterranean Centre on Climate Change;
- (vii) Increased collaboration among existing partners and expansion of the Global Partnership on Nutrient Management, the Global Partnership on Marine Litter and the Global Wastewater Initiative;
- (h) Financing innovations (e.g. technological, policy, economic and financial) that are replicable, scalable and potentially transformational to address key sources of marine pollution. Engaging a blended (blue) finance framework may be relevant to catalyse action and innovation;
- (i) Developing partnerships with industry and civil society, including the informal sector, to raise awareness of the impacts of marine litter and other land-based sources of pollution, such as nutrient and wastewater pollution, on biological diversity, the health and productivity of the marine environment, and consequent economic loss;
- (j) Cooperating with States, industry and civil society on environmentally sound, risk-based and cost-effective measures to prevent and reduce marine litter and plastic pollution, including through strengthened cooperation under the Global Partnership on Marine Litter Digital Platform, which aims to bring together actors, information and evidence;
- (k) Engaging the informal sector and providing scale models and examples of its inclusion in waste collection. These can be obtained through public-private partnerships or by private businesses on their own;
- (l) Identifying potential sources and coastal and oceanic hotspots of marine debris, and developing and implementing joint risk-based and cost-effective prevention and recovery programmes for marine litter;
- (m) Sharing best practices in the fields of protection of the marine environment, human health and safety, prevention, emergency response, and mitigation, and in this regard encouraging the undertaking of and collaboration in scientific research, including marine scientific research, to better understand the consequences of marine oil spills or marine spills involving hazardous or noxious substances;
- (n) Engaging in collaborative research with international experts, while gaining valuable insights into the presence of pollutants;
- (o) Addressing emerging pollutants in wastewater, including, for example, pharmaceuticals, microplastics and endocrine disrupting chemicals, as well as identifying sources of wastewater pollution and hotspots, and implementing joint prevention and recovery programmes, especially for fragile ecosystems such as coral reefs;
- (p) Making a stronger connection between illegal, unreported and unregulated fishing and the proliferation of ghost gear, and highlight the importance of the prevention of ghost gear, through codification of the FAO Voluntary Guidelines for the Marking of Fishing Gear;
- (q) Partnerships for evaluating and supporting emerging localized public-private initiatives, such as the “Urban Ocean” initiative (a three-way cooperative

partnership between the Ocean Conservancy, the Global Resilient Cities Network and the Circulate Initiative) and others.

## **VI. Conclusions and recommendations**

### **A. Conclusions**

54. Governments and local authorities face major challenges in addressing pollution. Anthropogenic activities threaten to exceed the oceans' environmental limits. Major shifts away from the way economies currently function, and a shift in societal behaviours towards more sustainable consumption and production, are needed to reduce pollution. Increasing levels of pollution undermine the oceans' ability to support climate stability, climate change mitigation, biological integrity, economic stability and coastal livelihoods. Immediate action is needed to ensure the adequate treatment of wastewater (as three fourths of the world's wastewater is discharged into the environment) and solid waste, particularly plastics.

### **B. Major challenges**

55. One of the main challenges is fragmented funding, combined with the need for continuous risk determination. Therefore, scientific risk assessments focused on knowledge transfer and capacity-building regarding the most pertinent pollution issues are needed.

56. Robust financial structures and long-term budgetary commitments are needed to facilitate science that effectively addresses marine pollution and to understand the effectiveness of actions taken with regard to complex ecosystem interactions and already prevailing pollution loads.

57. Equitable access to ways of tackling pollution requires expanding capacity in developing countries. For example, the waste and wastewater management infrastructure in developing and emerging economies may not be adequate to deal with the increasing production and consumption of plastic and the production of wastewater.

58. Another topic that deserves further consideration is effective science-policy dialogue, especially as it relates to the implementation of science-based and adaptive management.

### **C. Required actions**

59. Addressing pollution requires concerted action across the life cycle of production and consumption systems, and at the local, national and international levels. Countries and the international community as a whole need to strengthen their implementation measures to address pollution. This can be enhanced by further identifying areas where synergies exist. For example, targeting pollution addresses not only climate change but also biodiversity loss.

60. Enabling conditions need to be in place to support efforts to address pollution. For example, policy frameworks, sustainable financing and the unlocking of private and public resources together with stakeholder engagement are needed. Remediation and restoration should accompany the prevention of pollution at source. Baselines need to be established by monitoring sources and pathways in order to reduce inputs. Furthermore, adequate targets are needed to guide evidence-based decision-making, drive change and track progress.

61. International instruments to address pollution have had a positive impact, but further ratification, implementation and incorporation into domestic policies and legislation are required. There is a need to understand how the implementation of legal obligations affects pollution loads. In addition, the identification and the adoption of binding and quantitative targets that facilitate a circular economy are needed.

## VII. Guiding questions

62. The following guiding questions may be used to inform the dialogue:

### **Source-to-sea**

(a) How can cooperation be enhanced between upstream river basin organizations and land practices and their coastal counterparts, in order to work together on source-to-sea approaches to marine pollution reduction and control?

### **Financing**

(b) How can additional financing be unlocked to prevent and address marine pollution?

(c) How can public and private financing institutions (banks, insurance companies and investors) support the transition towards pollution-free oceans?

### **Prevention and reduction**

(d) What are the drivers that encourage innovative solutions, as well as key barriers to policy implementation? What are some financial instruments to prevent and address marine pollution reduction?

(e) Are we adequately considering the practical realities of reducing marine pollution and addressing climate change? For example, how can we holistically consider the greenhouse gas implications of plastics and their alternatives with respect to the ultimate goal of net zero emissions and a circular economy? What is the global goal to aim for? Could zero leakage of plastics into nature be the vision of a new international instrument?

### **Coordination and collaboration**

(f) How can supporting policies and common language be developed in the scientific community to provide evidence for policymakers and stakeholders, including financing entities?

(g) How can voluntary actions benefit from a new global agreement on plastics? What can be learned from voluntary commitments (e.g. the New Plastics Economy Global Commitment) when designing a new global framework?

(h) How can stakeholders collaborate to shape, for example, the Global Partnership on Marine Litter Digital Platform to facilitate the coordination of evidence-based action?

(i) How can the interconnectedness of marine pollution issues be strengthened with regard to multilevel governance policies to address multisectoral cumulative impacts, as well as the high technicality of solutions?

### **Best practices and lessons learned**

(j) What mechanisms exist to translate lessons and best practices from one activity, country or region to another, so as to build on such experiences?

(k) How can the United Nations Decade of Ocean Science for Sustainable Development and the United Nations Decade on Ecosystem Restoration be used to strengthen the global, regional and local knowledge bases on marine pollution?

**Research and monitoring**

(l) How accurate is information regarding sources and fates of pollution?

(m) Are the data measurement processes and standards appropriate (comparing apples to apples)?

(n) How do we define marine pollution?

(o) What are the best ways to create baselines and measure progress towards addressing marine pollution prevention? Are these monitoring tools applicable across governance scales?

**Technology and infrastructure**

(p) How can technology development be used to enhance the recycling rate of current marine debris, while seeking international cooperation and strengthening the role of developing countries?

(q) How can scientific development and innovation be fostered through ongoing work, while strengthening the role of developing and least developed countries?

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