Sixth session
Agenda Item 2

Marine Plastic Litter
Report of the Executive Director

Summary

As a ubiquitous substance, plastic is deeply integrated into everyday life. Resulting from human consumption, plastic litter ends up in waterways. This issue affects the health of land and water ecosystems, as well as the lives of people around the world, particularly those living in coastal communities. The growing issue of marine plastic litter is causing increasing environmental destruction; it must be addressed immediately. To tackle this global issue, the international community must consider both the root of the issue and the scope of the problem.

Damage resulting from marine plastic litter is two-fold. First, plastics are poisoning and polluting waterways. Plastic pollution endangers the survival of marine and land animals, which in turn damage ocean ecosystems. Second, plastics pollution also leads to political, economic, and social consequences at the governmental and societal levels. The problems posed by marine plastic litter are political in nature and directly impact the relationship between the “Global North” and the “Global South.”

The threat of plastics to the planet’s ecosystems is a well-established and growing epidemic. It jeopardizes the lives of all living organisms, including that of humans. Plastic debris as a global challenge will rupture the political, economic, and social structures of every society, even putting the planet’s very survival on the line. Member States must work together to find solutions to this widespread issue by developing ways to combat this growing problem that impacts our ability to achieve.
Introduction

1. Plastic is cheap, lightweight, strong and malleable. These properties along with its relatively low cost make plastics ideal materials for a wide range of manufacturing and packaging applications. Due to its beneficial qualities and low cost to produce, plastic has been replacing traditional natural materials. However, the properties that make plastics so useful also make plastic waste a significant environmental threat. Their durability means that they persist in the environment for many years — one single water bottle can remain on the planet for around 450 years — and their low density means that they are readily dispersed by water and wind, sometimes travelling thousands of kilometres from where the entered into the ocean. Ocean currents and circulation patterns move microplastics around like confetti, making them difficult to track. As a result, plastic waste is now found everywhere, on ocean surfaces, near the mouths of rivers, on coasts and even in deep-sea sediments — even in the most remote areas of the world. The rapid increase in global plastic production has resulted in an increase in the amount of plastic items and fragments in marine systems.

How much plastic is polluting the oceans

2. The abundance of organisms including birds, mammals and insects has decreased significantly over the past half-century, in some groups by about half. In 2010, the number of organisms worldwide was estimated to have decreased by 34% relative to pre-industrial levels and projected to decrease by 38–46% by 2050 due to the anticipated stresses of future land use and climate change. Of the 8,300 animal breeds known, 8% are extinct and 22% are at risk of extinction. Of the over 80,000 tree species, less than 1% have been studied for potential use.

3. The rate of extinction is at least tens to hundreds of times higher than the average rate of extinction over the past 10 million years and is accelerating. While loss of species has always occurred as a natural phenomenon, the pace of extinction has accelerated dramatically as a result of human activity. We are creating the greatest extinction crisis since the natural disaster that wiped out the dinosaurs 65 million years ago. These extinctions are irreversible. Over 1 million of the estimated 8 million plant and animal species on Earth are at an increased risk of extinction as a direct or indirect consequence of human activities. The population sizes of wild vertebrates have dropped by an average of 68% in the last 50 years, and the abundance of many wild insect species has fallen by more than half. The number of local varieties of domesticated plants and animal breeds and their wild relatives has been reduced sharply. For example, over 9% of animal breeds have become extinct and at least another 17% are threatened with extinction. Three-quarters of the land-based environment and about two-thirds of the marine environment have been significantly altered by human actions. Many species are endangered by overharvesting and poaching for human consumption in local or international markets, practices that also increase the risk of the emergence of novel zoonotic diseases like COVID-19.
4. Fertilizers, used in agriculture, have leaked in coastal ecosystems producing more than 400 ocean “dead zones” and a third of marine fish stocks have declined as a consequence of overharvesting. These are just two examples of the major impact human activity has had on biodiversity. Ecosystems are deteriorating at an unprecedented rate, due to the way the use of land is changing, the over-exploitation of natural resources, climate change, air and water pollution and the spread of invasive alien species.

5. Services provided by ecosystems included:

- Provision of food, fuel, fiber and shelter and building materials
- Purification of air and water, detoxification and decomposition of waste
- Stabilization and moderation of the Earth's climate
- Moderation of floods, droughts, temperature extremes and the forces of wind
- Generation and renewal of soil fertility, including nutrient cycling
- Pollination of plants, including many crops; control of pests and diseases
- Maintenance of genetic resources as key inputs to crop varieties and livestock breeds and medicines
- Cultural and aesthetic benefits

6. In addition to the increased risk of extinction caused by human activity (e.g., unsustainable hunting and harvesting) and land use practices (e.g., the rapid expansion of agriculture), climate change caused by burning fossil fuels, another human activity, exacerbates all other threats to biodiversity. As a result of climate change, many terrestrial, freshwater and marine species have had to change their habitats, adapt to smaller habitats, modify seasonal activities, and change migration patterns, among other changes leading to a loss of biodiversity.

7. Climate change increases the risk of extinction.\(^1\) As the average global temperature increases so too does the risk of extinction. The global fraction of insects, vertebrates and plants that would not be able to survive in their current habitat would be 4–8% if global warming increases by 1.5°C, 8–18% if global warming increases by 2°C, 26–49% for 3.2°C and 44–67% for 4.5°C. Such extensive losses would undermine important ecosystem services such as pollination on a global scale which is critical to having an adequate food supply. A decrease in marine animal communities is also projected over the twenty-first century. The effort required for humans to adapt to loss of biodiversity on economic development, livelihoods, food security, health and culture will be far-reaching and substantial.

8. Today, biodiversity remains intact in just less than a quarter of the Earth’s land surface. This quarter is mostly located in dry, cold, or mountainous areas, where the human population is low and has undergone little transformation. It also includes

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\(^1\) IPBES-IPCC co-sponsored workshop report on biodiversity and climate change (2021), https://zenodo.org/record/5101133#.YW22x6wMI1I
much of the terrestrial land that is a protected network covering 15% of the land area. One third of the remaining land surface has been radically transformed from its natural state. The original ecosystems have been replaced by croplands, plantations, planted pastures, infrastructure such as roads, railways, dams, human settlements, industrial developments, waste dumps or active or abandoned mining lands. The rate of this transformation has accelerated since the middle of the twentieth century. The other two thirds of the remaining land surface (i.e. half of the total global land area) maintains some level of biodiversity but is increasingly human-dominated. It includes the rangelands of the world that are grazed by livestock, the semi-natural forests from which wood and other products are harvested, and freshwater systems, like wetlands. Wetlands are among the most degraded type of ecosystem. Sustaining the flow of benefits from nature increasingly depends on avoiding further loss of biodiversity.

9. Food production occupies half of the habitable land on Earth. Increasing the use of land for agricultural purposes resulted in a loss of biodiversity. Half of all agricultural expansion from 1980 to 2000 occurred at the expense of forests, primarily in the tropics, partly to accommodate cattle ranching and palm oil production. The world’s forests constitute nearly a third of Earth’s land area, and about 10% of forest area has been lost through conversions to other land uses since 1990. Satellite imaging shows that human pressures reduced forests by 7% globally from 2000 to 2013. More than two thirds of the remaining forests are either managed or plantation. Land is also converted to build infrastructure (e.g., roads) and mining. Urban areas have more than doubled since 1992.

10. More than 75% of global food crop types, including fruits and vegetables and some of the most important cash crops, such as coffee, cocoa and almonds depend on pollination. Presently, the abundance, diversity and health of pollinators are threatened by habitat fragmentation and land use change, intensive agricultural practices, pesticides, parasites and diseases, invasive alien species and climate change.

11. Biodiversity loss in agriculture threatens the resilience of food systems. The decline in pollinators, crop and livestock diversity threatens the agricultural yields of the few main crops that feed the world. Diversity increases the choices available to producers in their efforts to adapt production systems to environmental stress and to breeders in their search for better-adapted plant and animal populations. While more than 6,000 plant species have been cultivated for food, fewer than 200 make substantial contributions to global food output, with only nine (sugar cane, maize, rice, wheat, potatoes, soybeans, oil-palm fruit, sugar beet and cassava) accounting for 66% of total crop production in 2014. The world’s livestock production is based on about 40 animal species, but only a handful provide most of the global output of meat, milk and eggs. Among extant local breeds, 26% are classed as being at risk of extinction. A third of freshwater fish species assessed are considered threatened. Pollinators, natural enemies of pests, and beneficial soil organisms are under pressure from threats including habitat degradation and pollution.
12. Biodiversity loss and the degradation of ecosystems pose risks to food production through the impact it is having on pollination.

*Drivers of biodiversity loss*

13. Land use change is ranked the most important direct driver of land degradation\(^2\) (i.e., soil erosion, contamination, acidification, salinization, loss of soil organic carbon, soil sealing due to rapid urbanization and land take that refers to the loss of agricultural, forest\(^3\) and other land to urban and other artificial land development) and loss of biodiversity on land (e.g., loss of biodiversity in subsurface ecosystems due to soil erosion and pesticide)\(^4\). In addition to the loss of biodiversity under the soil surface, the expansion of human land use has resulted in the reduction of habitats (e.g., when native grasses and shrubs and forests have been cleared and drained for agriculture production) that reduces the number of organisms that can be supported by a smaller habitat and as the number of organisms decreases genetic diversity within a species reduces as well.

14. Land use is also responsible for promoting climate change, which in turn further impact ecosystems and the loss of biodiversity. An estimated 23% of greenhouse gas emissions (from 2007–2016) stem from agriculture, forestry and other forms of land use, including carbon dioxide emissions from deforestation, methane emissions from animals that chew their cud and the cultivation of rice, and nitrous oxide emissions from fertilizer use.

15. One of the consequences of changing land use is desertification. The desertification process is the result of poor land management which can be aggravated by climatic variations. Converting wild lands to agriculture often involves ploughing the soils which leads in temperate regions to an average decline in soil organic matter between 25 and 40% over twenty-five years. Decreasing soil organic matter is always a clear indication of soil degradation, and often is accompanied by reductions in water

\(^2\) There is an important difference between land transformation and land degradation. Transformation may be legal or illegal, but it is usually intentional. The ecosystem is deliberately altered for the purpose of increasing the delivery of a particular benefit to a group of people, often at the expense of other benefits, and almost always with a loss of biodiversity. For instance, a natural forest may be converted to a managed tree plantation, or a grassland into a cropland. In the developed world, transformation often occurred centuries ago, and is often assumed to be the natural and desired state. In the present time, active transformation is more visible in the developing world, where it attracts much attention. Degradation, on the other hand, is the loss of ecosystem function, in either transformed or natural lands, as a consequence of human actions. It is usually unintentional. The loss of ecological function leads to a reduction in benefits to people in the services provided by ecosystems. Degradation, like transformation, is typically accompanied by loss of biodiversity. Degradation is widespread and ongoing (even accelerating) in both the developed and developing world. Restoration, which aims to return both function and biodiversity to some previous state before transformation occurred, is harder to achieve and takes a long time.

\(^3\) Raw timber production has risen by 45%. Approximately 60 billion tons of renewable and non-renewable resources are now extracted globally every year, having nearly doubled since 1980.

\(^4\) https://www.unccd.int/issues/land-and-biodiversity
infiltration, fertility, and ability to retain fertilizers. Ploughing also exposes soils to wind and water erosion, resulting in large-scale pollution of freshwater resources.

16. In marine ecosystems, which cover 70% of the planet, the most important driver of biodiversity loss is fishing. One third of fish stocks globally were over harvested in 2015, up from 10% of stocks in 1974. In some areas fish stocks have plunged as a result of overfishing. Another 60% are fished at the limit of sustainability. Only 7% are harvested at levels below the maximum sustainable yield. As the temperature of the ocean increases as a result of climate change, fish stocks are likely to fall further. This threatens benefits for coastal livelihoods, especially for fishing communities in the tropics, sub-tropics and the Arctic.

17. In freshwater habitats, the introduction of alien species is the second leading cause of species extinction, and on islands it is the main cause of extinction over the past 20 years, along with habitat destruction. Records of alien species have increased by 40% since 1980 and are associated with increased trade. Nearly one fifth of Earth’s surface is at risk of plant and animal invasions which have a negative impact on biodiversity.

18. Resource extraction is ranked the second most important driver of biodiversity loss in freshwater. Between 1970 and 2017, mining of metal ores increased by three and a half times and mining for sand, gravel and clay increased by nearly five times.

19. Resource extraction often involves the use of land and water in combination. Agricultural crop production has increased by about 300% since 1970. Agriculture accounts for nearly three quarters of all freshwater use and the extraction of water predominantly for irrigation in agriculture, grew by nearly 65% from 1970 to 2010. One of the most dramatic examples of the impact of resource extraction and climate change on biodiversity is the freshwater Lake Chad, once one of Africa’s largest freshwater bodies and a source of livelihood for about 30 million. The Lake has diminished by 90% since the 1960s as a result of poor human management through overgrazing and unsustainable irrigation. Native vegetation has been replaced with invasive plant species (now covering 50% of the lake) and fish production has declined by 60 percent resulting in a devastating impact on both terrestrial and marine biodiversity and the livelihoods of millions of people.

20. Pollution is regarded as the third most important driver of biodiversity loss in freshwater and the fourth in terrestrial and marine systems. Up to 400 million tons of heavy metals, solvents, toxic sludge and other industrial wastes are dumped annually into the world’s waters, and fertilizers entering coastal ecosystems have produced dead zones. In addition, water pollutants from agriculture and human settlements that also result in loss of biodiversity include excess nutrients, salts and sediments which leak into waterways.

21. Marine plastic pollution which is found in all oceans at all depths has increased tenfold since 1980 and makes up 60 to 80% of marine debris. Marine mammals often
become entangled in plastic debris preventing them from moving freely or causing them to choke or starve because they are less capable of finding food, or lose a limb due to amputation or suffer lacerations that can then become infected. For whales, entanglement in plastic is a greater threat than whaling. Marine mammals such as sea lions, dolphins, and seals are regular victims of plastics because the are curious to explore what these plastic objects. Marine wildlife such as seabirds, whales, fishes and turtles, mistake plastic waste for prey, and most die of starvation as their stomachs are filled with plastic debris. Plastic straws, for example, along with other small plastic items, can be ingested by birds scavenging at landfill sites. Since they are not biodegradable they stay in the bird’s stomach until it dies. When the bird itself biodegrades, the plastic straw is left to be blown or washed into waterways as before and potentially repeat the same cycle with another seabird or other animal. In addition, plastic is responsible for transporting invasive species and pollutants from one part of the world to another.

*Genetic resources and the importance of maintaining a diverse gene pool*

22. An important part of the biodiversity debate involves access to and sharing of the benefits arising out of the commercial and other use of genetic material, such as pharmaceutical products. The treaty recognizes a country’s sovereignty over its genetic resources, and provides that access to valuable biological resources be carried out on "mutually agreed terms" and subject to the "prior informed consent" of the country of origin. When a micro-organism, plant or animal is used for a commercial application, the country from which it came has the right to benefit through cash, samples of what is collected, the participation or training of national researchers, the transfer of biotechnology equipment and know-how, and shares of any profits.

23. Animal and plant domestication, sometimes over centuries or millennia, have created a large variety of plants and animals used by humans that are highly adapted to local conditions. Over time humans have altered their genetic makeup through selective breeding and cross-fertilization. The results have been greater agricultural productivity and improved human nutrition. In recent years, advances in biotechnology techniques have enabled us to cross the species barrier by transferring genes from one species to another. We now have “transgenic” plants, such as tomatoes and strawberries that have been modified to protect the plants from frost. Some varieties of potato and corn have received genes from a bacterium that enables them to produce their own insecticide. Other plants have been modified to tolerate herbicides sprayed to kill weeds. Living Modified Organisms (LMOs) are becoming part of an increasing number of products, including foods and food additives, beverages, drugs, adhesives, and fuels. Agricultural and pharmaceutical LMOs have rapidly become a multi-billion-dollar global industry. Biotechnology is being promoted as a better way to grow crops and produce medicines, but it has raised concerns about potential side effects on human health and the environment. In some countries, genetically altered agricultural products have been sold without much
debate, while in others, there have been vocal protests against their use, particularly when they are sold without being identified as genetically modified. In response to these concerns, Governments negotiated a subsidiary agreement to the CBD to address the potential risks posed by cross-border trade and accidental releases of LMOs. Adopted in January 2000, the Cartagena Protocol on Biosafety allows Governments to signal whether or not they are willing to accept imports of agricultural commodities that include LMOs by communicating their decision to the world community via a Biosafety Clearing House, a mechanism set up to facilitate the exchange of information on, and experience with, LMOs. In addition, commodities that may contain LMOs are to be clearly labelled as such when being exported. Exporters must also provide detailed information to each importing country in advance of the first shipment of seeds, live fish and other LMOs that are to be intentionally introduced into the environment, and the importer must then authorize the shipment. The aim is to ensure that recipient countries have both the opportunity and the capacity to assess any risks involving the products of modern biotechnology.

24. The diversity of plants and animals is key to the survival of the planet because together they contain a rich gene pool which is vital to weathering environmental stresses and shocks. The number of local varieties and breeds of domesticated plants and animals and their wild relatives has, however, been reduced sharply as a result of land use change, selective breeding for increased productivity, knowledge loss, market dynamics and large-scale trade. The loss of diverse genetic resources can leave species vulnerable to extinction.

25. An important consequence of the loss of biodiversity has been a reduction in genetic diversity. This has had negative consequences on the ability of ecosystems to be resilient in the face of stress. Biodiversity ensure a rich gene pool in agricultural systems decreases vulnerability to stresses and shocks, reducing their impacts and supporting recovery and adaptation in the face of climate change and other environmental shifts. When the gene pool is reduced due to loss of biodiversity, ecosystems are more vulnerable to collapse. Species and genetic diversity in agriculture, which are critical to resilient food systems, is lower than ever. Biodiversity loss poses risks to food production.

26. Gene technology has opened up new ways of altering the traits of microorganisms, plants and animals to boost production or improve tolerance of pests, heat and drought, but its application could potentially have negative effects on human health, food production and the environment unless managed carefully. Gene technology is of concern because of its potential to alter and reduce biodiversity.

27. It is estimated that between 25 000 and 75 000 plant species are used for traditional medicine. Only 1% is known by scientists and accepted for commercial purposes. Part of the modern pharmaceutical industry is developed on the basis of plants discovered and use by indigenous peoples and local communities, even though the economic benefits are not equitably shared. The Convention on Biological Diversity, 1992
(CBD) mandates that contracting Parties, to preserve and maintain knowledge, innovations and practices of indigenous peoples and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovation and practices and encourage the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices. Traditional Knowledge in the fields of medicine, healing, and biodiversity conservation are well known and the need for protection of this traditional knowledge is a cross-cutting issue at the moment involved in discussions from different institutions, with different approaches. The Intellectual Property Rights mechanisms are not able at the moment to protect those forms of traditional knowledge and indigenous peoples and local communities believe that they are subject of biopiracy which is the unauthorized use of traditional knowledge or biological resources.

**Biodiversity and health**

28. Often, the least affluent and most vulnerable segments of society are the most directly reliant on biodiversity for their livelihoods, health and well-being. They are also often the least responsible for biodiversity loss. Healthy communities rely on well-functioning and biodiverse ecosystems. These provide clean air, fresh water, medicines, food and nutrition security. Healthy and biodiverse ecosystems also limit the emergence and spread of disease.

29. Biodiversity loss appears to increase the risk of human exposure to both new and established zoonotic pathogens. And human disturbance of ecosystems and biodiversity loss are increasingly linked to the occurrence of zoonotic diseases and illnesses caused by parasites, viruses or bacteria. Human disturbances to natural ecosystems affect patterns of infectious diseases by reducing the abundance of some organisms and modifying interactions among organisms. Deforestation, for example, is one of those activities impacting ecosystems that is thought to increase the risk of disease pandemics such as COVID-19. Previous research has shown that outbreaks of diseases that cross over from animals to humans have increased in the past few decades. This is likely to be the direct result of increased contact between humans, wildlife and livestock, as people move into undeveloped areas. These interactions happen more frequently on the frontier of human expansion because of changes to the natural landscape and increased encounters with animals. Deforestation leads to the fragmentation of habitats which then increases the direct encounters between people and animals living the forest as their habitat is destroyed. This is what is happening in Uganda where deforestation has increased encounters between primates and people as primates ventured out of the forest to raid crops and people ventured in to collect wood.

30. A key question has been whether the decline in biodiversity that inevitably accompanies human expansion on the rural frontier increases the pool of pathogens that can make the jump from animals to humans. Recent research suggests that the
loss in biodiversity usually results in a few species replacing many — and these species tend to be the ones hosting pathogens that can spread to humans. Many ecologists have long suspected that while some species are going extinct, those that tend to survive and thrive — rats and bats, for instance — are more likely to host potentially dangerous pathogens that can make the jump to humans. Thus, biodiversity loss appears to increase the risk of human exposure to both new and established zoonotic pathogens.

31. An estimated 4 billion people rely primarily on natural medicines for their health care, with communities living in lower-income settings particularly reliant on largely plant-based traditional medicines. The health of these people is compromised as wild collected medicinal plants become less available. Some 70% of drugs used for cancer are natural or are synthetic products inspired by nature and more than 20% of modern drugs used for all diseases are based on leads from natural molecules, identified by science or based on indigenous local knowledge, including aspirin, vincristine and taxol. Though novel natural medicines are continuously being identified, the potential for future discoveries is critically undermined by biodiversity loss. Biodiversity is also an important source of genetic resources for the development of many treatments, vaccines and a range of biotechnology products used in both modern and traditional medicines, as well as agriculture and industry.

32. The relative importance of the main drivers of biodiversity loss differ across different biomes. For example, habitat transformation is the major threat for tropical forests, while invasive alien species have their most severe impacts on islands and freshwater ecosystems. Alleviating these pressures will permit many populations and communities of wild organisms to remain viable as they track the moving location of their preferred climate zone.21 Such adaptation strategies are consistent with the objectives and programmes of action of the conventions and other international undertakings on biodiversity, desertification, forest protection, air pollution, chemical management and ozone protection. Some solutions are beneficial to more than one issue; for example, the protection of intact forests reduces carbon emissions and also conserves biodiversity.22,23 Such solutions are also consistent with nature-based adaptation strategies under the climate convention but are potentially undermined by unrestricted use of land-based climate mitigation options such as biofuel production or afforestation.

33. In 2019, the General Assembly adopted resolution 73/284 that the UN Decade on Ecosystem Restoration would begin in 2021.5 Led by the United Nations Environment Programme and the Food and Agriculture Organization of the United Nations, The UN Decade is building a strong global movement to protect and revive ecosystems all around the world, for the benefit of people and nature. It aims to halt the degradation of ecosystems, counteract climate change, and stop the collapse of biodiversity.

5 https://www.decadeonrestoration.org/about-un-decade
**Biodiversity and the Sustainable Development Goals**

34. Biodiversity supports the achievement of the 2030 Agenda in the following ways: 1) SDG 6 (Clean Water and Sanitation): Healthy ecosystems are needed to provide reliable sources of freshwater; 2) SDG 7 (Affordable and Clean Energy): Bio-energy produced from renewable biomass such as forestry by-products and agricultural residues can provide major opportunities for supplying cleaner and affordable energy; 3) SDG 11 (Sustainable Cities and Communities): Ecosystems help secure freshwater supplies on which cities rely and can provide resilience to climate change and natural disasters; 4) SDG 12: Responsible Consumption and Production. Utilizing more resource-efficient approaches to production is essential for the sustainable use of biodiversity. Reducing wastes and pollutants is also an important element to reduce the negative impacts of human activities on biodiversity; and 5) SDG 15: Life on Land. The conservation, restoration and sustainable use of terrestrial ecosystems in order to reverse land degradation and halt desertification is essential for sustainable development and must be integrated into national and local development planning and poverty reduction strategies. Actions to halt biodiversity loss and protect ecosystem services which support people’s lives and livelihoods are all the more urgent in light of the fact that they continue to be degraded and lost at unprecedented rates.

*The development of international law on biodiversity and other UN action*

35. Six international agreements have been adopted with the goal of slowing or reversing biodiversity loss, however, nearly a third of the goals set by these agreements are not being met or in some cases becoming even further out of reach.

36. The notion of an international convention on bio-diversity was conceived at a United Nations Environment Program (UNEP) Ad Hoc Working Group of Experts on Biological Diversity in November 1988. The subsequent year, the Ad Hoc Working Group of Technical and Legal Experts was established for the drafting of a legal text which addressed the conservation and sustainable use of biological diversity, as well as the sharing of benefits arising from their utilization with sovereign states and local communities. In 1991, an intergovernmental negotiating committee was established, tasked with finalizing the convention’s text.

37. The UN Conference on Environment and Development (otherwise known as the Earth Summit) was held in in Rio de Janeiro, Brazil, in 1992 and asserted, like the World Charter before it, that economic policies of the day were resulting in a deterioration of ecosystems that in turn were leading to increasing levels of poverty, hunger and ill health. The Summit resulted in the adoption of the Rio Declaration on Environment and Development, the Statement of Forest Principles, and the adoption of Agenda 21, a non-binding action plan on sustainable development. Chapter 15 of Agenda 21

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focuses on activities needed to improve the conservation of biological diversity and the sustainable use of biological resources.

38. The Earth Summit also led to the establishment of the United Nations Convention on Biological Diversity (CBD) which entered into force on 29 December 1993, 90 days after the 30th ratification. The first session of the Conference of the Parties was scheduled for 28 November – 9 December 1994 in the Bahamas.

39. Treaty commitments under the CBD include:

- Identifying and monitoring the important components of biodiversity that need to be conserved and used sustainably.
- Establishing protected areas to conserve biodiversity while promoting environmentally sound development around these areas.
- Rehabilitating and restoring degraded ecosystems and promoting the recovery of threatened species in collaboration with local residents.
- Respecting, preserving and maintaining traditional knowledge of the sustainable use of biological diversity with the involvement of indigenous peoples and local communities.
- Preventing the introduction of, controlling and eradicating alien species that could threaten ecosystems, habitats or species.
- Controlling the risks posed by organisms modified by biotechnology.
- Promoting public participation, and educating people and raising awareness about the importance of biological diversity and the need to conserve it.
- Reporting on how each country is meeting its biodiversity goals.

40. In 1993, the Second Committee of the General Assembly established the International Day for Biological Diversity to be celebrated every year on 29 December (the date of entry into force of the Convention on Biological Diversity) to increase understanding and awareness of biodiversity issues. In 2000, the date was shifted to commemorate the adoption of the Convention on May 22, 1992, at the Rio Earth Summit, and partly to avoid the many other holidays that occur in late December. On this day, governments and citizens from around the world take time to discover the biodiversity that surrounds them, and celebrate some of the successful activities that support biodiversity conservation and sustainable use.

41. The Convention on Biological Diversity (CBD) is the international legal instrument for "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources" that has been ratified by 196 countries. 7 The Convention on Biological Diversity sets targets to halt the loss of biodiversity and is the first time that the conservation of biodiversity is recognized in international law as "a common concern of humankind" and is an integral part of the development process. The agreement

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covers all ecosystems, species, and genetic resources. The CBD also calls for the conservation of genetic resources by preserving sensitive ecosystems, rehabilitating degraded ecosystems, and enacting legislation that protects endangered plant and animal species. Additionally, the treaty requests financial assistance for developing countries so that they can afford programs designed to conserve their biological resources.

42. On 29 January 2000, the Conference of the Parties to the Convention on Biological Diversity adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety. And the Cartagena Protocol on Biosafety enters into force on 11 September 2003.\(^8\)

43. The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. The Protocol also establishes a Biosafety Clearing-House to facilitate the exchange of information on living modified organisms and to assist countries in the implementation of the Protocol.

44. The parties to the Protocol were required to promote and facilitate public awareness, education and participation concerning the safe transfer, handling and use of LMOs in relation to the conservation and sustainable use of biological diversity.

45. After a decade, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity was adopted at the tenth meeting of the Conference of the Parties on 29 October 2010, in Nagoya, Japan.\(^9\)

46. The agreement expects to cover “all possible domains that are directly or indirectly related to biodiversity and its role in development” and entered into force in October 2014. The objective of this Protocol is the fair and equitable sharing of the benefits arising from the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding, thereby contributing to the conservation of biological diversity and the sustainable use of its components.\(^10\) The effectiveness of the Nagoya Protocol was show-cased with the International Cooperative Biodiversity Group working on the Sustainable use of Biodiversity in Papua New Guinea Project. The task completed scientific research which focused on the biological chemical and medicinal properties of the biodiversity within Papua New Guinea.

47. In 2010, the Conference of the Parties for the Convention on Biological Diversity (CBD), adopted a revised and updated Strategic Plan for Biodiversity. The Strategic

\(^9\) https://www.cbd.int/abs/doc/protocol/nagoya-protocol-  
\(^10\) https://earth.org/what-is-the-nagoya-protocol-on-biological-diversity/
Plan for Biodiversity is a ten-year framework on biodiversity for the period starting in 2011 and ending in 2020. It aims to “take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet’s variety of life, and contributing to human well-being” and to ensure that, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented.

48. The Strategic Plan includes 5 strategic goals and 20 ambitious targets know as the Aichi Biodiversity Targets.\footnote{https://www.cbd.int/sp/targets/} The 5 strategic goals are:

- To address the underlying causes of biodiversity loss.
- To reduce the direct pressures on biodiversity and promote sustainable use.
- To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.
- To enhance the benefits to all from biodiversity and ecosystem services.
- To enhance implementation through participatory planning, knowledge management and capacity building.

49. None of the 20 Aichi Biodiversity targets were fully met by the target deadline of 2020. One assessment of progress found partial progress in just four of the 20 targets that had been set. Areas of progress included increases in the proportion of land and oceans designated as protected areas and improved international financial flows to developing countries. The assessment also showed that there had been moderate or poor progress in most of the targets aimed at addressing the causes of biodiversity loss and little or no progress has been made on others, including the elimination of harmful subsidies. In addition, there has been moderate or poor progress on maintaining genetic diversity of cultivated plants and their wild relatives, restoring ecosystems and no progress overall in enhancing carbon storage. It is estimated that more than half a million terrestrial species have insufficient habitat for their long-term survival, and are committed to early extinction, many within decades, unless their habitats are restored; that most warm-water coral will die if global warming increases by 2–3°C, boreal forests will not reproduce, and ice-dependent ecosystems (such as permafrost, glacier and seasonal ice sheets) will face eventual collapse. Biodiversity and the benefits it provides are set to decline further because of continued climate change and changes in land-use.\footnote{https://ipbes.net/sites/default/files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf}

50. Some progress, however, has been made in raising awareness of the value of biodiversity, developing national action plans, improving scientific understanding of
the causes and consequences of biodiversity loss, and in increasing protected areas around the world grow.

51. In its resolution 65/161, the General Assembly declared the period 2011–2020 to be “the United Nations Decade on Biodiversity, with a view to contributing to the implementation of the Strategic Plan for Biodiversity for the period 2011-2020”. The Decade emphasized importance of biodiversity in agriculture, forests, mountains and all bodies of water and that preserving biodiversity can be helpful in providing continuous benefits like development and eradication of poverty, business development, controlling climate change, communication- education and public awareness, economics and trade measures, global conservation, health and lifestyle.

52. At the World Summit on Sustainable Development, held in Johannesburg 2002, biological diversity was addressed in Chapter IV of the outcome document, the “Johannesburg Plan of Implementation”. The Summit also endorsed the target to achieve, by 2010, a significant reduction of the rate of biodiversity loss at global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on earth, which had some months earlier been adopted by the sixth meeting of the CBD Conference of Parties (COP).

53. At the Rio+20 Conference in 2012, Member States adopted the outcome document, *The Future We Want*, that reaffirms the “intrinsic value of biological diversity, as well as the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its critical role in maintaining ecosystems that provide essential services, which are critical foundations for sustainable development and human well-being”. Member States also recognized “the severity of global biodiversity loss and degradation of ecosystems” and stressed the negative impact that this situation has on food security, nutrition, access to water, health of the rural poor and people worldwide. Biodiversity losses in these systems can lead to reduction in the quantity and quality of food available, increasing risk of malnutrition, stunted childhood growth, susceptibility to infectious diseases, food poisoning and other diseases.

54. Biodiversity has also been discussed by the Commission on Sustainable Development on several occasions, and was one of the themes of the 2012/2013 two-year cycle.

55. UNESCO leads the global Education for Sustainable Development (ESD) agenda and actively supports education on biodiversity. The organization has initiated activities to strengthen biodiversity education and learning, notably in the area of teacher training and the development of learning materials in the context of biosphere reserves, World Heritage sites and UNESCO Global Geoparks, with the involvement of the UNESCO Associated Schools Network (ASPnet).
Current UN Actions on biodiversity

56. The United Nations Summit on Biodiversity was convened by the President of the General Assembly on 30 September 2020, at the level of Heads of State and Government under the theme of “Urgent action on biodiversity for sustainable development”. The Summit highlighted the crisis facing humanity from the degradation of biodiversity and the urgent need to accelerate action on biodiversity for sustainable development. It provided an opportunity for Heads of State and Government and other leaders to raise ambition for the development of the post-2020 global biodiversity framework to be adopted at the 15th meeting of the Conference of Parties to the Convention on Biological Diversity, to be held in 2021. This framework, and its effective implementation, must put nature on a path to recovery by 2030 to meet the SDGs and realize the Vision of “Living in harmony with nature”.

57. There are few more further meetings to be held in this year, which will be the Fifteenth meeting of the conference of the parties to the convention on biological diversity, Tenth meeting of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety, Fourth meeting of the Conference of the Parties serving as the meeting of the Parties to the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization. These meetings will now be held from 11 to 24 October 2021, in Kunming, Yunnan Province, China. The discussions in these meetings generally will be revolving around two documents:

- The recently published fifth Global Biodiversity Outlook, and
- The updated zero draft of Post 2020 global biodiversity framework.

58. According to UNEP “Biodiversity is the basis of our food, medicines, fuel and livelihoods. It is the source of our cultural and spiritual enrichment. By conserving, restoring and sustainably using biodiversity, we ensure that we have viable solutions to present and future challenges, including climate change, water scarcity, food security, sustainable development, and peace and security”. Hence, it’s the responsibility of every human on this plant to conserve the mother nature and nurture it with care so that we don’t lose our biodiversity.

II. Challenges

59. Many environmental and conservation actions require long-term planning. One of the roadblocks to taking the appropriate actions is that decisions are often tied to short-term political and election cycles. A long-term vision based on solid science and short-term, practical, implementation action needs to be at the heart of our decision-making.

60. Another major roadblock that is impeding progress is the mindset that we are separate from nature and superior to it. This misconception sits at the root of people’s
disconnect from nature and the fragmentation we see in environmental governance and policymaking. Significant changes are required in our mindset – as decision makers, producers, and consumers to acknowledge that our economic model is rooted in unsustainable consumption and production patterns. One of the major challenges we face is how to meet the increasing demand for biological resources caused by population growth and increased consumption and while at the same time protect biodiversity. We need to shift to an economic model that accounts for the fact that we operate within a closed system – planet Earth – and that our economic growth is limited by the ecological limits of the planet, also known as “planetary boundaries.”

61. The expansion of formally protected areas, such as national parks, has been the main pillar of biodiversity conservation action for over a century. Despite significant progress (protected areas now cover more than 14% of land, and almost 6% of the ocean), there are still important gaps in the representation of some ecosystems. Wetlands are an example of a critical, highly threatened and biodiversity-rich ecosystem needing urgent protection. Many protected areas are too small or isolated to be effective in the long term, given the impacts of climate change. Increasing connections between fully or partly protected areas can decrease their fragmentation and make them more resilient to climate change and more able to sustain viable populations of threatened species. Some protected areas have weak management and governance and need increased investment to pay for surveillance and law enforcement. When the true value of natural capital and the services it provides are not considered, protected area expansion can seem politically and economically costly. Taking into account the risks of not protecting ecosystems and locating new protected areas will be important moving forward.

62. Awareness about the importance of combating invasive alien species is increasing, but effective implementation of preventative measures is lacking.

63. Large-scale reforestation with native vegetation can simultaneously help address climate change, biodiversity loss, land degradation and water security. A key challenge, however, is avoiding unintended consequences. For instance, large scale afforestation projects that replace native vegetation with monoculture crops to supply bioenergy can be detrimental to biodiversity and water resources.

64. Unplanned urban expansion has been observed worldwide, mostly on fertile and productive lands. Urbanization may alter consumption patterns and hence indirectly lead to additional impacts on land and biodiversity.

65. Global financing for biodiversity is estimated at about US$80–90 billion annually, far below the conservatively estimated hundreds of billions of US dollars needed. Biodiversity, climate and other environmental finance could be ramped up by redirecting some of the estimated more than US$5 trillion in annual subsidies on fossil fuels, non-sustainable agriculture and fishing, non-renewable energy, mining and transportation. The investments needed to restart economies stalled by the
COVID-19 pandemic may make raising the investments needed to reduce biodiversity loss difficult. The investments required to reach the SDGs exceed the capacity of public funding, therefore substantial private sector financing is essential. In the current economic environment this may be equally challenging.

66. Human activities are driving an unprecedented rate of loss of biodiversity which has potentially severe consequences for human well-being, especially for the poor and vulnerable groups in society and the current rate of loss of terrestrial, freshwater and marine biodiversity is more rapid than at any time in human history and shows no indication of slowing. Given the complex linkages between biodiversity and other global issues like climate change, pollution and land degradation, it will be difficult to turn tide without addressing all of these issues together.

67. The conflict between development and biodiversity is also an issue that needs to be addressed. Development leads to over-exploitation of natural resources bringing about a direct loss of wildlife species and habitats. Thus, reducing biodiversity loss is at the heart of achieving the sustainable development goals. Anything that threatens the achievement of the SDGs will likewise threaten achieving targets for biodiversity.

68. Trade liberalization also impacts negatively on biodiversity in a number of different ways: it may increase demand for natural resources; through price competitiveness; it may encourage poor environmental standards in production; it tends to shift production in the type of crops grown to those that serve export production rather than domestic consumption; it leads to the importation of fertilizers, pesticides and other goods that may deplete biodiversity.

69. Deforestation is a major driver of biodiversity loss accounts for up to 20 percent of the global greenhouse gas emissions that contribute to global warming, adversely impacts water and soil resources, contributes to species extinction through reduction and fragmentation of habitats, reduces food security in at least some regions of the world and lowers the resilience of forest ecosystems and makes it more difficult for them to cope with changing environmental conditions. While the overall rate of deforestation may be decreasing in many areas it is increasing due to a growing demand for more lumber, more fuel, more food, and more space as the population grows. In order to combat deforestation, you need to address the needs people have that is contributing to this problem.

70. Climate change also poses a huge challenge in declining quality of biodiversity. Extreme climate variability, such as prolonged drought and extreme rainfall places stresses on biodiversity. Ocean acidification related to levels of carbon in the atmosphere also affects marine biodiversity, and availability of marine products, and warming sea surface temperatures directly affect the integrity of coral reefs and coastal fisheries. If warming exceeds 2°C, both marine and terrestrial animals and plants are projected to decline, including the decline of warm-water coral reefs by
99%, the decline of Arctic summer sea ice, large declines in marine fishery catches and the placing of 20–30% of terrestrial species at increased risk of extinction.

71. Illicit poaching and trafficking of wildlife continues to thwart conservation efforts, with nearly 7,000 species of animals and plants reported in illegal trade involving 120 countries. Global trade in wildlife is estimated to be over US $20 billion annually. Global trade includes at least 40,000 primates, ivory from at least 90,000 African elephants, 1 million orchids, 4 million live birds, 10 million reptile skins, 15 million furs and over 350 million tropical fish.

72. The biodiversity is already under threat and global demands for energy are growing rapidly, with estimations of the world’s energy needs in 2030 being almost 60% higher than today. Although most growth in energy demand is in developing countries and countries in transition seeking a greater supply of the energy services that drive development. However, Trade-offs don’t come easily as biodiversity is the basis for ecosystem services and hence the basis for human life, while energy use lies at the core of modern industrialized society.

73. Biodiversity and tourism are closely inter-related. Unsustainable tourism can threaten biodiversity and ecosystem services. Some of notable dangers such as land use conversion, unplanned tourism development, disturbance of species, unsustainable consumption, introduction of invasive alien species, discharge and disposal of waste, pollution and greenhouse gas emissions. Tourism contributes to climate change, for instance through the emissions of greenhouse gases from the transportation of tourists to and from destinations, which impacts biodiversity. Protected areas with more biodiversity tend to have more tourists, according to new research. That popularity can mean more money for conservation and help bolster human interest in wildlife, but it can also raise other concerns. balancing between protecting biodiversity and fostering ecotourism is a global challenge. Finding the proper balance between protecting biodiversity and fostering ecotourism is a global challenge.

74. Sometimes solutions to environmental problems clash. For example, the protection of intact forests reduces carbon emissions and also conserves biodiversity. Such solutions are consistent with nature-based adaptation strategies under the climate convention but land-based mitigation options that include unrestricted use of land for biofuel production can lead to the fragmentation of habitats that we know reduces biodiversity. Care must be taken to balance the cost and benefits of these climate change adaptation and mitigation options.

III. Future Priorities

75. Loss of biodiversity is anticipated to accelerate in coming decades, unless actions to halt and reverse human transformation and degradation of ecosystems and to limit
climate change are urgently implemented. The causes of biodiversity decline are many and deeply embedded in society, so the future of life on land, in freshwater and in the oceans fundamentally depends on society embracing transformative pathways. Halting and reversing biodiversity loss means addressing the direct drivers such as land and sea use, overexploitation, climate change, air and water pollution and invasive species. That in turn is contingent on incentive structures, improved management systems and the rule of law that promotes conservation, restoration and sustainable use of biodiversity. Such efforts need to be embedded in system-wide reforms addressing poverty, sustainable livelihoods, food, energy and resource-use systems. They also need to encompass combatting the illegal wildlife trade and avoiding human development in biodiversity hotspots. Systemic shifts will mean changing lifestyles and economic systems.

76. Conserving, restoring and sustainably managing habitats and ecosystems is recognized as the most effective way to protect existing target species. Many protected areas are currently too small or isolated to be effective in the long term, given that climate change is shifting the geographic ranges of animal and plant species. Increasing connectivity between protected areas makes them more resilient to climate change and more able to sustain populations of species that are being threatened with extinction. Some ostensibly protected areas have weak management and governance and need increased investment for surveillance, law enforcement and restoration. That is why many Member States are supporting a push to protect at least 30 percent of the planet’s land and water by 2030, up from 16.64 % of land and 7.74 % of oceans that are protected today. Increasing the percentage of land and water that is protected is key to protecting biodiversity. It helps to ease existing and growing pressures on wild organisms by allowing them to shift their ranges in response to climate change. Member States supporting this proposal hope to include this proposal in a global agreement that will be negotiated at a conference in China later this year. The proposal is one of 21 targets included in the first draft of the Global Biodiversity Framework (GBF). Others proposals include ending farming subsidies that are driving wildlife losses and boosting conservation funding by at least $200 billion a year.

77. Protecting life on Earth, including human life, requires actions that are significantly more effective than those taken thus far. Action to halt the loss of biodiversity and land degradation, stopping climate change and keeping the effects of chemicals within tolerable limits must be coordinated to be effective. All these forms of degradation are primarily driven by the unsustainable level of consumption by the well-off, while the poor are left behind. Achieving transformative change requires that the fundamental drivers of overconsumption are addressed, through changes in personal values, norms, economic and social operating rules, technologies and regulations.

78. Member States need to implement nature-based solutions that include restoration or protection of coral reefs, seagrass meadows, coastal wetlands, mangroves, and

beaches to reduce coastal flooding and erosion as well as restoration of floodplains, peatlands, and vegetation situated on the banks of rivers to reduce river flooding.

79. Biodiversity loss cannot be addressed in isolation from climate change and pollution. Climate change and land degradation combine to drive loss of biodiversity and increase extinction risks. Therefore, the goals of carbon neutrality, land degradation neutrality and conservation of biodiversity need to be integrated into all economic and fiscal policies and decisions. Furthermore, key international environmental agreements need to be aligned and become more mutually supportive. The further development of the goals, targets, commitments and mechanisms under multilateral agreements in the areas of climate change, biodiversity, land degradation, oceans and pollution needs to be aligned and become more mutually supportive.

80. Member States need to come up with options that can address multiple environmental issues at the same time and that can preserve and restore the environment and contribute to achieving some of the other SDGs as well. For example, large-scale reforestation with native vegetation can simultaneously help address climate change, biodiversity loss, land degradation and water security.

81. In order for governance to be more effective it needs to consider more nature-based solutions given the close interlinkages between climate change and biodiversity loss, and the potential for nature-based solutions to address both issues at once.

82. They must all can be tackled jointly within the framework of the Sustainable Development Goals. Toward this end, society needs to reduce carbon dioxide emissions by 45% by 2030 compared to levels measured in 2010 levels and reach net-zero emissions by 2050 to limit warming to 1.5 °C as outlined in the Paris Agreement, while at the same time conserving and restoring biodiversity and minimizing pollution and waste. While this report focuses primarily on loss of biodiversity, we must never lose sight of its linkages to these other two issues. The situation will be catastrophic if we let the average global temperature increase by more than 2°C combined and allow both loss of biodiversity and pollution (both air and water) to increase unabated.

83. The removal by governments of implicit or explicit subsidies that have the unintentional effect of driving the loss of biodiversity or its habitats, including some forms of subsidies for farming, fishing, mining and industries exporting commodities will assist the private sector in achieving sustainable use.

84. Consumer education that includes increasing consumer and retail awareness of the environmental and human health consequences of different purchasing patterns together with the establishment of a certification of products as being climate, ecosystem and biodiversity-friendly can permit consumers to make informed choices between harmful and sustainable products. The private sector can help protect biodiversity by ensuring that the products it trades are sustainably sourced. Some companies, such as those trading and processing commodities like palm oil and cocoa, have adopted policies to reduce their environmental footprint, for instance by purchasing supplies from deforestation-free farmers or fisheries that reduce damage to land and marine organisms. Well-designed government policies are needed to facilitate market transformation across the economy.
85. The investments required to reach the SDGs exceed the capacity of public funding, therefore substantial private sector financing is essential. Socially- and environmentally-oriented investment funds that provide low-cost financing for sustainable projects can close part of the financing gap. Currently there is an estimated US$500 billion of assets in impact investing. However, achieving large-scale financial flows on the scale needed to achieve the SDGs will likely require making such investments more financially attractive. New approaches are needed to incentivize private sector funding. The Global South needs increased access to low-interest finance in order to achieve the SDGs. The Global North has exacerbated the shortfall by failing to meet its commitments under environmental conventions and on international development assistance.

86. Good practices should be highlighted so that other Member States can learn from them. For example, Costa Rica and Botswana serve as outstanding examples. Costa Rica prides itself on being the “Green Republic.” A little more that on quarter of the country’s territory is protected by national parks. There has also been a lot of reforestation in Costa Rica, in part because of a decision to have an ecosystem services law to tax gasoline and use the revenue to benefit reforestation. As a result, Costa Rica is the first tropical country to have stopped and reversed deforestation: over half of its land is covered by forest, compared to 26% in 1983.

87. Botswana has recognized that its wilderness and wild animals are an incredible source of economic benefit, so it outlawed the hunting of lions and other trophy hunting. The country has a thriving ecotourism industry. When you think about ecotourism, it is everything that feeds into supporting the tourism industry. And when it’s done right, the revenue reinforces the economic well-being of the people in the region.

88. Actions need to be taken now even where the benefits may not be realized for years due to the long-lasting nature of environmental effects. Essential actions with delayed effects include reforestation and restoration of degraded lands.

89. More attention needs to played to how to ensure food supply while reducing the impact of agricultural production on biodiversity. Two methods to address this are land sparing and land sharing. Land sparing attempts to reduce the need to transform natural ecosystems to agricultural lands by increasing productivity on already-converted lands. Land sharing attempts to meet production, biodiversity conservation and climate mitigation objectives on the same land parcel. There is increasing consensus that sustainable land-use systems will lie between these contrasting models. Some types of biodiversity and ecosystem services fare better with one approach and other types of biodiversity and ecosystem services fare better with the other approach.

90. Careful and appropriate agricultural intensification¹⁴ can also reduce the loss of natural ecosystems, including by avoiding deforestation, and create space on former agricultural lands for protecting biodiversity. To deliver the promised biodiversity and ecosystem services benefits, the spared land (i.e. land not used for agriculture thanks to intensification) must be used for ecosystem restoration and protection.

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¹⁴Sustainable intensification (SI) is defined as a process or system where agricultural yields are increased without adverse environmental impact and without the conversion of additional non-agricultural land.
91. Many uses of land have both under- and over-intensive elements, and the optimal solution involves both land-sparing and land-sharing. De-intensification should be implemented when the land use-intensity already exceeds sustainability limits.

92. In locations outside protected areas that are more densely populated by humans, policymakers must explore ways to regulate the development of land and use of resources that are less harmful to biodiversity but still benefit humans. This should include a multiple land-use approach that promotes pastoral, agricultural and forestry practices that sustain biodiversity and support local livelihoods, while avoiding land degradation.

93. Effective management of land and sea resources and their biodiversity requires a combination of financial and non-financial incentives to resource owners; and regulations and agencies to monitor and enforce them; and coordinating actions across the various agencies and jurisdictions involved.

94. Recognition of the traditions and knowledge of indigenous peoples and local communities, and the use of participatory approaches to resource management, are key success factors. It is necessary to work with indigenous peoples and local communities to provide legal tools, and various forms of protection of traditional knowledge.

95. Actions to restore marine biodiversity should include: sustainable fish quotas which are essential to reform fisheries, end overfishing and restore marine biodiversity; trade negotiations that include rules on the elimination of harmful fisheries subsidies; expansion of protected areas; reducing pollution; eliminating harmful illegal, unreported and unregulated fishing; adapting fisheries management to climate change impacts; reducing the environmental impact of aquaculture; and implementing strict no-take areas where fishing is prohibited in both territorial waters and the open ocean to conserve and rebuild stocks of commercial and non-commercial species and protect aquatic ecosystems. Ensuring sustainable food production from the oceans while protecting marine biodiversity requires policy actions that apply sustainable harvesting approaches to fisheries management while addressing threats such as climate change, ocean acidification and pollution.

96. Ending overfishing and rebuilding depleted resources may result in an increase of as much as 20% in potential yield. Marine protected areas (including no-take zones) have demonstrated success in biodiversity conservation when managed effectively and can be further expanded through larger or more interconnected protected areas or new protected areas in underrepresented regions and key biodiversity areas.

97. The removal by governments of implicit or explicit subsidies that have the unintentional effect of driving the loss of biodiversity or its habitats, including some forms of subsidies for farming, fishing, mining and industries exporting commodities will assist the private sector in achieving sustainable use.

98. The deep seas mostly fall outside of national sovereignty and thus have no pre-existing formal ownership rights. Consequently, only 5.3–7.4% of the deep seas are

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15 No-take areas have been demonstrated to be an effective and practical solution to overfishing.
currently protected. Consequently actions on how to conserve fish stocks in these areas need to be agreed to by the international community.


100. Restoring marine life in both the open oceans and in coastal areas is achievable but only if global warming is limited to 1.5°C (which would hold the acidification of the oceans below critical thresholds) and the contamination of the oceans with chemicals, plastics, sewage and sediment (from land degradation) is halted.

101. Many species are endangered by overharvesting and poaching for human consumption in local or international markets, practices that also increase the risk of the emergence of novel zoonotic diseases like COVID-19. Key actions to conserve biodiversity such as reversing the net loss of habitat, halting overharvesting, reducing pollution and slowing the spread of invasive alien species will help nature adapt to climate change.

102. Transformation of diets and reduction of food waste can help to significantly reduce emissions resulting from the food system. At present, the global food system as a whole emits 21–37% of global greenhouse gases, much of it from deforestation to create new agricultural lands. Transformation of diets such that protein needs are derived more from plants and less from animals has the potential to reduce annual greenhouse gas emissions by 2–20% of current emissions by 2050. Benefits from changing our diets include improvements in human health and wellbeing, conservation of biodiversity and enhanced ecosystem services. Improving access to safe, nutritious and affordable food for all, while reducing food waste and changing dietary choices and consumer behaviour in high-income countries and groups, is central for the achievement of hunger, biodiversity, waste and climate goals. Changing the dietary habits of consumers, particularly in developed countries, where consumption of energy- and water-intensive meat and dairy products is high, would reduce pressure on biodiversity and the climate system. These habits are a function of individual choices but are also influenced by advertising, food and agricultural subsidies and excess availability of cheap food that provides poor nutrition.

103. Reform national economic, financial, planning and tax systems to include environmental costs in decision-making.

104. Ensuring sustainable food production from the oceans while protecting marine biodiversity requires policy action to apply sustainable harvesting approaches to fisheries management, while addressing at the same time threats such as climate change, ocean acidification and pollution.

105. Similarly, large-scale reforestation with native vegetation can simultaneously help address climate change, biodiversity loss, land degradation and water security. A key challenge is to avoid unintended consequences. For instance, large scale afforestation schemes and replacing native vegetation with monoculture crops in order to supply
bioenergy to mitigate climate change can be detrimental to biodiversity and water resources.

106. Recognition of the custodial traditions and knowledge of indigenous peoples and local communities is also important. Pastoral, agricultural and forestry practices can sustain biodiversity while supporting local livelihoods, avoiding land degradation and embracing restoration of degraded lands.

107. Different stakeholders have different responsibilities with regard protecting biodiversity. Here is a summary of actions that each stakeholder can take to turn the tide and reduce biodiversity loss:

- **Governments:** Develop policies and strategies to integrate biodiversity conservation and restoration into the many uses of terrestrial, freshwater and marine ecosystems, as well as expanding and improving protected areas. Drastically reduce deforestation and systematically restore forests and other ecosystems. Integrate conservation of biodiversity into all economic and fiscal policies and decisions;

- **Intergovernmental institutions:** Advance international cooperation on addressing the biodiversity emergency by negotiating multilateral environmental agreements. Promote ambitious post-2020 targets and actions for biodiversity. Support the UN Decade on Ecosystem Restoration focused on preventing, halting and reversing the degradation of forests, land and other ecosystems worldwide.

- **Financial institutions:** Develop and promote innovative financing mechanisms for the conservation and restoration of biodiversity, including through payments for ecosystem services. Support the expansion and better management of protected areas and other effective area-based conservation measures.

- **Private sector:** Develop and promote innovative public-private partnerships for financing and engaging in the conservation and restoration of biodiversity, including through the use of payments for ecosystem services. Implement sustainable land management practices for agriculture and forestry. Develop sustainable global supply chains for deforestation-free agricultural commodities.

- **NGOs:** Develop local-regional-national conservation programmes. Participate in community-led initiatives to conserve nature. Support the development and management of protected areas and other effective area-based conservation measures.

- **Individuals:** Engage in local and national conservation and restoration efforts and awareness campaigns to influence consumer behaviour.

- **Scientific and educational organizations:** Assess the impact of multiple drivers on biodiversity and ecosystem degradation, and the efficacy and cost-effectiveness of conservation and restoration activities, including nature-based solutions.
• Academic institutions: Assess the costs and benefits of mitigating and adapting to climate change, loss of biodiversity and ecosystem degradation, land degradation, and air and water pollution; assess the implications of reforming measures and models of economic growth; promote education, information and awareness on sustainable economic and financial systems.

• Media and social network: Highlight the importance of biodiversity for human prosperity and well-being and the options for its conservation and restoration. The media and social networks play a critical role in informing the public about the interconnected nature of pressing issues and the role that environmental degradation plays in exacerbating societal issues, thus stimulating public awareness and political support for meaningful solutions. The media can also hold governments and businesses to account, comparing promises with actions taken. Social networks can also expose false claims.

108. With regard to urbanization, numerous approaches and technologies that address critical human needs while conserving and restoring nature and ecosystem services have been developed. These include: engaging in sustainable urban planning; encouraging densification for compact communities, especially in sprawling cities; regional planning to mainstream biodiversity, nature and ecological restoration into development plans in urban areas; promoting sustainable production and consumption; promoting nature-based solutions; increasing urban green spaces and improving access to them; and promoting urban agriculture to increase local food supply.

109. The primary biodiversity Goals (SDG 14 and 15) seek to conserve and sustainably use the land and marine environment, yet all 17 SDGs ultimately depend on healthy ecosystems and biodiversity. Ultimately, success on reducing biodiversity loss will depend on how much progress is made on the other goals.