

CONTEXT FOR THE ISSUANCE OF A NON-PAPER ON SBSTTA-24 AGENDA ITEM 9

During the first part of its twenty-fourth meeting held online, from 3 May to 9 June 2021, the Subsidiary Body on Scientific, Technical and Technological Advice considered agenda item 9 on biodiversity and health. In considering the item at the eighth plenary session, on 8 June 2021, the Subsidiary Body had before it a note by the Executive Secretary on biodiversity and health (CBD/SBSTTA/24/9), which included a suggested recommendation and two information documents (CBD/SBSTTA/24/INF/25, CBD/SBSTTA/24/INF/26).

The Chair of the session, Ms. Helena Jeffery Brown (Antigua and Barbuda), recalled that the item had not been on the agenda of the informal session and said that, owing to time constraints, a draft recommendation on the topic would only be considered during the second part of the twenty-fourth meeting of the Subsidiary Body, which will be held from 12 to 28 January 2022 in Geneva, Switzerland.

At the ninth session of part I of the meeting, on 9 June 2021, the Chair of SBSTTA, Mr. Hesiquio Benitez Diaz (Mexico), announced that, following consultations with the Bureau, a contact group would be established to further discuss the issue when the Subsidiary Body meets in person. The specific mandate of the contact group would be to review the annex of the document, a global action plan for biodiversity and health, and, if time allowed, to also review the recommendations. The contact group would be co-chaired by Ms. Jeffery Brown and Ms. Marina von Weissenberg (Finland).

The present non-paper has been prepared to support the further discussions in the contact group. It is based on interventions and submissions made during the first reading of agenda item 9 on biodiversity and health on 8 June 2021. The non-paper reflects statements and interventions delivered by regional groups, Parties, and observers.

NON-PAPER

BIODIVERSITY AND HEALTH

The Subsidiary Body on Scientific, Technical and Technological Advice may wish to recommend that the Conference of the Parties at its fifteenth meeting adopt a decision along the following lines:

The Conference of the Parties,

Recognizing that human health and well-being are not possible without biodiversity and the ecosystem functions and services that biodiversity underpins, that the loss of biodiversity can impact health negatively, and that health-related activities can have potential impacts on biodiversity which may threaten the provision of ecosystem functions and services,

Recalling decisions XII/21, XIII/6 and 14/4 on biodiversity and health and decision XIII/3 on the mainstreaming and integration of biodiversity within and across sectors, and acknowledging the guidance on integrating biodiversity considerations into One Health approaches, among other holistic approaches,

Recognizing that the COVID-19 pandemic has further highlighted the importance of the relationship between people and biodiversity, the urgency of addressing the biodiversity crisis alongside the climate crisis, the need for a sustainable and inclusive recovery within the “build back better” agenda, and that a biodiversity-inclusive One Health approach among other holistic approaches would help to prevent and reduce the risk of future diseases of zoonotic origin and other infectious diseases,

Stressing that mainstreaming biodiversity in the health sector and strengthening cooperation as recognized in the long-term approach to mainstreaming biodiversity (CBD/COP/DEC/15/--) and cooperation with other conventions and organizations (CBD/COP/DEC/15/--), and leveraging biodiversity and health co-benefits are very important for halting the loss of biodiversity and for the achievement of the post-2020 global biodiversity framework and the 2030 Agenda for Sustainable Development,

Emphasizing the essential role of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization for health-related technological developments, and the need to achieve the fair and equitable sharing of the benefits arising out of the

utilization of genetic resources and to foster scientific and technological research in the field of healthcare and other health-related activities,

Recognizing the importance of the sustainable use of biodiversity to support food security and to provide co-benefits for human health, in line with the 2030 Agenda for Sustainable Development,

Recognizing the long-standing collaboration between the Secretariat of the Convention on Biological Diversity and the World Health Organization, which contributes to a strengthened understanding of biodiversity-health linkages and to raising the importance of One Health approaches,

Taking note of the report on the Workshop on Biodiversity and Pandemics¹ convened by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services,

Welcoming the World Health Organization's report launched on 20 May 2021² on *Nature, Biodiversity and Health: an overview of interconnections*, presenting ways nature and ecosystems can support and protect health and well-being, and describing how nature degradation and the loss of biodiversity can threaten human health,

1. *Welcomes* the strengthened collaboration on the One Health approach by the World Health Organization, the World Organization for Animal Health, the Food and Agriculture Organization of the United Nations, and the United Nations Environment Programme, including the recent establishment of the One Health High-level Expert Panel;

2. *Invites* Parties, other Governments and relevant stakeholders to consider opportunities for a sustainable and inclusive recovery from the COVID-19 pandemic, also through short-term stimulus measures³ and longer-term approaches that contribute to the conservation and sustainable use of biodiversity, and benefit-sharing, and thereby contribute to minimizing the risk of future diseases of zoonotic origin, taking into account a biodiversity-inclusive One Health approach among other relevant approaches and making use, as appropriate and in accordance with national circumstances and priorities, of the information provided in the fifth edition of the *Global Biodiversity Outlook* and the note prepared by the Executive Secretary for the special virtual sessions of the Subsidiary Body on Scientific, Technical and Technological Advice and the Subsidiary Body on Implementation on Biodiversity, One Health, and the response to COVID-19 and pandemics, convened in December 2020;⁴

3. *Endorses* the global action plan for biodiversity and health annexed to the present decision, *encourages* Parties, and *invites* other Governments and relevant stakeholders, to implement this plan, including through the mainstreaming of biodiversity and health linkages into existing and future policies, plans and strategies, as appropriate and in accordance with national priorities and circumstances, and the reinforcement of collaboration among ministries and agencies responsible for all the sectors identified in the global action plan for biodiversity and health, with a view to enhancing implementation of the three objectives of the Convention, the post-2020 global biodiversity framework, and the 2030 Agenda for Sustainable Development, with the full and effective participation of indigenous peoples and local communities, women, youth and older persons;

3.bis. *Invites* Parties, other Governments and relevant stakeholders to consider opportunities for raising awareness on linkages between biodiversity and health, recognizing the need to address the common drivers of biodiversity loss and climate change, and thereby promoting better health and well-being outcomes;

4. *Invites* the World Health Organization, the World Organization for Animal Health, the Food and Agriculture Organization of the United Nations and the United Nations Environment Programme, to

¹ <https://www.ipbes.net/pandemics>

² www.euro.who.int/en/nature-biodiv-health

³ Appendix 2 presents options to integrate biodiversity considerations into COVID-19 stimulus and recovery measures.

⁴ [CBD/SBSTTA-SBI-SS/2/2](https://www.cbd.int/doc/2020/02/CBD/SBSTTA-SBI-SS/2/2)

continue collaboration with the Convention on Biological Diversity through the recently established One Health High-Level Expert Panel, other relevant expert groups and multilateral initiatives, among others:

(a *ante*) To promote a biodiversity-inclusive and whole-of-society One Health approach;

(a) To support the implementation of the global action plan for biodiversity and health in cooperation with indigenous peoples and local communities, women, youth and older persons, and relevant partners;

(b) To further support the development and implementation of measures, guidance and tools for promoting and supporting the mainstreaming of biodiversity and health linkages;

(c) To support reporting on health-related indicators for the monitoring of the global action plan for biodiversity and health;

4bis. Also invites the Global Environment Facility (GEF), donors and other organizations, to provide Parties, and in particular developing countries, small island developing states as well as countries with economies in transition, with technical and financial support for the effective implementation of the global action plan for biodiversity and health;

5. Requests the Executive Secretary, subject to the availability of resources, and in collaboration with the World Health Organization and other partners and indigenous peoples and local communities, women, youth and older persons, and relevant partners:

(a) To facilitate the implementation of the global action plan for biodiversity and health, and promote a biodiversity-inclusive One Health approach;

(b) To continue collaboration with the World Health Organization, the World Organisation for Animal Health, the Food and Agriculture Organization of the United Nations and the United Nations Environment Programme, including, as appropriate, the One Health High-level Expert Panel, to promote a biodiversity-inclusive One Health approach;

(c) To report on progress to the Subsidiary Body on Scientific, Technical and Technological Advice prior to the sixteenth meeting of the Conference of the Parties.

Annex I

DRAFT GLOBAL ACTION PLAN FOR BIODIVERSITY AND HEALTH

Leveraging biodiversity and health linkages to achieve a healthy living in harmony with nature

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I. OVERVIEW

1. The global action plan for biodiversity and health, developed in line with decisions [XII/21](#), [XIII/6](#), and [14/4](#) of the Conference of the Parties to the Convention on Biological Diversity, is aimed at catalysing the mainstreaming of biodiversity and health linkages and accelerate efforts towards a biodiversity-inclusive One Health transition, recognizing the One Health approach among other holistic approaches to health. Recognizing the complexity and wide range of interlinkages between biodiversity and health, the action plan defines action areas and activities framed under six elements in line with the specified strategic and supporting objectives: cross-sectoral mainstreaming, sector-specific mainstreaming, education and awareness raising, surveillance and monitoring, research, and capacity-building and funding. Parties and other Governments, at all levels, relevant organizations and initiatives, indigenous peoples and local communities, women, youth older persons, and relevant stakeholders, including business and civil society organizations are encouraged to implement this action plan, in accordance with national circumstances and priorities. The implementation of this action plan is envisaged to contribute to support the implementation of the post-2020 global biodiversity framework and the achievement of the 2050 Biodiversity Vision of living in harmony with nature, responding to challenges for the health of people, animals, plants, other organisms and our environment in a holistic manner.

II. BACKGROUND

2. In decision 14/4, the Conference of the Parties of the Convention on Biological Diversity requested the Executive Secretary, subject to the availability of financial resources, and invited the World Health Organization, in collaboration, as appropriate, with other members of the Inter-agency Liaison Group on Biodiversity and Health as well as other partners, to develop a draft global action plan to mainstream

biodiversity and health linkages into national policies, strategies, programmes and accounts. The action plan has been developed in pursuance of this request and in line with other decisions of the Conference of the Parties of the Convention on Biological Diversity, in particular decisions XII/21, XIII/6, and 14/4.

3. In decision XII/21, the Conference of the Parties recognized the value of the One Health approach to address the cross-cutting issue of biodiversity and human health, as an integrated approach consistent with the ecosystem approach (decision V/6) that takes in consideration the complex relationships between humans, microorganisms, animals, plants, agriculture, wildlife and the environment. In decision XIII/6, the Conference of the Parties welcomed the *State of Knowledge Review on Connecting Global Priorities: Biodiversity and Human Health*⁵ and requested a guidance to support the consideration of biodiversity and ecosystem management in the application of the “One Health” approach, among other holistic approaches. A *guidance on integrating biodiversity considerations into One Health approaches*⁶ was subsequently adopted in decision 14/4.

III. INTRODUCTION TO A GLOBAL ACTION PLAN FOR BIODIVERSITY AND HEALTH

4. As a fundamental element of sustainable development and as a human right, health has a central place in the 2030 Agenda for Sustainable Development, with Sustainable Development Goal 3 calling on all stakeholders to “ensure healthy lives and promote well-being for all at all ages”. In addition to socioeconomic determinants of human health and well-being, the impact of environmental, climate, biodiversity loss, including ecosystem change and degradation, on health is increasingly recognized. Human health ultimately depends upon biodiversity and ecosystem services. Human rights and a healthy planet are mutually dependent. A safe, clean, healthy and sustainable environment is integral to the full enjoyment of a wide range of human rights, including the rights to life, health, food, water and sanitation.⁷ To realize our human rights, we must heal, protect and sustainably live on our planet.⁸

5. Biodiversity underpins nature’s contributions to people (NCP) that are essential to human health and well-being. As defined by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES),⁹ NCP impact health through, among other things: (a) dietary health, (b) environmental exposure which includes the health risk associated with degradation of environmental quality, (c) exposure to communicable diseases, (d) hazard risk reduction relating to exposure to extreme weather, drought or fire, (e) psychological health as interaction with nature are known to improve mental health, and (f) use of natural compounds in medicinal products and biochemical compounds. Many of nature’s contributions to people, including those conveying mental and physical benefits, are essential for human health and well-being. Biodiversity is also integral to key development sectors that modulate health outcomes directly or indirectly, such as pharmacy, biochemistry, biotechnology, agriculture, or tourism.

6. With biodiversity declining faster than at any time in human history, the deterioration in nature’s contributions to people threatens a good quality of life.¹⁰ The costs of inaction on biodiversity loss are high and are anticipated to increase.¹¹ Although the impact of environmental degradation and biodiversity loss

⁵ WHO/CBD, Connecting global priorities: biodiversity and human health: a state of knowledge review, 2015, <https://www.cbd.int/health/SOK-biodiversity-en.pdf>

⁶ CBD/SBSTTA/21/9.

⁷ In line with resolution [A/HRC/48/L.23/Rev.1](#) on the right to a clean, healthy and sustainable environment adopted by the UN Human Rights Council on 8 October 2021.

⁸ Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, Human rights depend on a healthy biosphere, [A/75/161](#) and annex on good practices, 2020.

⁹ IPBES, Global Assessment on Biodiversity and Ecosystem Services, Chapter 2.3. Status and Trends - Nature’s Contributions to People (NCP), May 2019, https://www.ipbes.net/sites/default/files/ipbes_global_assessment_chapter_2_3_ncp_unedited_31may.pdf

¹⁰ Ibid.

¹¹ Organisation for Economic Co-operation and Development (OECD), Biodiversity: Finance and the Economic and Business Case for Action, May 2019, <https://www.oecd.org/environment/resources/biodiversity/G7-report-Biodiversity-Finance-and-the-Economic-and-Business-Case-for-Action.pdf>

on health outcomes is more direct on vulnerable population groups, it affects all people worldwide, as has become even more clear in the light of the COVID-19 pandemic.

7. Emerging infectious diseases (e.g. Ebola virus disease, HIV/AIDS, Monkeypox, SARS, MERS, COVID-19) highlight the complex linkages among biodiversity, global environmental change and human health,¹² and the critical need for integrated, transdisciplinary approaches such as One Health among other holistic approaches to address the intricate linkages between the health of all people, animals, plants and other organisms, and our shared environment. Taking note of the findings of the IPBES Workshop Report on Biodiversity and Pandemics,¹³ almost all pandemics, and the majority of emerging infectious diseases (EIDs), are caused by wildlife-origin pathogens, and pandemics risk is increasing rapidly, driven by exponentially increasing anthropogenic changes, with more than five new diseases emerging in people every year. The COVID-19 pandemic also shed light on the importance of nature for people, as people sought increasingly the outdoors and nature during the pandemic in order to keep themselves mentally and physically healthy. The COVID-19 pandemic highlights the urgent need to provide adequate means of implementation to developing countries, to enable them to respond to health emergencies, while supporting the conservation and sustainable use of biodiversity and addressing their social and economic challenges.

8. One Health, among other holistic approaches such as EcoHealth and Planetary Health,¹⁴ recognizes that human health is intimately connected to the health of the planet, all living beings, ecosystems, our environment, and relevant systemic drivers. While there is no universal definition, One Health is defined by the World Health Organization (WHO) as “an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes” and by the United Nations Environment Programme (UNEP) as “a cross-cutting and systemic approach to health based on the fact that human health and animal health are interdependent and linked to the health of the ecosystems in which they co-exist”. As biodiversity conservation, ecosystem dynamics, and socioeconomic drivers of human activities impacting biodiversity and ecosystems, have often received less attention in One Health approaches than human-animal interconnections, it is critical to further integrate the full range of biodiversity and health linkages and relevant systemic drivers through a transdisciplinary approach and consider the importance of the three pillars of the Convention for human health in a balanced manner.

9. Over the last decade, the multiplicity and complexity of linkages between biodiversity and human health have been increasingly recognized, as reflected in the findings of the *State of Knowledge Review on Connecting Global Priorities: Biodiversity and Human Health*.¹⁵ The action plan builds on resources and reports developed by the Secretariat of the Convention, WHO, the Inter-agency Liaison Group on biodiversity and health and other partners over the last years, including the Guidance on integrating biodiversity considerations into One Health approaches. The action plan supports a “biodiversity-inclusive

¹² As highlighted in CBD/SBSTTA-SBI-SS/2/INF/1, with regard to links between biodiversity and infectious diseases, higher biodiversity may be expected to increase the *hazard* of emerging infectious diseases, because host diversity (for example of wild mammals) is correlated with the diversity of pathogens (organisms that cause disease). However, this relationship is not necessarily predictive of disease risk since some event is needed to convert a hazard into a risk of pathogen emergence. Such risk factors include encroachment into natural habitats and contact with wildlife. Also, paradoxically, greater host diversity may actually decrease risk of zoonotic pathogen spillover by reducing the prevalence of pathogens among a diversity of host species (“dilution effect” - though this is not always the case). Thus, efforts to minimize biodiversity loss can also reduce disease risk, mostly by reducing contact between humans and wildlife and limiting introduction of exotic species, even if these efforts maintain areas of high disease hazard through the diversity of pathogens.

¹³ IPBES Workshop Report on Biodiversity and Pandemics, 27-31 July 2020, <https://www.ipbes.net/pandemics>. This workshop report and any recommendations or conclusions contained therein have not been reviewed, endorsed or approved by the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

¹⁴ EcoHealth and Planetary Health are presented as other holistic approaches to health in the *Guidance on integrating biodiversity considerations into One Health approaches*, CBD/SBSTTA/21/9. The Action plan builds on the value of the One Health approach, which has been recognized in the guidance and former decisions of the Conference of the Parties, while acknowledging other holistic approaches.

¹⁵ WHO/CBD, Connecting global priorities: biodiversity and human health: a state of knowledge review, 2015, <https://www.cbd.int/health/SOK-biodiversity-en.pdf>

One Health transition” identified in the fifth edition of the *Global Biodiversity Outlook*¹⁶ as part of the eight areas of transition that may be needed to achieve living in harmony with nature by 2050 and takes the WHO *Global Strategy on Health, Environment and Climate Change*¹⁷ into consideration. With regard to the agenda on mainstreaming biodiversity and health linkages, the action plan complements the long-term approach to mainstreaming biodiversity and its related action plan for the long-term approach to mainstreaming biodiversity,¹⁸ noting that mainstreaming of biodiversity within and across sectors is crucial in the promotion of an integrated approach to health.

10. The action plan also takes into account the preparatory documents of the special virtual session of the Subsidiary Body on Scientific, Technical and Technological Advice and the Subsidiary Body on Implementation convened in December 2020 to discuss interlinkages between biodiversity and health, the One Health approach, and the response to COVID-19 and pandemics.¹⁹ It also builds on the findings of the report by UNEP on *Preventing the next pandemic - Zoonotic diseases and how to break the chain of transmission*²⁰ and the publication entitled *The COVID-19 challenge: Zoonotic diseases and wildlife. Collaborative Partnership on Sustainable Wildlife Management's four guiding principles to reduce risk from zoonotic diseases*²¹ developed by the Members of the Collaborative Partnership on Sustainable Wildlife Management (CPW) and the Food and Agriculture Organization of the United Nations (FAO). The action plan also takes note of the work programme of IPBES adopted at its seventh plenary²² foreseeing the elaboration of a biodiversity nexus assessment, which will include linkages between biodiversity and health, taking into account the Workshop report on Biodiversity and Pandemics.²³ The action plan also supports the ‘build back better’ agenda, which includes economic recovery by protecting nature and thus protecting health, in line with the *WHO Manifesto for a Healthy Recovery from COVID-19*²⁴ with particular attention to the first prescription to *Protect and Preserve the Source of Human health: Nature*.

11. In the context of the COVID-19 pandemic and the “build back better” agenda, there is a growing momentum on environmental components of One Health, as illustrated by the joining of UNEP to the Tripartite consisting of WHO, the World Organisation for Animal Health (OIE) and FAO, as well as the creation of a One Health High Level Expert Panel.²⁵ Given the evolving landscape and building on this momentum, the Secretariat of the Convention on Biological diversity will continue to facilitate awareness of biodiversity and health linkages and work closely with its partners, including WHO and through the Inter-agency Liaison Group on Biodiversity and Health, as well as UNEP, with a view to contributing to those ongoing initiatives and promoting a biodiversity-inclusive One Health approach, among other holistic approaches, while seeking synergies and ensuring there is no duplication of work. By recognizing the value of One Health as part of the post-2020 global biodiversity framework and through this action plan, the Parties to the Convention on Biological Diversity have an opportunity to reinforce the importance of the biodiversity components of One Health and accelerate the achievement of a biodiversity-inclusive One

¹⁶ *Global Biodiversity Outlook*, fifth edition, Secretariat of the Convention on Biological Diversity, 2020,

¹⁷ WHO Global Strategy on Health, Environment and Climate Change, WHO, 2020, <https://apps.who.int/iris/bitstream/handle/10665/331959/9789240000377-eng.pdf?ua=1>

¹⁸ CBD/SBI/3/13 and CBD/SBI/3/13/Add.1.

¹⁹ CBD/SBSTA-SBI-SS/2/2 and CBD/SBSTA-SBI-SS/2/INF/1.

²⁰ UNEP, *Preventing the next pandemic - Zoonotic diseases and how to break the chain of transmission*, July 2020, <https://www.unep.org/resources/report/preventing-future-zoonotic-disease-outbreaks-protecting-environment-animals-and>

²¹ FAO, *The COVID-19 challenge: Zoonotic diseases and wildlife. Collaborative Partnership on Sustainable Wildlife Management's four guiding principles to reduce risk from zoonotic diseases*, 2020, <http://www.fao.org/3/cb1163en/CB1163EN.pdf>

²² <https://www.ipbes.net/work-programme>, under Objective 1: thematic assessment of the interlinkages among biodiversity, water, food and health

²⁴ *IPBES Workshop Report on Biodiversity and Pandemics, 27-31 July 2020*, <https://www.ipbes.net/pandemics>

²⁴ WHO, *WHO Manifesto for a healthy recovery from COVID-19*, 2020, https://www.who.int/docs/default-source/climate-change/who-manifesto-for-a-healthy-and-green-post-covid-recovery.pdf?sfvrsn=f32ecfa7_8

²⁵ <https://news.un.org/en/story/2021/02/1084982>

Health transition, recognizing the One Health approach among other holistic approaches to health, in the next decade.

12. Achieving this transition in a manner that remains economically sustainable for populations in developing countries; fully supports human health, all living beings, ecosystems and relevant systemic drivers; and addresses the common drivers of biodiversity loss, habitats disruption, disease risk, and health impacts will enable a virtuous cycle. A One Health transition can play a critical and catalytic role in reducing the loss and degradation of biodiversity, restoring healthy ecosystems, enhancing the health, well-being and livelihood of all living beings, including humans, animals and plants, and preventing future pandemics.

IV. STRATEGIC OBJECTIVES AND RATIONALE OF THE ACTION PLAN

13. The *main and overall objective* of the action plan is to support Parties and other Governments, at all levels, relevant organizations and initiatives, indigenous peoples and local communities, women, youth and older persons, business and civil society organizations, as well as other stakeholders, in (a) mainstreaming biodiversity and health linkages into policies, strategies, programmes and accounts at all levels, and (b) accelerating and upscaling efforts towards a One Health approach, among other holistic approaches, to the conservation and sustainable use of biodiversity and the promotion of health, in line with the *Guidance on integrating biodiversity considerations into One Health approaches*.²⁶

14. The *rationale* of the action plan is to work towards achieving health and well-being for all, in harmony with nature, and to respond to challenges that threaten the health of the planet and people animals, plants, other organisms, and our shared environment in a holistic manner by 2030 and within the post-2020 global biodiversity framework.

15. The action plan is articulated through the following strategic *operational objectives*:

(a) To mainstream²⁷ health, well-being and biodiversity linkages in cross-sectoral plans, in the development and implementation of health, biodiversity and environment-related policies and in the work and practices of relevant ministries or agencies, with a view to contributing to human health and biodiversity recovery as well as the conservation and sustainable use of biodiversity, and achieving co-benefits;

(b) To mainstream biodiversity and health linkages through sector-specific plans, including in the health sector, and through the use and application of open standards methodology for conservation, with a view to reducing the common drivers of biodiversity loss and health impacts and thus promoting the conservation and sustainable use of biodiversity alongside human well-being and animal welfare;

(c) To promote education, including on conservation, increase awareness and improve the understanding of biodiversity and health linkages, including among the general public and non-State actors, and leverage the role of indigenous peoples and local communities and their traditional knowledge, with a view to catalysing sustainable patterns of consumption and production.

16. The implementation of the aforementioned strategic *operational objectives* will enable and be reinforced by the following strategic *supporting objectives*:

(a) To strengthen planning and surveillance, through information sharing and knowledge management, to address health threats, including the risk of pathogen spillover, epidemics and pandemics, and prevent diseases, through a biodiversity-inclusive One health approach among other holistic approaches, with due consideration of the specific capacity as well as technical and technological gaps faced by developing countries;

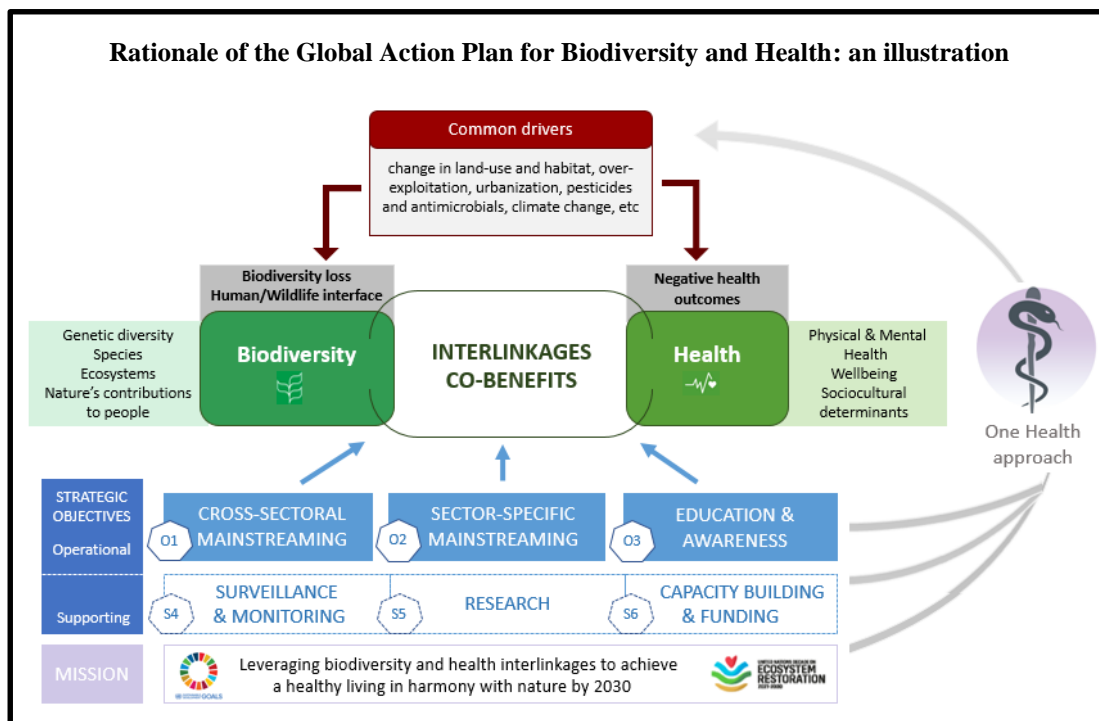
(b) To consolidate scientific research to further investigate the full range of linkages between biodiversity and health, particularly the complex trophic relations within ecosystems, the role of pathogens,

²⁶ [CBD/SBSTTA/21/9](#).

²⁷ Following the narrative of the long-term approach to biodiversity mainstreaming and its complementary action plan (CBD/SBI/3/13 and CBD/SBI/3/13/Add.1), and CBD's definition of mainstreaming (glossary).

vectors, hosts and predators, in line with a biodiversity-inclusive One Health approach among other holistic approaches;

(c) To support capacity-building and ensure allocation of predictable and sustainable funding to policies and programmes promoting biodiversity and health linkages and One Health approaches, including to least developed countries, small island developing States, as well as countries with economies in transition, with investments aiming to reverse unsustainable anthropogenic consumption and exploitation patterns and promote ecosystem-based approaches.



V. PRINCIPLES OF THE ACTION PLAN

17. The action plan is based on six guiding principles adapted from the *Guidance on integrating biodiversity considerations into One Health approaches*,²⁸ as follows:

(a) *A rights-based approach*: A safe, clean, healthy and sustainable environment is integral to the full enjoyment of a wide range of human rights, including the rights to life, health, food, water and sanitation. Principle 1 of the Rio Declaration recalls that human beings are at the centre of concerns for sustainable development and are entitled to a healthy and productive life in harmony with nature. Individuals and communities have a vital role to play in protecting ecosystems and biodiversity.²⁹ The WHO Constitution enshrines that the highest attainable standard of health is a fundamental right of every human being. The implementation of the action plan employs a rights-based approach empowering individuals and communities to actively participate in the development of solutions and activities;

(b) *A holistic consideration of the health of all people, as well as of animals, plants and other organisms*. The action plan encompasses the full range of sociocultural and environmental determinants of health, including food security, food safety and nutrition, water quantity and quality, clean air, infectious and non-communicable diseases status, social support networks and culture, in line with WHO's definition

²⁸ CBD/SBSTTA/21/9.

²⁹ Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, Human rights depend on a healthy biosphere, [A/75/161](#) and annex on good practices, 2020.

of health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity”. As highlighted by WHO,³⁰ clean air, stable climate, adequate water, sanitation and hygiene, safe use of chemicals, protection from radiation, healthy and safe workplaces, sound agricultural practices, health-supportive cities and built environments, and a conserved nature are all prerequisites for good health;

(c) *An application of the ecosystem approach* to promote conservation, recovery and sustainable use of biodiversity and ecosystem services in an equitable way, recognizing that people are an integral component of ecosystems. The ecosystem approach is based on the application of scientific evidence on levels of biological integrity of the ecosystems which encompass the essential processes, functions and interactions among organisms and their environment;

(d) *An engagement that relies on participation and inclusiveness, social justice and gender equality*, through an effective involvement of all stakeholders with participation of indigenous peoples and local communities, as well as women, youth, older persons, and relevant stakeholders. The integration of a gender, intergenerational perspective and an appropriate representation, particularly of women and girls who have a differentiated and fundamental role in the maintenance of family health and in the healthcare workforce, should be ensured, alongside a full and effective participation of indigenous peoples and local communities, recognizing the value of health-related and culturally relevant traditional knowledge;

(e) *A cross-sectoral, multinational, and transdisciplinary collaboration*. Managing complex socio-ecological systems and addressing the drivers of biodiversity loss that have a clear link with health require a cross-sectoral, multinational, and transdisciplinary collaboration. The establishment of broad-based partnerships across sectors, the formation of relevant bodies within governments, the creation of networks along the research-to-delivery continuum in ways that support the sharing of information, data, samples, and experience, are essential for surveillance and policy action;

(e)*bis* *A consideration of biosafety and biosecurity aspects*, to ensure biodiversity safeguards measures in research, development and commercialization activities involving any living organism;

(f) *A flexible approach with due consideration of local contexts and specificities*. A flexible approach is needed to address the circumstances and needs of local communities, and ensure an effective implementation that supports good health and living in harmony with nature. While the action plan provides an overall framework and objectives to further mainstream biodiversity and health linkages, its strength will lie in the commitment from stakeholders at all levels. Although Parties will be encouraged to apply the action plan on a voluntary basis in a flexible manner according to their national conditions, priorities and capabilities, a gender approach must be included as part of the considerations of local contexts and specificities.

VI. KEY ELEMENTS OF THE ACTION PLAN

18. For each of the action plan’s objectives, specific action areas and activities are provided below. The suggested activities are primarily directed to the Parties and other Governments, to be undertaken as appropriate and on a voluntary basis. Parties and other Governments are invited to involve, as appropriate and at all levels of government, relevant organizations and initiatives, indigenous peoples and local communities, women, youth and older persons, business and civil society organizations, as well as other stakeholders.

19. Within the mandate and objectives of the Convention of Biological Diversity, the Secretariat will work closely with its partners, including academia, biodiversity and health experts, international and United Nations organizations, regional bodies and organizations, existing and newly-established cross-sectoral initiatives, experts and inter-agency liaison groups, to support countries in implementing the action plan. The Secretariat will implement activities in line with the decisions from the Conference of the Parties, provide and disseminate policy guidance, necessary documentation and evidence, as appropriate, and will ensure that duplication with existing organizations and initiatives is avoided, building on the expertise areas

³⁰ https://www.who.int/health-topics/environmental-health#tab=tab_1

of the Convention with regards to biodiversity and the promotion of a biodiversity-inclusive One Health approach. The Secretariat will leverage opportunities for synergies and ensure activities related to biodiversity and health linkages are coherent and mutually supportive of activities undertaken by partners, other relevant multilateral agreements, multilateral organizations, and the different sectors they convene.

20. The action plan should be implemented mindful of the International Health Regulations and in a manner consistent with the World Health Organization (WHO)'s function to stimulate and advance work to eradicate epidemic, endemic and other diseases,³¹ and recognizing the leading roles of the WHO and the World Organisation for Animal Health (OIE), as well as their regional and representation offices, and other relevant regional health organizations.

21. The strategic elements responding to the *operational and supporting* objectives and corresponding actions areas/activities are presented as follows.

ELEMENT 1: CROSS-SECTORAL MAINSTREAMING OF BIODIVERSITY AND HEALTH LINKAGES IN HEALTH, BIODIVERSITY AND ENVIRONMENT-RELATED POLICIES

Strategic objective

To protect human, animal, plant, other organisms, and environmental health by mainstreaming biodiversity and health linkages in the development and implementation of health, biodiversity and environment-related policies,³² and in the work and practices of governments through a whole-of-government approach involving all relevant ministries, agencies, and institutions.

Rationale

Ensuring the conservation of biodiversity, making sure that its use is sustainable and without risk to health, and limiting the health risks from biodiversity loss, including ecosystem degradation and destruction, is imperative for the continued functioning of ecosystems at all scales and the delivery of ecosystem services that are essential for health and well-being. Achieving the fair and equitable sharing of the benefits arising out of the utilization of genetic resources is of utmost importance to foster scientific and technological developments and collaboration in the field of healthcare. The importance of the three pillars of the Convention for promoting human, animal, plant, other organisms, and environmental health highlights the importance of achieving a balanced approach towards its three objectives. Mainstreaming biodiversity and health linkages in respective health, biodiversity and environment-related policies, including in the implementation of agricultural, forest, marine, freshwater, air, water, and water- and land-use policies, and promoting mutually reinforcing policy action enables greater co-benefits. There is a potential to better mainstream the full range of biodiversity and health linkages across policies, relevant platforms and responsible authorities, including relevant Ministries agencies, and institutions.

Action area 1.1. Protect human, animal, plant, other living organisms, and environmental health by promoting biodiversity and health linkages in the work and practices of Ministries, agencies and institutions responsible for biodiversity and health dimensions

Activities

1.1.1. Based on the national context, define specific entry-points to help set out the mainstreaming of biodiversity and health linkages in relevant policies and practices of ministries, agencies and institutions, as appropriate;

1.1.2. Promote and facilitate dialogue between Ministries, agencies and relevant bodies responsible for biodiversity and those responsible for health and other relevant sectors, across all levels of government;

³¹ WHO Constitution, paragraph (g), https://www.who.int/governance/eb/who_constitution_en.pdf

³² Following the narrative of the action plan for the long-term approach to biodiversity mainstreaming, CBD/SBI/3/13/Add.1, especially strategy area I - Mainstreaming biodiversity across government and its policies.

1.1.3. Ensure that agencies and stakeholders responsible for biodiversity conservation are included in inter-sectoral national coordination mechanisms promoting One Health among other holistic approaches to health, and work to ensure structural and policy improvements to bring sectors together;

1.1.4. Ensure that civil society, indigenous peoples and local communities, women, youth and older persons are effectively involved in national dialogues and coordination mechanisms related to biodiversity and health, recognizing their relevant contributions and active role to the conservation and mainstreaming of biodiversity;

1.1.5. Promote the recognition of linkages between biodiversity and health in global instruments, platforms, fora and relevant international processes through interministerial collaboration and within the mandate and remit of each organization or convention, especially those with a focus on environmental and/or health issues.

Action area 1.2. Protect human, animal, plant and environmental health by promoting biodiversity and health linkages in the development and implementation of health, biodiversity, environment, forest and other related or relevant policies

Activities

1.2.1. Consider relevant biodiversity and health linkages³³ in developing and updating national policies and programmes, strategies, plans, and accounts, including national public health and environmental health policies, national biodiversity strategies and action plans (NBSAPs) and sustainable development and poverty eradication strategies, in accordance with national circumstances and priorities;

1.2.2. Take into consideration biodiversity and health linkages in environmental impact assessments, risk assessments including for the use of living modified organisms (LMOs),³⁴ national ecosystem assessments, non-monetary valuation of ecosystem services, as well as in health impact assessments, and in the evaluation of trade-offs;

1.2.3. Mainstream biodiversity considerations and biodiversity-health linkages in health policies, recognizing the importance of ecosystems for human health, including for the development and sustainable production/harvesting, and the use of organisms for medicine use, and nutritious and safe food, and for animal health and welfare, and taking into account biosafety and biosecurity measures;

1.2.4. Apply ecosystem-based approaches for health and access to biodiversity rich green and blue spaces within built landscapes, to improve the health and quality of life, and promote the co-benefits for biodiversity and health arising from dietary patterns and healthy diets;

1.2.5. Identify any unintended and undesirable negative impacts of biodiversity conservation and restoration measures on health (e.g. conservation or restoration measures potentially increasing pathogen/parasite reservoirs or pathogen/parasite vector populations, including both human, animal and plant pathogens or creating new ecological connections between such populations) and of health interventions on biodiversity (e.g. risk of medicine residues in freshwater systems), and define specific entry-points to help evaluate, monitor and mitigate undesirable impacts.

Implementation milestones for monitoring purpose by 2030:

(a) Collaboration among Ministries, agencies and stakeholders responsible for biodiversity and health related issues is effective and implemented through dedicated coordination mechanisms or dialogue;

(b) Coordination mechanisms or initiatives enable the implementation of One Health approach and other holistic approaches to health, with appropriate representation from Ministries, agencies and stakeholders committed to the sustainable use and conservation of biodiversity;

³³ Appendix 1 provides an overview of some of interlinkages between biodiversity and health, and opportunities for integration.

³⁴ In line with the Guidance on risk assessment of living modified organisms and monitoring in the context of risk assessment, UNEP/CBD/BS/COP-MOP/8/8/Add.1.

(c) Biodiversity and health linkages and One Health approaches are considered and included in national biodiversity strategies and action plans, in national environmental and health strategies and action plans.

ELEMENT 2: SECTOR-SPECIFIC MAINSTREAMING OF BIODIVERSITY AND HEALTH LINKAGES

Strategic objective

To mainstream biodiversity and health linkages within specific sectors, by leveraging common interests and co-benefits.³⁵

Rationale

Biodiversity loss, ecosystem degradation and negative health outcomes share many common drivers, including deforestation and forest degradation and other changes in land-/sea-use and habitats overexploitation (including overharvesting, overfishing, overgrazing), unsustainable food production practices, unsustainable consumption of natural resources including unsustainable consumption of wildlife, water management processes, unsustainable urbanization, pollution and use of chemicals of concern, inappropriate or excessive use of chemicals (such as fertilizers, pesticides and pharmaceuticals), invasive alien species, climate change, as well as underlying factors such as travel, migration, population growth, and social inequality, among others. In addition, the health sector³⁶ can contribute to mainstreaming biodiversity by recognizing nature's contribution to human mental and physical health, and by promoting biodiversity resilient and environmentally sustainable practices.

Action area 2.1. Mainstream biodiversity and health linkages through specific sectoral policies

Activities

2.1.1. Among sectors prioritized for mainstreaming biodiversity - agriculture, forests, fisheries and aquaculture, tourism, energy and mining, infrastructure, manufacturing and processing, and health³⁷ - the following sectors have a particularly important role to play in mainstreaming biodiversity and health linkages, by leveraging specific entry-points:

2.1.2. Infrastructure

2.1.2.1. Leverage the important role of biodiversity in providing physical and mental health benefits, in particular the beneficial role of native plants and vegetation, in urban planning and development;

2.1.2.2. Create and enhance biodiversity rich green and blue spaces and promote urban forest stands and single trees, to better contribute to the health, well-being and quality of life;

2.1.2.3. In water supply, sanitation and wastewater treatment policies and programmes, including the planning and design of water-related infrastructure, consider the role of terrestrial and inland water ecosystems as "green and blue spaces" in regulating the quantity, quality and supply of freshwater and flood regulation.

2.1.3. Food systems

³⁵ Following the narrative of the action plan for the long-term approach to biodiversity mainstreaming, CBD/SBI/3/13/Add.1, especially strategy area II - Integrate nature and biodiversity into business models, operations and practices of key economic sectors, including the financial sector.

³⁶ Health has been identified as one of the areas for mainstreaming biodiversity within and across sectors, in line with decisions XIII/3 and 14/3.

³⁷ In line with decisions XIII/3 and 14/3.

2.1.3.1. Enable a sustainable transformation of food systems, by leveraging sustainable agricultural practices, integrated landscape planning, biodiversity for food and agriculture³⁸ including associated biodiversity and the use of integrated pest management to reduce the need for chemical pesticides;³⁹

2.1.3.2. Promote the diversity and sustainable use of wild foods, local crops and livestock, fisheries, including from marine and inland water sources, considering local characteristics and national needs and priorities, while ensuring the implementation of adequate sanitary controls in particular for the sustainable consumption of wild meat;

2.1.3.3. With consideration of local characteristics, promote the use of effective tools, technology development and technology transfer for developing countries, to contribute to sustainable production, food security and safety, minimize, and ensure the responsible use of antibiotics, chemical pesticides and other chemical inputs;⁴⁰

2.1.3.4. Promote the recognition of traditional, national, and local food cultures and provide information on the nutritional value of diverse foods, as well as their carbon footprint;

2.1.3.5. Limit the negative effects of telecoupling and promote sustainable production and consumption, implement policies that address local production and consumption, food safety and security and access, food excess and waste, including through information sharing and public awareness activities.

Action area 2.2. Mainstream biodiversity and health linkages in ecosystem, wildlife and land/sea use management, as well as in the context of climate change and pollution

Activities

2.2.1. Land and sea use planning, and ecosystem management

2.2.1.1. Promote One Health approaches among other holistic approaches to the management of ecosystems, associated degradation of natural habitats, and minimize disturbance to natural ecosystems;

2.2.1.2. Promote measures to halt or minimize the degradation of terrestrial, freshwater, coastal and marine aquatic ecosystems and increase sustainable land management, halt overexploitation, and avoid encroachment into natural habitats, considering the importance of species and habitats in guaranteeing food security for populations;

2.2.1.3. Encourage land reform efforts and enforcement of regulations that avoid human encroachment, while recognizing and ensuring access for indigenous peoples and local communities, including through inclusive governance systems, and promote sustainable, inclusive land use;

2.2.1.4. Increase the conservation and protection of areas of importance for biodiversity and ecosystem services and native habitats within working landscapes to increase connectivity, including those provided by natural regulation and resistance to pathogens that local animal communities have developed through coevolution with these pathogens,⁴¹ especially around or near intact ecosystems⁴² and potential hotspots of disease emergence;

³⁸ FAO, *The State of the World's biodiversity for food and agriculture*, 2019, <http://www.fao.org/3/CA3129EN/ca3129en.pdf>

³⁹ In line with WHO, *Guidance on mainstreaming biodiversity for nutrition and health*, 2020, <https://www.who.int/publications/i/item/guidance-mainstreaming-biodiversity-for-nutrition-and-health>

⁴⁰ Noting the relevance of the programme of work on agricultural biodiversity (decision V/5), and of the international initiative on pollinators (decision VIII/23 B).

⁴¹ In the natural areas where pathogens are found among wild host populations, the long history of coevolution between these pathogens and their hosts may have brought some natural resistance to these pathogens on wild populations, which may be used to cure human populations from these pathogens, as reflected in Beans et al., *Studying immunity to zoonotic diseases in the natural host — keeping it real*, *Nature reviews immunology*, 2013, <https://www.nature.com/articles/nri3551>

⁴² Hotspots for pathogen spillover are generally the environments just around or near intact ecosystems, the risk within these intact ecosystems themselves are less because of lower human activity, as reflected in Gibb R. et al, *Zoonotic host diversity increases in human-dominated ecosystems*, *Nature*, 2020, <https://www.nature.com/articles/s41586-020-2562-8>

2.2.1.5. Consider human, plant and wildlife health when carrying out ecosystem restoration and mitigation activities, in particular in areas of habitat fragmentation and environmental degradation and within human settlements where there may be increased contact with wildlife.

2.2.2. Wildlife management

2.2.2.1. Ensure all exploitation, including harvesting, hunting, fishing, trading and using of wild species is regulated and ensure all practices, including in communities that depend on such practices for their livelihood, are legal, sustainable and safe;

2.2.2.2. Enhance the sustainable management of wild meat at the source and improve the regulation of markets selling wild and domesticated animals through improved hygiene, sustainable practices and with consideration of food safety measures, while refraining from and addressing measures which would negatively affect local communities who depend on wildlife, including through traditional foods and cultural practices;⁴³

2.2.2.3. Recognize wildlife health in the design, resourcing, and operations of national biodiversity and health programmes, national development and infrastructure programmes, and the contribution of wildlife health to One health strategies;⁴⁴

2.2.2.4. Promote the understanding of disease processes in wildlife populations and develop appropriate strategies to prevent, manage and control wildlife diseases;

2.2.2.5. Reduce pressures on wildlife including habitat and ecosystem degradation, capture, transport, and contact with animals in farms and markets, and consequently reduce the risk of zoonotic disease spillover and outbreak;

2.2.2.6. Develop approaches for the prevention, control and management of invasive alien species to address biological invasions of pathogenic agents, to improve risk analysis and identify potential “sleeper” alien species that are likely to become invasive as a result of climate change or other anthropogenic factors;

2.2.2.6.bis. Promote biodiversity conservation and sustainable use measures to address the prevention of health associated risks.

2.2.3. Climate change

2.2.3.1. Prioritize ecosystem-based approaches and measures that jointly contribute to health and well-being, ensure the safety and security of vulnerable populations, and promote the conservation and sustainable use of biodiversity;

2.2.3.2. Promote joint actions between climate change and biodiversity plans and strategies, considering that climate change adaptation measures impact biodiversity and health (both positively and negatively) and that biodiversity loss exacerbates climate change.

2.2.4. Pollution

2.2.4.1. Develop coherent multi-sectoral research and policies across sectors for preventing air, soil, water pollutions, as well as for avoiding and reducing the use of chemicals of concerns (including but not limited to developmental neurotoxicants, endocrine disruptors, insecticides, chemical herbicides, heavy metals, pharmaceutical wastes, and nano-particles);

⁴³ In line with OIE, WHO, UNEP Interim guidance, Reducing public health risks associated with the sale of live wild animals of mammalian species in traditional food markets, April 2021, https://www.oie.int/fileadmin/Home/MM/OIE-WHO-UNEP_Guidance_for_traditional_food_markets.pdf

⁴⁴ In line with OIE wildlife health framework “Protecting wildlife health to achieve One health”, concept note, 2021, https://rr-asia.oie.int/wp-content/uploads/2021/01/wildlifehealth_conceptnote_final.pdf

2.2.4.1.*bis* Promote strategies to reduce light and noise pollution, especially in urban areas, that affect the survival and healthy development of fauna and flora and the health, including mental health, of human beings;

2.2.4.2. Raise global awareness of the negative impact of pollution to mobilize the resources and re-enforce national and international regulations that are needed to effectively tackle pollution to prevent harm to people, biodiversity and ecosystem services.⁴⁵

Action area 2.3. Mainstream biodiversity in the health sector

Activities

2.3.1. Encourage health supply chains, health care facilities,⁴⁶ businesses and the pharmaceutical sector, including for veterinarian purposes, to actively transition towards more sustainable technologies and practices and thus avoid biodiversity negative impacts;

2.3.1.*bis* Promote access to genetic resources and the fair and equitable sharing of benefits arising from their utilization consistent with the Convention and 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;

2.3.1.*ter* Support the implementation of access and benefit sharing measures, where appropriate, within the health sector to promote compliance with international and national obligations;

2.3.1.*quater* Promote capacity-building to foster the participation of Parties in biotechnological research activities, especially in developing countries which provide genetic resources for health-related research;

2.3.2. Promote the sustainable use and avoid the illegal use, management and trade of plants and animals used in traditional medicine, as well as the integration and sharing of knowledge and experiences, based on prior and informed consent, and the fair and equitable sharing of benefits between traditional medical practitioners and the broader medical community, and consistent with the regulatory framework of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);

2.3.3. Identify through scientific evidence and/or risk assessment medicinal products with negative impacts on biodiversity, both for human and for veterinary uses, in order to phase them out, target risk management and communication strategies, and avoid the inappropriate use and disposal of antimicrobial agents⁴⁷ in human medicine, veterinary practice, plant breeding, agricultural and aquaculture use;

2.3.4. Avoid the unsustainable and illegal use of threatened or protected wild animals and plants for prescriptions for medicinal use,⁴⁸ and wherever possible, use alternative, sustainable sources for medicinal use;

2.3.5. Promote environmental surveillance through routine assessment including antimicrobial resistance screening in some specific environments, to identify contamination hotspots and emissions;

⁴⁵ In line with the recommendations of the Lancet Commission on pollution and health, Vol. 391, Issue 10119, 2018, [https://doi.org/10.1016/S0140-6736\(17\)32345-0](https://doi.org/10.1016/S0140-6736(17)32345-0)

⁴⁶ In line with WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities, WHO, 2020, <https://www.who.int/publications/i/item/9789240012226>

⁴⁷ In line with WHO Global action plan on antimicrobial resistance, WHO, 2015, https://apps.who.int/iris/bitstream/handle/10665/193736/9789241509763_eng.pdf?sequence=1, FAO-WHO, Codex of Practice to Minimize and Contain Antimicrobial Resistance, 2005 and Guidelines for Risk Analysis of Foodborne Antimicrobial Resistance, 2011, <http://www.fao.org/fao-who-codexalimentarius/thematic-areas/antimicrobial-resistance/en/> and OIE Strategy on Antimicrobial resistance and the prudent use of antimicrobials, November 2016, https://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/PortailAMR/EN_OIE-AMRstrategy.pdf

⁴⁸ In line with the sustainable trade strategies established through other global instruments such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

2.3.6. Enhance the sustainability of all streams of waste in the health sector by conducting a life cycle impact assessment in regulatory approval and incentivizing the reduction of impact of products and disposal practices;

2.3.6.bis Promote the role of biodiversity rich green / blue spaces in supporting and enhancing mental and physical health and well-being.

Action area 2.4. Mainstream biodiversity in economic stimulus measures that can also contribute to the enhancement of health⁴⁹

Activities

2.4.1. Integrate biodiversity considerations while developing economic stimulus measures and recovery plans, including in the context of the post COVID-19 recovery as highlighted in appendix 2, in all economic sectors, to support the conservation and sustainable use of biodiversity, including by maintaining or enhancing support for developing countries to safeguard their biodiversity;

2.4.2. Screen and monitor stimulus measures for their biodiversity impacts to ensure they are aligned with long-term policy goals for the three objectives of the Convention and the 2030 Agenda for Sustainable Development, and contribute to better health outcomes and/or the mainstreaming of biodiversity-health linkages;

2.4.3. Employ sustainable public procurement with environmental certification to support companies and producers that contribute to the conservation and sustainable use of biodiversity;

2.4.4. Promote jobs and income support for biodiversity conservation, sustainable use and restoration to stimulate economic recovery as well as in research, including in the field of One Health;

2.4.5. Promote a bioeconomy, based on the sustainable management of biodiversity and biomass to generate new products, processes and value-added services based on knowledge and innovation;

2.4.5.bis Promote compliance across economic sectors with international agreements and national provisions on access and benefit sharing, to ensure timely access and increase benefit sharing arising from health-related economic activities.

Implementation milestones for monitoring purpose by 2030:

(a) Biodiversity and health linkages are recognized in sector-specific policies, with a view to promoting better health outcomes alongside the conservation and sustainable use of biodiversity;

(b) The health sector follows biodiversity-inclusive sustainable practices and implements policies to avoid or limit potential adverse effect on biodiversity;

(b)bis Other sectors follow biodiversity-inclusive sustainable practices and implement policies to avoid or limit potential adverse effect on biodiversity;

(c) Funding is allocated to biodiversity conservation, restoration and sustainable use programmes and/or activities also providing health benefits;

(d) Biodiversity investment targets are established and implemented under economic stimulus measures and recovery plans, including in the context of the post-COVID-19 recovery.

⁴⁹ In accordance with Appendix 2 which presents options to integrate biodiversity considerations into COVID-19 stimulus and recovery measures.

ELEMENT 3: EDUCATION AND AWARENESS ON BIODIVERSITY AND HEALTH LINKAGES

Strategic objective

To improve awareness and understanding of biodiversity and health linkages to catalyse a transformative behavioural and attitude change at all levels, and foster sustainable consumption and production patterns, including through educational programmes grounded in conservation education.

Rationale

A common narrative and vision are needed to raise the issue of biodiversity and health linkages in the global agenda. While linkages between biodiversity and health are multiple and complex, clear messages which present the current policy approaches to health, biodiversity and the environment are needed for decision-makers and policymakers, as well as the general public. Guidance and recommendations on potential trade-offs and synergies should be provided to policymakers and the general public. Aligning messages and developing advocacy tools will catalyse a transformative change at all levels.

Action area 3.1. Define key messages and advocacy tools on biodiversity and health interlinkages and co-benefits, building on traditional knowledge and conservation education

Activities

3.1.1. Promote and disseminate advocacy tools, best practices and examples of policies that maximize biodiversity and health co-benefits, building upon the key messages provided in appendix 3 and highlighting the relevant contributions of indigenous peoples and local communities, women, youth and older persons;

3.1.2. Demonstrate through case studies how conservation and sustainable use of biodiversity, the fair and equitable sharing of benefits arising from the utilization of genetic resources, can result in multiple health benefits and improved resilience for ecosystems and our shared environment;

3.1.3. Leverage biodiversity and health linkages to promote sustainable consumption, including in the context of the ‘build back better’ agenda and the need for a sustainable recovery from the current COVID-19 and future pandemics;

3.1.4. Support campaigns and activities to engage stakeholders in the promotion of biodiversity and health linkages and One Health approaches among other holistic approaches, including through World Days,⁵⁰ multilateral fora and associated communication networks;

3.1.5. Communicate on health risks arising from the cost of inaction and continued ecosystem degradation and biodiversity loss, including unsustainable land management, depletion of marine environment, wildlife exploitation or illegal trade.

Action area 3.2. Raise awareness among general public and non-State actors

Activities

3.2.1. Engage the education sector, especially at the primary and secondary levels, and empower citizen scientists to gain knowledge and invest in their own communities, with a view to internalizing biodiversity and health linkages and generating a multiplying impact;

3.2.2. Include educational programmes on One Health among other holistic approaches and biodiversity-health linkages in national education curricula and national biodiversity strategies and action plans, as appropriate, and support citizen projects promoting biodiversity-health linkages;

3.2.3. Introduce biodiversity and health interlinkages into the curricula of human and animal healthcare and welfare professionals, as well as professionals in areas related to agriculture, forestry, fisheries and

⁵⁰ Including World Wildlife Day (3 March), World Health Day (7 April), International Day of Biological Diversity (22 May), World Environment Day (5 June), World Environmental Health Day (26 September), World Mental Health Day (10 October) and World Antibiotic Awareness Week (18-24 November).

aquaculture, tourism, energy and mining, infrastructure, manufacturing and processing, and health, as appropriate, as part of life-long learning and skills development;

3.2.4. Encourage network-building activities, including through conferences, dissemination of information on biodiversity-health linkages through public databases, web portals, social media and information networks that facilitate access to all relevant stakeholders;

3.2.5. Promote global advocacy efforts for mainstreaming biodiversity and health linkages into the sustainable development agenda, the post-2020 global biodiversity framework, the United Nations Decade on Ecosystem Restoration, the United Nations Decade of Ocean Science for Sustainable Development and all areas to which biodiversity and health linkages can contribute, building on existing messages developed in appendix 3;

3.2.6. Raise the awareness of the private sector and encourage non-State actors to contribute to broader initiatives led by partners including the Sharm El Sheik to Kunming Action Agenda for Nature and People “Reversing Biodiversity Loss and Promoting Positive Gains to 2030”,⁵¹ among other initiatives,⁵² with a view to instilling a transformative change to catalyse a healthy living in harmony with nature.

Implementation milestones for monitoring purpose by 2030:

(a) Communication materials and tools, including culturally appropriate materials and available in indigenous languages, promoting the understanding of biodiversity and health linkages are developed and adapted to the national context, building on key messages;

(b) Key messages on biodiversity and health linkages are defined and incorporated in national biodiversity strategies and action plans, in health strategies and action plans, in accordance with national circumstances and priorities;

(c) Education programmes for the sustainable use and conservation of biodiversity and the promotion of biodiversity and health linkages are incorporated in national education curricula, national biodiversity strategies and action plans, in health strategies and action plans, in accordance with national circumstances and priorities;

(d) Non-state actors from various countries pledge to commitments on biodiversity and health under Action Agenda “Reversing Biodiversity Loss and Promoting Positive Gains to 2030”.⁵³

ELEMENT 4: SURVEILLANCE AND MONITORING TO ADDRESS HEALTH THREATS

Supporting objective

To strengthen planning, surveillance and mitigation efforts to address health threats, including the risk of foodborne diseases, plant and animal diseases, neglected tropical diseases, emerging infectious diseases, vector-borne diseases and zoonotic pathogen spillover, outbreaks, epidemics, and pandemics of zoonotic origin, through One Health approaches among other holistic approaches, and the rapid international sharing of information, data, sample.

Rationale

Reinforcing surveillance of biodiversity, including on wildlife habitats and assessing zoonotic pathogen spillover risk is instrumental to better address health threats and disease risks. Zoonotic disease and pandemics risk can be reduced, mostly by conserving natural ecosystems and by reducing contact between humans and livestock with wild species that may act as reservoirs for potential pathogens, and also by limiting the introduction of invasive alien species. Reinforcing surveillance also requires a substantial

⁵¹ An agenda for action, Reversing Biodiversity Loss and Promoting Positive Gains to 2030, <https://www.cbd.int/action-agenda/>

⁵² Note for example the Call to Action on the Berlin Principles on One Health, <https://oneworldonehealth.wcs.org/About-Us/Mission/The-2019-Berlin-Principles-on-One-Health.aspx>, as well as other relevant frameworks and documents that deliver precise recommendations, listed in CBD/SBSTTA/24/INF/25.

⁵³ <https://www.cbd.int/action-agenda/>

increase of adequate means of implementation, such as capacity-building and development, technology transfer, scientific and technical cooperation and funding, especially for developing countries.

Action area 4.1. Reinforce surveillance and monitoring systems through cross-sectoral collaboration, in line with One Health approaches

Activities

4.1.1. Strengthen cross-sectoral and trans-disciplinary surveillance of essential components of pandemics preparedness, including on emerging infectious pathogens and diseases, vector-borne diseases, neglected tropical diseases, transboundary animal diseases, zoonotic pathogen spillover risk, alien species, plants and habitats of wildlife;

4.1.2. Promote community-based surveillance, and participatory monitoring from indigenous peoples and local communities, as elements of pandemic preparedness, with particular attention to people who have contact with wildlife, livestock and farmed animals;

4.1.3. Monitor wildlife population resilience and maintain wildlife surveillance for high-risk pathogens, especially where there is a large diversity of viral strains in wildlife with significant potential for spillover to people;

4.1.4. Increase surveillance of wildlife disease events and emerging/re-emerging and exacerbated communicable disease threats, including water-borne, vector-borne, food-borne diseases and transboundary animal diseases;

4.1.5. Promote prompt and clear, timely, and publicly accessible information sharing and systematic collection, analysis, interpretation and dissemination of data on health;

4.1.6. Enable the timely, open and secure sharing of pathogens, specimens, sequence information and relevant meta data which are essential for the rapid development of medical biotechnology, diagnostic assays, therapeutic interventions, vaccine development and prophylactic measures;⁵⁴

4.1.7. Design, implement and ensure the use of early warning systems for eventual invasions, by alien species, including through E-DNA analysis and monitoring, and warning systems such as the WAHIS and WAHIS-Wild developed by the World Organisation for Animal Health (OIE), the Global Outbreak Alert and Response Network-(GOARN) developed by the World Health Organization (WHO), and the implementation of International Health Regulations (IHR);

4.1.7.bis Invest in early warning systems and matching infrastructure that can provide rapid, effective responses to emerging threats, including epidemiological and laboratory capacity, with appropriate data systems, taking into account the specific capacity gaps faced by developing countries;

4.1.8. Foster effective and efficient collaboration among experts,⁵⁵ to provide cross-sectoral scientific guidance, contribute to disease surveillance programmes, assess and discuss potential trade-offs.⁵⁶

Implementation milestones for monitoring purpose by 2030:

(a) Cross-sectoral and transdisciplinary efforts on surveillance and monitoring are strengthened, through effective collaboration, reporting or information sharing systems;

(b) Proportion of potential hotspots of disease emergence that are under strict protection regime;

⁵⁴ In line with the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization and the International Health Regulations, see WHO/CBD, Questions and Answers, Implementation of the Nagoya Protocol in the context of human and animal health, food safety: Access to pathogens and fair and equitable sharing of benefits, Living document, May 2018, https://www.who.int/influenza/pip/QA_NP_Public_Health.pdf?ua=1

⁵⁵ Including biologists, microbiologists, ecologists, public health experts including epidemiologists and virologists, veterinarians, health practitioners, social scientists, indigenous peoples and local communities and relevant professionals across disciplines.

⁵⁶ McShane T.O et al, Hard choices: Making trade-offs between biodiversity conservation and human well-being, *Biological Conservation*, vol. 144, issue No. 3, p.966–972, 2011, <https://doi.org/10.1016/j.biocon.2010.04.038>.

(c) Disease alerts are detected and reported through surveillance systems, including the OIE-led “World Animal Health Information System” WAHIS and WAHIS–Wild and under the International Health Regulations (IHRs), as appropriate and in line with a “plan–do–check–act” (PDCA) cycle approach.

ELEMENT 5: RESEARCH ON BIODIVERSITY AND HEALTH LINKAGES

Supporting objective

To consolidate scientific research and knowledge management to further investigate the full range of linkages between biodiversity and health within the framework of One Health among other holistic approaches, including at the regional and local levels, considering and respecting the traditional knowledge and skills of indigenous peoples and local communities, ensuring that access to traditional knowledge is based on their free, prior and informed consent, or approval and involvement, and ensuring fair and equitable sharing of benefits.

Rationale

Scientific research contributes to further explore and understanding the full range of biodiversity and health linkages within the framework of One Health among other holistic approaches. Scientific research plays an essential role in protecting health and conserving biodiversity alongside traditional knowledge - not only in understanding, measuring and assessing change, but also in providing innovative solutions to long standing challenges. Ongoing efforts to conduct environmental and health assessments, to strengthen national monitoring capacities and data collection, to develop interdisciplinary education, training and research programmes are instrumental to inform and support policy action.

Action area 5.1. Strengthen the understanding of the full range of biodiversity and health linkages and support access to scientific evidence, data and good practices, based on the identification of research gaps and needs

Activities

5.1.1. Invest in traditional knowledge programmes based on access and benefit-sharing standards, and scientific research, and support universities, research institutes, collaborating centres and other leading research actors including indigenous peoples and local communities, to increase data, experience, and scientific evidence;

5.1.1.bis Facilitate access to and transfer of technology, including biotechnology and innovative health-related technology, scientific and technical cooperation and capacity-building, to enable Parties, in particular developing countries, to benefit from access to scientific materials, data and good practices;

5.1.1.ter Promote the effective participation of Parties which provide genetic resources and associated information for biotechnological health-related research activities in such research;

5.1.3. Invest in inter/transdisciplinary research efforts to capture the full breadth of the complex biodiversity and health linkages with the framework of One Health, and when relevant enable gender, age and indigenous status disaggregated data, including for example in below research areas:

5.1.3.1. Invest in biodiversity rich green and blue spaces which enhance mental and physical health and the contribution of biodiversity for new medicine and food;

5.1.3.2. Promote research on the linkages between the diversity of the human microbiome, environmental biodiversity, benefits for mental and physical health, and their implications for human settlements;

5.1.3.3. Promote research on the relationships between hosts populations, pathogens and natural resistance to these pathogens, and coevolution in these systems,⁵⁷ biodiversity, ecosystem destruction and degradation;

⁵⁷ Beans et al., Studying immunity to zoonotic diseases in the natural host — keeping it real, *Nature Reviews Immunology*, 2013, <https://www.nature.com/articles/nri3551>.

5.1.3.4. Promote research on the linkages between unregulated wildlife and livestock markets, and incidence in zoonotic diseases;

5.1.3.5. Promote research on the interlinkages between health and sustainable, increased plant-based, diverse and healthy diets, diversity of crops, livestock and seafood, soil biodiversity, pollinators and other associated agrobiodiversity, marine and inland water ecosystems, and the effects of agrochemicals on human health and agrobiodiversity;

5.1.3.6. Promote research on the significance for health of marine and terrestrial biodiversity, such as that from forests, including for infectious emerging disease risk, food security and food safety, and the consequences of multiple stressors and overexploitation on marine ecosystems (e.g. pathogens, chemicals, plastics and microplastics, climate change and habitat degradation);

5.1.3.6.*bis* Promote research on the linkages between the loss of species or ecological functions and the consequences on human health (e.g. the disappearance of the bee populations);

5.1.3.7. Promote research on the linkages between migratory species and human health, including links between migratory behaviour and pathogen dynamics, and the impact of climate change and habitat changes;

5.1.3.8. Promote research on the linkages between invasive alien species and human health, animal health, plant health and wildlife species, considering that alien species may act as vectors or hosts of pathogens;

5.1.3.9. Promote research on the linkages between climate change, biodiversity and human health, including research into soil health and climate change impact on health;

5.1.3.10. Promote pollution-related research to understand the consequences of the different forms of pollution on the interlinkages between biodiversity and health, to control pollution and drive change in pollution prevention and monitoring policy;

5.1.3.10.*bis* Promote research benefits provided by nature, including in monetary terms, to human physical and mental health.

5.1.4. Strengthen international, regional, national and subnational monitoring and surveillance capacities through active surveillance systems that facilitate systematic inputs and data exchange between public health, animal health and welfare, environment, wildlife and other sectors, taking into account the specific capacity gaps of developing countries.

Action area 5.2. Promote cross-sectoral collaboration and foster the implementation of One Health approaches among other holistic approaches at local, national, regional and international levels

Activities

5.2.1. Strengthen collaboration among experts,⁵⁸ to build comprehensive scientific guidance for policy action and the application of One Health approaches among other holistic approaches, including through innovative knowledge-sharing platforms, digital technologies, tools and data gathering and dissemination methods;

5.2.2. Promote and sustain existing national, regional and international networks and partnerships, joint work programmes, cross-sectoral collaboration on biodiversity and health linkages, to identify and manage health risks posed by ecosystem degradation and biodiversity loss;

5.2.3. Harness findings, reports and recommendations from global platforms, partnerships and initiatives, including experts and inter-agency liaison groups, which can inform risk analysis and emergence response protocols to improve the science-policy interface;

⁵⁸ Including biologists, microbiologists, ecologists, public health experts including epidemiologists and virologists, veterinarians, health practitioners, social scientists, indigenous peoples and local communities and other relevant professionals.

5.2.4. Promote community engagement and stewardship for disease risk reduction and sustainable use of natural resources and expand attention to socioeconomic and behavioural factors.

Implementation milestones for monitoring purpose by 2030:

(a) Funding is allocated to transdisciplinary research on the full range of linkages between biodiversity and health and One Health at the national level;

(b) Increase in number of transdisciplinary research publications and projects on biodiversity and health linkages;

(c) Countries are promoting One Health collaborations, by establishing collaborating centres and joint programmes, participating in international One Health collaborations, and providing funding to One Health project or schemes dedicated to the promotion of biodiversity and health.

ELEMENT 6: CAPACITY-BUILDING AND FUNDING

Supporting objective

To support capacity-building and ensure predictable and sustainable funding to policies and programmes promoting biodiversity and health linkages and One Health approaches, among other holistic approaches.

Rationale

Building capacities and mobilizing resources from all sources, private and public, national and international, in a transparent and efficient manner, to implement biodiversity and health related policies, while maximizing synergies with measures related to other goals and approaches and avoiding double structures in implementation of measures and monitoring and evaluation, is key to ensure action and long-lasting impact. Investing upstream, in prevention and early warning systems is a priority and less costly than emergency response once an epidemic has emerged.

Action area 6.1. Promote capacity-building at all levels, across disciplines and sectors

Activities

6.1.1. Strengthen the capacity of health, environment, agriculture, fisheries, aquaculture, forestry, food and nutrition, and other relevant ministries, agencies and organizations to promote biodiversity and health linkages, and One Health approaches, among other holistic approaches;

6.1.2. Drive cooperation and collaboration between sectors to align interventions, develop best management practices, building on existing expertise developed within governments, international and non-governmental organizations, indigenous peoples and local communities, and other stakeholders;

6.1.3. Promote mutual learning and collaborative activities, by leveraging peer-to-peer learning and building on current transdisciplinary training schemes;

6.1.4. Promote collaboration between traditional and scientific knowledge that contribute to enhance the understanding of biodiversity and health linkages and the promotion of One Health approaches, among other holistic approaches, where it is sustainable and there is no known risk to human or animal health and well-being;

6.1.5. Develop tools, technology transfer and digital technology to reinforce knowledge sharing, and develop partnerships and alliances that support multi-disciplinary, cross-sectoral approaches and address the capacity gaps of developing countries;

6.1.6. Enhance technical and scientific cooperation, including North-South and South-South cooperation, to strengthen the capacity of developing countries in adopting technologies and developing skills that are key to promoting biodiversity and health linkages;

6.1.6.bis Improve risk assessment of disease emergence and develop prevention strategies adapted to the local socioeconomic and cultural context in cooperation with local communities, stakeholders and policymakers.

Action area 6.2. Mobilize predictable and sustainable resources to enable implementation of biodiversity-health related policies

Activities

6.2.1. Investigate the costs of inaction in relation to the conservation, restoration, and sustainable management of biodiversity as a means to reduce health risks and related costs of possible pandemics, and develop investment case-studies to help quantify the positive impact and return on investment from biodiversity-inclusive One Health policies, among other holistic approaches, which can be reflected in national accounting practices, provide cost-effectiveness evidence including on the impact of nature's benefits to human mental and physical health, and identify funding needs with greater granularity;

6.2.2. Consistent with the resource mobilization component of the post-2020 global biodiversity framework,⁵⁹ set national targets for domestic resource mobilization, include budget lines for biodiversity and health as part of national biodiversity finance plans or similar instruments and prioritize finances on integrative and co-beneficial actions for other environmental issues, as appropriate;

6.2.3. Consistent with the resource mobilization component of the post-2020 global biodiversity framework,⁶⁰ identify gaps in financial sources to secure adequate resources from all sources for programmes and projects related to biodiversity and health linkages and/or One Health approaches, in accordance with Article 20 of the Convention;

6.2.4. Leverage direct and indirect biodiversity and health-related international finance as well as private sector investment and engage the financial sector in mainstreaming biodiversity, including for developing countries;

6.2.5. Involve multilateral development banks and development finance institutions in considering investments in biodiversity and health, including in portfolios related to sustainable recovery plans;

6.2.5.bis Consider opportunities for the Global Environment Facility (GEF) to support eligible countries in the implementation of this action plan;

6.2.6. Scale up investment by governments, public authorities, development banks and others in measures to reduce health threats, provide early warning systems, invest in health systems as a foundation of societal cohesion and well-being, and strengthen the capacity of Parties, in particular developing countries, to respond to health emergencies.

Implementation milestones for monitoring purpose by 2030:

(a) Capacities of relevant Ministries, agencies and organizations are strengthened through specific programmes, tools and platforms, and enhanced collaboration mechanisms;

(b) Domestic finance, including funding for indigenous peoples and communities, enables the funding of programmes related to biodiversity-health linkages and/or One Health approaches, among other holistic approaches;

(c) Financial assistance enables the funding of projects related to biodiversity-health linkages and/or One Health approaches, among other holistic approaches, in developing countries, in particular least developed countries, and including for indigenous peoples and local communities, women, youth and older persons.

VII. MONITORING THE ACTION PLAN PROGRESS

22. Monitoring progress and milestones will be instrumental to assess progress made towards the mainstreaming of biodiversity and health linkages, and to ensure that vulnerable populations most directly dependent on biodiversity are protected from health impacts associated with biodiversity loss, ecosystem degradation and other risk factors, including climate change.

⁵⁹ A draft strategy is provided in CBD/SBI/3/5.

⁶⁰ Ibid.

23. The *implementation milestones* suggested for each element in section VI will help to monitor progress towards achieving the strategic *operational or supporting objectives* of the action plan. Based on those proposed *implementation milestones*, it is suggested that countries set their own targets taking into consideration the local context, priority, baseline, and capacity.

24. In addition, the implementation of the action plan will be monitored against indicators from the draft post-2020 global biodiversity framework, with a view to supporting synergies and avoiding additional monitoring and reporting. Consequently, it is suggested to use selected headline indicators from the monitoring framework of the post-2020 global biodiversity framework which are relevant for the monitoring of the action plan, once the list of indicators for the post-2020 global biodiversity framework is finalized.

25. As the post-2020 global biodiversity framework is under elaboration, the below suggested indicators could also be used as possible candidate supplementary indicator inputs to inform the monitoring framework of the post-2020 global biodiversity framework:

- (a) Implementation of International Health Regulations (WHO indicator on Zoonotic Events and the Human-animal Interface, IHR State Party Self-Assessment Annual Report);
- (b) Effective reporting under the World Animal Health Information System (WAHIS), a database system providing information on zoonosis and (re-)emerging diseases affecting animals & Performance of Veterinary Services (PVS)⁶¹ to assess veterinary services at the national level;
- (c) Environmental burden of disease per year (WHO indicator, percentage).

⁶¹ OIE tool for the evaluation of performance of veterinary services, 2019,
https://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/docs/pdf/2019_PVS_Tool_FINAL.pdf

GLOSSARY

Animal welfare: The physical and mental state of an animal in relation to the conditions in which it lives and dies. The guiding principles which inform the OIE's work on the welfare of terrestrial animals include the 'Five Freedoms' which describe society's expectations for the conditions animals should experience when under human control, namely: freedom from hunger, malnutrition and thirst; freedom from fear and distress; freedom from heat stress or physical discomfort; freedom from pain, injury and disease; and freedom to express normal patterns of behaviour (OIE).

Antimicrobial resistance: Antimicrobial resistance (AMR) threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi. AMR occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections harder to treat and increasing the risk of disease spread, severe illness and death. As a result, the medicines become ineffective and infections persist in the body, increasing the risk of spread to others (WHO).

Agricultural biodiversity or Agrobiodiversity: Agricultural biodiversity is the biological diversity that sustains key functions, structures and processes of agricultural ecosystems. It includes the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels (IPBES).

Determinants of health: Determinants of health include the social and economic environment, the physical environment, and the person's individual characteristics and behaviours. The context of people's lives determines their health, and so, blaming individuals for having poor health or crediting them for good health is inappropriate. Individuals are unlikely to be able to directly control many of the determinants of health (WHO).

Ecosystem services: The benefits people obtain from ecosystems. Ecosystem services can be categorized into supporting, regulating, provisioning and cultural services (Millennium Ecosystem Assessment).

Mainstreaming: Integrating or including actions related to conservation and sustainable use of biodiversity at every stage of the policy, plan, programme and project cycle, regardless whether international organizations, businesses or governments lead the process. In Article 6 (b), the Convention on biological diversity calls upon Parties to "integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies (CBD).

Nature's contributions to people (NCP): all the contributions, both positive and negative, of living nature (i.e. diversity of organisms, ecosystems, and their associated ecological and evolutionary processes) to the quality of life for people. Beneficial contributions from nature include such things as food provision, water purification, flood control, and artistic inspiration, whereas detrimental contributions include disease transmission and predation that damages people or their assets (IPBES).

Older persons: There is no internationally agreed definition of older persons. A number of UN entities define older persons as persons aged 60 years and older. The issue is currently being discussed at the Titchfield Group on Ageing-related Statistics and Age-disaggregated Data (UN⁶²). The 2002 Political Declaration and the Madrid International Plan of Action on Ageing provides recommendations for action give priority to older persons and development, advancing health and well-being into old age, and ensuring enabling and supportive environments.

One Health: A cross-cutting and systemic approach to health based on the fact that human health and animal health are interdependent and linked to the health of the ecosystems in which they co-exist (UNEP).

Telecoupling: Telecoupling refers to socioeconomic and environmental interactions over distances. It involves distant exchanges of information, energy and matter (e.g., people, goods, products, capital) at multiple spatial, temporal and organizational scales (IPBES).

⁶² United Nations sustainable development group, Policy Brief: The impact of COVID-19 on older persons, May 2020, <https://unsdg.un.org/resources/policy-brief-impact-covid-19-older-persons>

Traditional medicine: the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness (WHO).

Urban biodiversity: the variety and richness of living organisms (including genetic variation) and habitat diversity found in and on the edge of human settlements, which ranges from the rural fringe to the urban core and includes (i) remnants of natural landscapes (e.g. leftovers of primeval forests), (ii) traditional agricultural landscapes (e.g. meadows, areas of arable land), and (iii) urban–industrial landscapes (e.g. city centres, residential areas, industrial parks, railway areas, formal parks and gardens, brownfields). (*Cities and Biodiversity Outlook, Action and Policy*, <https://www.cbd.int/doc/health/cbo-action-policy-en.pdf>).

Well-being: A perspective on a good life that comprises access to basic resources, freedom and choice, health and physical well-being, good social relationships, security, peace of mind and spiritual experience. Well-being is achieved when individuals and communities can act meaningfully to pursue their goals and can enjoy a good quality of life. The concept of human well-being is used in many western societies and its variants, together with living in harmony with nature, and living well in balance and harmony with Mother Earth. All these are different perspectives on a good quality of life (IPBES).

Zoonose/Zoonotic disease: A zoonosis is an infectious disease that has jumped from a non-human animal to humans. Zoonotic pathogens may be bacterial, viral or parasitic, or may involve unconventional agents and can spread to humans through direct contact or through food, water or the environment. They represent a major public health problem around the world due to our close relationship with animals in agriculture, as companions and in the natural environment. Zoonoses can also cause disruptions in the production and trade of animal products for food and other uses (WHO).

Annex II

This annex is based on the Appendix 1, 2 and 3 of the draft global action plan for biodiversity and health.⁶³

Appendix 1

INTERLINKAGES BETWEEN BIODIVERSITY AND HEALTH: AN OVERVIEW⁶⁴

Biodiversity and Health Topic	Health Sector Opportunity
Physical, mental and cultural dimensions of health <ul style="list-style-type: none">• Microbial Diversity• Physical and mental health• Animal health and Welfare• Access to nature, including urban blue and green spaces• Cultural/spiritual enrichment	Direct responsibility: <ul style="list-style-type: none">• Integrate ‘value of nature’ into health policy <i>Indirect responsibility:</i> <ul style="list-style-type: none">• Promote protection of values, species and ecosystems
Water <ul style="list-style-type: none">• Water quantity• Water quality• Water supply	Direct responsibility: <ul style="list-style-type: none">• Integrate ecosystem management considerations into health policy <i>Indirect responsibility:</i> <ul style="list-style-type: none">• Promote protection and restoration of ecosystems at the watershed scale that supply water and promote sustainable water use
Food systems <ul style="list-style-type: none">• Species, varieties and breeds including domesticated and wild components• Diversity of diets (both diversity of species and diversity within species, i.e. genetic diversity)• Ecology of production systems• Total demand on resources• Sustainability of offtake, harvesting and trade of species used for food• Changing status of species used for food	Direct responsibility: <ul style="list-style-type: none">• Recognize and promote dietary diversity, food cultures and their contribution to good nutrition• Recognize synergies between human health and sustainable use of biodiversity <i>Indirect responsibility:</i> <ul style="list-style-type: none">• Promote sustainable production harvesting and conservation of agrobiodiversity• Promote sustainable fishing and aquaculture
Diseases <ul style="list-style-type: none">• Infectious diseases and non-communicable diseases• Disease source and regulation services• Ecosystem integrity, ecological connectivity and diversity	Direct responsibility: <ul style="list-style-type: none">• Integrate ecosystem management considerations into health policy <i>Indirect responsibility:</i> <ul style="list-style-type: none">• Promote ecosystem integrity

⁶³ CBD/SBSTTA/24/9, annex)

⁶⁴ Adapted from Connecting global priorities: biodiversity and human health: a state of knowledge review, WHO/CBD, 2015, <https://www.cbd.int/health/SOK-biodiversity-en.pdf>, p.259

Biodiversity and Health Topic**Health Sector Opportunity****Medicines**

- Traditional medicines
- Drug development (genetic resources and traditional knowledge associated with biodiversity) and pharmaceuticals
- Chemical/pharmaceutical accumulation in ecosystems
- Sustainability of offtake/harvesting and trade of medicinal species
- Changing status of species used for medicine

Direct responsibility:

- Recognize contribution of genetic resources and traditional knowledge to medicine

Indirect responsibility:

- Prevent unsustainable exploitation of biodiversity for medicinal use or research that endangers non-pathogenic species and ecosystems and protect traditional knowledge
- Ensure benefit-sharing and prior informed consent

Adaptation to climate change and disaster risks

- Ecosystem resilience
- Genetic resources ('options' for adaptation)
- Shifting reliance to biodiversity with climate change "shocks"

Indirect responsibility:

- Promote ecosystem resilience and conservation of genetic resources
- Decrease vulnerability of people reliant on important food and medicinal species which are likely to be impacted by climate change
- Strengthen current vector-borne diseases control efforts to minimize the negative effects of increasing temperatures and changes on weather patterns on the progress made against vector-borne diseases

Appendix 2

EXCERPTS OF CBD/SBSTTA-SBI-SS/2/2, PARAGRAPH 27: OPTIONS TO INTEGRATE BIODIVERSITY CONSIDERATIONS INTO COVID-19 STIMULUS AND RECOVERY MEASURES

1. There are many opportunities for responses to COVID-19, including both short term stimulus measures and longer-term approaches to “build back better” to contribute to sustainable development, and reduce the risk of future pandemics. Recent studies have identified a range of options to integrate biodiversity considerations into such stimulus and recovery measures.

2. These include the following:⁶⁵

(a) *Maintain and strengthen regulations on land use, wildlife trade, and pollution, and ensure that they are effectively enforced.* While the loosening of environmental regulation with a view to speeding up economic recovery may seem politically convenient, over a longer term it would likely be counterproductive given the links between biodiversity loss and pandemic risk. Indeed, such links provide a powerful case for tightening of environmental regulation;

(b) *Ensure that COVID-19 economic recovery measures contribute to and do not compromise biodiversity.* There are a number of options that Governments may wish to consider ensuring that public financial support for stimulus and recovery measures is positive for biodiversity. These may include:

- (i) Attaching environmental conditionality to bailouts of companies to drive sustainability improvements, particularly for bailouts in sectors with a large biodiversity footprint such as agriculture, energy and industry;
- (ii) Screening (*ex ante*) and monitor (*ex post*) stimulus measures for their biodiversity impacts to ensure they are aligned with long-term policy goals for sustainability;
- (iii) Setting biodiversity spending targets for COVID-19 stimulus measures and recovery plans. Some Parties have set targets for recovery measures to contribute to climate goals; similar targets could be envisaged for biodiversity goals;
- (iv) Employing public procurement to support companies and producers that meet biodiversity criteria;
- (v) Employing fiscal policies (e.g. ecological fiscal transfers) to reward biodiversity positive outcomes when financing subnational governments to balance their budgets;

(c) *Promote jobs and income support for biodiversity conservation, sustainable use and restoration to stimulate economic recovery.* Activities such as ecosystem restoration, reforestation, invasive alien species management and environmental monitoring and enforcement tend to be labour intensive and quick to implement, because worker-training requirements are relatively low and projects often have minimal planning and procurement requirements. Investing in biodiversity thus creates immediate job opportunities. Basic income and cash transfers could also be used to support conservation;

(d) *Maintain or enhance support for developing countries to safeguard their biodiversity.* Aid finance is needed both in the short term (especially in the light of reduced revenues from nature-based tourism) and in the longer term to scale up efforts to tackle deforestation and other biodiversity loss and illegal wildlife trade and poaching, and thereby reduce pandemic risk;

(e) *Improve incentives for biodiversity conservation:*

⁶⁵ The following list draws in particular on OECD, *Biodiversity and the Economic Response to COVID-19: Ensuring a green and resilient recovery*, OECD Policy Briefs, 28 September 2020, <http://www.oecd.org/coronavirus/policy-responses/biodiversity-and-the-economic-response-to-covid-19-ensuring-a-green-and-resilient-recovery-d98b5a09/> and McElwee et al, *Ensuring a Post-COVID Economic Agenda Tackles Global Biodiversity Loss, One Earth*, 2020, <https://doi.org/10.1016/j.oneear.2020.09.011> and Global Goal for Nature Group, *COVID-19 Response and Recovery: Nature-Based Solutions for People, Planet and Prosperity*, 2020, <https://www.wri.org/news/2020/10/statement-covid-19-response-and-recovery-nature-based-solutions-people-planet-prosperity>.

- (i) Reform subsidies harmful to biodiversity. Subsidies that are harmful to biodiversity could be redirected to activities that have larger socioeconomic benefits and positive impacts on biodiversity. The link between biodiversity and pandemic risks provides an additional rationale for such as shift;
- (ii) Maintain or increase taxes on activities that harm biodiversity. Revenue from biodiversity-relevant taxes and other environment-relevant taxes could be re-directed towards green stimulus measures or used to reduce budget deficits;
- (f) *Engage businesses and the finance sector for a biodiversity-positive recovery:*
 - (i) Require or encourage disclosure by companies of impacts and dependencies on biodiversity and to integrate biodiversity considerations across all areas of business, including risk management;
 - (ii) Require or encourage national central banks and all public development banks to reorient their strategies, investment patterns, activities and operating modalities to contribute to sustainable development including the conservation and sustainable development;

(g) *Leverage behavioural change towards sustainable consumption.* There may be an opportunity to leverage this moment to promote transformative change. For example, the pandemic has led many people to question what is truly “essential” and this may have shifted what is regarded as necessary and desirable for a dignified and good quality of life. Governments may also consider moving from indicators such as gross national income to more inclusive measures of progress;

Some of these approaches would need to be implemented in the short term to avoid negative impacts of all response measures (e.g. (a), (b), (d)) and to leverage biodiversity-positive outcomes from short-term stimulus measures (e.g. (c)). Others might be implemented over the medium to longer term (e.g. (f), (g), (h)). With a view to promoting a *just transition*, attention will be needed to ensure that measures contribute to reducing inequalities.

Appendix 3

KEY MESSAGES ON MAINSTREAMING BIODIVERSITY AND HEALTH LINKAGES⁶⁶

Biodiversity and the health of all living beings are closely interlinked across a wide range of scales, from the planetary to that of individual human microbiome.

(a) Biodiversity is a key environmental determinant of human health, and the conservation and sustainable use of biodiversity can benefit human health by maintaining ecosystem services and options for the future;

(b) Ecosystems and biodiversity help regulate the planet's material and energy flows, and its responses to abrupt and gradual change. Ecosystems, including food production systems, depend on a great diversity of organisms to provide the necessary services for life, including food, clean air, the quantity and quality of fresh water, medicines, spiritual and cultural values, climate regulation, pest and disease regulation, and disaster risk reduction, each of which are fundamental for human health, both mental and physical;

(c) Human microbiome – the symbiotic microbial communities present in the gut, respiratory and urogenital tracts and on skin – is closely interlinked with human health at an individual level, contributing to nutrition, aiding immune system function and preventing infection;

(d) Biodiversity is an important source of genetic resources used 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;

(e) Nature and biodiversity contribute to the health of all living beings. Access to nature, forests, indigenous lands and protected areas in the natural environment, and to biodiversity rich green and blue spaces in urban areas, supports human mental and physical health and well-being.

Reducing land-use change, pollution, poor water quality, chemical/waste contamination and causes of ecosystem degradation is an effective way to address biodiversity loss, climate change, and generate positive health and well-being outcomes.

(a) Air pollution poses significant threats to biodiversity, contributes to the economic burden and to the rise in noncommunicable diseases including cardiovascular diseases and cancer, respiratory diseases and chronic obstructive pulmonary diseases;

(b) Direct effects of climate change on health may include stroke and dehydration associated with heatwaves, negative health consequences associated with reduced air quality and the spread of allergens. Effects are also mediated through the impacts on ecosystems and biodiversity. Such effects may include decreased food production and changes in the spread of climate sensitive waterborne and water related, food borne and vector borne diseases;

(c) Overharvesting, habitat alteration, and climate change are among major drivers of declines in commercially important wild plant resources used for food and medicinal purposes. These three drivers pose a threat both to the wild species and to the livelihoods of collectors, who often belong to the poorest social groups;

(d) Loss of genetic diversity, particularly in crop wild relatives, can lead to loss of food security and opportunities to develop more nutritious foods;

(e) There may be synergistic effects of climate change, land-use change, pollution, invasive species and other drivers of change which can amplify impacts on both biodiversity and health.

⁶⁶ Adapted from *Connecting Global Priorities: Biodiversity and Human Health: A State of Knowledge Review*, <https://www.cbd.int/health/SOK-biodiversity-en.pdf>, CBD/SBSSTA-SBI-SS/2/2, CBD/SBSTTA-SBI-SS/2/INF/1.

One health, among other holistic approaches such as Ecohealth or Planetary health, provides an opportunity to integrate the full range of biodiversity-health linkages.

(a) We can improve our understanding of the complex linkages between biodiversity, ecosystem services, human and animal health and promote co-benefits through more integrated policies and mutually-reinforcing implementation activities, by strengthening collaboration with the health sector and mainstreaming biodiversity and health linkages into national strategies policies;

(b) Coordinated, cross-sectoral holistic approaches such as One Health help to address the common drivers of biodiversity loss, climate change, negative health outcomes and increased pandemics risk;

(c) There are significant strategic opportunities to integrate the full range of biodiversity-health interlinkages in the application of One Health approaches in a more systematic, comprehensive and coordinated manner.

COVID-19 and recovery measures

(a) The COVID-19 pandemic has further highlighted the importance of the relationship between people and nature. While the relationship between biodiversity and infectious disease is complex, it is clear that the loss and degradation of biodiversity undermines the web of life and increases the risk of disease spillover from wildlife to people;

(b) Overall plans for post-COVID-19 recovery, and specifically plans to reduce the risk of future epidemics, need to go further upstream than early detection and control of disease outbreaks, by prioritizing prevention actions rather than reactions to emerging issues;

(c) Biodiversity and conservation efforts at all levels (genes, species, and ecosystems) increase resilience by mitigating the risks to severe disruptions caused by climate change and pathogen spillover that can lead to global pandemics;⁶⁷

(d) Reducing systemic drivers and anthropogenic impacts in emerging disease hotspots could reduce pandemic risk, protect biodiversity and ecosystem services.⁶⁸ The COVID-19 pandemic raised awareness that the health risks that arise from continued ecosystem degradation and loss and the cost of inaction on biodiversity conservation and restoration need to be addressed;

(e) The risk of future pandemics could also be reduced through a more integrated, cross-sectoral and biodiversity-inclusive One Health approach that builds the health and resilience of people and ecosystems, in line with the 2030 Agenda for Sustainable Development;

(f) There are many opportunities for responses to COVID-19, including both short-term stimulus measures and longer-term approaches to ‘build back better’, contribute to sustainable development, and reduce the risk of future pandemics.

Key messages from the Workshop on Biodiversity and Pandemics of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services⁶⁹

- (a) Pandemics emerge from the microbial diversity found in nature;
- (b) Human ecological disruption, and unsustainable consumption drive pandemic risk;
- (c) Reducing anthropogenic global environmental change may reduce pandemic risk;

⁶⁷ Evans et al, Links Between Ecological Integrity, Emerging Infectious Diseases Originating from Wildlife, and Other Aspects of Human Health - An Overview of the Literature, 2020,

<https://oxfordinberlin.eu/files/wcslinksbetweenecologicalintegrityandeidsoriginatingfromwildlife1pdf>

⁶⁸ [IPBES Workshop Report on Biodiversity and Pandemics](https://www.ipbes.net/pandemics), held virtually on 27-31 July 2020, <https://www.ipbes.net/pandemics>. This workshop report and any recommendations or conclusions contained therein have not been reviewed, endorsed or approved by the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

⁶⁹ IPBES Workshop Report on Biodiversity and Pandemics, Headlines from Executive Summary, 2020, https://ipbes.net/sites/default/files/2020-11/201104_IPBES_Workshop_on_Diversity_and_Pandemics_Executive_Summary_Digital_Version.pdf

(d) Land-use change, agricultural expansion, and urbanization cause more than 30 per cent of emerging disease events;

(e) The trade and consumption of wildlife is a globally important risk for future pandemics;

(f) Current pandemic preparedness strategies aim to control diseases after they emerge. These strategies often rely on, and can affect, biodiversity;

(g) Escape from the Pandemic Era requires policy options that foster transformative change towards preventing pandemics:

(i) Enabling mechanisms;

(ii) Policies to reduce the role of land-use change in pandemic emergence;

(iii) Policies to reduce pandemic emergence related to the wildlife trade;

(iv) Closing critical knowledge gaps;

(v) Foster a role for all sectors of society to engage in reducing risk of pandemics.
