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BIODIVERSITY AND CLIMATE CHANGE

Note by the Executive Secretary

BACKGROUND

1. In decision 14/5, paragraph 13, the Conference of the Parties requested the Executive Secretary, in consultation with the Intergovernmental Panel on Climate Change (IPCC), and subject to the availability of resources:

(a) To review new scientific and technical information including by taking into account traditional knowledge and the findings of Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, with respect to:

(i) The impacts of climate change on biodiversity and on communities that depend on ecosystem services and functions, particularly indigenous peoples and local communities;

(ii) The role of ecosystems and their integrity, for climate change adaptation, mitigation and disaster risk reduction, and ecosystem restoration and sustainable land management;

(b) To prepare a report on potential implications of the above for the work of the Convention for consideration by the Subsidiary Body on Scientific, Technical and Technological Advice at a meeting to be held prior to the fifteenth meeting of the Conference of the Parties;

(c) To develop targeted messaging on how biodiversity and ecosystem integrity, functions and services contribute to tackle the challenges of climate change.

2. Pursuant to this request, the Secretariat has prepared the present report, which contains a summary of the main findings from the review of new scientific and technical information on biodiversity and climate change and of its implications for the work of the Convention. A more detailed analysis, with references to the assessments and other literature, is available in CBD/SBSTTA/23/INF/1.

3. Section I of the present report responds to paragraph 13(a) of decision 14/5 and presents key messages from the review of new scientific and technical information. The main five recent assessments reviewed are the following:

(a) *IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*

* CBD/SBSTTA/23/1.

(SR1.5).[1] The report provides information on: projected climate change, potential impacts and associated risks; emission pathways and system transitions consistent with 1.5°C global warming; and on strengthening the global response in the context of sustainable development and efforts to eradicate poverty;

(b) *IPCC special report on the ocean and cryosphere in a changing climate (SROCC)*.[2] The report provides information on: high mountain areas; polar regions; sea level rise and implications for low-lying islands, coasts and communities; changing ocean, marine ecosystems, and dependent communities; and extreme, abrupt changes and managing risks;

(c) *IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (SRCCL)*. The report provides information on: land-climate interactions; desertification; land degradation; food security; interlinkages between desertification, land degradation, food security and greenhouse gas fluxes including synergies, trade-offs and integrated response options; and risk management and decision-making in relation to sustainable development;

(d) *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) global assessment on biodiversity and ecosystem services*. The report assesses the status and trends with regard to biodiversity and ecosystem services, the impact of biodiversity and ecosystem services on human well-being and the effectiveness of responses, including the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets;

(e) *IPBES assessment report on land degradation and restoration*. The report provides an analysis of the state of knowledge regarding the importance, drivers, status, and trends of terrestrial ecosystems. The report identifies governance options, policies and management practices to reduce land degradation and to rehabilitate and restore degraded land.

4. In addition to these assessments, information was taken from the key messages from the workshop on "Biodiversity and climate change: integrated science for coherent policy", organized by the Secretariat in cooperation with IPBES and IPCC, as well as the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), and held in Paris on 18 October 2018.[3]

5. A review of relevant literature published after the release of the IPCC SR1.5 report was also conducted. Key articles with significant new scientific and technical information were included in the review. Information document CBD/SBSTTA/23/INF/1 provides the full list of references and sources of information for each statement.

6. Section II of the present report responds to paragraph 13 (b) of decision 14/5 and discusses the potential implications of the new scientific and technical information presented in section I.

7. Section III contains suggested recommendations.

I. KEY MESSAGES FROM THE REVIEW OF NEW SCIENTIFIC AND TECHNICAL INFORMATION ON BIODIVERSITY AND CLIMATE CHANGE

8. *Climate change and biodiversity loss are inseparable threats to humankind and must be addressed together*. Biodiversity and climate are interconnected in many ways. On the one hand, biodiversity is strongly affected by climate change, with negative consequences for human well-being and the long-term stability of critical ecosystems. On the other hand, the conservation of biodiversity, through the ecosystem services it supports, makes an indispensable contribution to addressing climate change.

[1] See https://www.ipcc.ch/sr15/.

[2] This report will be reviewed at the fifty-first session of IPCC (20-23 September 2019) for approval. Any information taken from this report will only be published by the Secretariat following official approval by the IPCC.

[3] Key messages form the workshop on "biodiversity and climate change: integrated science for coherent policy" (CBD/COP/14/INF/22).

9. *Biodiversity and ecosystems play an important role in strengthening the global response to climate change, while delivering multiple benefits*. Better protection, management and restoration of natural and managed ecosystems can make significant contributions to the mitigation of human-induced climate change. Ecosystem-based approaches can also contribute significantly to climate change adaptation and disaster risk reduction thereby reducing the vulnerability of people, especially indigenous people and local communities and those disproportionally impacted, and the ecosystems upon which they depend, in the face of climate change.

A. The impacts of climate change on biodiversity and on communities that depend on ecosystem services and functions, particularly indigenous peoples and local communities

10. *There are significantly greater risks to natural and human systems in a world with global warming of 2°C above pre-industrial temperatures compared to 1.5°C and impacts are already apparent with current levels of global warming (about 1°C above pre-industrial levels)*. Projections of some indicators show that biodiversity loss can be twice as high or more under global warming of 2°C compared to 1.5°C.

11. Impacts of climate change on biodiversity and ecosystem functions and services include:

(a) Under 2°C of global warming, the global terrestrial land area that is projected to undergo ecosystem transformation will be doubled, compared to 1.5°C. Impacts on the geographical distribution of species at 2°C are thus expected to be at least twice as high as impacts at 1.5°C. At 1.5°C of warming, 6 per cent of insects, 4 per cent of vertebrates and 8 per cent of plant species are projected to lose over half of their climatically determined geographic range, compared with 18 per cent of insects, 8 per cent of vertebrates and 16 per cent of plants for global warming of 2°C;

(b) Risks to ecosystem functionality, phenological mismatches and geographic ranges of key insect crop pollinator families are lower under global warming of 1.5°C compared to 2°C or higher;

(c) Opportunities for the spread of invasive species and the associated risks would generally be lower at 1.5°C compared to 2°C of global warming;

(d) Under global warming of 2°C, forest ecosystems and their biodiversity, functions and services are expected to experience greater risks such as forest fires, extreme weather events, and the spread of invasive species, pests and diseases, compared to 1.5°C;

(e) Ocean ecosystems have experienced geographical shifts and cascading impacts for marine species due to warming ocean temperatures, ocean acidification and the weakening of ocean circulation patterns and mixing;

(f) Coastal ecosystems have experienced the same degradation as ocean ecosystems with the added pressures of sea-level rise, coastal erosion from storms, eutrophication and a greater degree of destructive human activity. These causes of coastal ecosystem degradation impact key marine organisms, such as seagrass meadows, mangrove forests and coral reefs (see figure 1);

(g) The distribution and abundance of coral reefs have decreased by approximately 50 per cent over the past 30 years. Impacts on coral reefs are expected to be an order of magnitude worse in a world that is 2°C warmer compared to 1.5°C warmer: recent assessments state with very high confidence that coral reefs are projected to decline by 70 to 90 per cent at 1.5°C of global warming compared to greater than 99 per cent at 2°C. Thus, while there is a chance of some tropical coral reefs surviving with 1.5°C of warming, coral reefs are projected to virtually disappear with 2°C warming (see figure 1).

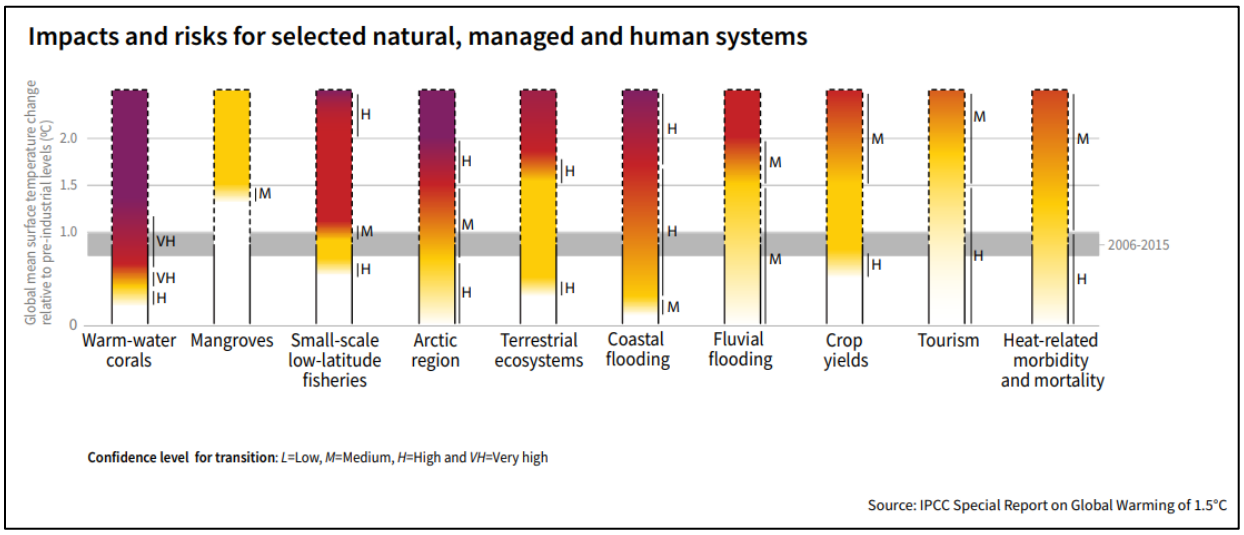

Figure 1. **How the level of global warming affects the impacts and risks for selected natural, managed and human systems**

Purple indicates very high risks of severe impacts/risks and the presence of significant irreversibility or the persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or impacts/risks; red indicates severe and widespread impacts/risks; yellow indicates that impacts/risks are detectable and attributable to climate change with at least medium confidence; and white indicates that no impacts are detectable and attributable to climate change.

12. Impacts of climate change on communities and livelihoods that depend on biodiversity and ecosystem functions and services include:

(a) *Competition for land use for agriculture and food production can negatively affect biodiversity and exacerbate climate change-induced changes in crop yield and long-term food security*. It is projected that there will be a greater reduction in global crop yields and global nutrition under global warming of 2°C compared to 1.5°C. Climate change is also expected to impact livestock indirectly through changes in feed quality, the spread of pests and diseases and changes in water resource availability;

(b) *Changes in ocean circulation patterns as a result of warmer ocean surface temperatures can have significant consequences for industries and people who depend on fisheries for food and livelihoods, including indigenous peoples and local communities*. Limiting global warming to 1.5°C is expected to yield lower risks to marine biodiversity, ecosystems, and their functions and services to humans than at 2°C warming. Climate change is projected to decrease ocean net primary production by between 3 per cent and 10 per cent and fish biomass by between 3 per cent and 25 per cent by the end of the century. Climate change is also expected to negatively impact seafood security and safety, elevating risks of nutritional health for communities with high seafood consumption, such as coastal indigenous peoples and local communities;

(c) *Climate change is expected to have impacts on several indices of water quality in lakes and watersheds*, such as the chloride standard for drinking water, oxygen and nutrient concentrations, impacts posed by land-use change, and annual nitrogen and phosphorus yields, in which the negative impact of each index will be greater at 2°C compared to 1.5°C. Each increasing degree of global warming can also lead to an expansion of the global land area that will experience significant increases in runoff and flood hazards; amplifying the exposure of vulnerable communities and ecosystems, such as small islands and low-lying coastal areas, and including indigenous peoples;

(d) *Climate change threatens the ecosystems and biodiversity that underpins all dimensions of human health*. Ecosystem functions and services mediate physical and psychological health, while biodiversity, through species and gene diversity, provides humans with alternatives for food and medicine

in the face of an uncertain future. Climate change can compromise these functions and services to humans by increasing exposure and vulnerability to climate-related stresses, such as the range, seasonality and intensity of climate-related infectious diseases;

(e) *All countries are affected by global warming, but the impacts tend to fall disproportionately on the poor and vulnerable, as well as those least responsible for the problem*. The negative impacts of climate change are often disproportionately distributed, including over large populations of indigenous peoples and the world's poorest communities who depend on ecosystem functions and services for subsistence, livelihoods and health, and can intensify inequalities, especially for people marginalized due to gender, age, race, class, caste, indigeneity and disability.

B. The role of ecosystems and their integrity, for climate change adaptation, mitigation and disaster risk reduction, and ecosystem restoration and sustainable land management

13. *Protecting and conserving biodiversity and ecosystems is critical in order to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change, as well as to maintain the capacity of ecosystems to store carbon*. Diverse, well-functioning and resilient ecosystems are better able to provide society with ecosystem services and benefits that support climate change adaptation and disaster risk reduction, and to contribute to climate change mitigation. Realizing that adaptation needs will be reduced at global warming of 1.5°C, the loss of biodiversity and the degradation of ecosystems significantly reduce their resilience and undermine their capacity for carbon storage and sequestration, potentially leading to increases in emissions of greenhouse gases. Protected areas and other area-based conservation measures and ecosystem restoration are important tools for climate change adaptation and mitigation as they conserve biodiversity, ecosystems and their functions and services.

14. *In order to limit global warming to well below 2°C, and closer to 1.5°C above pre-industrial levels, strong actions are needed to protect and enhance carbon sinks on land and in the oceans through ecosystem-based approaches as well as to reduce greenhouse gas emissions from fossil fuel use and other industrial and agricultural activities*. There is not one single action that can achieve the reduction in atmospheric greenhouse gas concentrations necessary to limit global warming to 1.5°C. Ecosystem-based approaches to climate change adaptation and mitigation, including biodiversity conservation, the reduction of ecosystem degradation, restoration of ecosystems, and sustainable soil management ("nature-based solutions or "natural climate solutions") could provide about one third of the cost-effective CO_2 mitigation by 2030 in order to have a greater than 66 per cent chance of limiting warming to below 2°C. If appropriately designed and managed, such approaches can also deliver benefits to biodiversity and livelihoods. These measures are generally more cost-effective and immediately accessible and thus could be implemented as "no-regret" priority actions. While land-use actions will not be sufficient on their own to reach the climate goal, they are essential components in the collective effort.

15. *At their current standing, national ambitions accumulated from nationally determined contributions fall short of achieving the goals of the Paris Agreement*. Ambitions need to be raised significantly if the global goal of 1.5°C warming is to be achieved. Nature-based or ecosystem-based mitigation measures could contribute to greater ambition and aid in reducing trade-offs and synergizing climate change actions, conservation and the sustainable use of biodiversity and the Sustainable Development Goals. How carbon stocks are managed can play a significant role in efforts not only to mitigate and adapt to climate change, but also in reversing biodiversity loss and ecosystem and land degradation. Investing simultaneously in ecosystem restoration, the rehabilitation of degraded agricultural and pasture lands, and ways to sustainably enhance agricultural productivity can contribute to combating climate change, land degradation and biodiversity loss and enhance food security at the same time.

16. *Afforestation and bioenergy measures may have significant negative impacts on agricultural and food systems, biodiversity, and other ecosystem functions and services*. The deployment of bioenergy, including bioenergy with carbon capture and storage (BECCS), on a very large scale as envisaged in some mitigation scenarios, could have significant negative impacts on biodiversity and food security through

land use change. When considering bioenergy and biomass-based measures, attention should be given to the direct and indirect effects of related land-use changes, including net greenhouse gas emissions, water and nutrient constraints and changes in albedo. This will be necessary to ensure that these measures contribute to climate change mitigation without unduly compromising biodiversity, food security, ecosystem resilience and adaptation to climate change. Ecological safeguards must be put in place in order to avoid potentially devastating long-term and irrevocable losses for biodiversity and ecosystems and their resilience and integrity.

17. *Soil carbon sequestration is a carbon dioxide removal option with minimal risk related to land-use and water and can have positive impacts for mitigating and adapting to climate change, reducing biodiversity loss and reversing land degradation*. Enhancing soil carbon sequestration through sustainable land management, conservation and restoration of ecosystems, can also improve soil nutrient levels, soil fertility and food security.

18. *Adaptation needs will be lower in a 1.5°C global warming world compared to 2°C*. Ecosystems, food and health systems will face fewer challenges when adapting to climate change at 1.5°C of global warming compared to 2°C; while the integrity and adaptability of ecosystems will be compromised under high emission scenarios. The ability of biodiversity and ecosystems to adapt to the effects of climate change greatly depends on the world's level of commitment to reducing emissions. Strong ambitions to reduce global emissions make it easier for ecosystems to further enhance climate change mitigation and adaptation.

C. Addressing underlying common drivers of climate change and biodiversity loss

19. *Climate change can exacerbate pressures on natural systems by interacting with drivers of biodiversity loss such as land-use change and invasive alien species*. It is important to address the effects of climate change in the context of interacting drivers of biodiversity loss and ecosystem degradation and their resilience and ability to respond to the impacts of climate change.

20. *Many of the direct (e.g. changes in land and sea use) and most of the indirect drivers (e.g. consumption of food, materials and energy) of biodiversity loss and climate change are the same. Addressing these common drivers must be an essential part of efforts to address both challenges*. Land-use change may result in increased greenhouse gas emissions, reductions in sequestration potential, biodiversity loss and a loss in the resiliency of ecosystems, compromising their adaptation capacities. Addressing behavioural change and consumption patterns, such as excessive consumption of meat, would reduce pressures on both biodiversity and climate change.

21. *Climate change response measures that increase diversification in food systems, such as more sustainable consumption and production, less food loss and waste and dietary changes, can be used to deliver multiple benefits to biodiversity, climate change, land restoration, food and water security and human health*. Dietary changes and reduced food loss and waste can aid in the transition towards low greenhouse gas emission food systems by reducing pressure on land. More sustainable dietary choices, including more balanced diets and plant-based foods, can reduce demand for land conversion, thereby not only reducing biodiversity loss but also creating further opportunities for other land-based measures that would have benefits for biodiversity and climate change mitigation and adaptation.

II. IMPLICATIONS FOR THE WORK OF THE CONVENTION

22. The review of information presented in section I of the present report highlights the following key points:

(a) Urgent and large-scale action to address climate change and its impacts on biodiversity and communities is essential to achieve the 2050 Vision for Biodiversity;

(b) It is necessary to address the multiple drivers of biodiversity loss to increase the resilience of ecosystems to climate change;

(c) Climate change considerations must be integrated into the design and management of protected areas and other measures for the conservation and sustainable use of biodiversity;

(d) There is a large potential for nature-based solutions to contribute to climate change adaptation, mitigation and disaster risk reduction;

(e) It is important to take into account the potential impacts of climate change response measures on biodiversity;

(f) Many of the underlying drivers of biodiversity loss and climate change are common and addressing these must be an essential part of the efforts to address both challenges.

These points are addressed in subsections B to F below. Some general issues are addressed in subsection A. The implications of the new findings for the post-2020 global biodiversity framework and the achievement of the 2050 Vision of "living in harmony with nature" are discussed in section G. Finally, section H presents some opportunities for synergies for financing and resource mobilization.

23. A wealth of relevant information has already been developed under the Convention on these issues and should be taken into account together with the experience of Parties in implementing the Convention. In the present section, an overview of past and current work on the interlinkages between biodiversity and climate change under the Convention is provided and analysed vis-à-vis the recent findings presented in section I, to identify implications and potential gaps.

24. The Conference of the Parties at its tenth meeting adopted a comprehensive decision on biodiversity and climate change (decision X/33), providing guidance to Parties on ways to conserve, sustainably use and restore biodiversity and ecosystem services while contributing to climate change mitigation and adaptation. This guidance was derived from the work of the Second Ad Hoc Technical Expert Group (AHTEG) on Biodiversity and Climate Change.[4]

25. The guidance in paragraph 8 of decision X/33, although adopted in 2010, is still relevant given the new scientific and technical information. The guidance covers essential considerations related to assessing the impacts of climate change on biodiversity, on reducing the impacts of climate change on biodiversity and biodiversity-based livelihoods, on ecosystem-based approaches for adaptation and mitigation, on reducing the impacts of climate change mitigation and adaptation measures and on valuation and incentive measures.

26. Climate change is also considered in other programmes of work of the Convention. The in-depth review of the cross-cutting issue on biodiversity and climate change[5] undertaken in 2010 identified the climate change elements and guidance in the other programmes of work under the Convention. An update is provided in CBD/SBSTTA/23/INF/1. The analysis reveals that the majority of the programmes contain some references to climate change, but few of them provide information on specific activities to integrate climate change.

27. In addition to the programme of work adopted through decisions, a number of initiatives, cross-cutting issues, plans or strategies under the Convention have references to climate change (e.g. ecosystem approach, invasive alien species, global strategy for plant conservation, and short-term action plan for ecosystem restoration).

28. Climate change is also explicitly addressed through Aichi Biodiversity Target 10 on reducing pressures on coral reefs, and other vulnerable ecosystems impacted by climate change. The urgency of action was reflected in the decision to make 2015 the deadline for meeting Target 10, instead of 2020 as with most of the other targets. The IPBES global assessment revealed that this target was not met by 2015 and that it was the one with least progress, mostly because the multiple pressures on coral reefs, including pressures from both land-based and marine activities, continue to significantly increase. Findings on the state of coral reefs and other vulnerable ecosystems, discussed above in section I A, underline the need to urgently and significantly reduce the direct pressures on biodiversity and promote sustainable use.

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[4] Secretariat of the Convention on Biological Diversity (2009). *Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change*. Montreal, Technical Series No. 41, 126 pp: https://www.cbd.int/doc/publications/cbd-ts-41-en.pdf

[5] UNEP/CBD/SBSTTA/14/6.

29. Another target which explicitly refers to climate change is Target 15 on enhancing ecosystem resilience and the contribution of biodiversity to carbon stocks, through conservation and restoration, thereby contributing to climate change mitigation and adaptation and to combating desertification.

30. Recent findings highlight the important role of ecosystem restoration for climate change mitigation, adaptation, and other multiple benefits, providing justification for increased focus on ecosystem restoration.

31. Other Aichi Biodiversity Targets are also linked to climate change. Information document CBD/SBSTTA/23/INF/1 provides a review of all 20 Targets and identifies links with climate change and implications of recent findings.

32. A major message derived from the recent assessments is the key role of biodiversity and ecosystems for action on climate change. Therefore, enhancing implementation of the Convention on Biological Diversity in general would have benefits for both issues.

33. While the guidance already provided under the Convention could be amended to address the links between biodiversity and climate change more explicitly, it is important to stress that increasing implementation of these existing decisions would greatly contribute to reducing impacts of climate change on biodiversity and communities.

A. Addressing climate change and its impacts on biodiversity and on communities

34. A wealth of information is now available on the observed and projected impacts of climate change on biodiversity and communities (as shown in section I A). One major message arising from recent climate change assessments is that every extra bit of warming will worsen impacts on biodiversity, ecosystems and human well-being. This implies that responding to the impacts of climate change on biodiversity is more critical and urgent than ever if we want to maintain the capacity of ecosystems to provide services essential to human well-being, and thus enhance their capacity to reduce vulnerability to climate change.

35. A number of decisions of the Conference of the Parties address the impacts of climate change on biodiversity and provide guidance on ways and means to reduce those impacts (in particular decisions IX/16, X/33, XI/21, XIII/4 and 14/5).

B. Addressing the multiple drivers of biodiversity loss to increase resilience to climate change

36. The Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change[6] showed that climate change will interact with other pressures including land-use change and related habitat loss, invasive alien species and disturbance by fire. For example, climate change is very likely to facilitate the spread and establishment of invasive alien species, and also affect the incidence of fire. These pressures in turn further amplify climate change impacts by causing fragmentation and degradation of ecosystems. It is therefore critical to consider the effects of climate change in the context of interacting pressures and compounding effects among the drivers.

37. Under Strategic Goal B of the Strategic Plan for Biodiversity 2011-2020, to reduce the direct pressures on biodiversity and promote sustainable use, the Aichi Biodiversity Targets directly contribute to reducing non-climatic stresses in order to increase the resilience of ecosystems to the impacts of climate change: Target 5 addresses habitat loss; Target 6 calls for the sustainable management of fisheries; Target 7 calls for sustainable agriculture, aquaculture and forestry; Target 8 aims at reducing pollution; Target 9 addresses invasive alien species; and, more specifically, Target 10 addresses the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification.

[6] See Secretariat of the Convention on Biological Diversity (2009). *Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change*. Montreal, Technical Series No. 41, 126 pp: https://www.cbd.int/doc/publications/cbd-ts-41-en.pdf

38. As noted above, coral reefs are regarded as one of the most stressed ecosystems globally and are among the most vulnerable to climate change. The fourth edition of the *Global Biodiversity Outlook*, released in 2014, found that, based on available evidence, there has been a shift away from achieving Aichi Biodiversity Target 10 and that significantly accelerated actions are needed to reverse this trend. Accordingly, in decision XII/23, the Conference of the Parties adopted a set of priority actions[7] to achieve Aichi Biodiversity Target 10 for coral reefs and closely associated ecosystems. These priority actions update the previous version of the specific work plan on coral bleaching (decision VII/5, annex I, appendix) and aim to support the management of coral reefs and associated ecosystems as socioecological systems undergoing change due to the interactive effects of multiple stressors. Increased implementation of these actions is even more urgent today.

39. Similar guidance could be developed to address threats to other vulnerable ecosystems identified by recent assessments, such as montane and polar ecosystems, and other coastal and marine ecosystems, particularly mangroves, seagrass and kelp forests. The guidance should also include considerations of interactions among the various drivers, as well as compounding factors.

C. Protected area networks and design

40. Area-based conservation is one of the most effective policy-based measures to safeguard the integrity of ecosystems, thereby reducing the impacts of climate change on biodiversity. Protected areas have a mitigation potential through storing carbon that is present in vegetation and soil and sequestering carbon dioxide from the atmosphere in natural ecosystems, as well as an adaptation role through the protection/maintenance of ecosystem integrity, buffering local climate change impact, reducing risks and impacts from extreme events such as storms, droughts and sea-level rise.

41. Aichi Biodiversity Target 11 aims to conserve at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes, by 2020. While the quantitative element of Target 11 to expand terrestrial and marine protected areas is on track to be achieved, many of the other elements still need more attention.

42. Protected area systems need to incorporate climate change considerations in management and design in order to fulfil their conservation objectives. For example, consideration of habitat shifts due to climate change is essential to the effective design and management of land-based conservation as these shifts may dramatically change the suitability of protected areas for native biodiversity. Researchers are developing high-resolution databases and visualization tools that map climate-related threats to regional biodiversity.[8] Recent assessments show that biome shifts are projected to impact an area of land twice as large at 2°C of global warming compared to 1.5°C.

43. Further efforts could also focus on taking into account climate change in the identification of areas of importance, including marine protected areas, ensuring that protected areas are ecologically representative, well-connected and integrated, and effectively and equitably managed. Global biodiversity patterns have begun to be mapped and incorporated into interactive tools which can help inform these decisions.[9]

44. Indigenous conservation areas can also play an important role for carbon sequestration, while strengthening ecosystem connectivity and resilience, maintaining essential ecosystem services and supporting biodiversity-based livelihoods.

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[7] Available in the annex to decision XII/23, and also presented in a booklet: https://www.cbd.int/doc/publications/cbd-aichi-target-10-en.pdf.

[8] Such as "AdaptWest – A Climate Adaptation Conservation Planning Database for North America": https://adaptwest.databasin.org/

[9] Such as the "Map of Life": https://mol.org/

D. Nature-based solutions for climate change adaptation, mitigation and disaster risk reduction

45. The evidence and recognition of the role of biodiversity and ecosystems for addressing multiple agendas is growing as is reflected in recent scientific assessments from IPCC and IPBES.

46. Ecosystem-based adaptation (EbA) is described in decision X/33 as the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the adverse effects of climate change. It aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change. In the same decision, the Conference of the Parties invited Parties to implement ecosystem-based approaches for adaptation.

47. EbA is gaining traction worldwide, with more case studies and literature demonstrating that EbA can be a flexible, cost-effective and broadly applicable approach for reducing the impacts of climate change, with multiple benefits, including biodiversity conservation, poverty reduction, sustainable development, climate change mitigation, and disaster risk management.

48. In addition, evidence has been established to support the hypothesis that there is some degree of linkage between higher levels of species diversity and higher rates of carbon sequestration, and that higher biodiversity can increase the resilience of ecosystems and their carbon stocks to disturbance. Management methods that maintain or restore biodiversity can support the effectiveness of ecosystem-based climate change mitigation efforts.[10]

49. Under the Convention, much attention has been given to highlighting the role of biodiversity and ecosystems for adaptation, mitigation and disaster risk reduction. The Secretariat continues to work closely with relevant partners to support the design and implementation of ecosystem-based approaches.

50. Effective climate change adaptation planning processes require the consideration of biodiversity information and integration with relevant biodiversity planning processes. Parties to UNFCCC have committed to developing national adaptation plans and other adaptation planning processes. Science-based climate vulnerability and risk assessment is a critical step in the formulation of these planning processes. The consideration of biodiversity and ecosystem service information is a crucial input to achieve a comprehensive understanding of the drivers and impacts of climate change which influence climate vulnerability and risk. Moreover, ecosystem-based approaches often present cost-effective solutions to climate adaptation that should be considered within an integrated adaptation planning process. Achieving these logical linkages requires systematic coordination between planning processes, which are unfortunately often managed as parallel processes, thereby missing useful opportunities for increased efficiency and impact.

51. Like other adaptation activities, ecosystem-based adaptation is not without complexity, uncertainty, and risk. The Conference of the Parties, in decision XIII/4, requested the development of voluntary guidelines for the design and effective implementation of ecosystem-based approaches to climate change adaptation and disaster risk reduction. These voluntary guidelines were adopted by the Conference of the Parties at its fourteenth meeting, and published in CBD Technical Series No. 93.[11] The report builds on progressive work on ecosystem-based approaches to climate change adaptation and disaster risk reduction in recent years, including a synthesis report on experiences with ecosystem-based approaches to climate change adaptation and disaster risk reduction (CBD Technical Series No. 85[12]) developed pursuant to decision XII/20, which identifies lessons learned as well as gaps and challenges with the implementation of ecosystem-based approaches to climate change adaptation and disaster risk

[10] "Managing ecosystems in the context of climate change mitigation: A review of current knowledge and recommendations to support ecosystem-based mitigation actions that look beyond terrestrial forests" (UNEP/CBD/SBSTTA/20/INF/3).

[11] Secretariat of the Convention on Biological Diversity (2019). *Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction and Supplementary Information*. Technical Series No. 93. Montreal, 156 pp. Available at: https://www.cbd.int/doc/publications/cbd-ts-93-en.pdf

[12] Lo, V. (2016). *Synthesis Report on Experiences with Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction*. Technical Series No. 85. Secretariat of the Convention on Biological Diversity, Montreal, 106 pp. Available at: https://www.cbd.int/doc/publications/cbd-ts-85-en.pdf

reduction. The reports provide information on principles, safeguards, tools, and a flexible framework for planning and implementing ecosystem-based approaches, to support countries in integrating ecosystem-based approaches into their national biodiversity strategies and action plans, but also into other sectoral policies.

52. Although nature-based solutions to climate change have gained significant attention in recent years and are increasingly being integrated into national plans and strategies, there remain a number of gaps and challenges. An analysis of nature-based solutions in nationally determined contributions reveals that 130 of the signatories to the Paris Agreement (66 per cent) include nature-based solutions in their nationally determined contributions. A total of 103 included nature-based solutions as an adaptation tool and 27 included them as a strategy for climate mitigation. The most commonly implemented or planned nature-based adaptation strategies are the protection, restoration or afforestation of terrestrial forests, coastal or marine ecosystems and catchments including wetlands, with the strongest emphasis on forests. Mountain, grassland and rangeland ecosystems were identified far less, despite their importance for carbon storage and other ecosystem services. While many nationally determined contributions articulated a vision for adaptation based on nature, less than seven per cent of nationally determined contributions which have identified nature-based solutions as an adaptation tool have measurable targets for adaptation. The lack of such targets compromises the ability to assess progress towards the adaptation goals.

53. The time now is to go beyond theory and principles and to develop concrete tools for decision-making and implementation of nature-based solutions. More work on increasing the evidence base for ecosystem-based approaches, including for quantifying effectiveness, and the development of targets to measure progress, would help build the case for integrating nature-based solutions into plans and policies, and enhance implementation. Data and experiences from the field could help validate cost-effectiveness and generate good principles and standards to further facilitate integration into international adaptation policy instruments and national adaptation policies. Work led by the International Union for Conservation of Nature (IUCN) is under way to develop a global standard for the design and verification of nature-based solutions.[13] The aim is to create a standard understanding and consensus on what constitutes a good nature-based solution to ensure the quality, credibility and effectiveness of nature-based solutions.

54. New scientific assessments clearly demonstrate that reducing land degradation and restoring degraded land is a key solution for multiple challenges. With the appropriate safeguards, scaling up ecosystem restoration could make significant contributions to climate mitigation, while contributing to biodiversity goals, food security and other sustainable development goals.

55. In decision XIII/5, the Conference of the Parties adopted a short-term action plan on ecosystem restoration as a flexible framework for immediate action towards achieving relevant Aichi Biodiversity Targets, the Global Strategy for Plant Conservation, and other internationally agreed goals and targets. Key considerations for optimizing the benefits and minimizing negative impacts of ecosystem restoration on biodiversity, such as avoiding the afforestation of grasslands and ecosystems with naturally low tree cover, and preventing the introduction of invasive alien species, are presented in the appendix to the note by the Executive Secretary on protected areas and ecosystem restoration (UNEP/CBD/SBSTTA/20/12). Additional guidance and tools for ecosystem restoration developed under the Convention and by partner organizations and initiatives are provided in information documents UNEP/CBD/SBSTTA/20/INF/35 and UNEP/CBD/SBSTTA/20/INF/36. Further guidance on ecosystem restoration is provided in decisions XI/16 and XII/19.

56. While restoration of degraded ecosystems is mentioned in Article 8(f) of the Convention, this topic has only been addressed as a separate programme recently under the Convention. With the urgent need to use a range of methods to achieve climate change goals, including the restoration of vast areas of degraded lands, further work could be undertaken to help countries harness the full range of multiple benefits from restoration measures. It is expected that the proclamation by the United Nations General

[13] https://www.iucn.org/theme/ecosystem-management/about/our-work/a-global-standard-nature-based-solutions

Assembly of 2021–2030 as the United Nations Decade on Ecosystem Restoration[14] will enhance political support, scientific research and funds to significantly scale up ecosystem restoration. Making sure that biodiversity is part of the conversation will be important.

E. Potential impacts of climate change response measures on biodiversity

57. Limiting global warming to 1.5°C above pre-industrial levels is possible but will require unprecedented transitions in all aspects of society, and the use of a range of measures. Some of these measures could have untended negative impacts on biodiversity without careful planning and adequate assessments. On the other hand, there is potential for addressing climate change while positively contributing to biodiversity goals, and vice versa.

58. Recent assessments have shown that some measures intended to mitigate climate change could have significant negative impacts on biodiversity and even on greenhouse gas emissions. In particular, when considering bioenergy and biomass-based measures, attention should be given to the direct and indirect effects of related land use changes, including net greenhouse gas emissions, water and nutrient constraints and changes in albedo. It is important to ensure that these measures contribute to climate change mitigation without unduly compromising biodiversity, food security, ecosystem resilience and adaptation to climate change.

59. Analyses using scenarios developed with integrated assessment models can provide important insights to the synergies and trade-offs among different climate change mitigation approaches because they model and account for many of the complex interactions between various components of the earth system.[15]

60. Under the Convention, the need to increase positive and reduce negative impacts of climate-change mitigation and adaptation measures on biodiversity was acknowledged in several decisions. In particular, guidance was developed on enhancing the positive and minimizing the negative impacts on biodiversity of climate change adaptation and mitigation activities in response to decision XII/20, paragraph 7(d). Recommendations include the application of the ecosystem approach, the consideration of traditional knowledge and full involvement of indigenous peoples and local communities and other stakeholders, the application of strategic environmental assessments and environmental impact assessments, the inclusion of the value of biodiversity and ecosystem services in decision-making and allowing for monitoring and evaluation, and adaptive management.[16]

61. There is a wide range of forestry-related mitigation options that could potentially provide important biodiversity conservation benefits, including reducing emissions from deforestation and forest degradation, forest conservation, sustainable forest management and enhancement of forest carbon stocks. The extent to which these activities deliver benefits depends on how and where they are implemented. For example, a focus on forest-based activities strictly looking at climate change mitigation benefits, such as monoculture plantations of fast-growing exotic tree species, could run the risk of compromising biodiversity and human well-being and even their long-term carbon storage potential through reduced resilience. The Secretariat has studied the linkages between forests and climate change response activities, in particular the relationship between forest resilience, biodiversity, and climate change, in CBD Technical Series No. 43,[17] and in relation to reducing emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon

[14] See General Assembly resolution 73/284 of 1 March 2019.

[15] The IPBES Assessment of methodologies for scenario analysis and modelling of biodiversity and ecosystem services is relevant in this regard.

[16] "Guidance on enhancing positive and minimizing negative impacts on biodiversity of climate change adaptation activities (UNEP/CBD/SBSTTA/20/INF/1).

[17] Thompson, I., Mackey, B., McNulty, S., Mosseler, A. (2009). *Forest Resilience, Biodiversity, and Climate Change. A Synthesis of the Biodiversity/Resilience/Stability Relationship in Forest Ecosystems*. Secretariat of the Convention on Biological Diversity, Montreal. Technical Series No. 43, 67 pp. https://www.cbd.int/doc/publications/cbd-ts-43-en.pdf.

stocks in developing countries, in CBD Technical Series No. 59.[18] These links are also addressed in a number of decisions of the Conference of the Parties (including decisions XI/19, X/33, and IX/5).

62. With regard to the use of biofuels, the Conference of the Parties, in decision IX/2, urged Parties to promote the positive and minimize the negative impacts of biofuel production and its use on biodiversity and the livelihoods of indigenous and local communities, and, in decision X/37, requested the Executive Secretary to examine tools and approaches as well as gaps pertaining to the sustainable production of biofuels. Such information is presented in CBD Technical Series No. 65.[19]

63. Increasing attention has been recently given to more speculative options to mitigate climate change, such as climate-related geoengineering. The possible impacts of geoengineering techniques on biodiversity and associated social, economic and cultural considerations, and the regulatory mechanisms for climate-related geoengineering, have been studied in detail in response to decision X/33, and the findings are published in CBD Technical Series No. 66.[20] An updated report[21] has also been prepared in response to decision XI/20 based on relevant recent scientific reports, such as the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

64. Safeguards are also important for adaptation activities as they can threaten biodiversity either directly—through the destruction of habitats, for example, building sea walls, thus affecting coastal ecosystems—or indirectly, through the introduction of new species, for example, mariculture or aquaculture. Relevant principles and safeguards are presented in the voluntary guidelines for the design and effective implementation of ecosystem-based approaches to climate change adaptation and disaster risk reduction that were adopted by the Conference of the Parties in decision 14/5 (further discussed in section II.D above).

65. Policies around mitigation and adaptation measures should take into account people's needs, biodiversity, food production and competition with other ecosystem services and land use by local communities, making use of available good practice principles, tools and guidance, especially for the identification of trade-offs and potential unintended consequences of measures.

F. Addressing underlying common drivers of biodiversity loss and climate change

66. Biodiversity has experienced unprecedented change in the past 50 years. This change is driven by both direct factors, such as changes in land and sea use, exploitation, climate change, pollution and invasive alien species, and indirect factors which are rooted in societal values and behaviours including production and consumption patterns, human population trends and trade. While the rate of change differs among regions, the net result has been globally impactful as biodiversity is facing threats of a magnitude never seen before. The negative trend in biodiversity and ecosystem functions is expected to continue or even worsen in many scenarios in response to these indirect drivers.

67. Global population growth, in addition to rising consumption rates, has caused unprecedented rates of freshwater and land use, which has come mostly at the expense of the world's forests, wetlands and grasslands. While agricultural expansion and commercial production have supported the growing global population, these changes, with regional variation, have contributed to greenhouse gas emissions and loss of biodiversity and ecosystem services. Levels of consumption differ among countries, but the impacts are felt globally.

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[18] Secretariat of the Convention on Biological Diversity (2011). *REDD-plus and Biodiversity*. Montreal, Technical Series No. 59. 68 pp. https://www.cbd.int/doc/publications/cbd-ts-59-en.pdf.

[19] Webb, A. and D. Coates (2012). *Biofuels and Biodiversity*. Secretariat of the Convention on Biological Diversity. Montreal, Technical Series No. 65, 69 pages. https://www.cbd.int/doc/publications/cbd-ts-65-en.pdf.

[20] Secretariat of the Convention on Biological Diversity (2012). *Geoengineering in Relation to the Convention on Biological Diversity: Technical and Regulatory Matters*, Montreal, Technical Series No. 66, 152 pages. https://www.cbd.int/doc/publications/cbd-ts-66-en.pdf.

[21] Williamson, P., and Bodle, R. (2016). Update on Climate Geoengineering in Relation to the Convention on Biological Diversity: Potential Impacts and Regulatory Framework. Technical Series No.84. Secretariat of the Convention on Biological Diversity, Montreal, 158 pages. https://www.cbd.int/doc/publications/cbd-ts-84-en.pdf

68. In addition, consumption choices have a large impact on biodiversity and climate change. Dietary shifts towards foods with lower emissions and land requirements, such as those based on coarse grains, legumes, fruits and vegetables, and animal-sourced protein produced in sustainable and low greenhouse gas emission systems, present major opportunities for both climate change adaptation and mitigation while generating significant health and biodiversity co-benefits. Dietary shifts alone could contribute to one fifth of the mitigation needed to limit global warming to 2°C at a fraction of the cost and would alleviate pressure on land.[22]

69. Many synergies exist among solutions to address the direct and indirect drivers of biodiversity loss and climate change together. Pathways to limit global warming to 1.5°C that include low energy demand, low material consumption, and low greenhouse gas-intensive dietary preferences have the most synergies and fewest trade-offs with respect to sustainable development. Dietary shifts, increased yields and reduction in food waste can help avoid further land conversion for agriculture and spared land can be restored to natural habitat. These changes will require widespread behavioural shifts towards less-consumptive lifestyles in line with development goals and equitable well-being.

G. Post-2020 global biodiversity framework and 2050 Vision of "living in harmony with nature"

70. Given the overwhelming negative trends for biodiversity under future climate change scenarios, it is clear that the 2050 Vision of "Living in Harmony with Nature" can only be achieved if we maintain global warming well below 2°C, and closer to 1.5°C above pre-industrial levels. Failing to achieve this outcome will prevent us from reaching our biodiversity goals and will undermine the achievement of many of the Sustainable Development Goals.

71. Recent assessments from IPCC and IPBES strongly reinforce the critical role of biodiversity for achieving the climate change, land degradation neutrality and sustainable development goals. Many of the measures to address development and climate change issues are the same that are needed to support biodiversity, providing opportunities for the promotion of conservation, sustainable use and ecosystem restoration.

72. Pathways to achieve the 2050 Vision will need to include ambitious climate change mitigation measures. Pathways which avoid or limit the use of measures with potentially negative impacts on biodiversity should be prioritized. These pathways could rely on behavioural and lifestyle changes, including less resource intensive diets and reduction of food waste, and rapid reduction of greenhouse gas emissions in other sectors. The IPBES global assessment and the fifth edition of the *Global Biodiversity Outlook* discuss the possible pathways to achieve the 2050 Vision.

73. In decision 14/5, the Conference of the Parties requested the Executive Secretary to consider the linkages and interdependencies between biodiversity and climate change in the preparation of the post-2020 global biodiversity framework, informed by the reports and assessments of IPCC and IPBES. Information contained in this report could serve to inform the process, in particular by highlighting the need for rapid, far-reaching and unprecedented changes in all aspects of society to achieve climate goals and by emphasizing the potential synergies between the various international goals, and the importance of minimizing trade-offs.

[22] Griscom, B.W. et al., 2017: Natural climate solutions. Proceedings of the National Academy of Sciences, 114(44), 11645–11650, doi:10.1073/pnas.1710465114.

H. Synergies for financing and resource mobilization

74. The land sector is responsible for nearly a quarter of global greenhouse gas emissions.[23] Natural climate solutions such as conservation, restoration and improved land management that increase carbon storage and/or avoid greenhouse gas emissions in forests, wetlands, grasslands, and agricultural land, are estimated to contribute to a third of climate change mitigation.[24] However, despite this high potential contribution, land-based sequestration efforts were found to receive less than 3 per cent of climate finances.[25]

75. Projects that maximize the co-benefits between biodiversity conservation, ecosystem restoration and climate change mitigation and adaptation can tap several sources of funding and increase investments and mobilize finance mechanisms.

76. Climate change-related funding mechanisms provide opportunities for investments in nature-based solutions. This potential could be mobilized more effectively with increased coordination among various funding mechanisms. Possible options for synergies with climate-related financial mechanisms exist through the Global Environment Facility (GEF), the Green Climate Fund (GCF) and the Adaptation Fund under the Kyoto Protocol to UNFCCC, among others.

77. The Paris Agreement designated GCF as a key provider of predictable financial resources, and the Conference of the Parties to UNFCCC requested GCF to support developing countries with the formulation and implementation of nationally determined contributions and national adaptation plans. The Secretariat of the Convention on Biological Diversity issued a notification[26] in 2017 providing national focal points to the Convention with information on opportunities under GCF, including information on potential entry points for engagement with GCF, and encouraging coordination with GCF national designated authorities or focal points to facilitate integration of ecosystem-based approaches into proposals for GCF funding. Ecosystems and ecosystem services are an explicit results area for GCF finance, with an increasing volume of investment targeting transformative impact in this area. Moreover, one of the six investment criteria of GCF is to focus on environmental sustainability, which requires synergies with biodiversity.

78. Possible ways to strengthen the linkages between the work of the Convention and of GCF include facilitating the flow of information for national level coordination related to the wealth of information available in national biodiversity strategies and action plans, the relevance of that information to climate change mitigation and adaptation, and potential synergies with national adaptation plans and project preparation programmes of GCF.

79. Further collaboration with GCF could also include working with the Project Preparation Facility to support Accredited Entities (AEs), especially Direct Access AEs, and others in the preparation of project concepts focused on the GCF results area of ecosystems and ecosystem services. This collaboration could serve to strengthen the capacity of countries and AEs (particularly Direct Access AEs), to prepare project concepts that address key elements required to access GCF resources, while also supporting GCF in meeting its objectives.

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[23] Smith P., M. Bustamante, H. Ahammad, H. Clark, H. Dong, E.A. Elsiddig, H. Haberl, R. Harper, J. House, M. Jafari, O. Masera, C. Mbow, N.H. Ravindranath, C.W. Rice, C. Robledo Abad, A. Romanovskaya, F. Sperling, and F. Tubiello, 2014: Agriculture, Forestry and Other Land Use (AFOLU). In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, United States of America.

[24] According to Griscom et al (2017), natural climate solutions can provide 37 per cent of cost-effective CO_2 mitigation needed through 2030 for a greater than 66 per cent chance of holding warming to below 2 °C.

[25] Griscom, B.W. et al., 2017: Natural climate solutions. Proceedings of the National Academy of Sciences, 114(44), 11645–11650, doi:10.1073/pnas.1710465114.

[26] https://www.cbd.int/doc/notifications/2017/ntf-2017-077-cc-en.pdf

80. While financing from domestic public sources can be consistent and provide more flexibility in terms of allocation, capacities of public sector financing are often insufficient to be effective. Leveraging regional and international cooperation initiatives can help to achieve more effective resource mobilization and investment in ecosystem-based approaches. For example, the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety finances climate and biodiversity pilot projects that help mainstream ecosystem-based adaptation at the policy and strategic levels. Opportunities also exist at the regional level, such as through the Caribbean Biodiversity Fund (CBF) and its "EbA Facility", which provides resources directly to selected national and regional projects on ecosystem-based adaptation to climate change in the Caribbean.

81. Integrating ecosystem-based approaches in climate finance is often constrained by a lack of understanding of ecosystem-based approaches by stakeholders, including GCF Accredited Entities. The Secretariat could support capacity-building to increase awareness and understanding and help identify financing options.

82. The provision of positive incentives for implementing nature-based solutions and the removal of harmful subsidies are also cost-effective approaches to consider.

III. SUGGESTED RECOMMENDATION

83. The Subsidiary Body on Scientific, Technical and Technological Advice may wish to adopt conclusions along the following lines:

The Subsidiary Body on Scientific, Technical, and Technological Advice

1. *Welcomes* the review of new scientific and technical information on biodiversity and climate change and its implications for the work of the Convention presented in the note by the Executive Secretary[27] and the accompanying information document;[28]

2. *Recommends* that the Open-ended Working Group on the Post-2020 Global Biodiversity Framework takes into account the information contained in these documents;

3. *Also recommends* that the Open-ended Working Group on the Post-2020 Global Biodiversity Framework and Subsidiary Body on Implementation consider opportunities for climate finance to contribute to the support of the implementation of the post-2020 global biodiversity framework.

84. 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 climate change and biodiversity loss are inseparable challenges of unprecedented severity that must be addressed together to achieve the Sustainable Development Goals,

Noting that holding the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels is necessary to reduce biodiversity loss and achieve the 2050 Vision for biodiversity and will require rapid and far-reaching changes in all aspects of society,

Emphasizing that while climate change should primarily be addressed by reducing anthropogenic emissions, that the use of ecosystem-based approaches to climate change adaptation, mitigation and disaster risk reduction is also necessary,

[27] CBD/SBSTTA/23/3.

[28] CBD/SBSTTA/23/INF/1.

Recalling decisions IX/16, X/33, XIII/4, and 14/5, and in particular, the critical role of biodiversity and ecosystem functions and services for climate change adaptation, mitigation and disaster risk reduction,

1. *Takes note* of the review of new scientific and technical information on biodiversity and climate change and its implications for the work of the Convention contained in the note by the Executive Secretary[29] and in the accompanying information document;[30]

2. *Reaffirms* its encouragement to Parties to promote the use of ecosystem-based approaches ("nature-based solutions") to climate change adaptation, mitigation and disaster risk reduction;

3. *Invites* Parties to strengthen their efforts to integrate ecosystem-based approaches into new or updated nationally determined contributions, where appropriate, and when pursuing domestic climate action under the Paris Agreement,[31] including national adaptation plans and other planning processes;

4. *Encourages* Parties, other Governments and relevant organizations, when designing and implementing climate change adaptation and mitigation measures, to identify and minimize potential risks and trade-offs and enhance synergies for biodiversity, making use of existing tools and guidance developed under the Convention on Biological Diversity;

5. *Encourages* Parties, other Governments, funding agencies and the private sector, to scale up investments for ecosystem-based approaches to climate change adaptation, mitigation and disaster risk reduction, including ecosystem restoration, and to make use of opportunities for synergies between biodiversity and climate change financing mechanisms;

6. *Requests* the Executive Secretary, subject to available resources and in collaboration with relevant organizations:

(a) To provide guidance on ways and means to address threats to vulnerable ecosystems impacted by climate change and communities that depend on ecosystem services and functions, including montane regions, polar ecosystems, low-lying islands, coasts and communities;

(b) To support Parties in identifying financing options for ecosystem-based approaches to climate change adaptation, mitigation and disaster risk reduction.

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[29] CBD/SBSTTA/23/3.

[30] CBD/SBSTTA/23/INF/1.

[31] United Nations, *Treaty Series*, Registration No. I-54113.