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OPEN-ENDED WORKING GROUP  
ON THE POST-2020 GLOBAL  
BIODIVERSITY FRAMEWORK  
Third meeting  
Online, 23 August – 3 September 2021

### **ONE-PAGERS ON THE GOALS AND TARGETS OF THE FIRST DRAFT OF THE POST-2020 GLOBAL BIODIVERSITY FRAMEWORK**

*Note by the Executive Secretary*

#### **I. BACKGROUND**

1. The Co-Chairs of the Open-ended Working Group on the Post-2020 Global Biodiversity Framework, with support from the Secretariat have prepared 25 one-pagers as an information supplement to the first draft of the post-2020 global biodiversity framework ([CBD/WG2020/3/3](#)).
2. The one-pagers are intended to assist in enhancing Parties' and stakeholders' understanding of the first draft by providing further information on the components of the four goals and 21 targets of the first draft, the respective indicators under the proposed monitoring framework, and linkages with the objectives of the Convention, other targets contained in the first draft, relevant Sustainable Development Goals, and the transitions to sustainable pathways identified in the fifth edition of the *Global Biodiversity Outlook*.
3. The information contained in these one-pagers draws significantly on the scientific and technical information prepared by the Subsidiary Body on Scientific, Technical and Technological Advice to support the review of the proposed goals and targets in the updated zero draft of the post-2020 global biodiversity framework ([CBD/SBSTTA/24/3/Add.2/Rev.1](#)).

#### **II. ANNEX**

**(starts on next page)**

**Goal A. The integrity of all ecosystems is enhanced, with an increase of at least 15% in the area, connectivity and integrity of natural ecosystems, supporting healthy and resilient populations of all species, the rate of extinctions has been reduced at least tenfold, and the risk of species extinctions across all taxonomic and functional groups, is halved, and genetic diversity of wild and domesticated species is safeguarded, with at least 90% of genetic diversity within all species maintained.**

**Objective:**

Addresses all three levels of biodiversity: ecosystems, species and genetic diversity.

- *Ecosystem diversity:* The area, connectivity and integrity of ecosystems are essential for the protection of species and genetic diversity, ecosystem functioning and for the continued provision of ecosystem services. This will need to be achieved by avoiding further loss of natural ecosystems, where possible, and by reducing current rates of loss. It will further require restoring both converted and degraded ecosystems. Models, scenarios and other studies suggest that an increase in the area of natural ecosystems of the order of 10 to 15 per cent, globally, across all terrestrial ecosystem types, by 2050 may be feasible.<sup>1</sup>

- *Species diversity:* Maintaining, or, where possible, restoring, the diversity of species and ensuring that populations of species are healthy is indispensable to the achievement of the 2050 Vision. Further, conserving species diversity and abundance is essential for the integrity of ecosystems and contributes to the conservation of genetic diversity. Currently, the global species extinction rate is at least tens to hundreds of times higher than the average over the past 10 million years, and the rate is increasing. About 1 million species (or 13 per cent) are currently threatened with extinction, although the extinction risk varies significantly across taxa<sup>2</sup>. It will be necessary to reduce both the extinction rate and the extinction risk (a tenfold reduction is proposed, given that a zero rate is unrealistic and would not account for extinctions due to natural reasons), as well as to maintain or improve the population abundances and the geographical extent of all species.

- *Genetic diversity:* Genetic diversity is critical for the long-term stability, adaptability and resilience of biodiversity, both at the species and ecosystem levels, and also supports the continued provision of Nature’s contributions to people.<sup>3</sup> It is important to safeguard the genetic diversity of both wild, domesticated and other farmed or cultured species. In addition to action to address issues related to the direct drivers of biodiversity loss, species-specific management interventions are critical for the conservation of genetic diversity of many threatened species. The aim is to improve, or at least maintain current levels of genetic diversity by 2030 (maintaining 90% of genetic diversity is proposed), and progressively increase the diversity, abundance and distribution of populations of species thereafter, towards 2050.

<b>Milestones</b>	<b>Component</b>	<b>Indicators (Headline in bold)</b>
<p><b>Milestone A.1</b> Net gain in the area, connectivity and integrity of natural systems of at least 5 per cent.</p> <p><b>Milestone A.2</b> The increase in the extinction rate is halted or reversed, and the extinction risk is reduced by at least 10 per cent, with a decrease in the proportion of species that are threatened, and the abundance and distribution of populations of species is enhanced or at least maintained.</p> <p><b>Milestone A.3</b> Genetic diversity of wild and domesticated species is safeguarded, with an increase in the proportion of species that have at least 90 per cent of their genetic diversity maintained.</p>	<p>A.1 Area of natural ecosystems</p> <p>A.2 Connectivity of natural ecosystems</p> <p>A.3 Integrity of natural ecosystems</p> <p>A.4 Abundance and distribution of populations of species</p> <p>A.5 Species extinction rate</p> <p>A.6 Species extinction risk</p> <p>A.7 Proportion of species that are threatened</p> <p>A.8 Maintenance of genetic diversity</p>	<p><b>A.0.1 Extent of selected natural ecosystems (forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macro algae and intertidal habitats)</b></p> <p><b>A.0.2 Species Habitat Index</b></p> <p><b>A.0.3 Red list index</b></p> <p><b>A.0.4 The proportion of populations maintained within species with genetically effective population size &gt;500</b></p> <p>A.2.1 CMS connectivity indicator (CMS)</p> <p>A.3.1 Ecosystem Integrity Index</p> <p>A.4.1 Species status information index (GEOBON)</p> <p>A.8.1 Proportion of populations maintained within species (GEOBON)</p>

<b>Further explanation of target elements</b>
<b>Extinction rate</b> – Actions to reduce the extinction rate would reduce the number of species threatened with extinction and improve the status of threatened species. Scenarios suggest that it would be feasible to reduce the proportion of species threatened with extinction in the wild by 2030 and aim to reduce extinction risk across all species by 2050. <sup>4</sup>
<b>Linkages</b>
<b>Objectives of the CBD</b> – conservation of biological diversity
<b>Drivers of biodiversity loss</b> – land/sea-use change, direct exploitation, climate change, pollution, invasive species
<b>GBF targets</b> – all targets
<b>Sustainable Development Goals</b> Goal 6: Ensure availability and sustainable management of water and sanitation for all Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
<b>GBO-5 pathways</b> Sustainable freshwater transition; land and forests transition; sustainable fisheries and oceans transition; biodiversity-inclusive one health transition

<sup>1</sup> For example, see Leclère et al. (2020). Bending the curve of terrestrial biodiversity needs an integrated strategy. *Nature*. 585, 551–556 <https://doi.org/10.1038/s41586-020-2705-y>. Strassburg et al (2020). Global priority areas for ecosystem restoration. *Nature* 586:724–729. <https://doi.org/10.1038/s41586-020-2784-9>.

<sup>2</sup> IPBES (2019). *Global Assessment Report on Biodiversity and Ecosystem Services*. IPBES Secretariat, Bonn, Germany. <https://ipbes.net/global-assessment>.

<sup>3</sup> Des Roches et al (2021). Conserving intraspecific variation for nature’s contributions to people. *Nature Ecology and Evolution*. <https://doi.org/10.1038/s41559-021-01403-5>; Stange et al (2021). The importance of genomic variation for biodiversity, ecosystems and people. *Nature Reviews Genetics* 22, 89–105. <https://doi.org/10.1038/s41576-020-00288-7>

<sup>4</sup> For example, see Hannah, et al (2020), 30% land conservation and climate action reduces tropical extinction risk by more than 50%. *Ecography*, 43: 943-953. <https://doi.org/10.1111/ecog.05166>.

**Goal B. Nature's contributions to people are valued, maintained or enhanced through conservation and sustainable use supporting the global development agenda for the benefit of all.**

**Objective:**

Nature's capacity to contribute to people's lives, wellbeing and livelihoods is reliant on the area and integrity of both natural and managed ecosystems and their constituent species, and within-species genetic diversity and between-species phylogenetic diversity. Thus the need to maintain, and where appropriate, enhance nature's contributions to people provides a strong rationale for the conservation and sustainable use of biodiversity. In particular, actions to achieve benefits to people from nature's contributions through ecosystem-based approaches, disaster risk-reduction, sustainable management of wild species, sustainable agricultural ecosystems, regulation of air and water, and urban green spaces, will be critical to the achievement of the 2050 Vision.

<b>Milestones</b>	<b>Component</b>	<b>Indicators (Headline in bold)</b>
<p><b>Milestone B.1</b> Nature and its contributions to people are fully accounted and inform all relevant public and private decisions.</p> <p><b>Milestone B.2</b> The long-term sustainability of all categories of nature's contributions to people is ensured, with those currently in decline restored, contributing to each of the relevant Sustainable Development Goals.</p>	<p>B.1 Nature and its contributions to people are fully accounted for</p> <p>B.2 Long-term sustainability of nature's contributions to people is ensured</p> <p>B.3 Nature's contributions to people in decline restored</p> <p>B.4 Contribution to relevant Sustainable Development Goals</p>	<p><b>B.0.1 National environmental economic accounts of ecosystem services</b></p> <p>B.2.1 Nature's regulating contributions including climate regulation, disaster prevention and other (from the environmental economic accounts)</p> <p>B.3.1 Nature's material contributions including food, water and others (from the environmental economic accounts)</p> <p>B.4.1 Nature's non-material contributions including cultural (from the environmental economic accounts)</p>

**Linkages**

**Objectives of the CBD** – conservation of biological diversity, sustainable use of the components of biological diversity

**GBF targets** – all targets

**Sustainable Development Goals**

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 12: Ensure sustainable consumption and production patterns

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

<p><b>Goal C. The benefits from the utilization of genetic resources are shared fairly and equitably, with a substantial increase in both monetary and non-monetary benefits shared, including for the conservation and sustainable use of biodiversity</b></p>		
<p><b>Objective:</b> The fair and equitable sharing of benefits from the utilization of genetic resources is one of the three objectives of the Convention on Biological Diversity and the primary objective of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization. Benefits generated from the access to and use of genetic resources and/or associated traditional knowledge can contribute to the conservation and sustainable use of biodiversity and can supplement the financial resources required for implementing the 2050 Vision. However, it should be noted that the benefits generated can take various forms, i.e. monetary or non-monetary.</p>		
<p><b>Milestones</b></p>	<p><b>Component</b></p>	<p><b>Indicators (Headline in bold)</b></p>
<p><b>Milestone C.1</b> The share of monetary benefits received by providers, including holders of traditional knowledge, has increased.</p> <p><b>Milestone C.2</b> Non-monetary benefits, such as the participation of providers, including holders of traditional knowledge, in research and development, has increased.</p>	<p>C.1 Monetary benefits received by providers C.2 Non-monetary benefits</p>	<p><b>C.0.1 Amount of monetary benefits (in United States dollars) received by countries from utilization of genetic resources as a result of an ABS agreement, including traditional knowledge</b></p> <p><b>C.0.2 Number of research and development results or publications shared as a result of an ABS agreement</b></p>
<p><b>Linkages</b></p>		
<p><b>Objectives of the CBD</b> – fair and equitable sharing of the benefits arising out of the utilization of genetic resources</p>		
<p><b>GBF targets</b> – T13 access to genetic resources, and fair and equitable sharing of benefits</p>		
<p><b>Sustainable Development Goals</b> Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>		
<p><b>GBO-5 pathways</b> Biodiversity-inclusive one health transition; sustainable food systems transition; sustainable agriculture transition</p>		

**Goal D. The gap between available financial and other means of implementation, and those necessary to achieve the 2050 Vision, is closed.**

**Objective:**

The post-2020 global biodiversity framework will be implemented primarily through activities at the national and subnational level, with supporting actions at the regional and global levels. However, the capacity for implementing the Convention in terms of human, technical and financial resources is limited in many countries, especially in developing countries. Reaching the 2050 Vision for biodiversity will require that the necessary means of implementation are available to enable Parties and stakeholders to undertake the necessary actions. These means of implementation will be required throughout to 2050 at a level commensurate with the ambition of the other goals.

<b>Milestones</b>	<b>Component</b>	<b>Indicators (Headline in bold)</b>
<p><b>Milestone D.1</b> Adequate financial resources to implement the framework are available and deployed, progressively closing the financing gap up to at least US \$700 billion per year by 2030.<sup>5</sup></p> <p><b>Milestone D.2</b> Adequate other means, including capacity-building and development, technical and scientific cooperation and technology transfer to implement the framework to 2030 are available and deployed.</p> <p><b>Milestone D.3</b> Adequate financial and other resources for the period 2030 to 2040 are planned or committed by 2030.</p>	<p>D.1 Close the US\$ 700 billion financial gap</p> <p>D.2 Avoid future costs and increase financial resources</p> <p>D.3 Other means are available and deployed</p> <p>D.4 Financial and other resources are planned or committed</p>	<p><b>D.0.1 Funding for implementation of the global biodiversity framework</b></p> <p><b>D.0.2 Indicator on national biodiversity planning processes and means of implementation</b></p>

**Linkages**

**Objectives of the CBD** – conservation of biological diversity, sustainable use of the components of biological diversity, and fair and equitable sharing of the benefits arising out of the utilization of genetic resources

**GBF targets** – all targets

**Sustainable Development Goals**

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Goal 5: Achieve gender equality and empower all women and girls

Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Goal 10: Reduce inequality within and among countries

Goal 12: Ensure sustainable consumption and production patterns

Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

<sup>5</sup> A proposed increase of US\$200B in financial resources, coupled with a US\$ 500B in reduction in harmful subsidies, will contribute to closing the US\$ 700B financial gap, based on Deutz et al (2020). Financing Nature: closing the global biodiversity financing gap. The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability

<b>Target 1. Ensure that all land and sea areas globally are under integrated biodiversity-inclusive spatial planning addressing land- and sea-use change, retaining existing intact and wilderness areas.</b>	
<b>Objective</b> Land-use and sea-use change are major direct drivers of biodiversity loss. More effective and widespread spatial planning, which accounts for biodiversity and the objectives of the Convention, will be crucial, both in terms of the management of managed ecosystems (whose biotic composition is the result of deliberate alteration by people) and the conservation of intact ecosystems. A plausible pathway towards such an outcome requires that net gain, or at a minimum no net loss, of ecosystems be achieved globally by 2030 through spatial planning and restoration.	
<b>Component</b>	<b>Indicators (headline in bold)</b>
<b>Area under integrated biodiversity-inclusive spatial planning</b> - A method or process for analyzing and allocating the spatial and temporal distribution of activities in a given environment in order to achieve various objectives, including social, ecological and economic objectives. <sup>6</sup>	<b>1.0.1 Percentage of land and seas covered by spatial plans that integrate biodiversity</b>
<b>Retention of existing intact and wilderness areas</b> - Areas with high integrity and biodiversity value, rare or vulnerable ecosystems, those essential for planetary function, and those, which cannot be restored should be avoided.	1.2.1 Priority retention of intact / wilderness areas
<b>Further explanation of target elements</b>	
<b>Land and sea areas</b> – It is understood that land and sea areas include all terrestrial and aquatic ecosystems, including freshwater biomes.	
<b>Land- and sea- use change</b> – Land-use change includes the conversion of land cover (e.g. deforestation or mining), changes in the management of the ecosystem or agro-ecosystem (e.g. through the intensification of agricultural management or forest harvesting) or changes in the spatial configuration of the landscape (e.g. fragmentation of habitats). <sup>7</sup>	
<b>Integrated biodiversity-inclusive spatial planning</b> – i.e. integrating biodiversity considerations.	
<b>Intact and wilderness areas</b> – Natural areas that are undisturbed by significant human activity, free of modern infrastructure and where natural forces and processes predominate. <sup>8</sup>	
<b>Linkages</b>	
<b>Objectives of the CBD</b> – conservation of biological diversity	
<b>Drivers of biodiversity loss</b> – direct exploitation, climate change, pollution and invasive species	
<b>GBF targets</b>	
<b>Reducing threats to biodiversity</b> – T2 ecosystem restoration, T3 protected areas, T8 ecosystem-based approaches	
<b>Meeting people’s needs</b> – T10 managed/productive ecosystems, T11 nature’s contributions to people, T12 green and blue spaces	
<b>Tools and solutions</b> – T20 traditional knowledge & education, T21 equitable participation and rights over resources	
<b>Sustainable Development Goals</b>	
Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
<b>GBO-5 pathways</b>	
Sustainable freshwater transition; land and forests transition; sustainable fisheries and oceans transition	

<sup>6</sup> Metternicht (2017). Land Use and Spatial Planning: Enabling Sustainable Management of Land Resources. Springer Briefs in Earth Sciences.

<sup>7</sup> IPBES. Models of drivers of biodiversity and ecosystem change. <https://ipbes.net/models-drivers-biodiversity-ecosystem-change>

<sup>8</sup> IUCN. Category Ib: Wilderness Area. <https://www.iucn.org/theme/protected-areas/about/protected-area-categories/category-ib-wilderness-area>

**Target 2. Ensure that at least 20 per cent of degraded freshwater, marine and terrestrial ecosystems are under restoration, ensuring connectivity among them and focusing on priority ecosystems.**

**Objective:**

Restoring both converted and degraded ecosystems will be essential to achieve the objective of this target. To reach the 2050 Vision, a significant net increase in both area, connectivity, and integrity of natural ecosystems is needed. A plausible pathway towards such an outcome requires that net gain, or at a minimum no net loss, of ecosystems be achieved globally by 2030 through spatial planning and restoration (20% is suggested as a feasible target based on scientific studies<sup>9</sup>).

**Component:**

**Area of freshwater, marine and terrestrial ecosystems restored** – Restoration may include: (a) restoring converted areas back to natural states; (b) improving the ecological integrity of degraded natural areas; and (c) rehabilitating converted and degraded areas (e.g. degraded agricultural lands) to improve both productivity and integrity.<sup>10</sup>

**Connectivity** – Ecological connectivity is important to maintain the integrity of ecosystems and to allow unimpeded movement of species, within and across ecosystems, and the flow of natural processes.

**Indicators (Headline in bold)**

**2.0.1 Percentage of degraded or converted ecosystems that are under restoration**

2.2.1 Maintenance and restoration of connectivity of natural ecosystems

**Further explanation of target elements**

**Degraded freshwater, marine and terrestrial ecosystems** – Ecosystem degradation can occur either through a loss of biodiversity, ecosystem functions or services. Natural ecosystems are often degraded prior to being transformed. For example, the degradation of marine ecosystems may take the form of changed trophic structures in a marine community, transformation of the soft and hard benthos or artificial reef construction.<sup>11</sup>

**Priority ecosystems** – A recent study demonstrated that ecosystem restoration can be prioritised depending on factors such as biodiversity conservation and climate change mitigation (wetlands and forests) or minimizing costs (arid ecosystems and grasslands). Additional priorities may be converted areas within relatively intact tropical forests and shrublands in South America and Africa.<sup>12</sup>

**Linkages:**

**Objectives of the CBD** – conservation of biological diversity

**Drivers of biodiversity loss** – land/sea-use change, direct exploitation, climate change

**GBF targets**

**Reducing threats to biodiversity** – T1 spatial planning, T3 protected areas, T8 ecosystem-based approaches

**Meeting people’s needs** – T10 managed/productive ecosystems, T11 nature’s contributions to people

**Tools and solutions** – T20 traditional knowledge & education, T21 equitable participation and rights over resources

**Sustainable Development Goals**

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Sustainable freshwater transition; land and forests transition; sustainable fisheries and oceans transition, sustainable agriculture transition; sustainable climate action transition; biodiversity-inclusive one health transition; sustainable food systems transition

<sup>9</sup> One study showed that up to 55 per cent of converted land could be restored while maintaining current agricultural production if existing yield gaps could be closed by 75 per cent, nothing that similar estimates are not currently available for many ecosystems, it was found that restoring 15 per cent of converted lands in priority areas could avoid over 60 per cent of expected extinctions (see Strassburg et al (2020). Global priority areas for ecosystem restoration. *Nature* 586:724–729. <https://doi.org/10.1038/s41586-020-2784-9>).

<sup>10</sup> In decision 14/5, the Conference of the Parties adopted the short-term action plan on ecosystem restoration which could help to inform actions towards the attainment of this proposed target.

<sup>11</sup> See CBD/POST2020/WS/2019/11/3

<sup>12</sup> Strassburg et al (2020). Global priority areas for ecosystem restoration. *Nature*. vol. 586, p. 724–729, <https://doi.org/10.1038/s41586-020-2784-9>

**Target 3. Ensure that at least 30 per cent globally of land areas and of sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved 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.**

**Objective:**

In order to safeguard ecosystem diversity, reduce the rate and risk of extinction and improve species population abundance, as well as maintain and enhance many ecosystem services and nature's contributions to people, protected area and other areas-based conservation measures (OECM) coverage needs to be expanded (the proposed target of 30% is supported by scientific studies<sup>13</sup>) with appropriate prioritization and improved management. However, the importance of focusing on biodiversity outcomes rather than spatial area has to be emphasized, since an increase in coverage alone will not be sufficient.<sup>14</sup> In addition to the coverage and location of protected areas and OECMs, attention also needs to be given to their management effectiveness.

**Component:**

**Area protected and conserved** - A geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives<sup>15</sup>.

**Areas of particular importance for biodiversity protected and conserved** – Includes, for example, Key Biodiversity Areas (sites that contribute significantly to the global persistence of biodiversity).

**Effective management and equitable governance of the systems of protected areas and other area-based conservation measures** - Effective management requires adopting appropriate management objectives and governance systems, adequate and appropriate resourcing and the timely implementation of appropriate management strategies and processes<sup>16</sup> (the IUCN Framework for Assessing Management Effectiveness of Protected Areas provides a consistent basis for evaluating effectiveness). Equitable management refers to ensuring effective participation in decision-making, transparent procedures, access to justice in conflicting situations, and the recognition of the rights and diversity of local people.<sup>17</sup>

**Connectivity within the system of protected areas and other effective area-based conservation measures** - Connectivity (i.e. ecological connectivity) is the unimpeded movement of species and the flow of natural processes that sustain life on Earth. It may thus also refer to continuous ecosystems often connected through ecological corridors.

**Further explanation of target elements**

**Ecologically representative protected areas** - To safeguard biodiversity, it would be necessary to protect areas, which are representative of the various ecosystems found on the planet. The IUCN Global Ecosystem Typology 2.0<sup>18</sup> provides an overview of the diversity of ecosystems and can be used as a tool to ensure that representativeness has been protected.

**Other effective area-based conservation measures (OECMs)** - A geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.<sup>19</sup>

**Wider landscapes and seascapes** - The landscape/seascape level usually combines several ecosystems (agricultural, inland waters, coastal, forest, etc.) and planning at that scale can support decision-making with regard to trade-offs

**Indicators (Headline in bold)**

**3.0.1 Coverage of Protected areas and OECMs (by effectiveness)**

3.2.1 Protected area coverage of key biodiversity areas (SDG 14.5.1 and 15.1.2)

3.3.1 Protected Area Management Effectiveness (PAME) (Protected Planet)

3.4.1 Species Protection Index (GEOBON)

between different elements of sustainability, while taking into account the effects (actual or potential) of management activities on adjacent ecosystems.<sup>20</sup>

### **Linkages**

**Objectives of the CBD** – conservation of biological diversity

**Drivers of biodiversity loss** – land/sea-use change, direct exploitation, climate change

### **GBF targets**

**Reducing threats to biodiversity** – T1 spatial planning, T2 ecosystem restoration, T8 ecosystem-based approaches

**Meeting people’s needs** – T10 managed/productive ecosystems, T11 nature’s contributions to people

**Tools and solutions** – T20 traditional knowledge & education, T21 equitable participation and rights over resources

### **Sustainable Development Goals**

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

### **GBO-5 pathways**

Sustainable freshwater transition, land and forests transition, sustainable fisheries and oceans transition, sustainable climate action transition, biodiversity-inclusive one health transition

<sup>13</sup> Dinerstein, et al (2019), *Op. cit.*; Visconti et al (2019). Protected area targets post-2020. *Science*. 364. eaav6886.

<https://doi.org/10.1126/science.aav6886>; IUCN (2016). Increasing marine protected area coverage for effective marine biodiversity conservation. [https://portals.iucn.org/library/sites/library/files/resrecfiles/WCC\\_2016\\_RES\\_050\\_EN.pdf](https://portals.iucn.org/library/sites/library/files/resrecfiles/WCC_2016_RES_050_EN.pdf); O’Leary et al (2016) Effective Coverage Targets for Ocean Protection. *Conservation Letters*, 9: 398-404. <https://doi.org/10.1111/conl.12247>; Woodley et al (2019). A review of evidence for area-based conservation targets for the post-2020 global biodiversity framework. *PARKS*. 31-46.

<https://doi.org/10.2305/IUCN.CH.2019.PARKS-25-2SW2.en>; Dinerstein et al (2020), A “Global Safety Net” to reverse biodiversity loss and stabilize Earth’s climate. *Science Advances* 6(36) eabb2824. <https://doi.org/10.1126/sciadv.abb2824>; Jones et al (2019). Area requirements to safeguard Earth’s marine species. *One Earth* <https://doi.org/10.1016/j.oneear.2020.01.010>; Hannah, et al (2020), 30% land conservation and climate action reduces tropical extinction risk by more than 50%. *Ecography*, 43: 943-953. <https://doi.org/10.1111/ecog.05166>.

<sup>14</sup> Maxell et al (2020) Area-based conservation in the 21st century. *Nature*, volume 586, pages 217–227. <https://doi.org/10.1038/s41586-020-2773-z>; Pimm et al (2018) How to protect half of Earth to ensure it protects sufficient biodiversity. *Science Advances*. 4 (8). <https://doi.org/10.1126/sciadv.aat2616>

<sup>15</sup> CBD. 2011. Protected areas and the CBD. <https://www.cbd.int/protected/pacbd/>

<sup>16</sup> Hockings et al (2006). *Evaluating Effectiveness: A framework for assessing management effectiveness of protected areas*. 2<sup>nd</sup> edition. IUCN, Gland, Switzerland and Cambridge, UK. xiv + p. 105.

<sup>17</sup> Zafra-Calvo et al (2019). Progress toward Equitably Managed Protected Areas in Aichi Target 11: A Global Survey. *BioScience*. 69 (3) 191–197. <https://doi.org/10.1093/biosci/biy143>

<sup>18</sup> Keith et al (2020). *The IUCN Global Ecosystem Typology 2.0: Descriptive profiles for biomes and ecosystem functional groups*. Gland, Switzerland: IUCN.

<sup>19</sup> CBD. Other Effective Area-based Conservation Measures (OECMs).

[https://www.cbd.int/protected/partnership/vilm/presentations/15\\_oecm\\_mackinnon.pdf](https://www.cbd.int/protected/partnership/vilm/presentations/15_oecm_mackinnon.pdf)

<sup>20</sup> UNEP/CBD/SBSTTA/15/13

**Target 4. Ensure active management actions to enable the recovery and conservation of species and the genetic diversity of wild and domesticated species, including through ex situ conservation, and effectively manage human-wildlife interactions to avoid or reduce human-wildlife conflict.**

**Objective:**

- *Active species management* – Various species-specific management interventions will be needed to ensure the conservation of species, which are threatened or extinct in the wild to achieve the species component of proposed Goal A. This target regroups all species related conservation actions that are not covered in other targets. Active measures have been instrumental in preventing a significant number of bird and mammal extinction in past decades; however, “emergency room” types of interventions will not result in full recovery if the underlying drivers of loss are addressed.<sup>21</sup>
- *Reducing human-wildlife conflict* - Reducing human-wildlife conflict and improving co-existence is important to improve human health and well-being and to reduce threats to wildlife, both intentional and unintentional. It is an essential element of efforts to maintain or reintroduce many keystone species and usually requires targeted management interventions.

<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<b>Conservation and recovery actions</b> – A fully recovered species is one that is viable and that fulfills its ecological roles in the ecosystems throughout its native range. <sup>22</sup> Further, conservation refers to the protection, care, management and maintenance of ecosystems, habitats, wildlife species and populations, within or outside of their natural environments, in order to safeguard the natural conditions for their long-term permanence. <sup>23</sup>	4.1.1 Green Status of Species Index (IUCN)
<b>Genetic diversity</b> – The genetic diversity of wild species provides the variation essential to maintain ecosystem stability and ensure benefits to people, and supports species survival and adaptation, linking explicitly to ecosystems and species.	<b>4.0.2 Number of plant genetic resources for food and agriculture secured in medium or long-term conservation facilities</b>
<b>Wildlife conflict</b> – Human-wildlife conflict is commonly described as conflict occurring between people and wildlife that has an adverse effect on human life, health, well-being, and/or livelihoods. As a result of those actions and threats, humans may damage or eliminate wildlife. These responses can be intentional and unintentional. <sup>24</sup>	<b>4.0.1 Proportion of species populations that are affected by human wildlife conflict</b>

**Further explanation of target elements**

**Active management actions** - Relevant actions related to this aspect of the target include species reintroductions, species recovery actions (such as vaccinations, supplementary feeding, provision of breeding sites, planting and protection of seedlings) and ex situ conservation where needed, including ex situ conservation of genetic resources within species, including for crops and livestock and their wild relatives.

**Ex situ conservation** - The conservation of components of biological diversity outside their natural habitats (e.g. captive breeding).<sup>25</sup>

**Human-wildlife interactions** - Interactions between humans and wildlife that do not necessarily cause conflict, damage or costs to either.

**Linkages**

**Objectives of the CBD** – conservation of biological diversity

**Drivers of biodiversity loss** – land/sea-use change, direct exploitation, climate change, pollution, invasive species

**GBF targets**

**Reducing threats to biodiversity** – T1 spatial planning, T2 ecosystem restoration, T3 protected areas, T5 harvest, trade and use, T6 invasive species, T7 pollution, T8 climate/ecosystem-based approaches

**Meeting people’s needs** – T9 sustainable management of wild species, T10 managed/productive ecosystems, T11 nature’s contributions to people, T12 green and blue spaces

**Tools and solutions** – T20 traditional knowledge, T21 equitable participation and rights over resources

**Sustainable Development Goals**

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

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<sup>21</sup> Bolam et al (2020). Preventing extinctions post-2020 requires recovery actions and transformative change. bioRxiv. doi: <https://doi.org/10.1101/2020.11.09.374314>

<sup>22</sup> IUCN (2018). IUCN proposes new method for measuring species' conservation success. <https://www.iucn.org/news/species/201803/iucn-proposes-new-method-measuring-species%E2%80%99-conservation-success>

<sup>23</sup> IUCN. IUCN Definitions. [https://www.iucn.org/sites/dev/files/iucn-glossary-of-definitions\\_en\\_2021.05.pdf](https://www.iucn.org/sites/dev/files/iucn-glossary-of-definitions_en_2021.05.pdf)

<sup>24</sup> CBD/WG2020/3/3/Add.2

<sup>25</sup> CBD. Article 2. Use of Terms. <https://www.cbd.int/convention/articles/?a=cbd-02>

<b>Target 5. Ensure that the harvesting, trade and use of wild species is sustainable, legal, and safe for human health.</b>	
<b>Objective:</b> The direct exploitation of wild populations of species is the largest direct driver of biodiversity loss in marine ecosystems and the second largest in terrestrial and freshwater ecosystems. Actions to address the legality, sustainability and safety of the use of wild species of fauna and flora need to take place at the point of harvest, landing, during transportation and trade, and at point of final consumption – the latter affecting overall demand. <sup>26</sup> Actions should also respect the customary sustainable use of biodiversity by indigenous peoples and local communities.	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<b>Harvesting, trade and use are sustainable, legal and safe</b> - (explained below)	<b>5.0.1 Proportion of wildlife that is harvested legally and sustainably</b> <b>5.0.2 Proportion of fish stocks within biologically sustainable levels</b>
<b>Further explanation of target elements</b>	
<b>Harvesting</b> - Involves the gathering, catching or hunting of wild species for human uses. <b>Trade and use</b> - Includes the use of wild species for food and non-food purposes, such as for clothing, medicinal, cultural, scientific, recreational and work-related uses, as well as for selling or trading (i.e. selling of dead or living wildlife and/or products derived from them). <b>Wild species</b> - Wild living organisms, including fauna, flora, fungi and bacteria. <b>Legal, sustainable and safe</b> – Implies the harvesting, trade and use of organisms at a rate within the bounds of its capacity for renewal, respects international and national laws and is safe for people and other wildlife (e.g. does not contribute to the spread of pathogens or invasive species).	
<b>Linkages</b>	
<b>Objectives of the CBD</b> – sustainable use of the components of biological diversity	
<b>Drivers of biodiversity loss</b> – direct exploitation	
<b>GBF targets</b> <b>Reducing threats to biodiversity</b> – T3 protected areas, T6 invasive species, T8 ecosystem-based approaches <b>Meeting people’s needs</b> – T9 sustainable management of wild species, T10 managed/productive ecosystems, T11 nature’s contributions to people, T13 access to genetic resources <b>Tools and solutions</b> – T15 businesses, T16 responsible choices, T18 harmful incentives, T20 traditional knowledge, T21 equitable participation and rights over resources	
<b>Sustainable Development Goals</b> Goal 12: Ensure sustainable consumption and production patterns Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
<b>GBO-5 pathways</b> Sustainable fisheries and oceans transition; land and forests transition; sustainable agriculture transition, biodiversity inclusive one health transition, sustainable food systems transition, sustainable food systems transition	

<sup>26</sup> Coad et al (2019) Towards a sustainable, participatory and inclusive wild meat sector. Bogor, Indonesia: CIFOR. <https://doi.org/10.17528/cifor/007046>; Booker (2019) Engaging local communities in tackling illegal wildlife trade: A synthesis of approaches and lessons for best practice. Conservation Science and Practice, 1(5), e26. <https://doi.org/10.1111/csp2.26>; Lavorgna and Sajeve (2020). Studying Illegal Online Trades in Plants: Market Characteristics, Organisational and Behavioural Aspects, and Policing Challenges. European Journal of Criminal Policy and Research. <https://doi.org/10.1007/s10610-020-09447-2>

<p><b>Target 6. Manage pathways for the introduction of invasive alien species, preventing, or reducing their rate of introduction and establishment by at least 50 per cent, and control or eradicate invasive alien species to eliminate or reduce their impacts, focusing on priority species and priority sites.</b></p>	
<p><b>Objective:</b>                  Invasive alien species are one of the main direct drivers of biodiversity loss at the global level, and in some ecosystems, such as many island ecosystems, they are the leading cause of biodiversity decline. Some invasive alien species are also agents of infectious disease. To achieve the 2050 Vision and the proposed Goals of the post-2020 global biodiversity framework, limiting new introductions and eradicating or controlling those invasive alien species that pose a significant risk for threatened species or the provision of ecosystem services will be required.</p>	
<p><b>Component:</b></p>	<p><b>Indicators (Headline in bold)</b></p>
<p><b>Rate of introduction and establishment</b> – A measure of organisms that have been introduced outside their native distribution and which subsequently become established and harmful to the environment, animal or human health, or the economy, compared to the natural occurrence frequency, or that in a different location or at a different time.</p>	<p><b>6.0.1 Rate of invasive alien species spread</b></p>
<p><b>Control or eradicate invasive alien species</b> – Control refers to management measures that are applied to established invasive alien species over the long term that successfully reduce the impacts from the invasive alien species to desired (and measurable) levels. On the other hand, eradicate refers to management measures that are applied to established IAS that remove all individuals from an area, where there is no chance of re-introduction<sup>27</sup>.</p>	
<p><b>Reducing the impact on priority species and priority sites</b> - Refers to minimizing negative impacts, which can, for instance, be achieved through the application of the mitigation hierarchy.<sup>28</sup></p>	<p>6.3.1 Rate of invasive alien species impact (GEOBON)</p>
<p><b>Further explanation of target elements</b></p>	
<p><b>Pathways</b> – Also referred to as vectors, are the means by which alien species are introduced to new environments. The evidence suggests that the highest number of introductions occur through escape, transport-contaminants and intentional release to nature.</p> <p><b>Priority species and sites</b> - Focusing on regions that are particularly vulnerable to invasive species, such as islands and freshwater systems, can result in the largest biodiversity benefits. Similarly, there should be a focus on invasive species that are currently the most harmful, as well those that are predicted to become the most harmful in the future.<sup>29</sup></p>	
<p><b>Linkages</b></p>	
<p><b>Objectives of the CBD</b> – conservation of biological diversity</p>	
<p><b>Drivers of biodiversity loss</b> – land/sea-use change, direct exploitation, climate change</p>	
<p><b>GBF targets</b></p> <p><b>Reducing threats to biodiversity</b> – T2 ecosystem restoration, T4 species recovery, T5 trade, harvest and use, T8 ecosystem-based approaches</p> <p><b>Meeting people’s needs</b> – T9 sustainable management of wild species, T10 managed/productive ecosystems, T11 nature’s contributions to people, T13 access to genetic resources, T17 biotechnology</p> <p><b>Tools and solutions</b> – T20 traditional knowledge &amp; education, T21 equitable participation and rights over resources</p>	
<p><b>Sustainable Development Goals</b></p> <p>Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	

Goal 12: Ensure sustainable consumption and production patterns

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

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<sup>27</sup> Essl et al (2020). The Convention on Biological Diversity (CBD)'s Post-2020 target on invasive alien species – what should it include and how should it be monitored? *NeoBiota* 62: 99-121. <https://doi.org/10.3897/neobiota.62.53972>

<sup>28</sup> Sincaillr et al. The Conservation Hierarchy Underpinning the Post-2020 Biodiversity Framework. <https://www.cbd.int/doc/strategic-plan/Post2020/postsbi/biodiversify1.pdf>

<sup>29</sup> Op. cit. Essl et al (2020).

<b>Target 7. Reduce pollution from all sources to levels that are not harmful to biodiversity and ecosystem functions and human health, including by reducing nutrients lost to the environment by at least half, and pesticides by at least two thirds and eliminating the discharge of plastic waste.</b>	
<b>Objective:</b> Pollution is one of the main drivers of biodiversity loss, and many forms of pollution impact on biodiversity and in various ways. Most pollutants also have negative impacts on human health and some groups, such indigenous peoples and local communities, women, children and people living in vulnerable situations, may be disproportionately affected. To achieve the 2050 Vision and the proposed Goals of the post-2020 global biodiversity framework it will be necessary to reduce substantially levels of pollution, focusing on nutrients, pesticides and plastics, given that they were identified by IPBES as top priorities <sup>30</sup> (other groups of pollutants could become the focus of efforts in subsequent Global Biodiversity Frameworks and eventually all priority pollutants should be addressed by 2050).	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<b>Amount of nutrients leached or lost to the environment<sup>31</sup></b> - Excess nutrients (especially nitrogen and phosphorus), including from the historic and ongoing application of fertilizers, <sup>32</sup> cause eutrophication and “dead zones” in freshwater and coastal areas. It also negatively impacts and affects species composition in terrestrial, freshwater, marine and coastal ecosystems, and contributes to air pollution, climate change and stratospheric ozone depletion. It is proposed to reduce the use of nutrients, such as nitrogen, by half. <sup>33</sup>	<b>7.0.1 Index of coastal eutrophication potential (excess nitrogen and phosphate loading, exported from national boundaries)</b> 7.1.1 Fertilizer use (FAO) 7.1.2 Proportion of domestic and industrial wastewater flow safely treated (SDG 6.3.1)
<b>Amount of pesticides leached or lost to the environment</b> – Pesticide means any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling unwanted live organisms that are harmful to human, crops, or animal health or to the environment, or that can cause damage to human activities.	<b>7.0.3 Pesticide use per area of cropland</b>
<b>Amount of discharge of plastic waste<sup>34</sup></b> - Decades of overuse and a surge in short-lived, single-use plastics, has led to a global, environmental catastrophe. Up to 12 million tonnes of plastics are being swept into the oceans annually. While most plastics are expected to remain intact for decades or centuries after use, those that do erode end up as micro-plastics, consumed by fish and other marine wildlife, making their way into the global food chain.	<b>7.0.2 Plastic debris density</b>
<b>Amount of other pollutants</b> – Can include persistent organic pollutants (POPs), waste water, noise (including underwater noise) and light pollution. For instance, noise and light pollution disrupt the behaviour of many species and in some cases can kill or harm species.	7.4.1 Municipal solid waste collected and managed (SDG 11.6.1) 7.4.2 Underwater noise pollution 7.4.3 Hazardous waste generation (SDG 12.4.2)
<b>Further explanation of target elements</b>	
<b>Not harmful to biodiversity, ecosystem functions and human health</b> – Different metrics will be needed for different types of pollution. As an example, pesticide use can be reduced by between 20-70% without reducing yields or farmer income when following appropriate agronomic practices; <sup>35</sup> in some cases, this will be accompanied by improved yields and/or incomes can, as well as an associated increase in the populations of natural enemies of pests. <sup>36</sup> An ongoing reduction in pollution levels can be expected to improve the natural resilience of ecosystems; overtime achieving the goal of becoming non harmful as this resilience is no longer compromised.	
<b>Linkages</b>	
<b>Objectives of the CBD</b> – conservation of biological diversity	
<b>Drivers of biodiversity loss</b> – land/sea-use change, direct exploitation	

**GBF targets – all targets**

**Sustainable Development Goals**

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 12: Ensure sustainable consumption and production patterns

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

<sup>30</sup> IPBES (2019) Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services. IPBES secretariat, Bonn, Germany;

<sup>31</sup> A valuable resource and ally, the Global Partnership on Nutrient Management (a platform for governments, UN agencies, scientists and the private sector to forge a common agenda, mainstreaming best practices and integrated assessments, so that policy making and investments are effectively ‘nutrient proofed’) has as a primary focus the reduction of excess nutrients. See <http://www.nutrientchallenge.org/>

<sup>32</sup> For example see Van Meter et al (2018) Legacy nitrogen may prevent achievement of water quality goals in the Gulf of Mexico. *Science*, 360(6387), 427-430. <https://doi.org/10.1126/science.aar4462>; and Goyette et al (2018). Low buffering capacity and slow recovery of anthropogenic phosphorus pollution in watersheds. *Nature Geoscience*, 11(12), 921-925. <https://doi.org/10.1038/s41561-018-0238-x>

<sup>33</sup> Sutton et al (2020). The nitrogen decade: mobilizing global action on nitrogen to 2030 and beyond. *One Earth*. <https://doi.org/10.1016/j.oneear.2020.12.016>

<sup>34</sup> UN. Plastics. <https://www.un.org/pga/73/plastics/>; As a valuable resource, prepared by the UNEP, IUCN and the Life Cycle Initiative, on identifying plastic leakage ‘hotspots’, finding their impacts along the entire plastic value chain, and then prioritising actions once these hotspots are identified, see United Nations Environment Programme (2020). National guidance for plastic pollution hotspotting and shaping action - Introduction report. Boucher J.,; M. Zgola, et al. United Nations Environment Programme. Nairobi, Kenya

<sup>35</sup> Lechenet et al (2017). Reducing pesticide use while preserving crop productivity and profitability on arable farms. *Nature Plants* volume 3(17008). <https://doi.org/10.1038/nplants.2017.8>; Vasileiadis et al (2016). Farm- scale evaluation of herbicide band application integrated with inter- row mechanical weeding for maize production in four European regions. *Weed Research* 56(4), 313-322. <https://doi.org/10.1111/wre.12210>; National Research Council. 2003. *Frontiers in Agricultural Research: Food, Health, Environment, and Communities*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/10585>.

<sup>36</sup> Gurr et al (2016) Multi-country evidence that crop diversification promotes ecological intensification of agriculture, *Nature Plants*. doi: 10.1038/nplants.206.14. Settle et al (1996) Managing tropical rice pests through conservation of generalist natural enemies and alternative prey, *Ecology*, 77(7), 1996, pp 1975-1988. Lechenet et al (2017). Reducing pesticide use while preserving crop productivity and profitability on arable farms. *Nature Plants* volume 3(17008). <https://doi.org/10.1038/nplants.2017.8>; Vasileiadis et al (2016). Farm-scale evaluation of herbicide band application integrated with inter- row mechanical weeding for maize production in four European regions. *Weed Research* 56(4), 313-322. <https://doi.org/10.1111/wre.12210>; National Research Council. 2003. *Frontiers in Agricultural Research: Food, Health, Environment, and Communities*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/10585>. Wan et al (2020) multispecies coculture promotes ecological intensification of vegetable production. *Journal of cleaner production* 257 120851. <https://doi.org/10.1016/j.jclepro.2020.120851>.

<p><b>Target 8. Minimize the impact of climate change on biodiversity, contribute to mitigation and adaptation through ecosystem-based approaches, contributing at least 10 GtCO<sub>2</sub>e per year to global mitigation efforts, and ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity.</b></p>	
<p><b>Objective:</b> Climate change, and the associated pressure of ocean acidification, is already impacting biodiversity and is projected as the largest driver of biodiversity loss in the second half of this century. Effective and sustainable climate action, including stringent reductions in the use of fossil fuels, is a prerequisite to slowing and reversing biodiversity loss. Further, a number of ecosystem-based approaches, such as conservation, ecosystem restoration and improved management of agriculture, forestry, fisheries, aquaculture,<sup>37</sup> can contribute to both climate change mitigation and adaptation, while also contributing to biodiversity goals, the provision of ecosystem services and disaster-risk reduction.</p>	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<p><b>Minimize the impact of climate change</b> – while climate change affects all ecosystems, its impacts are particularly harmful to some types of ecosystems, such as coral reefs, mountains and ice-related habitats, because they are range restricted, slow growing or forming, and/or have limited ability to adapt to rising temperatures. A number of ecosystem-based approaches, such as conservation, ecosystem restoration and improved management of agriculture, forestry, fisheries, aquaculture, can contribute to both mitigation and adaptation, while also contributing to biodiversity goals, the provision of ecosystem services and disaster-risk reduction.</p>	<p>8.1.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications that reflect biodiversity (based on information from UNFCCC and SDG 13.2.1)</p>
<p><b>Contribute at least 10 GtCO<sub>2</sub>e to mitigation and adaptation through ecosystem-based approaches</b> – According to the UN Emissions Gap Report 2020, emissions need to be 32 GtCO<sub>2</sub>e lower for the 1.5°C goal to be achieved.<sup>38</sup> Research suggests that nature-based solutions could provide around 30% of the cost-effective mitigation; hence, the proposed target of 10 GtCO<sub>2</sub>e per year.<sup>39</sup></p>	<p><b>8.0.1 National green-house gas inventories from land use and land use change</b> 8.2.1. Total climate regulation services provided by ecosystems by ecosystem type (System of Environmental Economic Accounts)</p>
<p><b>Ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity</b> – Impacts of climate change on biodiversity include, among other things, loss of habitat, change in species behaviours, altered patterns of species movement and increased risk of extinction. These impacts are much greater at 2°C than at 1.5°C above pre-industrial levels. Moreover, climate change impacts undermine ecosystem resilience and thus weaken the contribution of ecosystems to both mitigation and adaptation of climate change.</p>	<p>8.3.1 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030 which include biodiversity (based on SDG 13.2.1)</p>
<p><b>Further explanation of target elements</b></p>	
<p><b>Ecosystem-based approaches</b> – Defined 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. This term may refer to a wide range of ecosystem management activities to increase the resilience and reduce the vulnerability of people and the environment, including to climate change and disasters.</p>	
<p><b>Linkages:</b></p>	
<p><b>Objectives of the CBD</b> – conservation of biological diversity</p>	
<p><b>Drivers of biodiversity loss</b> – land/sea-use change, direct exploitation, invasive species</p>	
<p><b>GBF targets</b> – all targets</p>	
<p><b>Sustainable Development Goals</b> Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	

Goal 6: Ensure availability and sustainable management of water and sanitation for all  
Goal 12: Ensure sustainable consumption and production patterns  
Goal 13: Take urgent action to combat climate change and its impacts  
Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development  
Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

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<sup>37</sup> Froehlich et al (2019). Blue growth potential to mitigate climate change through seaweed offsetting. *Current Biology*, 29(18), 3087-3093. <https://doi.org/10.1016/j.cub.2019.07.041>; Theuerkauf et al (2019). A global spatial analysis reveals where marine aquaculture can benefit nature and people. *PLoS One*, 14(10), e0222282. <https://doi.org/10.1371/journal.pone.0222282>

<sup>38</sup> United Nations Environment Programme (2020). Emissions Gap Report 2020. Nairobi. <https://www.unep.org/emissions-gap-report-2020>

<sup>39</sup> Seddon et al (2019). *Nature-based Solutions in Nationally Determined Contributions: Synthesis and recommendations for enhancing climate ambition and action by 2020*. Gland, Switzerland and Oxford, UK: IUCN and University of Oxford.

<b>Target 9. Ensure benefits, including nutrition, food security, medicines, and livelihoods for people especially for the most vulnerable through sustainable management of wild terrestrial, freshwater and marine species and protecting customary sustainable use by indigenous peoples and local communities.</b>	
<b>Objective:</b> Biodiversity is the source of many goods and services on which human wellbeing depends. The maintenance, in quantity and quality, of the benefits provided by biodiversity offers an important incentive for the conservation and sustainable use of biodiversity. It will not be possible to reach the 2050 Vision if the benefits provided by biodiversity, particularly those related to nutrition, food security livelihoods, health and well-being are not ensured.	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<b>Ensure benefits</b> – Wild terrestrial, freshwater and marine species contribute to human well-being in multiple ways by providing nutrition, food security, medicines, livelihoods, health and well-being. Contributions to food and nutrition are particularly important. For example, globally it is estimated that bushmeat can make up to 85% of protein intake of people living in or near forests, while more than 30 million people are estimated to be reliant on reef-based resources to meet their food, income and livelihood needs. <sup>40</sup>	<b>9.0.1 National environmental-economic accounts of benefits from the use of wild species</b> 9.1.1 Number of people using wild resources for energy, food or culture (including firewood collection, hunting and fishing, gathering, medicinal use, craft making, etc.) 9.1.2 Percentage of the population in traditional employment (ILO) 9.1.3 Spawning stock biomass (related to commercially exploited species)
<b>Further explanation of target elements</b>	
<b>Sustainable management</b> – This will require management that takes into account various uses of biodiversity (both consumptive and non-consumptive), as well as management of the demand for these. <b>Most vulnerable people</b> – includes indigenous peoples and local communities, women, youth, and people living in vulnerable situations (e.g. those living in poverty). <b>Customary sustainable use</b> – refers to indigenous and local systems for the control, use and management of natural resources. Customary use of biological resources includes spiritual, cultural, economic and subsistence functions. <sup>41</sup>	
<b>Linkages</b>	
<b>Objectives of the CBD</b> – sustainable use of the components of biological diversity	
<b>Drivers of biodiversity loss</b> – land/sea-use change, direct exploitation, climate change, pollution, invasive species	
<b>GBF targets</b> <b>Reducing threats to biodiversity</b> – T2 ecosystem restoration, T3 protected areas, T4 species recovery, T5 trade, harvest and use, T6 invasive species, T7 pollution, T8 climate/ecosystem-based approaches <b>Meeting people’s needs</b> – T9 sustainable management of wild species, T10 managed/productive ecosystems, T11 nature’s contributions to people, T13 access to genetic resources <b>Tools and solutions</b> – T14 biodiversity values, T15 businesses, T16 responsible choices, T17 biotechnology, T18 harmful incentives, T20 traditional knowledge & education, T21 equitable participation and rights over resources	
<b>Sustainable Development Goals</b> Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture Goal 6: Ensure availability and sustainable management of water and sanitation for all Goal 12: Ensure sustainable consumption and production patterns Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
<b>GBO-5 pathways</b> Essential for the achievement of all transitions to sustainable pathways identified in GBO-5	

<sup>40</sup> Sumaila (2017) Investments to reverse biodiversity loss are economically beneficial. Current Opinion in Environmental Sustainability. 29, 82-88. <https://doi.org/10.1016/j.cosust.2018.01.007>.

<sup>41</sup> CBD. Quick guide to the Aichi Biodiversity Targets Traditional knowledge respected. <https://www.cbd.int/doc/strategic-plan/targets/T18-quick-guide-en.pdf>

<b>Target 10. Ensure all areas under agriculture, aquaculture and forestry are managed sustainably, in particular through the conservation and sustainable use of biodiversity, increasing the productivity and resilience of these production systems.</b>	
<b>Objective:</b> This target relates to land-use and sea-use change through the use of managed ecosystems, which contribute significantly to habitat loss. To achieve the 2050 Vision and the proposed Goals of the post-2020 global biodiversity framework there is a need to increase the productivity and sustainability of productive land- and sea-scapes, and, in particular, of existing agricultural areas, in order to limit and reduce the demand for land and water resources. <sup>42</sup> Productivity and sustainability can be increased by improving the efficiency of use of land and inputs of water, fertilizers, pesticides and other agrochemicals, including through genetic improvements to crops and livestock, substituting external inputs, and designing or redesigning systems based on agro-ecological approaches. <sup>43</sup> This target focuses specifically on how to enhance biodiversity in agricultural and other managed ecosystems.	
<b>Components:</b>	<b>Indicators (Headline in bold)</b>
<b>Agricultural ecosystems</b> – Land-use change due to the expansion of agriculture is the largest driver of terrestrial biodiversity loss. Further, many agricultural practices, such as intensive tillage, inappropriate or excessive fertilizer and pesticide use, as well as the overuse of antibiotics in livestock tend to reduce biodiversity. However, sustainable agriculture would allow for natural resources to be managed in a way that maintains ecosystem functions to support current, as well as future human needs.	<b>10.0.1 Proportion of agricultural area under productive and sustainable agriculture</b> 10.1.1 Average income of small-scale food producers, by sex and indigenous status (SDG indicator 2.3.2)
<b>Aquaculture</b> – Aquaculture or farming in water is the aquatic equivalent of agriculture or farming on land. Defined broadly, aquaculture covers the farming of both animals (including crustaceans, finfish and molluscs) and plants (including seaweeds and freshwater macrophytes). Aquaculture occurs in both inland (freshwater) and coastal (brackish water, seawater) areas. <sup>44</sup>	<b>10.0.1 (same as above)</b>
<b>Forestry</b> – The science or industry of growing and managing forests. <sup>45</sup> Many of the world's forests and woodlands are not being managed sustainably. Where forest management plans exist, they are frequently limited to ensuring the sustained production of wood and lack sufficient attention to the sustainable production of non-wood products and ecosystem services and the maintenance of social and environmental values. <sup>46</sup>	<b>10.0.2 Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan)</b> 10.3.1 Area of forest under sustainable management: total forest management certification by Forest Stewardship Council and Programme
<b>Further explanation of target elements</b>	
<b>Sustainable use</b> – The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. <sup>47</sup>	
<b>Productivity</b> – Productivity is commonly defined as a ratio of a volume measure of output to a volume measure of input use. <sup>48</sup>	
<b>Resilience</b> – The capacity of a system to recover from stress and disturbance while retaining its essential functions, structure, feedbacks and identity; resilient ecosystems sustain biological diversity and human livelihoods in times of severe and wide-ranging change. <sup>49</sup>	
<b>Linkages</b>	
<b>Objectives of the CBD</b> – sustainable use of the components of biological diversity	

**Drivers of biodiversity loss – land/sea-use change, pollution, invasive species****GBF targets**

**Reducing threats to biodiversity** – T1 spatial planning, T2 ecosystem restoration, T3 protected areas, T4 species recovery, T5 trade, harvest and use, T6 invasive species, T7 pollution (esp. nutrients), T8 climate/ecosystem-based approaches

**Meeting people's needs** – T9 sustainable management of wild species & customary sustainable use, T10 managed/productive ecosystems, T11 nature's contributions to people, T13 access to genetic resources

**Tools and solutions** – T14 biodiversity values, T15 businesses, T16 responsible choices, T17 biotechnology, T18 harmful incentives, T20 traditional knowledge & education, T21 equitable participation and rights over resources

**Sustainable Development Goals**

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture,

Goal 6: Ensure availability and sustainable management of water and sanitation for all,

Goal 12: Ensure sustainable consumption and production patterns,

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development,

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Sustainable freshwater transition, land and forests transition, sustainable fisheries and oceans transition, sustainable agriculture transition, sustainable food systems transition

<sup>42</sup> IPBES (2019) Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services. IPBES secretariat, Bonn, Germany; Leclère et al (2020), Bending the curve of terrestrial biodiversity needs an integrated strategy. *Nature*, volume 585, pp. 551–556. <https://doi.org/10.1038/s41586-020-2705-y>

<sup>43</sup> Altieri et al (2015). Agroecology and the design of climate change-resilient farming systems. *Agronomy for Sustainable Development*. 35, 869–890. <https://doi.org/10.1007/s13593-015-0285-2>; Fischer et al. (2017) Reframing the Food–Biodiversity Challenge. *Trends in Ecology and Evolution* 32:335–345. <https://doi.org/10.1016/j.tree.2017.02.009>; Gliessman (2018) Defining agroecology. *Agroecology and Sustainable Food Systems* 42:599–600. <https://doi.org/10.1080/21683565.2018.1432329>.

<sup>44</sup> FAO. Definitions. Aquaculture. <http://www.fao.org/3/x6941e/x6941e04.htm>

<sup>45</sup> Cambridge Dictionary. <https://dictionary.cambridge.org/dictionary/english/forestry>

<sup>46</sup> FAO. Sustainable forest management. <http://www.fao.org/sustainable-forests-management/en/>

<sup>47</sup> CBD (1992) Article 2. <https://www.cbd.int/convention/articles/?a=cbd-02>

<sup>48</sup> OECD (2001) Defining and Measuring Productivity. <https://www.oecd.org/sdd/productivity-stats/40526851.pdf>

<sup>49</sup> IUCN. Resilience. <https://www.iucn.org/commissions/commission-ecosystem-management/our-work/cems-thematic-groups/resilience>

**Target 11. Maintain and enhance nature's contributions to regulation of air quality, quality and quantity of water, and protection from hazards and extreme events for all people.**

**Objective:**

This target relates to the benefits provided to people in relation to the services provided by ecosystems (or nature's contributions to people, using IPBES categories) and aims to capture regulation services not captured elsewhere in the goals and targets.<sup>50</sup> These ecosystem services underpin the health and well-being of people, therefore safeguarding these ecosystem services is a key element of the 2050 Vision for Biodiversity.

**Component:**

**Indicators (Headline in bold)**

**Air quality** – The World Health Organisation estimated that poor air quality causes between 7 and 8 million premature deaths every year.<sup>51</sup> The regulating services provided by ecosystems include the removal of pollutants by filtering the air and water.<sup>52</sup>

**11.0.1 National environmental-economic accounts of regulation of air quality, quality and quantity of water, and protection from hazards and extreme events for all people, from ecosystems**

11.1.1 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (SDG 11.6.2)

11.1.2 Mortality rate attributed to household and ambient air pollution (SDG indicator 3.9.1)

**Quality and quantity of water** – As the global population grows, so too do the demands for water – for drinking, sanitation, farming and energy production, among many other uses. At the same time, human activity and climate change are disrupting natural water cycles, putting freshwater ecosystems under pressure. Pollution, infrastructure development and resource extraction pose additional challenges.<sup>53</sup>

**11.0.1. (same as above)**

11.2.1 Proportion of bodies of water with good ambient water quality (SDG 6.3.2)

11.2.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) (SDG indicator 3.9.2)

11.2.3 Level of water stress (SDG 6.4.2)

**Protection from hazards and extreme events** – Some estimates suggest that on our current trajectory the degradation of, and unsustainable pressures on, the natural environment and global water resources will put at risk 52% of the world's population, 45% of global gross domestic product and 40% of global grain production.<sup>54</sup>

**11.0.1 (same as above)**

11.2.1. Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population (SDG indicator 11.5.1)

**Further explanation of target elements**

**Maintain and enhance nature's contributions** – The protection and restoration of key ecosystems to address societal needs are sometimes known as “ecosystem-based approaches” and results in the maintenance and enhancement of nature's contributions. Required actions include reducing the direct pressures on the ecosystems that provide services related to the regulation of air quality, hazards and extreme events and quality and quantity of water, and proactive measures to conserve and restore key ecosystems, or to create or recreate green and blue spaces in urban areas.

**Regulation of air quality, quality and quantity of water** – Nature's contributions are provided by key ecosystems, such as forests and wetlands especially in upstream areas, coral reefs, mangroves, kelp forests, and sea-grass beds. As a result, people benefit from services such as the regulation of water flows, prevention of erosion, provision of protection against extreme events through physical barriers, or filtration of pollutants, which in turn result in the regulation of air quality, and quality and quantity of water.

**Linkages**

**Objectives of the CBD** – sustainable use of the components of biological diversity

**Drivers of biodiversity loss** – land/sea-use change, direct exploitation, climate change, pollution

**GBF targets** – all targets

**Reducing threats to biodiversity** – T1 spatial planning, T2 ecosystem restoration, T3 protected areas, T4 species recovery, T5 trade, harvest and use, T6 invasive species, T7 pollution (esp. nutrients), T8 climate/ecosystem-based approaches

**Meeting people's needs** – T9 sustainable management of wild species & customary sustainable use, T10

managed/productive ecosystems, T11 nature's contributions to people, T12 green and blue spaces, T13 access to genetic resources

**Tools and solutions** – T14 biodiversity values, T15 businesses, T16 responsible choices, T17 biotechnology, T18 harmful incentives, T19 means of implementation, T20 traditional knowledge & education, T21 equitable participation and rights over resources

**Sustainable Development Goals**

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

<sup>50</sup> The full list of nature's contributions includes: Habitat creation and maintenance, Pollination and dispersal of seeds, Regulation of air quality, Regulation of climate, Regulation of ocean acidification, Regulation of freshwater quantity, location and timing, Regulation of Freshwater Quality, Formation, protection and decontamination of soils and sediments, Regulation of hazards and extreme events, Regulation of organisms detrimental to humans, Energy, Food and feed, Materials and assistance, Medicinal, biochemical and genetic resources, Learning inspiration, Physical and psychological experiences, Supporting identities, Maintenance of options (see page 346 onwards, IPBES (2019) Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services. IPBES secretariat, Bonn, Germany)

<sup>51</sup> UNEP (2016). Actions on Air Quality. Policies and programmes for improving air quality around the World. <https://www.unep.org/resources/assessment/actions-air-quality>

<sup>52</sup> CBD. Living in harmony with nature. <https://www.cbd.int/undb/media/factsheets/undb-factsheet-ecoserv-en.pdf>

<sup>53</sup> UNEP. About water. <https://www.unep.org/explore-topics/water/about-water>

<sup>54</sup> United Nations World Water Assessment Programme/UN-Water (2019), The United Nations World Water Development Report 2019: Leaving No One Behind. Paris, UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000367306>.

<b>Target 12. Increase the area of, access to, and benefits from green and blue spaces, for human health and well-being in urban areas and other densely populated areas.</b>	
<b>Objective:</b> Green and blue spaces have a range of positive effects on human physical and mental well-being. <sup>55</sup> Further, these spaces can provide important habitat for species, improve habitat connectivity, provide ecosystem services and help mediate extreme events, if managed with such objectives in mind. <sup>56</sup> To achieve the 2050 Vision and the proposed Goals of the post-2020 global biodiversity framework there is a need to increase the area of, access to (including ex-situ transportation), and benefits from green and blue spaces.	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<b>Increase area of green and blue spaces</b>	<b>12.0.1 Average share of the built-up area of cities that is green/blue space for public use for all</b>
<b>Increase the access to and benefits from green and blue spaces</b> – Access to green and blue spaces can be increased by creating such spaces and/or by increasing the area of and access to existing ones. Such increases are then expected to result in increases in the benefits to people. Actions will likely require the direct involvement and participation of city and other subnational authorities, as these entities often have the mandate for the planning and development of urban environments.	12.2.1 National environmental-economic accounts of recreation and cultural services
<b>Further explanation of target elements</b>	
<p><b>Green and blue spaces</b> – areas of vegetation, inland and coastal waters, generally in or near to urban areas. These can have a range of positive effects on human physical and mental well-being and provide connection to nature. Further, green and blue areas provide important habitat for species, improve habitat connectivity, provide ecosystem services and help mediate extreme events, if managed with such objectives in mind.<sup>57</sup></p> <p><b>Human health and well-being</b> – Physical and psychological health and well-being. As an example, the critical importance of urban nature in providing resilience in time of crisis was demonstrated by the COVID-19 pandemic, during which access to green spaces in cities and the countryside has been an important factor in supporting health and well-being while people observe social distancing requirements.</p> <p><b>Urban and other densely populated areas</b> – Generally, access to green and blue spaces is more limited for urban dwellers and those living in densely populated areas. Further, more economically and/or socially marginalized groups often have more limited access to such spaces<sup>58</sup>, requiring specific attention to ensure that their needs are met.</p>	
<b>Linkages</b>	
<b>Objectives of the CBD</b> – sustainable use of the components of biological diversity	
<b>Drivers of biodiversity loss</b> – land/sea-use change, direct exploitation, climate change, pollution, invasive species	
<b>GBF targets</b>	
<b>Reducing threats to biodiversity</b> – T1 spatial planning, T2 ecosystem restoration, T3 protected areas, T4 species recovery, T7 pollution, T8 climate/ecosystem-based approaches	
<b>Meeting people's needs</b> – T11 nature's contributions to people	
<b>Tools and solutions</b> – T14 biodiversity values	
<b>Sustainable Development Goals</b>	
Goal 6: Ensure availability and sustainable management of water and sanitation for all	
Goal 11: Make cities inclusive, safe, resilient and sustainable	
Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
<b>GBO-5 pathways</b>	
Sustainable freshwater transition, land and forests transition, sustainable cities and infrastructure transition, sustainable climate action transition, biodiversity-inclusive one health transition	

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<sup>55</sup> For example, see Tyrväinen et al (2019). Health and well-being from forests – experience from Finnish research. *Santé Publique*, S1(HS1), 249-256. <https://doi.org/10.3917/spub.190.0249>; Wood et al (2018). Not All Green Space Is Created Equal: Biodiversity Predicts Psychological Restorative Benefits From Urban Green Space. *Frontiers in Psychology* 9.

<sup>56</sup> Lepczyk, et al (2017). Biodiversity in the City: Fundamental Questions for Understanding the Ecology of Urban Green Spaces for Biodiversity Conservation. *BioScience*. 67. <https://doi.org/10.1093/biosci/bix079>; Aronson et al (2017). Biodiversity in the city: key challenges for urban green space management. *Frontiers in Ecology and the Environment*. 15.

<sup>57</sup> Op. cit. Lepczyk, et al (2017)

<sup>58</sup> Geary et al (2021). A call to action: Improving urban green spaces to reduce health inequalities exacerbated by COVID-19. *Preventive Medicine*. 145. 106425. <https://doi.org/10.1016/j.ypmed.2021.106425>; Miró et al (2018). Links between ecological and human wealth in drainage ponds in a fast-expanding city, and proposals for design and management. *Landscape and Urban Planning*. 180. 93-102. <https://doi.org/10.1016/j.landurbplan.2018.08.013>.

<p><b>Target 13. Implement measures at global level and in all countries to facilitate access to genetic resources and to ensure the fair and equitable sharing of benefits arising from the use of genetic resources, and as relevant, of associated traditional knowledge, including through mutually agreed terms and prior and informed consent.</b></p>	
<p><b>Objective:</b> The fair and equitable sharing of the benefits arising out of the utilization of genetic resources is one of the three objectives of the Convention on Biological Diversity, further supported by the Nagoya Protocol. Sharing the benefits from the use of genetic resources creates incentives for the conservation and sustainable use of biodiversity and contributes to the creation of a fairer and more equitable economy to support sustainable development.</p>	
<p><b>Component:</b></p>	<p><b>Indicators (Headline in bold)</b></p>
<p><b>Measures to facilitate access to genetic resources ensuring fair and equitable sharing of benefits arising from the use of genetic resources</b> – The main action required is for countries that provide and use genetic resources and associated traditional knowledge to put in place appropriate measures for the access and benefit-sharing of genetic resources and ensure that such measures are applied so that benefit-sharing can be further supported. The issue of digital sequence information related to genetic resources in relation to both access and benefit-sharing is currently being examined under several international instruments and processes. The effectiveness of bilateral and multilateral approaches to benefit sharing is also the subject of analysis and discussion.</p>	<p><b>13.0.1 Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on PIC and MAT</b> 13.1.1. Number of permits or their equivalents for genetic resources (including those related to traditional knowledge) by type of permit</p>
<p><b>Further explanation of target elements</b></p>	
<p><b>Fair and equitable sharing of benefits</b> – Refers to the measures taken to ensure that the benefits arising from the utilization of biodiversity and associated traditional knowledge, as well as the subsequent applications and commercialization, are shared in a fair and equitable way among all those organizations or communities identified as having contributed to resource management, research and development, and/or commercialization.<sup>59</sup>  <b>Associated traditional knowledge</b> – In some cases, access to genetic resources may depend on the traditional knowledge of indigenous peoples and local communities. Access and benefit-sharing rules recognize the value of this knowledge by requiring users to obtain permission to use it, and to share any benefits resulting from its use with the communities who own it.<sup>60</sup>  <b>Mutually agreed terms (MAT)</b> – Mutually agreed terms are an agreement reached between the provider of genetic resources and a user with respect to the conditions of access to genetic resources in the provider country and the benefits to be shared between both parties, further to the commercial or other use of these resources.<sup>61</sup>  <b>Prior and informed consent (PIC)</b> – Permission from the competent national authority, or authorities of the provider country is to be obtained prior to accessing genetic resources, in accordance with national legislation.<sup>62</sup></p>	
<p><b>Linkages</b></p>	
<p><b>Objectives of the CBD</b> – fair and equitable sharing of the benefits arising out of the utilization of genetic resources</p>	
<p><b>GBF targets</b>  <b>Reducing threats to biodiversity</b> – T2 ecosystem restoration, T4 species recovery, T5 trade, harvest and use, T6 invasive species  <b>Meeting people’s needs</b> – T9 sustainable management of wild species &amp; customary sustainable use, T11 nature’s contributions to people  <b>Tools and solutions</b> – T14 biodiversity values, T15 businesses, T17 biotechnology, T20 traditional knowledge &amp; education, T21 equitable participation and rights over resources</p>	
<p><b>Sustainable Development Goals</b> Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	
<p><b>GBO-5 pathways</b> Sustainable food systems transition, biodiversity-inclusive one health transition, sustainable agriculture transition</p>	

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<sup>59</sup> The Union for Ethical BioTrade (2013). Fair and equitable benefit sharing. Manual for the assessment of policies and practices along natural ingredient supply chains. <https://www.cbd.int/abs/submissions/icnp-3/EU-UEBT-Sharing-Manual.pdf>

<sup>60</sup> CBD (2011). Convention on Biological Diversity: ABS. Introduction to access and benefit-sharing.

<https://www.cbd.int/abs/infokit/revised/web/all-files-en.pdf>

<sup>61</sup> CBD. Frequently Asked Questions on Access and Benefit-Sharing (ABS). <https://www.cbd.int/doc/programmes/abs/factsheets/abs-factsheet-faqs-en.pdf>

<sup>62</sup> Ibid.

<b>Target 14. Fully integrate biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts at all levels of government and across all sectors of the economy, ensuring that all activities and financial flows are aligned with biodiversity values.</b>	
<b>Objective:</b> Reaching the goals of the post-2020 global biodiversity framework and the 2050 Vision for Biodiversity will require that biodiversity moves from the periphery of decision-making to become a core consideration in decision and planning processes across government and all sectors of the economy and of society, recognizing the multiple values of biodiversity. There will be a need for greater and more explicit recognition of all biodiversity values in key national strategic policy and planning documents. Progress towards this target will support the attainment of most of the proposed goals and targets of the post-2020 global biodiversity framework.	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<b>Integrate biodiversity values into policies, regulations, planning, development processes and poverty reduction strategies</b> – Biodiversity values include the “intrinsic value of biological diversity, as well as the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its critical role in maintaining ecosystems that provide essential services, which are critical foundations for sustainable development and human well-being” as defined in the UN outcome document “Future We Want”. <sup>63</sup>	<b>14.0.1 Extent to which national targets for integrating biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies and accounts at all levels, ensuring that biodiversity values are mainstreamed across all sectors and integrated into assessments of environmental impacts</b>
<b>Integrate biodiversity into national accounts</b> – Biodiversity is the foundation of economic productivity, prosperity, sustainable development, and ultimately, poverty eradication. Hence, ecosystem services should be incorporated into national accounting systems in order to account for their contribution to the economy.	<b>14.0.2 Integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental-Economic Accounting</b>
<b>Assessments of environmental impacts</b> – Impact assessment is the process of identifying the future consequences of a current or proposed action. It is used to ensure that projects, programmes and policies are economically viable, socially equitable and environmentally sustainable. <sup>64</sup>	14.3.1 Existing legislation for environmental impact assessment
<b>Aligned financial flows with biodiversity values</b> – Refers to aligning financial flows to nature positive outcomes and managing the risks, impacts and dependencies of the operations invested, investing in or financing sectors or business models, which are nature positive and increase opportunities for positive outcomes on the ground, including restoration. <sup>65</sup>	<i>TBC (will align with the Task Force for Nature-related Financial Disclosures)</i>
<b>Further explanation of target elements</b>	
<b>Policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts</b> – The greater and more explicit recognition of all biodiversity values in key national strategic policy and planning documents will need to be supported by the further development and more effective use of instruments or policy tools for addressing biodiversity and ecosystem services and functions in a comprehensive manner within and across different sectors and policy areas. More specific actions to reach this target will include greater efforts to incorporate biodiversity values and considerations into sectoral policies, including policies related to development, forestry, agriculture, fisheries, energy, finance, and other economic sectors; to develop natural capital accounts; to undertake more effective strategic environmental assessments (SEA) and environmental impact assessments (EIA) and to further develop tools, guidelines and methodologies to support institutions in decision-making.	

<b>Linkages</b>
<b>Objectives of the CBD</b> – conservation of biological diversity, and sustainable use of the components of biological diversity
<b>Drivers of biodiversity loss</b> – (all) land/sea-use change, direct exploitation, climate change, pollution, invasive species
<b>GBF targets</b> – all targets
<b>Sustainable Development Goals</b> Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
<b>GBO-5 pathways</b> Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

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<sup>63</sup> UN. Sustainable Development Goals. Paragraph 197 of the Future We Want, Rio+20.

<https://sustainabledevelopment.un.org/unsystem/index.php?page=view&type=5007&menu=32&nr=164&template=924>

<sup>64</sup> COP 6 Decision VI/7

<sup>65</sup> CBD (2021). Financial Sector Guide for the Convention on Biological Diversity KEY ACTIONS FOR NATURE.

<https://www.cbd.int/doc/c/8e24/f151/326b69024f014a8fb9684a8d/cbd-financial-sector-guide-f-en.pdf>

<p><b>Target 15. All businesses (public and private, large, medium and small) assess and report on their dependencies and impacts on biodiversity, from local to global, and progressively reduce negative impacts, by at least half and increase positive impacts, reducing biodiversity-related risks to businesses and moving towards the full sustainability of extraction and production practices, sourcing and supply chains, and use and disposal.</b></p>	
<p><b>Objective:</b>                  Unsustainable production and supply chains used to meet the demand for goods and services globally are one of the main drivers of biodiversity loss and a factor contributing to unsustainable consumption. Reducing the negative impacts on biodiversity from production practices and supply chains will be important in making progress towards the 2050 Vision for Biodiversity.</p>	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<p><b>Businesses assess and report on dependencies and impacts on biodiversity</b> – The profitability of some industries depends directly on the health of ecosystems, for example forestry, fishing, agriculture and ecotourism.<sup>66</sup> A better understanding of the dependencies and impacts of industries on biodiversity, through regular assessment and reporting, can inform better decision-making. The Natural Capital Protocol<sup>67</sup> is one tool that helps businesses identify, measure, value and prioritize their impacts and dependencies on biodiversity and the ecosystem, which ultimately gives businesses new insight into their risks and opportunities.</p>	<p><b>15.0.1 Dependencies and impacts of businesses on biodiversity</b></p>
<p><b>Businesses reduce their negative impacts on biodiversity</b> – Once businesses have assessed and reported on their dependencies and impacts on biodiversity, they will be able to implement alternatives and over time reduce impacts on biodiversity.</p>	<p><b>15.0.1 (same as above)</b></p>
<p><b>Reducing biodiversity-related risks to businesses</b> – Businesses and financial organisations (including banks, insurers and investors) can face important ecological risks because of their biodiversity impacts and dependencies. Such risks are mainly operational risks associated with resource dependency, scarcity and quality. They can be linked to increased raw material or resource costs (e.g. limited natural resources like timber or fresh water), deteriorated supply chains (e.g. because of resource scarcity or more variable production of key natural inputs), or disrupted business operations (CBD, 2019[1]) (Natural Capital Coalition, 2016[2]).<sup>68</sup> Prioritising investments that reduce adverse impacts on biodiversity will, in turn, reduce the risk to businesses, industries and financial organisations over the long-term.</p>	<p><i>TBC (will align with the Task Force for Nature-related Financial Disclosures)</i></p>
<p><b>Move towards the full sustainable extraction and production practices, sourcing and supply chains, and use and disposal</b> – By some estimates, 90 per cent of global biodiversity loss and half of global greenhouse gas emissions can be linked to the extraction and processing of natural resources.<sup>69</sup> The impacts of production systems and supply chains related to food, as well as forestry, are particularly important, though the impacts vary. Extractive industries, energy and infrastructure development also have large impacts. Actions to support and encourage</p>	<p>15.4.1 Ecological footprint                  15.4.2 Recycling rate</p>

<p>more sustainable practices could include the further promotion of environmental impact assessment practices, labelling and certification schemes and/or moratoria, including environmental considerations in trade contracts, policies and agreements and the development and implementation of national, regional and global action plans for productive sectors and associated supply chains<sup>70</sup>.</p>	
<p><b>Linkages</b></p>	
<p><b>Objectives of the CBD</b> – conservation of biological diversity and sustainable use of the components of biological diversity</p>	
<p><b>Drivers of biodiversity loss</b> – (all) land/sea-use change, direct exploitation, climate change, pollution, invasive species</p>	
<p><b>GBF targets</b> – all targets</p>	
<p><b>Sustainable Development Goals</b>            Goal 6: Ensure availability and sustainable management of water and sanitation for all            Goal 12: Ensure sustainable consumption and production patterns            Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development            Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>	
<p><b>GBO-5 pathways</b>            Essential for the achievement of all transitions to sustainable pathways identified in GBO-5</p>	

<sup>66</sup> CBD. 2018. Dependencies and Impacts. <https://www.cbd.int/business/info/bb.shtml>

<sup>67</sup> See Capitals Coalition – The Natural Capital Protocol, [https://capitalscoalition.org/capitals-approach/natural-capital-protocol/?fwp\\_filter\\_tabs=guide\\_supplement](https://capitalscoalition.org/capitals-approach/natural-capital-protocol/?fwp_filter_tabs=guide_supplement)

<sup>68</sup> OECD (2019). Biodiversity: Finance and the Economic and Business Case for Action. Annex A. Biodiversity-related risks to businesses. OECD Publishing. Paris. <https://doi.org/10.1787/a3147942-en>

<sup>69</sup> IRP (2019) Global Resources Outlook 2019: Natural Resources for the Future We Want. A Report of the International Resource Panel. United Nations Environment Programme. Nairobi, Kenya. <https://www.resourcepanel.org/reports/global-resources-outlook>.

<sup>70</sup> The draft long-term approach to mainstreaming, and the associated action plan, contains a strategic action area directly relevant to this target and provides an indicative list of possible actions. For more information see CBD/SBI/3/13 and CBD/SBI/3/13/Add.1.

**Target 16. Ensure that people are encouraged and enabled to make responsible choices and have access to relevant information and alternatives, taking into account cultural preferences, to reduce by at least half the waste and, where relevant the overconsumption, of food and other materials.**

**Objective:**

Unsustainable consumption underlies each of the main direct drivers of biodiversity loss. Reaching the 2050 Vision will require that the use of biological resources does not exceed the capacity of the Earth to generate them. This will necessitate action across society, with governments having a particularly important role to play in creating an enabling environment for actions by the private sector and individuals.

**Component:**

**Indicators (Headline in bold)**

**Reduce waste and overconsumption** – Sustainable consumption patterns can be achieved in two main ways. First, by improving efficiencies and reducing waste from current consumption patterns. Significant efforts are already ongoing to improve efficiencies and reducing waste, including by promoting circular economy approaches; however, the aggregated demand for resources continues to increase, and therefore the impacts of their use remain well above safe ecological limits. Therefore, the second important action will be putting in place measures and tools to reduce the overall demand for resources.

**16.0.1 Food waste index**  
(15.4.2 Recycling rate)

**People have access to relevant information and alternatives** – In addition to various measures and tools, to reduce the overall demand for resources, public access to relevant information and alternatives will be crucial in reducing overconsumption and steering people towards the use of more durable and sustainable goods and materials.

**16.0.2 Material footprint per capita**

**Further explanation of target elements**

**Responsible choices** – Responsible choices are critical for eliminating unsustainable consumption patterns, and begin by ensuring people everywhere understand and appreciate the value of biodiversity.

**Encouraged and enabled** – This could include promoting changes in consumer preferences for the amount and type of resources which are consumed, promoting the use of goods from sustainable sources, support for biodiversity friendly business practices, developing national procurement policies that are in line with the objectives of the Convention on Biological Diversity, and the development of methods to promote science-based information on biodiversity in consumer and producer decisions.

**Linkages**

**Objectives of the CBD** – conservation of biological diversity and sustainable use of the components of biological diversity

**Drivers of biodiversity loss** – (all) land/sea-use change, direct exploitation, climate change, pollution, invasive species

**GBF targets**

**Reducing threats to biodiversity** – T4 species recovery, T5 trade, harvest and use, T6 invasive species, T7 pollution (esp. plastic waste), T8 climate/ecosystem-based approaches

**Meeting people's needs** – T9 sustainable management of wild species & customary sustainable use, T10 managed/productive ecosystems, T11 nature's contributions to people, T12 green and blue spaces

**Tools and solutions** – T14 biodiversity values, T15 businesses, T18 harmful incentives, T19 means of implementation (esp. capacity-building), T20 traditional knowledge & education, T21 equitable participation and rights over resources

**Sustainable Development Goals**

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 12: Ensure sustainable consumption and production patterns

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

<b>Target 17. Establish, strengthen capacity for, and implement measures in all countries to prevent, manage or control potential adverse impacts of biotechnology on biodiversity and human health, reducing the risk of these impacts.</b>	
<b>Objective:</b> The Convention on Biological Diversity requires that Parties, as far as possible and as appropriate, establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology, which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health. To achieve the 2050 Vision, there is a great potential to advance considerations of the issue of biotechnology, including strengthened capacity and improved management to reduce impacts on biodiversity and human health.	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<b>Measures to manage or control potential adverse impacts of biotechnology</b> – The Cartagena Protocol, in Article 16, requires Parties to adopt measures and strategies for preventing adverse effects and for managing and controlling risks identified by risk assessments (Articles 16.1 and 16.2). Parties are also required to take measures to prevent unintentional transboundary movements (Article 16.3); to ensure that Living Modified Organisms (LMOs) undergo appropriate periods of observation prior to use (Article 16.4); and to cooperate in identifying LMOs and their traits that may pose risks, and in taking appropriate management measures (Article 16.5).	<b>17.0.1 Indicator of measures in place to prevent, manage and control potential adverse impacts of biotechnology on biodiversity taking into account human health</b> 17.1.1 Number of countries that carry out scientifically sound risk assessments to support biosafety decision-making 17.1.2 Number of countries that establish and implement risk management measures 17.1.3 Percentage of countries with mechanisms to facilitate the sharing of and access to information on potential adverse impacts of biotechnology on biodiversity and human health 17.1.4 Percentage of counties with systems in place for restoration and compensation of damage to conservation and sustainable use of biological diversity
<b>Further explanation of target elements</b>	
<b>Biotechnology</b> – Under the Convention, “biotechnology” means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use (Article 2 of the Convention). <b>Reducing risk</b> – Biotechnology is a very new field, and much about the interaction of LMOs with various ecosystems is not yet known. Some of the concerns about the new technology include its potential adverse effects on biological diversity, and potential risks to human health. Potential areas of concern might be unintended changes in the competitiveness, virulence, or other characteristics of the target species; the possibility of adverse impacts on non-target species (such as beneficial insects) and ecosystems; the potential for weediness in genetically modified crops (where a plant becomes more invasive than the original, perhaps by transferring its genes to wild relatives); and the stability of inserted genes (the possibilities that a gene will lose its effectiveness or will be re-transferred to another host). <sup>71</sup> Risk assessments are required under the Biosafety Protocol to make decisions on import of LMOs for intentional introduction into the environment in accordance with scientifically sound risk assessments, <sup>72</sup> and can be effective tool to reduce the risks associated with new biotechnologies.	
<b>Linkages</b>	
<b>Objectives of the CBD</b> – conservation of biological diversity and sustainable use of the components of biological diversity and fair and equitable sharing of the benefits arising out of the utilization of genetic resources	
<b>GBF targets</b> <b>Reducing threats to biodiversity</b> – T2 ecosystem restoration, T4 species recovery, T5 trade, harvest and use, T6 invasive species, T7 pollution, T8 climate/ecosystem-based approaches <b>Meeting people’s needs</b> – T9 sustainable management of wild species & customary sustainable use, T10 managed/productive ecosystems, T11 nature’s contributions to people, T13 access to genetic resources <b>Tools and solutions</b> – T14 biodiversity values, T15 businesses, T16 responsible choices, T18 harmful incentives, T20 traditional knowledge & education, T21 equitable participation and rights over resources	
<b>Sustainable Development Goals</b>	

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 12: Ensure sustainable consumption and production patterns

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**GBO-5 pathways**

Biodiversity-inclusive one health transition, sustainable food systems transition, sustainable agriculture transition, land and forests transition; sustainable fisheries and oceans transition

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<sup>71</sup> Frequently Asked Questions (FAQs) on the Cartagena Protocol. [https://bch.cbd.int/protocol/cpb\\_faq.shtml](https://bch.cbd.int/protocol/cpb_faq.shtml)

<sup>72</sup> CBD. Risk Assessment. [http://bch.cbd.int/protocol/cpb\\_art15.shtml](http://bch.cbd.int/protocol/cpb_art15.shtml)

<b>Target 18. Redirect, repurpose, reform or eliminate incentives harmful for biodiversity, in a just and equitable way, reducing them by at least US\$ 500 billion per year, including all of the most harmful subsidies, and ensure that incentives, including public and private economic and regulatory incentives, are either positive or neutral for biodiversity.</b>	
<b>Objective:</b> Harmful incentives, including certain subsidies, are one of the main indirect drivers of biodiversity loss, particularly where they contribute to harmful land-/sea-use, unsustainable consumption and production patterns, overexploitation, pollution and climate change. Substantial and widespread changes to harmful incentives, will be a necessary and critical step to ensure the conservation and sustainable use of biodiversity.	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<b>Redirect, repurpose, reform or eliminate incentives harmful to biodiversity</b> – Financial savings from redirection, repurposing, reform and/or elimination of harmful subsidies has the potential to make resources available for the conservation and sustainable use of biodiversity as well as for other societal objectives.	<b>18.0.1 Value of subsidies and other incentives harmful to biodiversity, that are redirected, repurposed or eliminated</b>
<b>Further explanation of target elements</b>	
<b>Incentives harmful for biodiversity</b> – The value of subsidies that are harmful or potentially harmful to biodiversity is estimated at about US\$ 500 billion per year. <sup>73</sup> The most harmful elements include government support to agriculture and capacity-enhancing subsidies for fishing fleets. <sup>74</sup>	
<b>Incentives positive or neutral for biodiversity</b> – A positive incentive measure is an economic, legal or institutional measure designed to encourage beneficial activities. Positive incentive measures include for instance incentive payments for organic farming, agricultural land set-aside schemes, as well as public or grant-aided land purchases or conservation easements. <sup>75</sup> Further, increasing interest is being given to the concept of payments for ecosystem services.	
<b>Linkages</b>	
<b>Objectives of the CBD</b> – conservation of biological diversity, sustainable use of the components of biological diversity	
<b>Drivers of biodiversity loss</b> – (all) land/sea-use change, direct exploitation, climate change, pollution, invasive species	
<b>GBF targets</b> – all targets	
<b>Sustainable Development Goals</b>	
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture	
Goal 6: Ensure availability and sustainable management of water and sanitation for all	
Goal 12: Ensure sustainable consumption and production patterns	
Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
<b>GBO-5 pathways</b>	
Essential for the achievement of all transitions to sustainable pathways identified in GBO-5	

<sup>73</sup> OECD (2020). A Comprehensive Overview of Global Biodiversity Finance.

<https://www.oecd.org/environment/resources/biodiversity/report-a-comprehensive-overview-of-global-biodiversity-finance.pdf>; Also, see Deutz et al (2020). Financing Nature: closing the global biodiversity financing gap. The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability; and "Biodiversity, natural capital and the economy: A policy guide for finance, economic and environment ministers", *OECD Environment Policy Papers*, No. 26, OECD Publishing, Paris, <https://doi.org/10.1787/1a1ae114-en>.

<sup>74</sup> OECD (2019), Producer and Consumer Support Estimates. OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-pcse-data-en>; Sumaila et al (2019). Updated estimates and analysis of global fisheries subsidies. *Marine Policy*, 109, 103695. <https://doi.org/10.1016/j.marpol.2019.103695>; Deutz et al (2020). Financing Nature: closing the global biodiversity financing gap. The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability; Martini and Innes (2018). Relative Effects of Fisheries Support Policies, *OECD Food, Agriculture and Fisheries Papers*, No. 115, OECD Publishing, Paris, <https://doi.org/10.1787/bd9b0dc3-en>; Martini and Innes (2018), Relative Effects of Fisheries Support Policies, *OECD Food, Agriculture and Fisheries Papers*, No. 115, OECD Publishing, Paris, <https://doi.org/10.1787/bd9b0dc3-en>.

<sup>75</sup> CBD. Positive Incentive Measures. <https://www.cbd.int/incentives/positive.shtml>

**Target 19. Increase financial resources from all sources to at least US\$ 200 billion per year, including new, additional and effective financial resources, increasing by at least US\$ 10 billion per year international financial flows to developing countries, leveraging private finance, and increasing domestic resource mobilization, taking into account national biodiversity finance planning, and strengthen capacity-building and technology transfer and scientific cooperation, to meet the needs for implementation, commensurate with the ambition of the goals and targets of the framework.**

**Objective:**

Lack of financial resources has frequently been noted as a main obstacle to the conservation and sustainable use of biodiversity. Hence, progress towards resource mobilization will have implications for the feasibility of achieving all proposed goals and targets of the post-2020 global biodiversity framework.

**Component:**

**Indicators (Headline in bold)**

**Increase in financial resources from all sources** – A combination of resources will be needed. Additional resources could come from a combination of (a) reducing subsidies and other expenditures causing harm to biodiversity; (b) making use of funds redirected from subsidy reform; (c) generating additional resources from all sources, including domestic and international sources, as well as public and private sources; (d) making use of funds, which also serve other objectives, such as addressing climate change (e) enhancing the effectiveness and efficiency of resource use.

**19.0.1 Official development assistance for biodiversity**  
**19.0.2 Public expenditure and private expenditure on conservation and sustainable use of biodiversity and ecosystems**

**International financial flows to developing countries** – Official development assistance flows are defined as those flows to countries and territories on the DAC List of ODA Recipients and to multilateral development institutions (See OECD<sup>76</sup> for more details).

*(19.0.1 Official development assistance for biodiversity)*

**Capacity building and technology transfer and scientific cooperation** – The need for capacity-building, technology transfer, cooperation and partnerships, has been frequently noted by Parties in their national reports and national biodiversity strategies and action plans. In recent years, a number of initiatives and processes have been established to increase the amount of non-financial resources available to implement the Convention. However, there is currently no global-level synthesis available on the current status and needs for means of implementation for the post-2020 global biodiversity framework, other than finance.

**Further explanation of target elements**

**Leveraging private finance** – Recognizing that the public sector cannot provide all the finance needed, there is a potentially critical role for private sector financing.<sup>77</sup> This can be achieved through improved supply chain sustainability, investment risk management, expanding green financial products and others.

**Increasing domestic resource mobilization** – Governments hold significant power to influence and direct the economy in ways that can both increase certain types of revenue and discourage activities that harm nature. Examples of policies that would create new funding streams include taxes, fees, debt relief, loans, and tariffs.<sup>78</sup>

**Needs for implementation (commensurate with ambition of the goals and targets)** – Determining funding needs for the implementation of the post-2020 global biodiversity framework is challenging given the different methodological approaches exist for estimating financial needs. Recent estimates suggest a funding gap in the order of US\$ 700 billion per year.<sup>79</sup>

<b>Linkages</b>
<b>Objectives of the CBD</b> – conservation of biological diversity, sustainable use of the components of biological diversity, fair and equitable sharing of the benefits arising out of the utilization of genetic resources
<b>Drivers of biodiversity loss</b> – land/sea-use change, direct exploitation, climate change, pollution, invasive species
<b>GBF targets</b> – all targets
<b>Sustainable Development Goals</b> Goal 6: Ensure availability and sustainable management of water and sanitation for all Goal 10: Reduce inequality within and among countries Goal 12: Ensure sustainable consumption and production patterns Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
<b>GBO-5 pathways</b> Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

<sup>76</sup> OECD. Official development assistance – definition and coverage. <https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/officialdevelopmentassistancedefinitionandcoverage.htm>

<sup>77</sup> Deutz et al (2020). Financing Nature: closing the global biodiversity financing gap. The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability

<sup>78</sup> Ibid.

<sup>79</sup> A proposed increase of US\$ 200 billion in financial resources, coupled with a US\$ 500 billion in reduction in harmful subsidies, will contribute to closing the US\$ 700 billion financial gap, based on Deutz et al (2020). Financing Nature: closing the global biodiversity financing gap. The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability

<p><b>Target 20. Ensure that relevant knowledge, including the traditional knowledge, innovations and practices of indigenous peoples and local communities with their free, prior, and informed consent, guides decision-making for the effective management of biodiversity, enabling monitoring, and by promoting awareness, education and research.</b></p>	
<p><b>Objective:</b> Quality and timely biodiversity information is required to identify threats to biodiversity, to determine priority actions for conservation and sustainable use and to determine if such actions are effective. Biodiversity information, including traditional knowledge, will underpin progress towards all of the proposed goals and targets of the post-2020 global biodiversity framework. Similarly, improving public understanding of biodiversity, including awareness of its values, and the steps that can be taken to conserve and use it sustainably, will underpin progress towards the 2050 Vision for Biodiversity.</p>	
<b>Component:</b>	<b>Indicators (Headline in bold)</b>
<p><b>Ensure that relevant knowledge guides decision-making</b> – Despite important advances in recent years, biodiversity information remains limited or absent for many issues. For example, species data is still strongly biased towards animal species, especially birds, and higher plants, and many of the most diverse ecosystems, especially in the tropics, are still greatly underrepresented. Further, there is comparatively more information available on terrestrial ecosystems and species than on freshwater and marine ones. Information related to the open ocean and deep-sea is particularly limited. In addition to these gaps, important challenges remain in terms of the ease of access and use of information, its timeliness and quality. Filling in the knowledge gaps and addressing the access, use, quality and timeliness challenges will be highly relevant to guide decision-making for the effective management of biodiversity.</p>	<p><b>20.0.1 Indicator on biodiversity information and monitoring, including traditional knowledge, for management</b></p>
<p><b>Promoting awareness, education and research</b> – (see below)</p>	<p>20.2.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessments (SDG 4.7.1)</p>
<p><b>Further explanation of target elements</b></p>	
<p><b>Free, prior, and informed consent</b> – A principle meant to ensure that potential users of knowledge, innovations and practices that are held by indigenous peoples and local communities obtain the “free, prior and informed consent” in accordance with national legislation, and that these indigenous peoples and local communities obtain a fair and equitable share of benefits arising from the use and application of such traditional knowledge.<sup>80</sup></p> <p><b>Effective management</b> – Aims to prevent negative impacts on biodiversity, while promoting positive ones (e.g. improved ecosystem resilience and connectivity, improved population growth and genetic diversity for threatened species).</p> <p><b>Monitoring</b> – Refers to the monitoring of the status, trends and threats to biodiversity.</p> <p><b>Awareness</b> – Among the many barriers to achieving the objectives of the Convention on Biological Diversity, and of the other biodiversity-related conventions, lack of public awareness on the importance of biodiversity ranks as one of the most serious. Without an awareness of the fundamental value of biodiversity to human well-being, citizens and stakeholders cannot take the steps needed to mainstream biodiversity considerations into their daily lives and practices. The lack of public awareness also contributes to the relatively low political priority given to biodiversity issues to date.<sup>81</sup></p> <p><b>Education</b> - In 1992, the United Nations Conference on Environment and Development recognized the important role of education and public awareness in the quest to achieve sustainable development. Chapter 36 of the Agenda 21 is</p>	

devoted to promoting education, public awareness and training. Significant progress has been made in developing CEPA capacities through the Global Initiative on Biodiversity Education, which seeks to develop a plan to integrate biodiversity into all levels of formal and non-formal education. More recently, Parties agreed that Education was one of the 10 priority activities for the programme of work on CEPA.<sup>82</sup>

**Research** - Greater support for research and innovation will be required to achieve many targets. This includes research in effort to address major imbalances in the location and taxonomic focus of biodiversity studies and monitoring and to address knowledge gaps related to the consequences of biodiversity loss for people, including indigenous peoples and local communities, women, youth, and people living in vulnerable situations. Further, research and innovation can help us find solutions to many of the challenges we face.

### **Linkages**

**Objectives of the CBD** – conservation of biological diversity, sustainable use of the components of biological diversity, fair and equitable sharing of the benefits arising out of the utilization of genetic resources

**Drivers of biodiversity loss** – land/sea-use change, direct exploitation, climate change, pollution, invasive species

**GBF targets** – all targets

### **Sustainable Development Goals**

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

### **GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

<sup>80</sup> Secretariat of the Convention on Biological Diversity (2019). Mo' otz Kuxtal Voluntary Guidelines for the development of mechanisms, legislation or other appropriate initiatives to ensure the “prior and informed consent”, “free, prior and informed consent” or “approval and involvement”, depending on national circumstances, of indigenous peoples and local communities for accessing their knowledge, innovations and practices, for fair and equitable sharing of benefits arising from the use of their knowledge, innovations and practices relevant for the conservation and sustainable use of biological diversity, and for reporting and preventing unlawful appropriation of traditional knowledge. Montreal, 9 p. (CBD Guidelines Series)

<sup>81</sup> CBD. Aichi Biodiversity Target 1 and CEPA. <https://www.cbd.int/cepa/>

<sup>82</sup> CBD. Education. <https://www.cbd.int/education/>

**Target 21. Ensure equitable and effective participation in decision-making related to biodiversity by indigenous peoples and local communities, and respect their rights over lands, territories and resources, as well as by women and girls, and youth.**

**Objective:**

Reaching the 2050 Vision for Biodiversity will require a whole-of-society approach. It is important that the views, perspectives and experiences of all groups are taken into account in decision-making processes related to biodiversity. This will require equitable participation in decision-making processes, with a view to ensure that indigenous peoples and local communities, women and girls, and youth can effectively shape these decisions and that their rights are respected. Indigenous peoples and local communities, women and youth should be recognized and empowered in their crucial role as leaders and key actors in action towards biodiversity conservation and sustainable use.

**Component:**

**Indigenous people and local communities**

**Women and girls**

**Youth**

**Indigenous people and local communities**

**Women and girls**

**Youth**

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**Indigenous people and local communities**

**Indicators (Headline in bold)**

**21.0.1 Degree to which indigenous peoples and local communities, women and girls as well as youth participate in decision-making related to biodiversity.**

**21.0.2 Land tenure in the traditional territories of indigenous peoples and local communities**

**21.0.1 (same as above)**

**21.0.1 (same as above)**

**Further explanation of target elements**

**Equitable and effective participation in decision-making** – Under article 21.1 of the UN Universal Declaration of Human Rights, “[e]veryone has the right to take part in the government of his country, directly or through freely chosen representatives.”<sup>83</sup>

**Rights over lands, territories and resources** – Under article 26 of the UN Declaration on the Rights of Indigenous Peoples, “[i]ndigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired”.<sup>84</sup>

**Linkages**

**Objectives of the CBD** – conservation of biological diversity, sustainable use of the components of biological diversity, and fair and equitable sharing of the benefits arising out of the utilization of genetic resources

**GBF targets** – all targets. The equitable and effective participation of indigenous peoples, local communities, women and girls, and youth is a precondition to the successful implementation of the entire post-2020 global biodiversity framework.

**Sustainable Development Goals**

Goal 5: Achieve gender equality and empower all women and girls

Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

**GBO-5 pathways**

Essential for the achievement of all transitions to sustainable pathways identified in GBO-5

<sup>83</sup> UN. Universal Declaration of Human Rights. <https://www.un.org/en/about-us/universal-declaration-of-human-rights>

<sup>84</sup> UN. United Nations Declaration on the Rights of Indigenous Peoples. [https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP\\_E\\_web.pdf](https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf)