



## Convention on Biological Diversity

Distr.: General  
2 October 2026  
English only

**Conference of the Parties to the  
Convention on Biological Diversity  
Seventeenth meeting**  
Yerevan, 19–30 October 2026  
Item 18 (a) of the provisional agenda\*  
**Other scientific and technical issues related to the  
implementation of the Kunming-Montreal Global  
Biodiversity Framework: biodiversity and climate change**

### **Expanded supplement to the Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction\*\***

#### **Note by the Secretariat**

1. The present document has been produced as an expanded supplement to the Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction adopted by decision [14/5](#).
2. In paragraph 17 of decision [16/22](#), the Conference of the Parties to the Convention on Biological Diversity requested the Executive Secretary to develop, subject to the availability of resources, a supplement to the Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction providing voluntary guidance and tools based on good practices for the design, effective implementation and scaling up, as appropriate, of nature-based solutions and/or ecosystem-based approaches to climate change mitigation and adaptation to support the implementation of Targets 8 and 11, as well as other related targets, of the Kunming-Montreal Global Biodiversity Framework, where appropriate, consistent with United Nations Environment Assembly resolution 5/5, noting Mother Earth-centric actions, as recognized by some countries, in line with different national circumstances, priorities and capabilities, including updating guidance for fit-for-purpose social and environmental safeguards, based on existing safeguards, for consideration by the Subsidiary Body on Scientific, Technical and Technological Advice before the seventeenth meeting of the Conference of the Parties.
3. The Secretariat of the Convention hired a consultant to prepare a draft supplement, under its guidance. Two online consultation sessions were held on 19 March 2025 to define the structure of the supplement. A technical workshop was hosted by the United Nations Environment Programme World Conservation Monitoring Centre from 7 to 9 May 2025 to review the first draft of the guidelines and provide additional information. Funding for the preparation of the guidelines and the hybrid workshop was generously provided by the Deutsche Gesellschaft für Internationale Zusammenarbeit, the European Union, the Government Canada and SwedBio at the Stockholm Resilience Centre through the Biodiversity and Ecosystem Services Network.

\* CBD/COP/17/1/Rev.1.

\*\* The present document is being issued without formal editing.

4. The Subsidiary Body on Scientific, Technical and Technological Advice, at its twenty-seventh meeting, considered the Primer for Policymakers and, in paragraph 2 of recommendation [27/3](#), requested the Executive Secretary to invite Parties, other Governments, relevant organizations, indigenous peoples and local communities, women and youth organizations, civil society and other observers to participate in a peer review of an updated expanded supplement to the Voluntary Guidelines, including the revised primer for policymakers in the annex to the draft decision below and, following the peer review, to make the further revised primer for policymakers available for consideration by the Conference of the Parties at its seventeenth meeting.
5. The revisions made by the Subsidiary Body were incorporated into the expanded version of the supplement by the Secretariat. The full supplement was subsequently made available for peer review from 22 July to 2 September 2026, to which 14 comments were received from Parties and eight from observer organizations<sup>1</sup> and addressed by the Secretariat.
6. The present document provides the expanded version of the supplement in the annex. It includes the revised primer for policymakers (sect. II) which is consistent with the annex to recommendation [27/3](#) of the Subsidiary Body on Scientific, Technical and Technological Advice, as published in document [CBD/COP/17/2](#), and the updated table 1, as published in document [CBD/COP/17/11](#), supplement (sect. III) and annexes reflecting the outcomes of the peer review.

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<sup>1</sup> Parties: Australia, Canada, Colombia, Germany, Guatemala, Japan, Mexico, New Zealand, Norway, Peru, Philippines, South Africa, Spain, United Kingdom of Great Britain and Northern Ireland. Observers: Fauna and Flora, Food and Agriculture Organization of the United Nations, Imperial College London, International Organization for Migration, International Union for the Conservation of Nature, Pro Silva Europe, World Federation for Animals and International Fund for Animal Welfare (joint submission), Climate and Development Knowledge Network, Global Youth Biodiversity Network, Soka Gakkai Institute, SwedBio at the Stockholm Resilience Centre and Third World Network (joint submission). Available at <https://www.cbd.int/notifications/2026-058>.

## Annex

# Expanded supplement to the Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction

## *Voluntary Guidelines for the design, effective implementation and scaling up of NBSs and/or EBAs with climate change mitigation co-benefits*

### I. Introduction and background

1. The Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction published in 2019 included: (a) a primer for policymakers, offering high-level policy guidance; (b) voluntary guidelines for practitioners, focused on operationalizing ecosystem-based approaches; and (c) a compilation of briefs intended to support outreach into different sectors (SCBD, 2019)<sup>2</sup>.

2. The present supplement closely follows the original structure and is intended to be consulted alongside the original primer for policymakers and voluntary guidelines. It was developed in response to the request in paragraph 17 of decision [16/22](#), which is focused on guidance and tools based on good practices for the design, effective implementation and scaling up of nature-based solutions and ecosystem-based approaches, with a particular focus on fit-for-purpose safeguards and the other topics highlighted in the decision. The aim of the supplement is to add to the existing Voluntary Guidelines, with minimal repetition, while remaining a readable document. As the Voluntary Guidelines already cover ecosystem-based approaches to adaptation and disaster risk reduction, the supplement provides a stronger coverage of the use of nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits, while safeguarding biodiversity and ecosystem integrity.

3. The present supplement was initially prepared through consultation with a range of representatives of Parties, United Nations entities, international organizations and representatives of indigenous peoples and local communities, women and youth through two online consultation sessions (both held on 19 March 2025)<sup>3</sup> and a three-day hybrid technical workshop (7–9 May 2025)<sup>4</sup> hosted by the United Nations Environment Programme World Conservation Monitoring Centre. The consultation sessions and the workshop were attended by experts and practitioners from a wide range of countries and organizations, ensuring a geographically balanced representation. Funding for the preparation of the supplement and the technical workshop was generously provided by the Deutsche Gesellschaft für Internationale Zusammenarbeit, the European Union, the Government of Canada and SwedBio at the Stockholm Resilience Centre through the Biodiversity and Ecosystem Services Network. The primer for policymakers was revised by the Subsidiary Body at its twenty-seventh meeting in October 2025. The present expanded supplement is intended to reflect the revisions made to the primer for policymakers by the Subsidiary Body on Scientific, Technical and Technological Advice at its twenty-seventh meeting, as contained in the annex to recommendation [27/3](#) and the outcomes of a peer review process.

<sup>2</sup> Secretariat of the Convention on Biological Diversity (2019). Voluntary guidelines for the design and effective implementation of ecosystem-based approaches to climate change adaptation and disaster risk reduction and supplementary information. Technical Series No. 93. Montreal, 156 pages. <https://www.cbd.int/doc/publications/cbd-ts-93-en.pdf>

<sup>3</sup> See [www.cbd.int/meetings/CC-OM-2025-02](http://www.cbd.int/meetings/CC-OM-2025-02).

<sup>4</sup> See [www.cbd.int/meetings/CC-WS-2025-01](http://www.cbd.int/meetings/CC-WS-2025-01).

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## II. Primer for policymakers<sup>5</sup>

### A. Introduction

1. Nature-based solutions and/or ecosystem-based approaches form part of effective and coherent responses to interdependent crises, including biodiversity loss, climate change and disaster risk.<sup>6</sup> They are recognized as actions that can be taken to tackle societal, economic and environmental challenges under, inter alia, the Convention on Biological Diversity,<sup>7</sup> the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa,<sup>8</sup> the United Nations Framework Convention on Climate Change,<sup>9</sup> the United Nations Environment Assembly, the United Nations Office for Disaster Risk Reduction, the Intergovernmental Panel on Climate Change, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, the United Nations Convention on the Law of the Sea,<sup>10</sup> UN-Oceans, UN-Energy, UN-Water and the Group of Experts of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects. When well designed, they can support resilience and restore ecological integrity while advancing efforts towards sustainable development.

2. The Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction were adopted at the fourteenth meeting of the Conference of the Parties, in 2018.<sup>11</sup> A more detailed version was published in 2019 as *CBD Technical Series No. 93*. They provide clear guidance on how to integrate ecosystem-based approaches into climate change adaptation and disaster risk reduction effectively. Much of the guidance, including the principles and safeguards, may also be applicable to climate change mitigation and other social, economic and environmental challenges. Since 2019, there have been substantial developments in international policy and scientific understanding, notably the adoption of the Kunming-Montreal Global Biodiversity Framework<sup>12</sup> in 2022. The present supplement is aimed at complementing the Voluntary Guidelines and relevant decisions,<sup>13</sup> responding to the new developments and paying particular attention to implementing safeguards for climate change mitigation in line with Target 8 of the Framework, which is not covered in the Voluntary Guidelines.

3. In its resolution 5/5 of 2 March 2022, the United Nations Environment Assembly defined nature-based solutions as actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems that address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits.

4. Ecosystem-based mitigation can be understood as actions that protect, conserve, restore or sustainably use and manage natural or modified ecosystems for their carbon storage and sequestration service, to aid climate change mitigation by reducing greenhouse gas emissions and enhance carbon removals from the atmosphere and to deliver benefits for biodiversity. In decision [X/33](#) of 29 October 2010, Parties and other actors were invited to follow specific guidance for various ecosystems.

### B. Key messages

5. Nature-based solutions and/or ecosystem-based approaches provide many tangible benefits that directly support the achievement of global environmental, climate and development goals and targets, including Targets 8 (on minimizing the impacts of climate change and climate action on biodiversity and

<sup>5</sup> This version of the primer for policymakers is taken directly from the annex to [CBD/SBSTTA/REC/27/3](#).

<sup>6</sup> Decision [X/33](#) on biodiversity and climate change contains guidance for Parties on the implementation of ecosystem-based approaches for climate change mitigation and adaptation.

<sup>7</sup> United Nations, *Treaty Series*, vol. 1760, No. 30619.

<sup>8</sup> *Ibid.*, vol. 1954, No. 33480.

<sup>9</sup> *Ibid.*, vol. 1771, No. 30822.

<sup>10</sup> *Ibid.*, vol. 1833, No. 31363.

<sup>11</sup> Decision [14/5](#), annex.

<sup>12</sup> Decision [15/4](#), annex.

<sup>13</sup> Decisions [XII/20](#), [14/5](#), [15/4](#) and [16/22](#).

building resilience) and 11 (on restoring, maintaining and enhancing nature's contributions to people) of the Framework. The effective implementation of those approaches can enhance synergies across the Rio conventions, as well as other environmental and social priorities, including those of the biodiversity-related multilateral environmental agreements and the Sustainable Development Goals.

6. Embedding nature-based solutions and/or ecosystem-based approaches into climate action policies, strategies and budgets, where relevant, can enhance policy coherence. Strategies that are ambitious, rights-based, gender-responsive and long-term in vision can help to ensure the continued central contribution of ecosystem health and integrity to resilience, low carbon economies and just transition, while increasing equity.

7. Fit-for-purpose social and environmental safeguards, including frameworks for implementing and monitoring them, would promote the multiple benefits for biodiversity, ecosystem services, resilience and human well-being offered by nature-based solutions and/or ecosystem-based approaches, while avoiding or minimizing social and environmental risks. Safeguards for climate change mitigation actions should be consistent with decisions taken by the United Nations Framework Convention on Climate Change and the Paris Agreement.<sup>14</sup>

8. Nature-based solutions and/or ecosystem-based approaches are most effective when they deliver across multiple objectives, and there is whole-of-government and whole-of-society participation, including broad and sustained engagement and support from indigenous peoples and local communities, scientists and stakeholders. Such planning, design, implementation, governance and monitoring efforts will help to ensure success in delivering benefits for both biodiversity and climate. This is most effective when the multiple benefits and services across various timescales and for different actors or sectors is properly identified and quantified. It is also important to ensure that benefits for biodiversity take into account natural ecosystem integrity and functions. In addition, they need to be grounded in evidence-based decision-making, including scientific knowledge, and in respect for diverse world views and knowledge systems. Inclusive, rights-based design and governance are built on key principles, such as free, prior and informed consent,<sup>15</sup> gender equality and respect for traditional knowledge, cultures and practices. Adaptive monitoring frameworks will support ownership, transparency and long-term impact.

9. The Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction and the present supplement could be usefully complemented by regionally and culturally tailored toolkits, which may be ecosystem- or sector-specific. User-friendly, actionable toolkits could offer guidance on various topics, such as safeguards, design standards, co-benefit evaluation and institutional readiness.

### **C. Principles and safeguards**

10. The Voluntary Guidelines are underpinned by a set of 10 principles and nine safeguards. The principles serve as high-level standards to guide planning and implementation. They are framed as actions that promote: (a) resilience and adaptive capacity; (b) inclusivity and equity; (c) success on multiple scales; and (d) effectiveness and efficiency. The safeguards are aimed at preventing harm to people and to nature, facilitating transparency and promoting multiple benefits. The existing principles and safeguards, designed primarily for ecosystem-based adaptation and disaster risk reduction, are also broadly applicable to nature-based solutions and/or ecosystem-based approaches that can provide climate change mitigation co-benefits.

11. The present supplement updates the guidance on fit-for-purpose social and environmental safeguards by integrating some additional principles and safeguards for ensuring benefits for biodiversity from nature-based solutions and/or ecosystem-based approaches focused on climate change mitigation, in particular to deliver biodiversity benefits and to strengthen the safeguards for indigenous peoples and local communities, women and youth.

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<sup>14</sup> United Nations, *Treaty Series*, vol. 3156, No. 54113.

<sup>15</sup> "Free, prior and informed consent" refers to the tripartite terminology of "prior and informed consent", "free, prior and informed consent" and "approval and involvement".

12. Together, the principles and safeguards are an essential part of the inclusive, participative approaches to design and implementation described throughout the present text. These existing biodiversity principles and safeguards<sup>16</sup> apply to all stages of project design.

13. The principles and safeguards outlined in the present section provide a facilitative and flexible approach to the implementation of nature-based solutions and/or ecosystem-based approaches, while acknowledging that countries may wish to adapt those standards in accordance with their levels of development, priorities and circumstances. Nothing in the present Guidelines should be understood as modifying the rights and obligations of Parties under the Convention or any other international agreement.

## **1. Additional principles and safeguards for ensuring benefits for biodiversity from climate change mitigation**

14. When climate change mitigation is a key objective, additional principles and safeguards are necessary to ensure that the actions to be undertaken meet both adaptation and nature goals and avoid contradictions. Where countries follow these voluntary principles and safeguards, they should ensure alignment with their commitments under the United Nations Framework Convention on Climate Change and the Paris Agreement, including agreement relating to the implementation of Article 6 of the Agreement. While noting that international carbon market rules are set under said Article 6, the additions are focused on multiple benefits, with an emphasis on biodiversity and ecological integrity. The additional principles and safeguards for climate change mitigation relevant to both climate and nature goals are focused on multiple benefits, urgency, mitigation hierarchy, additionality, permanence and leakage. The table below includes descriptions of each of those principles, as well as potential safeguards.

## **2. Strengthening safeguards for indigenous peoples and local communities, women and youth**

15. Building on the principles and safeguards laid out in the Voluntary Guidelines, and consistent with section C of the Framework, the following areas deserve further attention:

(a) *Respect for different value systems.* Nature embodies different concepts for different people, including biodiversity, ecosystems, Mother Earth and systems of life. Nature's contributions to people also embody different concepts, such as ecosystem goods and services and nature's gifts. The Framework recognizes and considers diverse value systems and concepts that nature embodies, including biodiversity, ecosystems, Mother Earth, and systems of life. For example, nature itself is assigned an intrinsic value and rights, including within legal frameworks, for example, in countries that recognize a Mother Earth-centric world view.<sup>17,18</sup> This understanding is rooted in a common indigenous perspective that sees humans as part of nature and does not privilege them above other parts of an ecosystem. While existing safeguards, frameworks and standards often address the rights and traditional knowledge of indigenous peoples and local communities, they do not directly address all value systems, such as Mother Earth-centric world views. This aspect could be further developed, as appropriate, in diverse national contexts and in ways that are supportive of human rights and consistent with different national legislation and international obligations and principles of international law;

(b) *Respect for human rights.* Human rights-based approaches are essential to the legitimacy, integrity and effectiveness of nature-based solutions and/or ecosystem-based approaches. This is already embedded in the existing safeguards, but further strengthening in line with the Framework is recommended. Safeguarding the right of indigenous peoples to participate in governance structures and decision-making pertaining to nature-based solutions and/or ecosystem-based approaches that affect them is essential. Ensuring transparency, building trust and supporting flexible, inclusive implementation are also critical to

<sup>16</sup> I.e. applying environmental impact assessments at the earliest stages of project design and robust monitoring and evaluation systems; preventing the transfer of risks and impacts; avoiding degradation of natural habitats, loss of biodiversity, the introduction of invasive species and the creation or exacerbation of vulnerabilities to future disasters; promoting and enhancing biodiversity and ecosystem functions and services; and aiming for sustainable resource use while not enhancing the drivers of climate change and disaster risks.

<sup>17</sup> Cristina Espinosa, "The advocacy of the previously inconceivable: a discourse analysis of the Universal Declaration of the Rights of Mother Earth at Rio+20", *The Journal of Environment and Development*, vol. 23, No. 4 (December 2014).

<sup>18</sup> Haydn Washington and others, "Why ecocentrism is the key pathway to sustainability", *The Ecological Citizen*, vol. 1, No. 1 (2017).

successful scaling up. To address concerns around the recognition of the multiple values of nature and the distribution of benefits and burdens, the rights of indigenous peoples and local communities should be fully integrated into project design, implementation and governance. This will involve giving attention to free, prior and informed consent. It will also include attention to customary rights, cultural protection, participatory decision-making, participatory implementation, transparent communication and equitable benefit-sharing. Wherever solutions that would affect existing rights holders are proposed, the guidance outlined in the present supplement is relevant. Furthermore, advancing gender equality and the fulfilment of women's rights are fundamental for the effective and equitable implementation of nature-based solutions and/or ecosystem-based approaches.

#### **D. Overarching considerations**

16. The considerations below are intended to complement those presented in the Voluntary Guidelines in relation to the stepwise approach to design and implementation.

17. Good practices for the scaling-up of nature-based solutions and/or ecosystem-based approaches to climate change mitigation, adaptation and disaster risk reduction include:<sup>19,20</sup>

- (a) Identifying the costs and benefits (social, environmental and economic) of different approaches in different contexts, including over various timescales or for different actors;
- (b) Addressing factors that enable success and the barriers to scaling, through systematic monitoring, evaluation and reporting on effectiveness and efficiency;
- (c) Adopting integrated approaches for scaling up, aligning policies, incentives, finance and safeguard measures, and including regional planning;
- (d) Applying fit-for-purpose safeguards, standards and guidelines;
- (e) Enabling effective locally led actions, scaling up and coordinating existing local initiatives, with safeguards tailored to risks and settings, in the application of the precautionary approach;
- (f) Applying evidence-based decision-making and recognizing science as a driver of nature-based solutions and/or ecosystem-based approaches;
- (g) Integrating traditional knowledge and the efforts of indigenous peoples and local communities.

#### **(a) Recognizing and respecting traditional knowledge and the efforts of indigenous peoples and local communities**

18. Recognizing and respecting traditional knowledge, innovations and practices and valuing the efforts of indigenous peoples and local communities are crucial for the successful design, implementation and scaling up of nature-based solutions and/or ecosystem-based approaches. Key actions include:

- (a) The full, equitable, inclusive, effective and gender-responsive representation and participation of indigenous peoples and local communities, women and youth at the design stage and throughout project implementation, ensuring the co-creation of actions to be taken and enabling ownership at the local level. This may be facilitated by developing or amending policy and legislative frameworks that enable the full and effective participation of indigenous peoples and local communities, as well as facilitating their efforts to address climate change and biodiversity loss. This consideration builds upon principle 4 of the Voluntary Guidelines;
- (b) Addressing land tenure rights and access to natural resources and recognizing the role of indigenous peoples and local communities in managing biodiversity and ecosystem services. Many indigenous peoples and local communities face unclear and unrecognized tenure despite having customary land- or sea-use rights, which undermines their ability to implement actions that address biodiversity and climate concerns

<sup>19</sup> United Nations Environment Programme, *Nature-based Solutions: Opportunities and Challenges for Scaling Up* (Nairobi, 2022).

<sup>20</sup> European Environment Agency, *Scaling Nature-based Solutions for Climate Resilience and Nature Restoration* (Publications Office of the European Union, 2023).

and build resilience within their traditional territories. If the issue is left unaddressed, outside interventions can exacerbate land dispossession<sup>21</sup> or create uncertainty about land ownership. These considerations build upon safeguard 9 of the Voluntary Guidelines;

(c) Building bridges between different science and knowledge systems on the basis of best practices in existing forums, such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Much traditional knowledge is passed on orally and is context-specific. For this reason, care and attention to data sovereignty must be exercised when including such knowledge alongside scientific findings.<sup>22</sup> Data sovereignty policies can provide frameworks that Parties should use for the ethical use of data to advance collective indigenous well-being, and to prevent the unlawful use of traditional knowledge associated with genetic resources.<sup>23</sup>

## **(b) Mainstreaming nature-based solutions and/or ecosystem-based approaches**

19. Nature-based solutions and/or ecosystem-based approaches can only deliver their full transformative potential when mainstreamed into appropriate governance and policy frameworks and underpinned by inclusive planning, monitoring and transparency systems. When operationalizing the Framework, governments at all levels can ensure that the approaches are embedded through coherent land- and sea-use planning, as appropriate, climate-biodiversity budget alignment and spatial strategies. Many Governments have implemented programmes and frameworks to deliver nature-based solutions and/or ecosystem-based approaches with climate change mitigation benefits, for example, by reducing emissions from deforestation and forest degradation in developing countries (REDD-plus), from which lessons can be learned. Governments can, and increasingly do, integrate these approaches into national biodiversity strategies and action plans, voluntary land degradation neutrality targets, national adaptation plans and nationally determined contributions, also with a view to fostering collaboration and integrated policy and planning approaches across the Rio conventions in a manner consistent with national circumstance and priorities. Enhanced collaboration among the responsible ministries will help to leverage synergies, ensure alignment across different programmes or frameworks and avoid the duplication of efforts.

## **(c) Raising awareness and building capacity**

20. Communicating the multiple benefits of nature-based solutions and/or ecosystem-based approaches to a wide audience is crucial to uptake and sustainability. It is also essential to opening avenues for funding. Understanding the information and communication needs of diverse stakeholder groups will help to ensure effective outreach, build a common knowledge base, raise awareness and strengthen capacities in accordance with the long-term strategic framework for capacity-building and development.<sup>24</sup> Many organizations, partnerships, initiatives and coalitions are working on awareness-raising and capacity-building or on offering platforms for knowledge exchange.<sup>25</sup>

## **E. Stepwise approach to design and implementation**

21. The Voluntary Guidelines provide a stepwise approach designed for adaptation and disaster risk reduction objectives. Some additional considerations for each step, including for initiatives towards climate change mitigation, are highlighted below.

<sup>21</sup> Laura Notess and others, *The Scramble for Land Rights: Reducing Inequity between Communities and Companies* (Washington, D.C., World Resources Institute, 2018).

<sup>22</sup> See [www.gida-global.org/care](http://www.gida-global.org/care).

<sup>23</sup> Stephanie Russo Carroll, Tahu Kukutai and Maggie Walter, "Indigenous data sovereignty" in *The Indigenous World 2021*, 35th edition, Dwayne Mamo and others, eds., (International Work Group for Indigenous Affairs, 2021).

<sup>24</sup> Decision 15/8, annex I.

<sup>25</sup> Initiatives such as the National Biodiversity Strategy and Action Plan Accelerator Partnership, the Nationally Determined Contributions Partnership, the National Adaptation Plan Global Network, the Enhancing Nature-based Solutions for an Accelerated Climate Transformation Partnership, the Friends of Ecosystem-based Adaptation network and the Partnership for Environment and Disaster Risk Reduction, as well as their respective members, facilitate capacity-building, in particular for developing countries, and help to increase awareness and understanding of the impacts of climate change on biodiversity, including by sharing lessons learned from the implementation of nature-based solutions and/or ecosystem-based approaches.

**Step A: understanding the social-ecological system**

22. It is important to explore several issues when defining the challenge to be tackled and setting objectives for a new initiative, as outlined below:

(a) The history of the target social-ecological system, the drivers of ecosystem change and the rate of greenhouse gas emissions from ecosystem loss or degradation must be identified. Furthermore, the impact of future climate scenarios on the rate of ecosystem change and subsequent greenhouse gas emission should also be considered. Such an assessment will feed into an estimate of emission reductions and removals from possible activities that will be undertaken under step D;

(b) With regard to the social context, the dependence of local jobs, industries, livelihoods and cultures on natural and managed ecosystems, the destruction of ecosystems, barriers to ecosystem restoration and the aspirations of the local population must all be considered;

(c) It is necessary to identify how and with whom the benefits would need to be shared, including through any use of domestic or international market or non-market approaches. In addition, the carbon rights and land and sea tenure must be recognized and respected, as appropriate, as well as the local attitudes towards payments for ecosystem services.

**Step B: assessing vulnerabilities and risks**

23. Step B is focused on the vulnerability of nature and people to climate change and risk to hazardous events. Engaging early with traditional knowledge holders and including their knowledge into climate vulnerability and risk assessments, with full respect for knowledge and data sovereignty, are essential.

24. Social and environmental safeguards are crucial tools to supporting the understanding and reduction of risks. Environmental safeguards include addressing the risk of negative impacts of climate change mitigation measures on biodiversity, including ecosystem integrity, the risk of reversals of emission reductions and removals that may result from extreme events or slower onset climate impacts.

**Step C: identifying options for nature-based solutions and/or ecosystem-based approaches**

25. To reflect the Framework, step C will need to accommodate effective, equitable and scalable nature-based solutions and/or ecosystem-based approaches. The potential barriers to effectiveness and the multiple benefits derived from and the wider impacts of each envisaged option should be identified. Key actions for identifying climate change mitigation options specifically could involve: (a) identifying broad options for action, based on step A; (b) exploring specific options selected in similar geographical areas (e.g. through case studies); (c) working with the multi-stakeholder group concerned to identify favoured options; and (d) identifying elements addressed in *The Thematic Assessment Report on Interlinkages among Biodiversity, Water, Food and Health* (“nexus assessment”) of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), including the positive and negative feedbacks, trade-offs and benefits of an approach that considers all elements in achieving sustainable outcomes.

**Step D: prioritizing, appraising and selecting options**

26. Some additional criteria should be considered when prioritizing and appraising options for action with a climate change mitigation objective (key action (a) of the Voluntary Guidelines). The criteria may include: the position in the mitigation hierarchy; mitigation potential; resilience to climate change; and capacity to implement over the long term.<sup>26,27</sup> Relatively simple methods can be used to derive a first estimate of mitigation potential for many options. Although countries should seek to improve their transparency reporting over time, including through the increased use of higher-tier data and methods. The Intergovernmental Panel on Climate Change distinguishes three tiers of data and methods: tier 1 (default global values), tier 2 (country-specific) and tier 3 (more detailed models, more local data). Current understanding of ecosystem resilience to climate change (step B) is a factor in assessing the long-term

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<sup>26</sup> Sara M. Leavitt and others, *Natural Climate Solutions Handbook: A Technical Guide for Assessing Nature-Based Mitigation Opportunities in Countries*, 2nd ed. (Arlington, The Nature Conservancy, 2021).

<sup>27</sup> United Nations Environment Programme, *Nature-based Solutions for Climate Change Mitigation* (Nairobi and Gland, 2021).

viability of each option in delivering mitigation benefits. The capacity to implement will depend on existing skills and knowledge, training opportunities and access to the financial and other resources needed to enable implementation through time.

### **Step E: project design, implementation and scaling up**

27. Alongside the key actions specified in the Voluntary Guidelines, nature-based solutions and/or ecosystem-based approaches will also be more successful when diverse knowledge systems are acknowledged and incorporated. It may be especially helpful to integrate traditional knowledge into design and implementation.<sup>28</sup> When climate change mitigation co-benefits are intended, attention to the carbon-focused safeguards detailed in the table below is needed at the design and implementation stages.

28. One clear pathway to scaling up is the inclusion of nature-based solutions and/or ecosystem-based approaches in nationally determined contributions, national adaptation plans, voluntary land degradation neutrality targets and other national plans. A first step is to quantify the potential for multiple benefits, including for biodiversity, ecosystem integrity and climate change mitigation, adaptation and disaster risk reduction, often through spatial analysis and planning. Scaling up also represents a unique opportunity to promote private sector and multilateral investment for implementation, as well as an incentive for technology development related to adaptation, nature conservation, sustainable use and risk reduction.

### **Step F: holistic and transparent monitoring and evaluation mechanisms**

29. Nature-based solutions and/or ecosystem-based approaches aim to result in multiple benefits that help to address several social, economic and environmental challenges. Monitoring and evaluation frameworks should therefore encompass the entire suite of interventions, including the multiple intended benefits, as well as track any negative impacts. Emission reductions should be measured in line with methodologies under the United Nations Framework Convention on Climate Change and the Paris Agreement and in line with REDD-plus, the enhanced transparency framework and the requirements of mechanisms related to Article 6 of the Agreement, as appropriate. Multiple carbon standards and protocols are available, though they do not cover all types of nature-based solutions and/or ecosystem-based approaches.<sup>29</sup> Governments that deploy actions through REDD-plus are expected to develop safeguard information systems to provide transparent and consistent information on how safeguards are being addressed and respected.

*Table 1: Additional principles and safeguards focused on nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits*

<sup>28</sup> Nathalie Seddon and others, “Understanding the value and limits of nature-based solutions to climate change and other global challenges”, *Philosophical Transactions Royal Society B*, vol. 375, No. 1794 (March 2020).

<sup>29</sup> World Business Council for Sustainable Development, “Carbon standards for natural climate solutions (NCS) credits”, associated technical paper for the report *Nature-based Solutions in strategies for Net Zero, Nature Positive and addressing Inequality* (November 2022).

| <i>Theme</i>         | <i>Principle</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <i>Potential safeguard</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Multiple benefits    | <p>Prioritize approaches that address multiple social, economic and environmental challenges, seeking benefits for biodiversity, water security, ecosystem services, resilience and human well-being, without undermining the environmental quality of the ecosystems where they are implemented (see also principle 10 of the Voluntary Guidelines).</p> <p>Prioritize the protection, restoration and management of ecosystems and species important for the full carbon cycle, including wild fauna, and contributing to climate change adaptation, while also placing strong emphasis on safeguarding biodiversity by focusing on vulnerable and climate-sensitive species and ecosystems. Ensure a balanced mix of approaches across communities and diverse ecosystems.</p> | <p><b>Planning for multiple benefits</b></p> <p>Nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits and support Targets 8 and 11 of the Kunming-Montreal Global Biodiversity Framework should be designed taking their ability to deliver multiple benefits into account. This may involve:</p> <p>(a) Assessing the benefits, risks and trade-offs of selected actions across multiple social, economic and environmental challenges, considering the vulnerability of ecosystems;</p> <p>(b) Undertaking spatial prioritization that incorporates an analysis of the social and environmental risks and benefits of the proposed actions, including ecological integrity and ecosystem connectivity;</p> <p>(c) Over larger areas, aiming to achieve a balance among actions that prioritize several benefits, communities and ecosystems, so that all efforts are not directed to high-carbon ecosystems;</p> <p>(d) Consulting appropriate actors on the trade-offs among various benefits and the recognized risks when comparing proposed actions, through a consultation process oriented towards free, prior and informed consent, as part of participative decision-making processes.</p> |
| Urgency              | <p>Consider the pressing urgency of the biodiversity and climate crises, together with the longevity of greenhouse gases in the atmosphere. Actions that reduce emissions or enhance removals and protect or restore biodiversity in the short term with immediate, ongoing and permanent effect are more valuable than those with results that materialize only over a longer or temporary time frame. Avoid the trap of prioritizing speed over resilience (see “permanence and long-term impacts” below).</p>                                                                                                                                                                                                                                                                  | <p><b>Projection of carbon and biodiversity outcomes through time</b></p> <p>Nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits should be selected on the basis of an assessment of the expected results, where such information is available. Benefits to biodiversity should be considered and estimated. Cost per ton of carbon dioxide equivalent should be considered and, together with resilience considerations, may, for example, help countries to identify the types of conservation, restoration or management intervention most suitable for a given area. Urgent post-disaster responses may also provide opportunities to enhance benefits for biodiversity.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Mitigation hierarchy | <p>Prioritise the prevention of further loss or degradation of carbon stocks and, in a complementary and simultaneous manner where national circumstances permit, promote the restoration of degraded ecosystems and the recovery of their carbon stocks</p> <p>This principle is closely connected with the urgency principle and multiple benefit principles above. Emissions from the destruction of a natural ecosystem are near-instantaneous, while</p>                                                                                                                                                                                                                                                                                                                     | <p><b>Following the mitigation hierarchy</b></p> <p>Mitigation hierarchy should be considered in nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits. Where there is a choice between reducing both negative impacts on biodiversity and emissions by preventing the loss or degradation of natural ecosystems (e.g. deforestation) and emissions removals by restoring natural ecosystems, and each option has similar mitigation benefits, the mitigation hierarchy should be followed to avoid further negative impacts before restoring degraded</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| <i>Theme</i>                     | <i>Principle</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <i>Potential safeguard</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | the carbon removals resulting from the full restoration of an equivalent area of the same ecosystem will typically take many years.                                                                                                                                                                                                                                                                                                                                                                                            | ecosystems. Where comparable benefits can be achieved either by preventing loss or degradation or by restoring degraded ecosystems, avoidance of further biodiversity loss and ecosystem degradation is the preferred approach.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Additionality                    | Account only for biodiversity and ecosystem integrity benefits or carbon emission reductions or removals that would not have otherwise occurred (i.e. new benefits resulting from the activity). Additionality is a key requirement where carbon credits are generated, traded or retired; nature-based solutions and/or ecosystem-based approaches that deliver mitigation co-benefits without being part of a carbon-crediting scheme need not treat additionality as a deliverable, provided other co-benefits are secured. | <b>Ensuring additionality</b><br>Nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits should be designed on the basis of a stringent assessment of additionality, following accepted carbon standards, including those agreed under the Paris Agreement. The net reduction of carbon stocks in all organic carbon pools (above and below ground in the case of terrestrial ecosystems, and near-shore and pelagic or deeper-ocean pools in the case of marine ecosystems) should be prevented.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Permanence and long-term impacts | Prioritize activities where the emission reductions or removals and the biodiversity benefits are likely to be long-lasting, taking social and ecological factors into account.                                                                                                                                                                                                                                                                                                                                                | <b>Promoting permanence</b><br>Nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits should have long-lasting results. They should protect, maintain and restore biodiversity and ecological integrity (ecosystem condition, composition, structure and function).<br>Actions should be designed to reduce the risk of reversals (i.e. Cancun safeguard f), <sup>30</sup> which typically means tackling the underlying drivers of ecosystem degradation and barriers to ecosystem restoration or sustainable management.<br>Actions should be designed for climate and ecosystem resilience, prioritizing the use of local, climate-resilient native species in planting and restoration, and supporting the recovery of native flora and fauna and the ecological interactions that sustain long-term resilience.<br>Monitoring systems should be able to assess any reversals, and carbon and biodiversity accounting or crediting systems should include buffers to cater for the remaining risk of reversals. |
| Leakage                          | Avoid displacement (“leakage”) of emissions to, and negative impacts on biodiversity in, another location. Leakage can include local, national and international leakage.                                                                                                                                                                                                                                                                                                                                                      | <b>Avoiding leakage</b><br>Nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits should be designed to avoid leakage. Where international carbon markets are used, proponents should follow current and future guidance developed under the Paris Agreement, as appropriate. Solutions include:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

<sup>30</sup> Decision 1/CP.16, appendix I, subpara. 2 (f), of the Conference of the Parties to the United Nations Framework Convention on Climate Change.

| <i>Theme</i>                             | <i>Principle</i>                                                                                                                                                                                                                                                                                                                                                                                                                                      | <i>Potential safeguard</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>(a) Locating mitigation activities in well-governed landscapes and as part of an integrated spatial plan (see Target 1 of the Kunming-Montreal Global Biodiversity Framework);</p> <p>(b) Working in collaboration, through free, prior and informed consent processes, with actors who depend on land-use change to co-design alternative livelihoods and economic pathways, taking into account national and territorial contexts, that do not lead to leakage or to rebound effects, including by reducing the underlying drivers of ecosystem degradation;</p> <p>(c) Undertaking biodiversity and carbon accounting on a jurisdictional scale or within a nested scheme, to integrate local and domestic leakage into overall results;</p> <p>(d) Estimating the remaining risk of leakage on the local, domestic and international scales;</p> <p>(e) Deducting projected remaining leakage from the biodiversity and carbon results in accounting or crediting schemes, while recognizing that biodiversity loss displaced through leakage cannot be directly offset elsewhere.</p> |
| Equity, gender equality and human rights | <p>Take a human rights-based approach, including by respecting and protecting the rights and roles of indigenous peoples and local communities, women and youth, who are key actors in both protecting and restoring biodiversity and in implementing climate action. Their traditional knowledge, priorities and needs should be taken into account for biodiversity and climate actions to be equitable, inclusive, effective and rights-based.</p> | <p>Rights-based and gender-responsive considerations in the use of nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits should be designed and implemented with the full, effective, inclusive and gender-responsive participation and representation of indigenous peoples and local communities, women and youth. Actions that present risks or imply potential risks of dispossession, undermining rights, failing to consider free, prior and informed consent, or benefit-sharing, among others, should be avoided.</p> <p>When risks to indigenous peoples and local communities, women or youth cannot be fully avoided, an accessible, culturally-appropriate grievance and redress mechanism should be established and maintained to enable affected rights holders to raise concerns and obtain remedy throughout the project cycle.</p>                                                                                                                                                                                     |

### III. Supplement to the Voluntary Guidelines: the design and effective implementation of nature-based solutions and/or ecosystem-based approaches

#### A. Introduction

4. This expanded supplement to the Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction is developed in response to CBD COP [Decision 16/22](#) paragraph 17. The objective is to provide “*voluntary guidance and tools based on good practices for the design, effective implementation and scaling up, as appropriate,*

*of nature-based solutions and/or ecosystem-based approaches to climate change mitigation and adaptation to support the implementation of Targets 8 and 11, as well as other related targets, of the Kunming-Montreal Global Biodiversity Framework, where appropriate, consistent with [United Nations Environment Assembly resolution 5/5](#), noting Mother Earth-centric actions, as recognized by some countries, in line with different national circumstances, priorities and capabilities, including updating guidance for fit-for-purpose social and environmental safeguards, based on existing safeguards”.*

5. This supplement has been drafted through a consultative process coordinated by the Secretariat of the Convention on Biological Diversity (CBD), in collaboration with the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). It is part of systemic responses that foster coherence across national actions to implement international agreements, including the CBD, UNFCCC, UNCCD, the Ramsar Convention on Wetlands, Sendai Framework, the UN Human Rights system, and the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction. It reflects inputs received during preliminary online consultations conducted on 19 March 2025, as well as substantive contributions from participants in the dedicated hybrid workshop convened from 7-9 May 2025. The Primer for Policymakers was revised by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) at its 27<sup>th</sup> meeting in October 2025. The revisions made by the SBSTTA were subsequently incorporated into the expanded version of the supplement by the Secretariat. The full supplement was then made available for peer review between 22 July and 2 September 2026, to which 14 comments were received from Parties and eight from Observers.<sup>31</sup> The present document reflects the outcomes of that peer review process.

## **B. Overview of the supplement**

6. The supplement starts with an introduction covering the CBD decision that requested this text, and the process for its development. It then follows the structure of the Voluntary Guidelines, exploring principles and safeguards in section 2.2, some overarching considerations for design, implementation and scaling up in section 2.3 and building on the original stepwise approach to design and implementation of nature-based solutions and/or ecosystem-based approaches in section 2.4.

7. The Voluntary Guidelines address ecosystem-based approaches for adaptation to climate change and to disaster risk reduction. Throughout, this supplement aims particularly to capture additional considerations relating to nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits, while safeguarding biodiversity and ecosystem integrity, to support the implementation of [Target 8](#) (Minimize the impacts of climate change on biodiversity and build resilience, including through mitigation, adaptation and disaster risk reduction) and [Target 11](#) (Restore, maintain and enhance nature’s contributions to people) of the Kunming-Montreal Global Biodiversity Framework (KMGBF), as well as other related targets, including Targets 2, 6 and 7, and fit-for-purpose social and environmental safeguards. Safeguarding ecosystem integrity includes assessing interacting pressures, cumulative impacts and trade-offs among objectives, rather than considering each pressure or benefit in isolation.

8. The terms ‘natural climate solutions’ (Griscom *et al.*, 2017) and ‘nature-based climate solutions’ (Seddon *et al.*, 2019) are often used to describe approaches to better protect, manage and restore ecosystems with the objective of climate change mitigation. There is strong overlap with nature-based solutions, but the typology of natural climate solutions includes some activities in managed or modified ecosystems that may not fully qualify, such as methods for improved rice cultivation. Resources developed using this language have been drawn on in the current supplement where relevant. Where natural climate solution

<sup>31</sup> Parties: Australia, Canada, Colombia, Germany, Guatemala, Japan, Mexico, New Zealand, Norway, Peru, Philippines, South Africa, Spain, United Kingdom of Great Britain and Northern Ireland. Observers: Fauna and Flora, Food and Agriculture Organization of the United Nations, Imperial College London, International Organization for Migration, International Union for the Conservation of Nature, Pro Silva Europe, World Federation for Animals and International Fund for Animal Welfare (joint submission), Climate and Development Knowledge Network, Global Youth Biodiversity Network, Soka Gakkai Institute, SwedBio at the Stockholm Resilience Centre and Third World Network (joint submission). Available at <https://www.cbd.int/notifications/2026-058>.

typologies include managed- or modified-system activities, these should be screened against nature-based solutions criteria and safeguards before being presented as nature-based solutions, to avoid carbon-focused interventions being adopted without sufficient ecosystem-integrity safeguards.

### C. Principles and safeguards

9. The *Voluntary Guidelines* adopted by the parties to the CBD in November 2018, are underpinned by a set of ten principles and nine safeguards. The principles serve as “high-level standards to guide planning and implementation”. They are framed as actions that promote (i) resilience and adaptive capacity, (ii) inclusivity and equity, (iii) success on multiple scales and (iv) effectiveness and efficiency. The safeguards aim to prevent harm to people and to nature, facilitate transparency and promote multiple benefits. The principles and safeguards inform the *Guidelines*’ overarching considerations and stepwise approach for design and implementation of ecosystem-based adaptation (EbA) and ecosystem-based disaster risk reduction (Eco-DRR) (Table 2 and Table 3).

**Table 2: Principles included in the Voluntary Guidelines (SCBD, 2019)**

| <b>Principles</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Principles for building resilience and enhancing adaptive capacity through EbA and Eco-DRR</b></p> <p>1. Consider a full range of ecosystem-based approaches to enhance resilience of socio-ecological systems as a part of overall adaptation and disaster risk reduction strategies.</p> <p>2. Use disaster response as an opportunity to build back better for enhancing adaptive capacity and resilience and integrate climate-resilient ecosystem considerations throughout all stages of disaster management.</p> <p>3. Apply a precautionary approach in planning and implementing EbA and Eco-DRR interventions.</p>                                                                                                                                                                                                                           |
| <p><b>Principles for ensuring inclusivity and equity in planning and implementation</b></p> <p>4. Plan and implement EbA and Eco-DRR interventions to prevent and avoid the disproportionate impacts of climate change and disaster risk on ecosystems as well as vulnerable groups, indigenous peoples and local communities, women and girls.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p><b>Principles for achieving EbA and Eco-DRR on multiple scales</b></p> <p>5. Design EbA and Eco-DRR interventions at the appropriate scales, recognising that some EbA and Eco-DRR benefits are only apparent at larger temporal and spatial scales.</p> <p>6. Ensure that EbA and Eco-DRR are sectorally cross-cutting and involve collaboration, coordination, and co-operation of stakeholders and rights holders.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Principles for EbA and Eco-DRR effectiveness and efficiency</b></p> <p>7. Ensure that EbA and Eco-DRR interventions are evidence-based, integrate indigenous and traditional knowledge, where available, and are supported by the best available science, research, data, practical experience, and diverse knowledge systems.</p> <p>8. Incorporate mechanisms that facilitate adaptive management and active learning into EbA and Eco-DRR, including continuous monitoring and evaluation at all stages of planning and implementation.</p> <p>9. Identify and assess limitations and minimize potential trade-offs of EbA and Eco-DRR interventions.</p> <p>10. Maximize synergies in achieving multiple benefits, including for biodiversity, conservation, sustainable development, gender equality, health, adaptation, and risk reduction.</p> |

**Table 3: Safeguards included in the Voluntary Guidelines (SCBD, 2019)**

| <b>Safeguards for effective planning and implementation of Ecosystem-based approaches to Adaptation (EbA) and Eco-DRR</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applying environmental impact assessments and robust monitoring and evaluation                                            | 1. EbA and Eco-DRR should be subject, as appropriate, to environmental impact assessments including social and cultural assessments (referring to the Akwé: Kon guidelines) at the earliest stage of project design, and subject to robust monitoring and evaluation systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Prevention of transfer of risks and impacts                                                                               | 2. EbA and Eco-DRR should avoid adverse impacts on biodiversity or people, and should not result in the displacement of risks or impacts from one area or group to another.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Prevention of harm to biodiversity, ecosystems and ecosystem services                                                     | 3. EbA and Eco-DRR, including disaster response, recovery and reconstruction measures, should not result in the degradation of natural habitat, loss of biodiversity or the introduction of invasive species, nor create or exacerbate vulnerabilities to future disasters. Adverse impacts to also be avoided include declines in wild animal abundance, disruption of animal movement or ecological interactions, avoidable mortality or displacement of wildlife, and increased human-wildlife conflict.<br><br>4. EbA and Eco-DRR should promote and enhance biodiversity and ecosystem functions and services, including through rehabilitation/restoration and conservation measures as part of post-disaster needs assessment and recovery and reconstruction plans, and including the recovery of wild animal populations and the ecological interactions that sustain ecosystem functions |
| Sustainable resource use                                                                                                  | 5. EbA and Eco-DRR should neither result in unsustainable resource use nor enhance the drivers of climate change and disaster risks, and should strive to maximize energy efficiency and minimize material resource use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Promotion of full, effective and inclusive participation                                                                  | 6. EbA and Eco-DRR should ensure full and effective participation of the people concerned, including indigenous peoples and local communities, women, migrants, minorities and the most vulnerable, including the provisioning of adequate opportunities for informed involvement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Fair and equitable access to benefits                                                                                     | 7. EbA and Eco-DRR should promote fair and equitable access to benefits and should not exacerbate existing inequities, particularly with respect to marginalized or vulnerable groups. EbA and Eco-DRR interventions should meet national labour standards, protecting participants against exploitative practices, discrimination and work that is hazardous to their well-being.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Transparent governance and access to information                                                                          | 8. EbA and Eco-DRR should promote transparent governance by supporting rights to access to information, providing all stakeholders and rights holders, particularly indigenous peoples and local communities, with information in a timely manner, and supporting the further collection and dissemination of knowledge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Respecting rights of women and men from indigenous peoples and local communities                                          | 9. EbA and Eco-DRR measures should respect, protect, promote and fulfil human rights, including those of women and men, children and youth from indigenous peoples and local communities, and persons with disabilities, including access to and use of physical and cultural heritage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## **1. Principles and safeguards for nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits**

10. The principles and safeguards detailed in the *Voluntary Guidelines* are applicable to nature-based solutions and/or ecosystem-based approaches. While climate change mitigation is a key co-benefit of the nature-based solutions and/or ecosystem-based approaches to be undertaken, the same care to social and

environmental safeguards, including for biodiversity, water security and ecosystem integrity, is needed. There are also some considerations specific to nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits, given their focus on greenhouse gas emissions reductions and removals. Attention to these principles and safeguards can help address some of the concerns expressed around the validity of nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits (Seddon *et al.*, 2020, 2021).

11. When climate change is an identified key objective alongside biodiversity, additional principles and safeguards are necessary to ensure that the actions to be taken deliver on both climate and nature goals and avoid unintended consequences. These additional principles and safeguards are focused on ensuring benefits for biodiversity, and on strengthening safeguards for indigenous peoples and local communities, women and youth. They provide a facilitative and flexible approach to implementation, while acknowledging that countries may wish to adapt those standards in accordance with their levels of development, priorities and circumstances. Nothing in the present supplement should be understood as modifying the rights and obligations of Parties under the Convention or any other international agreement. Where countries follow these voluntary principles and safeguards, they need to be aligned with their commitments under the United Nations Framework Convention on Climate Change and the Paris Agreement, including rules and agreements relating to the implementation of Article 6 of the Agreement.<sup>32</sup> These additional principles and safeguards, relevant to both climate and nature goals, are focused on multiple benefits, urgency, mitigation hierarchy, additionality, permanence and leakage, with an emphasis on biodiversity and ecological integrity, as set out in Table 1.

12. Across all of these, nature-based solutions and/or ecosystem-based approaches should prioritize the avoidance of adverse impacts on natural ecosystems and critical ecological functions: activities should not result in the conversion, degradation or fragmentation of ecosystems of high ecological importance, or in significant and irreversible loss of biodiversity or ecosystem functions, and particular caution should be applied where impacts may be irreversible. This applies in particular to interventions affecting threatened species, critical habitats, high-integrity ecosystems, areas of high ecological connectivity, ecosystems providing essential functions for climate resilience, and ecosystems of particular importance to indigenous peoples and local communities. Where potentially serious or irreversible harm is identified and cannot be adequately avoided or mitigated, the activity should not proceed. Cumulative, indirect and reasonably foreseeable impacts, including impacts associated with infrastructure or induced land-use change, should be considered.

13. Healthy and viable wild animal populations support ecological processes – including pollination, seed dispersal, grazing, predation, scavenging, nutrient cycling and ecosystem engineering – that enable ecosystems to deliver climate change adaptation, disaster risk reduction and mitigation co-benefits. Nature-based solutions and/or ecosystem-based approaches should therefore maintain or recover wild animal populations, ecological interactions and the functions they perform, with outcomes monitored rather than inferred from habitat area or vegetation cover alone.

## **2. Respecting different value systems**

14. CBD decision 16/22, in requesting that this supplement be developed, notes “Mother Earth-centric actions, as recognized by some countries”. Nature embodies different concepts for different people, including biodiversity, ecosystems, Mother Earth and systems of life, and the Framework recognizes and considers these diverse value systems. A Mother Earth-centric (ecocentric or biocentric) worldview assigns an intrinsic value and rights to nature itself, including within legal frameworks in some countries (Espinosa, 2014; Washington *et al.*, 2017). The view is rooted in traditional knowledge perspective that sees humans as part of nature and does not privilege them above other parts of an ecosystem. This perspective aligns with the recognition by IPBES of the importance of respecting diverse value systems, as reflected in its development of the *Methodological Assessment of the Diverse Values and Valuation of Nature*, which seeks

<sup>32</sup> Article 6 encompasses cooperative approaches (Article 6.2), the mechanism established under Article 6.4 and non-market approaches (Article 6.8). A suite of environmental and social safeguards has also been developed under Article 6.4, with significant overlap with the safeguards set out in the Voluntary Guidelines and the present supplement.

to deepen understanding of the relationships between different worldviews and the values they ascribe to nature (IPBES, 2022). Consistent with the IPBES Values Assessment, decision-making should seek to recognize, balance and, where possible, bridge diverse worldviews, knowledge systems and value systems, including relational, intrinsic and instrumental values. Proponents are generally opposed to more utilitarian, anthropocentric views of nature, and to its monetization through payments for ecosystem services or REDD+ results. In a safeguards context, citizens may have the right to lodge a grievance or pursue a legal case to enforce the rights of nature, as in Ecuador (Tanăsescu et al., 2024). Bolivian law mandates a Mother Earth Ombudsman's Office to ensure the enforcement of nature's rights. A small number of other countries have recognized rights to parts of the natural world, such as sea turtles and their habitats (article 29, República de Panamá, 2023).

15. Whilst safeguards frameworks and standards often address the rights and traditional knowledge of indigenous peoples, they do not directly address all value systems, such as Mother Earth-centric world views and the rights of nature. This aspect could be further developed as appropriate in different national contexts and in ways that are mutually supportive of human rights and consistent with different national legislation and international obligations and principles of international law. Parties may adopt diverse legal, cultural and philosophical approaches regarding the relationship between people and nature, and the present guidance remains neutral and inclusive with respect to different value systems and national legal frameworks.

### **3. Respect for human rights**

16. Respect for human rights is central to the legitimacy, integrity and effectiveness of nature-based solutions and/or ecosystem-based approaches. This is already embedded in the existing safeguards, but further strengthening in line with the KMGBF is critical. This will also help to address any concerns around the recognition of the multiple values of nature and the distribution of benefits, costs, risks and burdens across social groups, including intergenerational impacts. The Right to a Clean, Healthy and Sustainable Environment, as affirmed in UNGA Resolution 76/300 and UNHRC Resolution 48/13, provides an overarching ethical basis for promoting human well-being through environmental protection. This includes the duty to ensure clean air, water, a stable climate, and healthy biodiversity. Recent advisory opinions of the International Court of Justice and the Inter-American Court of Human Rights on States' obligations in respect of climate change further underline the importance of human rights safeguards in climate action (International Court of Justice, 2025; Inter-American Court of Human Rights, 2025).

17. The strengthening of safeguards for indigenous peoples and local communities should also give explicit attention to local communities, including in national contexts where there are no indigenous peoples. Locally-led approaches, community stewardship and place-based solutions can improve the long-term effectiveness, legitimacy and resilience of nature-based solutions and/or ecosystem-based approaches, and safeguards should recognize and support community-led action, customary institutions and equitable community access to decision-making, benefits and remedy.

18. The rights of indigenous peoples and local communities, as articulated in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas (UNDROP), and as outlined as a nature-based solutions requirement by UNEA (UNEP, 2022a) should be integrated, where applicable, into project design and governance, ensuring the free, prior and informed consent, cultural protection, and equitable benefit-sharing and accountability, consistent with national legislation and circumstances and with international human rights obligations, and must not violate customary or land-tenure rights or cause dispossession or displacement. Human rights-based approaches are reinforced through guidance from the Office of the High Commissioner for Human Rights (OHCHR, 2016), which calls for the full integration of procedural rights, gender equality, and accountability into biodiversity planning. These principles are echoed in Section C of the KMGBF and align with the UN Guiding Principles on Business and Human Rights (UNGPs), which affirm both the state's duty to protect rights and the corporate responsibility to prevent, mitigate, and remedy harm.

19. The UNGPs underscore that state and business actors are responsible for acting on climate change, in order to avoid associated human rights impacts (UNHRSP, 2023). They also offer a framework to hold economic actors accountable for ensuring that their actions do not exacerbate social inequalities or violate the rights of affected communities. This is particularly salient in the context of climate change mitigation strategies, including private sector participation in carbon markets and sometimes contested carbon rights, where corporate engagement must not compromise human rights or equitable outcomes. Projects and programmes should undertake human-rights due diligence throughout the project cycle, including assessment of actual and potential impacts on rights-holders and effective grievance and remedy mechanisms. Rights-holders should actively and safely participate in designing and navigating any required remedy process. The role of national and subnational authorities, environmental authorities and other relevant institutions should also be recognized, particularly in the planning, coordination, implementation, monitoring and follow-up of nature-based solutions and/or ecosystem-based approaches, to facilitate the institutional and governance conditions needed at different territorial scales.

20. To ensure effective respect for free, prior and informed consent, proponents of nature-based solutions and/or ecosystem-based approaches must communicate clearly with communities about when and how benefits will materialize. Free, Prior and Informed Consent must be treated as a decision-making condition and as an ongoing rather than one-time process. Evidence indicates that consent processes can be procedurally complete while remaining substantively hollow – for example, where key decisions about eligible activities have already been taken by external actors before local engagement begins, or where local hierarchies, literacy barriers or time constraints limit affected people’s ability to meaningfully object; such processes should be avoided. In practice, consent processes should specify when consent is sought (before key design decisions are taken, and again when significant changes are proposed), who is responsible for conducting and documenting the process, how agreements and any conditions attached to them are recorded, and how a decision not to consent is respected, including whether and how the initiative is modified or does not proceed. This is especially relevant for restoration actions, given the long timeframe often required for ecological recovery. Anticipated trade-offs, along with the distribution of benefits and burdens over time and space must be made transparent, particularly in cases where benefits accrue at regional or global scales while burdens are borne locally. It is also essential to address intersectionality – recognizing how overlapping forms of marginalization affect vulnerability, and to ensure that benefits reach those most at risk, including women, children, indigenous peoples and local communities, migrants, displaced persons and persons with disabilities. Adopting gender-responsive approaches and facilitating the meaningful participation of women, youth and marginalized groups are vital to achieve both justice and effectiveness. Furthermore, advancing gender equality and social inclusion and the fulfilment of the rights of women and youth are fundamental for the effective and equitable implementation of nature-based solutions and/or ecosystem-based approaches. The Gender Plan of Action (2023–2030) adopted under the Convention in decision 15/11 provides further guidance for gender-responsive design and implementation.

21. Women-led conservation initiatives in Burkina Faso and Colombia illustrate how these principles can be operationalized: in Burkina Faso, women’s cooperatives manage shea-producing landscapes, combining ecological restoration with economic empowerment (UNCCD, 2024a, b) while in Colombia, indigenous women apply ancestral astronomical calendars to guide marine conservation. These examples demonstrate how women’s leadership and cultural practices can deliver equitable and effective outcomes, aligning with free, prior and informed consent and rights recognition. Ensuring transparency, building trust, and supporting flexible, inclusive implementation are critical to the success and legitimacy of nature-based solutions and/or ecosystem-based approaches at scale.

#### **4. Existing safeguards frameworks and guidance**

22. The effective design, implementation and scaling of nature-based solutions and/or ecosystem-based approaches require a robust foundation of guiding principles. These will integrate social and environmental risks and benefits, including human rights and equity considerations. Indeed, in 2022, UNEA 5/5 determined that nature-based solutions must “Respect social and environmental safeguards, in line with the three ‘Rio conventions’ (the Convention on Biological Diversity, the United Nations Convention to Combat Desertification and the United Nations Framework Convention on Climate Change), including such

safeguards for local communities and indigenous peoples” (UNEP, 2022a). UNEA did not recommend a specific set of safeguards or standards.

23. Nature-based solutions and/or ecosystem-based approaches should be subject to a risk-based safeguards framework establishing minimum requirements throughout the project or programme lifecycle. At a minimum, safeguards should: (a) identify and assess potential risks to biodiversity, ecosystem integrity, human rights, livelihoods, land tenure rights and cultural values before decisions on implementation or financing are taken; (b) demonstrate that identified risks have been avoided wherever possible and, where avoidance is not possible, minimized and effectively mitigated; (c) establish clear conditions under which an activity should not proceed, including where significant adverse impacts on critical ecosystem functions, biodiversity, customary rights or internationally recognized human rights cannot be adequately avoided or mitigated; (d) assign clear institutional responsibility for implementing, monitoring and enforcing safeguards; (e) provide accessible, timely and effective mechanisms for raising concerns, resolving grievances and securing remedy; and (f) require continued compliance with safeguards throughout implementation, including during scaling-up and post-implementation monitoring. Safeguard requirements should be proportionate to the nature and scale of risks, but proportionality should not be interpreted as permitting lower levels of protection where potentially irreversible, cumulative or significant impacts are identified.

24. Existing international standards and safeguards frameworks can offer a basis for shaping best practices (Valverde and Egbuwalo, 2023) or be directly adopted where appropriate. Several of the frameworks described below – including the Cancun Safeguards, the World Bank Environmental and Social Framework and the Principles for Locally Led Adaptation – informed the development of the Voluntary Guidelines themselves. Some relevant frameworks include:

25. [The Principles for ecosystem restoration to guide the United Nations Decade 2021–2030](#) (FAO, IUCN CEM and SER, 2021) are accompanied by a [Standards of practice to guide ecosystem restoration](#) (Nelson *et al.*, 2024). These guidance documents were developed by the FAO-led Task Force on Best Practices for the UN Decade on Ecosystem Restoration, the Society for Ecological Restoration (SER) and the International Union for Conservation of Nature Commission on Ecosystem Management (IUCN CEM), drawing on experience across different types of ecosystem restoration. The principles emphasize long-term ecological commitments, meaningful stakeholder inclusion and locally grounded solutions. They acknowledge the timeframes over which benefits may materialize. The standards put these principles into practice, recommending steps to take throughout the process of planning and implementing restoration.

26. [The seven Cancun Safeguards for REDD+](#) (UNFCCC, 2010) are applied at a jurisdictional scale by developing countries participating in efforts to reduce emissions from deforestation and forest degradation, and to conserve, sustainably manage and enhance forest carbon stocks (REDD+). The safeguards cover topics including transparency in governance, respect for the rights and knowledge of indigenous peoples and local communities, full and effective stakeholder participation and the conservation of natural forests. They rule out the conversion of natural forest as a REDD+ action. Instead, they expect that actions are used to incentivize the protection and conservation of natural forests and enhance other social and environmental benefits. Actions to address the risk of reversals and reduce displacement of emissions are included as standalone safeguards. Guidance on operationalizing this simple list of safeguards is offered by the UN-REDD Programme, including a conceptual framework to developing country approaches to safeguards (UN-REDD Programme, 2016), recommendations for developing summaries of information on safeguards (UN-REDD Programme, 2020b) and on designing safeguards information systems (UN-REDD Programme, 2020a). Experience with REDD+ implementation, including in several African countries, has also revealed persistent challenges – among them insecure land and carbon tenure, high transaction and monitoring costs, limited and delayed benefit flows to local communities, and difficulties in demonstrating additionality and permanence – from which lessons should be drawn when designing nature-based solutions and/or ecosystem-based approaches.

27. [The IUCN Global Standard for Nature-based Solutions](#) (IUCN, 2020; updated as a second edition, IUCN, 2025) was developed through an extensive IUCN member multi-stakeholder process and includes a

self-assessment tool. In the second edition, the criteria have been slightly reordered; Criteria 3, 5, 6 and 7 collectively function to ensure ecological and social integrity. Criterion 3 mandates the preservation and enhancement of biodiversity, ecosystem integrity and connectivity, thereby mitigating risks of environmental degradation. Criterion 6 emphasizes inclusive and participatory processes, safeguarding the rights and agency of indigenous peoples and local communities. Criterion 7 ensures transparent governance structures, which are essential for accountability and the prevention of institutional misuse. Criterion 8 promotes adaptive management informed by evidence, enabling continuous risk assessment and mitigation. Together, these criteria operationalize safeguards that underpin the ethical, resilient, and sustainable implementation of nature-based solutions and/or ecosystem-based approaches.

28. The eight [\*Principles for Locally Led Adaptation \(LLA\)\*](#), developed by IIED and partners, underline the importance of devolving decision-making to the lowest appropriate level, addressing structural inequalities, securing long-term and predictable finance and building enduring local capacity. Wherever possible, nature-based solutions and/or ecosystem-based approaches should align with the eight Principles for Locally Led Adaptation and demonstrate how local actors influence priorities, financing decisions, implementation and monitoring. The principles advocate for decentralized, participatory planning and iterative learning processes. They caution against the fragmented or selective implementation of normative guidance that may compromise the systemic coherence of adaptation actions or diminish their intended impact, especially in contexts where community-led initiatives are already operational.

29. The [\*Climate, Community and Biodiversity Alliance Standards \(CCB\)\*](#) aim to ensure that projects deliver across three key areas: climate change mitigation, community development and biodiversity conservation. These standards developed by Climate, Community, Biodiversity Alliance place multiple benefits and holistic approaches central to project design and delivering tangible benefits. The standards are applicable to any land management projects with climate change mitigation benefits.

30. The [\*Global Biodiversity Standard \(TGBS\)\*](#) developed by Botanic Gardens Conservation International and a consortium of partners aims to provide science-based guidance to promote the protection, restoration and enhancement of biodiversity (Bartholomew *et al.*, 2024). Their purpose is to combat “greenwashing” and ensure that nature-based solutions truly protect, restore and enhance biodiversity, in addition to providing climate and community benefits.

31. The [\*Gold Standards for Global Goals\*](#) provide robust safeguards and detailed guidance for assessing positive sustainable development impacts for all types of project within the voluntary carbon markets (Wissner & Schneider, 2022). Building on the Sustainable Development Goals (SDG) framework, the guidance highlights identification and mitigation of adverse social, economic and environmental impacts. It also includes the establishment of grievance mechanisms to enable stakeholders address their concerns and demand fair treatment.

32. The [\*Society for Ecological Restoration \(SER\) standards\*](#) offer principles and guidance documents to ensure that projects strive for optimal ecological outcomes while being socially responsible and embedded in scientific, traditional and local ecological knowledge. The SER standards have eight principles and include both an Ecological Recovery Wheel (ERW) and Social Benefit Wheel (SBW). They aim to obtain long term sustainability of ecosystem and multiple benefits for stakeholders.

33. The World Bank’s [\*Environmental and Social Framework\*](#) (ESF, World Bank, 2017) is broadly representative of the policies and standards set by multilateral development banks. The World Bank’s norms are often adopted by other banks in co-financed projects. Introduced in 2018, the ESF modernized and consolidated the Bank’s approach to managing environmental and social risks across its investments. It includes ten Environmental and Social Standards (ESSs) that address critical issues such as biodiversity, labour rights, community health and safety, and stakeholder engagement. By emphasizing transparency, inclusion, and adaptive risk management, the ESF aligns with the broader efforts in nature-based solutions and/or ecosystem-based approaches to ensure that development interventions are not only effective but also equitable and ecologically sound.

34. Established by the Friends of Ecosystem-based Adaptation (FEBA) network in 2017, the EbA qualification criteria ensure that initiatives reduce vulnerabilities, generate societal benefits, restore

ecosystem health, integrate with policies and support equitable governance (FEBA, 2017). These criteria are structured around the 2009 CBD definition of EbA, which states that EbA (i) helps people adapt to climate change (ii) by an active use of biodiversity and ecosystem services (iii) in the context of an overall adaptation strategy. All three elements of the CBD definition must be addressed in order for an activity, initiative, project, approach, strategy and/or measure to qualify as ecosystem-based adaptation. Not only do the five criteria help determine whether a proposed activity is actually EbA, but they also help practitioners avoid maladaptation – whereby the activity is in fact detrimental to adaptation in the long term, in a different aspect (socially, environmentally, economically, etc.), or for a neighbouring area.

35. Adoption of one or more of the frameworks above provides a structured basis for managing environmental and social risk, but formal adherence to a safeguards framework does not, on its own, guarantee that outcomes on the ground meet the framework's intent. Evidence-based evaluations of project-level implementation indicate that procedural compliance can coexist with outcomes that fail to deliver the intended ecological-integrity results, or to meaningfully shift decision-making power or benefit distribution (Milne and Mahanty, 2019; McDermott and Ituarte-Lima, 2016). Outcome-focused monitoring is therefore recommended alongside adherence to any of the frameworks listed above, so that the safeguards applied under these Guidelines function as an integrated system linking risk identification, decision-making, implementation, monitoring, corrective action and remedy.

## **5. Applying safeguards at jurisdictional and project scales**

36. The application of safeguards to nature-based solutions and/or ecosystem-based approaches will vary with the scale and institutional context. Safeguards frameworks may be mandated by national governments, international funders or certification bodies. Their operationalization varies significantly between jurisdictional and project-level interventions.

37. Across scales, the Sendai Framework for Disaster Risk Reduction 2015–2030 and international human rights and indigenous peoples' rights instruments – including Free, Prior and Informed Consent, self-determination, customary tenure, participation, and access to justice and remedy – should be treated as core safeguards rather than optional considerations. At the jurisdictional scale, many countries have developed comprehensive national approaches to safeguards within the context of REDD+. These typically start with the contextualization of the Cancun Safeguards within domestic legal and policy frameworks. Regulatory and institutional gaps are identified, and targeted measures formulated to ensure that safeguards are addressed and respected. Integral to this process is the establishment of a Safeguards Information System (SIS), which serves to track progress through defined indicators and may incorporate co-benefit metrics relevant to multilateral reporting obligations, such as those of the Green Climate Fund (UN-REDD Programme, 2020a). These national approaches often include grievance redress mechanisms to enhance accountability and stakeholder engagement. Guidance from the UN-REDD Programme has been instrumental in supporting countries in the design and operationalization of safeguards frameworks (UN-REDD Programme, 2025).

38. The extensive safeguards architecture developed under jurisdictional REDD+ initiatives can contribute to a robust enabling environment for the broader deployment of nature-based solutions and/or ecosystem-based approaches. The development of a REDD+ safeguards approach has often involved alignment with international environmental and social standards (UNDP, 2021).

39. REDD+ projects typically adopt one or more established project-level standards. These offer a structured and replicable framework for ensuring environmental and social integrity. They delineate safeguard principles, criteria, and performance indicators that guide the design, evaluation, and monitoring of project activities.

40. Where practitioners are free to choose a safeguards framework, the following considerations are recommended:

- **Alignment with National and International Standards:** Preference should be given to frameworks that are compatible with national policies and international conventions, including the CBD, UNFCCC, UNCCD, the Ramsar Convention on Wetlands and relevant human rights instruments.

- **Comprehensiveness and Flexibility:** The framework should encompass environmental, social, and governance dimensions while allowing for contextual adaptation.
- **Monitoring and Reporting Capacity:** Robust mechanisms for data collection, indicator tracking and transparent reporting are essential, particularly where co-benefits and climate finance are involved.
- **Stakeholder Inclusivity:** The framework should facilitate meaningful participation of indigenous peoples and local communities, rights holders and other stakeholders throughout the project lifecycle.
- **Upholding Human Rights:** Adherence to standards and frameworks for human rights, including the United Nations Declaration on the Rights of Indigenous Peoples.
- **Grievance Redress Mechanisms:** Effective and accessible channels for addressing complaints and disputes and for seeking remedies should be embedded within the framework.

41. Both jurisdictional and project-level actors frequently encounter overlapping safeguards requirements imposed by diverse funding entities. Best practice involves harmonizing these requirements into a unified safeguards framework that accommodates and monitors compliance across multiple standards. A notable example of this approach is the National Safeguards Framework for Climate Change developed by Honduras, which consolidates safeguard obligations across sectors and scales (UN-REDD Programme, 2021).

42. Project-level safeguards should be nested within, and demonstrably consistent with, applicable jurisdictional or national safeguards systems wherever such systems exist. Jurisdictional systems should establish minimum requirements, indicators, reporting arrangements and grievance and remedy mechanisms that can be applied consistently across projects, while allowing project proponents to add context-specific measures. Where no jurisdictional system yet exists, project-level safeguards should be designed so that they can later be aligned with, and absorbed into, an emerging national system.

#### **D. Overarching considerations for design, implementation and scaling up**

43. The *Voluntary Guidelines* highlight three cross-cutting considerations to take account of while implementing the stepwise approach to Ecosystem-based Adaptation and Eco-DRR. These are: (1) integrating the knowledge, technologies, practices and efforts of indigenous peoples and local communities, (2) mainstreaming of Ecosystem-based Adaptation and Eco-DRR, and (3) raising awareness and building capacity. This supplement first considers scaling approaches and then builds on each of the three areas covered in the *Voluntary Guidelines*, adding additional material in response to the elements highlighted in CBD [decision 16/22](#) paragraph 17.

### **1. Scaling up**

44. Scaling-up of nature-based solutions and/or ecosystem-based approaches can be understood in multiple dimensions: scaling up (system-level strategies, such as policy change), scaling out (replicating successful models), and scaling deep (changing cultural values, e.g. to further justice, rights, and sustainability) (Salafsky *et al.*, 2021). Where scaling up involves system-level changes to facilitate nature-based solutions and/or ecosystem-based approaches, there may be scope for broader transformative change to address the structural drivers of biodiversity loss and climate vulnerability. The IPBES Transformative Change Assessment highlights that these drivers include systemic inequalities, including those linked to gender, race, ethnicity, disability, age, caste, indigeneity, tenure status and economic marginalization, and unsustainable economic models (IPBES, 2024b).

45. Scaling up should also address freshwater and water-cycle considerations, including the conservation, sustainable management and restoration of freshwater ecosystems, the maintenance of environmental flows and hydrological connectivity, water quality, and the interdependence of the water and carbon cycles. This calls for integrated approaches across catchments, river basins, groundwater and connected terrestrial and coastal ecosystems, recognizing the needs of biodiversity and ecosystem services as well as those of indigenous peoples and local communities. Initiatives such as the Freshwater Challenge provide a relevant framework for advancing freshwater ecosystem restoration and demonstrating these interconnected climate, biodiversity, water and resilience benefits.

46. For coastal and marine systems, including blue-carbon ecosystems, this coherence should also encompass land-sea interactions and cross-sector governance, recognizing that upstream and terrestrial pressures affect the condition and mitigation potential of coastal and marine ecosystems.

47. While nature-based solutions and/or ecosystem-based approaches are most effective when they deliver multiple benefits, ecological and social outcomes are not always mutually reinforcing, and genuine trade-offs can occur even in otherwise successful interventions – for example, between carbon sequestration and biodiversity value in monoculture designs, or between short-term livelihood needs and long-term ecological recovery. Such trade-offs should be identified transparently, negotiated through inclusive processes, and resolved in ways that do not compromise ecosystem integrity or the rights of affected communities.

**Box 1: Case studies of Scaling of nature-based solutions and/or ecosystem-based approaches**

48. In Argentina, regenerative livestock farming practices are being promoted to reverse land degradation, improve soil carbon, and enhance resilience (Regenerative Fibers of Patagonia, 2025). Using holistic pasture management, these initiatives build long-term productivity and ecological integrity. However, challenges in scaling persist, including the need for technical capacity, access to finance, and supportive policy frameworks. This case highlights the importance of systemic approaches to scaling nature-based solutions and/or ecosystem-based approaches in agricultural landscapes. Similarly, efforts to restore ancient crop varieties in Tuscany, Italy, demonstrate how reviving traditional agricultural systems can enhance food system resilience and generate niche markets (Gualandi and Williams-Gualandi, 2021). By linking heritage grain cultivation to local economies and agroecological principles, these initiatives promote both biodiversity and economic diversification. This approach supports system-level change through cultural revitalisation and sustainable livelihoods.

49. Close-to-nature forest management in the Pahernik forest in Slovenia assures continuous economic returns (Sever et al., 2021). With continuous tending of individual high-quality crop trees (pruning, light increment), the economic returns are expected to increase even more in the near future. Within the last decade, the annual economic surplus was about 190 €/ha. The logs are sold to the local sawmill, which is also equipped with a band saw suitable for sawing larger-diameter logs. The high economic return is a result of 98% natural regeneration, indirect tending because of the long regeneration periods, and the involvement of the Slovenia Forest Service in the preparation of forest management plans and tree marking.

50. Questions of scale (both spatial and temporal) should be considered throughout the implementation of the stepwise approach. UNEP and EEA offer recommendations for scaling of nature-based solutions that are broadly applicable also to ecosystem-based approaches (UNEP, 2022b; EEA, 2023). These recommendations are summarized as follow:

- identifying the social, environmental and economic costs and benefits of different approaches in different contexts, including across diverse geographical areas, over various timescales, landscapes or their distribution across different actors
- addressing factors that enable success and the barriers to scaling, through systematic monitoring, reporting and evaluation on effectiveness and efficiency
- adopting integrated approaches to scale up nature-based solutions, aligning policies, incentives, finance and safeguard measures, and including regional planning
- developing, adapting and, where appropriate, applying fit-for-purpose safeguards, standards and guidelines, and adhering to them
- enabling effective locally-led actions, scaling and coordinating existing local initiatives, with safeguards tailored to risks and settings, in the application of the precautionary approach; applying evidence-based decision-making and recognizing science and other knowledge systems as a driver of nature-based solutions and/or ecosystem-based approaches; and recognizing and integrating, where applicable, local, indigenous and traditional knowledge systems and the efforts of indigenous peoples and local communities.

- supporting the development of ecological networks and connectivity across landscapes and seascapes to enhance biodiversity recovery and climate resilience

## **2. Recognizing and respecting traditional knowledge and the efforts of indigenous peoples and local communities**

51. The *Voluntary Guidelines* present various tools for integrating the knowledge, technologies, practices and efforts of indigenous peoples and local communities. They recommend actions to pursue during design and implementation.

52. Local understandings of ecosystem history, function and nature's contributions to people can significantly increase the success and resilience of these approaches. In addition, traditional knowledge is also essential for understanding climate risks, particularly in contexts where observational records are limited, as it provides valuable insights into climate hazards, impacts of extreme events, changing environmental conditions, vulnerability and adaptive capacity (Fauna & Flora, 2025). Blending traditional ecological knowledge developed over generations together with modern knowledge can provide deeper ecological understanding on managing resources sustainably. It can also provide wider perspectives that can drive more innovative strategies (Weaver, 2023). For example, integrated solutions like *cosechas de agua y tierra* (water and soil harvesting) in Central America deliver drought resilience, soil regeneration and food sovereignty, all while engaging communities in place-based ecological governance (Gras, 2009).

53. Working with indigenous peoples and local communities requires full engagement and consent of these groups in a way that respects their cultural and ecological rights as well as their access to land and natural resources (Seddon *et al.*, 2021). Attention should be paid to ensuring that free, prior and informed consent processes shape the fundamental design of an initiative, and are not limited to accepting or rejecting decisions already made elsewhere. However, there are some inherent challenges involved in ensuring approaches are inclusive and collaborative (UNEP, 2022). Practitioners designing nature-based solutions and/or ecosystem-based approaches often prioritize quantitative, process-based knowledge and scientific data and metrics. Meanwhile, traditional knowledge is broadly holistic, relational and qualitative and can be influenced by social and economic factors (Latulippe *et al.*, 2020). Misunderstanding or devaluation of local efforts and knowledge can lead to negative consequences for both people and biodiversity.

54. As such, the following additional key actions are recommended:

55. Encouraging, as appropriate, the full, equitable, inclusive, effective and gender-responsive representation and participation of indigenous peoples and local communities, women and youth, migrants and displaced persons, both at the design stage and throughout project implementation, recognizing diversity within communities and avoiding assumptions of homogeneous interests, ensuring co-creation of actions to be taken and enabling ownership at local level, as appropriate. This may be facilitated by developing or amending policy and legislative frameworks that enable their full and effective participation, consistent with national legislation and circumstances and with international human rights obligations, as well as facilitating their efforts to address climate change and biodiversity loss. This builds upon Principle 4 of the *Voluntary Guidelines*.

56. Securing land tenure rights and access to natural resources for sustainable use, as appropriate, and recognizing the rights and contributions of indigenous peoples and local communities in managing biodiversity and ecosystem services locally (e.g. WRI and Climate Focus, 2022; OHCHR, n.d.). The FAO Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests, and the related UNCCD technical guide on integrating them, offer internationally recognized guidance in this regard. Many indigenous peoples and local communities face unclear and unrecognized land tenure despite having customary land or sea use rights, which undermines their ability to implement actions that address biodiversity and climate concerns and build resilience within their traditional territories. If this issue is left unaddressed, outside interventions can exacerbate land dispossession or create uncertainty about land ownership (Notess *et al.*, 2018). This builds upon Safeguard 9 of the *Voluntary Guidelines*.

57. Building bridges between science and different knowledge systems on the basis of best practices in existing forums, such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, and initiatives led by indigenous peoples and local communities, such as the Local Biodiversity Outlooks. Much traditional knowledge and many practices are passed on orally and are context specific. Inclusion of such knowledge alongside scientific findings requires attention to indigenous data sovereignty. Data sovereignty policies, such as the CARE Principles for Indigenous Data Governance, can provide frameworks for the ethical use of data to advance the collective wellbeing of indigenous peoples and local communities, and to prevent the unlawful use of traditional knowledge more broadly including, but not limited to, knowledge associated with genetic resources (Russo Carroll et al, 2021). Benefit-sharing from the use of digital sequence information on genetic resources, including through the Cali Fund established by decision 16/2, is also relevant in this regard. Beyond the technical aspects of data sovereignty, developing long-term, respectful relationships will help support mutual learning and build trust (Reed et al., 2024; Lo et al., 2025).

58. Annex II lists some relevant tools and guidance on integrating traditional knowledge.

### **Box 2: Case studies: Traditional knowledge**

59. The Shinyanga Soil Conservation Programme or HASHI in Tanzania, East Africa provides an insight into how participatory approaches can be effectively implemented. This programme for land restoration has promoted the return of an indigenous land management system, “ngitilis” (or fodder reserves) (Barrow, 2014; Nzyoka *et al.*, 2021). Severe desertification involving declining soil fertility was identified and addressed, restoring 300,000 ha of forest (Barrow, 2014), sequestering 23 million tonnes of carbon across 25 years and providing biodiversity benefits with up to 152 species of trees recorded (Barrow, 2014). Benefits to local households included improved availability to water and forest products such as firewood and fruit. The respect for traditional practices helped to build trust among local community members and stakeholders from the start of the initiative. This encouraged greater community willingness to support the restoration and get involved (Wainaina *et al.*, 2021).

60. In Zimbabwe, community-led wetland restoration is enhancing both ecological integrity and food security (BirdLife International, 2023). With support from local governments, communities are trained in restoring degraded wetlands, managing grazing pressure and monitoring key species. These efforts revive traditional land stewardship while strengthening long-term ecosystem governance and resilience.

61. In Nepal, indigenous women have used their traditional knowledge to launch eco-enterprises based on sustainable harvesting of forest products. This improved their livelihoods while enhancing forest health and reducing fire risk (ForestAction, 2023). Their efforts led to changes in local forest governance and demonstrated how integrating traditional knowledge with supportive policy can deliver social and ecological benefits.

62. In Nicaragua, farming communities on Ometepe Island are strengthening climate resilience through agroecological and ecosystem restoration practices (Fauna & Flora, 2025). Supported by local cooperatives, farmers apply generational knowledge of land management, climate variability and ecosystem stewardship to help shape adaptation actions that are both technically sound and locally appropriate. This long-term collaboration demonstrates how integrating traditional and local knowledge with scientific evidence can strengthen adaptation outcomes, support community ownership, and enhance the resilience of both people and ecosystems.

### **3. Mainstreaming nature-based solutions and/or ecosystem-based approaches**

63. The *Voluntary Guidelines* provide clear guidance on how to effectively integrate ecosystem-based approaches into climate change adaptation and disaster risk reduction planning. This supplement expands the focus to also address the use of nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits, to minimize the impacts of climate change on biodiversity and enhance human wellbeing benefits, as highlighted in Targets 8 and 11 of the KMGBF. When operationalizing the KMGBF, governments at all levels can ensure, as appropriate, that these approaches are embedded through coherent land and sea use planning, climate-biodiversity budget alignment and

spatial strategies. In this context, ocean-based actions and land-based actions are complementary and equally essential pillars in the global response to climate change and biodiversity loss – while ocean-based efforts like protecting blue carbon habitats (including mangroves, tidal marshes, seagrass meadows, tidal flats, kelp forests and other macroalgal ecosystems), advancing sustainable aquaculture, and implementing marine spatial planning target marine ecosystems and coastal resilience, land-based strategies such as the protection of high-carbon ecosystems, ecosystem restoration (including reforestation and the rewetting of peatlands and floodplains), regenerative agriculture, and soil restoration, alongside the protection and restoration of marine and coastal ecosystems, address terrestrial carbon sinks, food security, and ecosystem health. Both are increasingly recognised as critical for National Biodiversity Strategies and Action Plans (NBSAPs), voluntary Land Degradation Neutrality (LDN) targets, National Adaptation Plans (NAPs), National Disaster Risk Reduction Strategies and Nationally Determined Contributions (NDCs) and to foster collaboration and integrated policy and planning approaches across the Rio conventions (Annex II). Enhanced collaboration between the responsible ministries will help to leverage synergies, maximise resource efficiency and avoid duplication of efforts and conflicting or antagonistic interventions.

64. UNEA resolution 5/5 recognizes the significant contribution that nature-based solutions may make to effectively and efficiently addressing major social, economic and environmental challenges, such as biodiversity loss, climate change, land degradation, desertification, food security, disaster risks, urban development, water security and flood resilience, poverty eradication, inequality and unemployment, as well as social development, sustainable economic development, human health and a broad range of ecosystem services. Nature-based solutions and/or ecosystem-based approaches can support nature-positive economic development, community resilience and a just transition alongside climate and biodiversity outcomes.

65. A high-profile effort to scale up nature action for climate change mitigation is the REDD+ initiative under the UNFCCC. The concept is that efforts to reduce emissions from forest loss and degradation, and increase removals, are tracked and rewarded at jurisdictional scale. This addresses many of the concerns about the true mitigation benefits of site-based nature-based solutions but has taken much longer to implement and to finance than early advocates expected, and has at times resulted in maladaptation and negative impacts on indigenous peoples and local communities. Lessons from REDD+ can help to inform the integration of other nature-based solutions and/or ecosystem-based approaches into NDCs (UNDP, 2021).

66. Case studies from Africa, Latin America, and Southeast Asia demonstrate that community-led nature-based solutions and/or ecosystem-based adaptation initiatives, especially when supported by enabling policies and secure financing, can be replicated and scaled effectively (Reij *et al.*, 2009; Seddon *et al.*, 2021).

67. As for adaptation, mainstreaming nature-based solutions and/or ecosystem-based approaches into national and subnational policies and standards offers a vital pathway to enhance climate change mitigation and resilience, as well as climate change adaptation, biodiversity conservation, ecosystem integrity and sustainable development. Long-term monitoring and adaptive management should also be mainstreamed into policies, since these approaches may require years or decades to deliver their full benefits, during which they remain exposed to fire, drought, pests, erosion, land-use change and institutional turnover. National and subnational planning should also address wildlife conservation and recovery, ecological connectivity and wildlife-mediated ecosystem functions, with spatial planning taking account of the movement routes and connected habitats that wildlife require. To scale up best practices, including for safeguards, it is essential to integrate these solutions and/or approaches into planning and budgeting processes, supported by robust monitoring frameworks and inclusive stakeholder engagement.

68. Financial instruments such as climate finance, green bonds and blended finance can help to deliver investment. Success is likely to require proponents to quantify ecosystem services benefits, climate mitigation and measurable returns (UNEP, 2022c). Only 17% of total investment in nature-based solutions comes from private finance (UNEP, 2023b). Bridging this divide requires collaborative efforts, for example to de-risk investment for private sectors through blended finance approaches. Multilateral climate funds,

such as the Green Climate Fund, the Adaptation Fund and the Global Environment Facility, remain a primary near-term financing channel for developing-country Parties, since blended-finance instruments are often difficult to access for countries with limited domestic private-sector carbon or ecosystem-service markets.

69. Awareness of the Rio conventions (UNFCCC, CBD and UNCCD), the biodiversity-related conventions, including the Ramsar Convention on Wetlands, and inter-ministerial coordination are vital for the effective design and implementation of strategies for nature-based solutions and/or ecosystem-based approaches. The three Rio conventions, while focused on climate change, biodiversity, and land degradation respectively, share overlapping goals that these tools and approaches can holistically address. Enhanced collaboration between ministries responsible for implementing the Rio conventions helps to foster integrated policymaking, leverages synergies, and avoids duplication of efforts. Aligning objectives and facilitating shared knowledge and resources can lead to efficient scaling up and out of nature-based solutions and/or ecosystem-based approaches (EEA, 2023).

70. To scale up these approaches, it helps to have an understanding of their impacts across multiple social, economic and environmental challenges. Measuring these impacts is complex, especially spread across ecosystem services, resilience and human wellbeing. The IUCN Global Standard for Nature-based Solutions offers one toolkit to understand impacts at different scales (IUCN, 2020).

#### **4. Raising awareness, capacity building and institutional strengthening**

71. The *Voluntary Guidelines* focus on opportunities to raise awareness through existing networks, especially those associated with multilateral environmental agreements. Raising awareness and strengthening capacity are critical components for the successful design, implementation and scaling up of nature-based solutions and/or ecosystem-based approaches. It is essential to address concerns that have been raised about nature-based solutions and to enable actions that respect the rights of indigenous peoples and local communities and have strong financial, environmental and social integrity.

72. Awareness initiatives can help diverse stakeholders including indigenous peoples and local communities, practitioners, subnational governments, businesses, financial actors and policymakers to understand the value of integrating nature into sustainable development and climate resilience strategies.

73. Capacity building equips practitioners with the technical knowledge, tools, and skills needed to plan, execute, and monitor nature-based solutions effectively, ensuring solutions are both scientifically sound and locally relevant. Some actions require a high level of technical knowledge, data and interpretation and financial planning to implement and scale up. For example, ecological engineering measures such as constructing wetland and the restoration of degraded habitats may require capacity building amongst practitioners.

74. Meanwhile, institutional strengthening enhances governance frameworks, fosters cross-sectoral collaboration, and ensures long-term support and scalability. Together, these elements create an enabling environment that empowers societies to harness the full potential of nature in addressing climate change, biodiversity loss, and social equity challenges.

75. Effective capacity building for the design and implementation of nature-based solutions and/or ecosystem-based approaches practices depends on a combination of participatory approaches, cross-sectoral collaboration, and tailored training tools. Community-led mapping, ecosystem service assessments and co-design methodologies can all help to ensure that strategies are context-specific and inclusive (Cabling *et al.*, 2024). Key tools will be context-dependent, but may include interactive workshops, scenario planning exercises and digital platforms for knowledge exchange, which enhance stakeholder engagement and promote local ownership. Capacity building is further strengthened through multi-level governance structures, peer-to-peer learning, and integrating indigenous and local knowledge (Dushkova and Kuhlicke, 2024). These approaches foster long-term skills development, enabling communities and institutions to co-create resilient, adaptive solutions aligned with environmental and socio-economic goals.

76. When nature-based solutions and/or ecosystem-based approaches are used to provide climate change mitigation co-benefits, a robust capacity building approach may be needed to enable practitioners and

policymakers to tackle, measure and finance carbon emissions and removals, operating within safeguards and carbon accounting frameworks. Capacity-building approaches should also recognize the wider co-benefits of nature-based solutions and/or ecosystem-based approaches, including improved water security and disaster risk reduction through the protection and restoration of ecosystems, and should draw on high-integrity carbon-market standards to avoid greenwashing. The [REDD+ Academy](#) is an online capacity building programme focused on jurisdictional REDD+. At landscape scale, the Endangered Landscapes and Seascapes Programme offers guidance on estimating climate benefits of interventions and identifying whether to engage in [voluntary carbon markets](#).

77. Capacity building on financing is essential to bridge the gap between innovative ecological solutions and sustainable funding mechanisms. The *Toolbox on Financing Nature-based Solutions* offers some guidance for private and public sector decision-makers on structuring and building blended finance instruments. It includes case studies on de-risking, engaging beneficiaries and the use of guarantees (Brasil-Leigh *et al.*, 2024). Training on accessing existing finance may involve stakeholders such as governments, NGOs, communities, and private sector actors with the skills and tools to develop robust business cases, conduct cost-benefit analyses and navigate blended finance models. Training programmes often focus on enhancing understanding of financial instruments such as green bonds, climate funds, and payment for ecosystem services (PES), while fostering public-private partnerships to mobilize investment (UNEP, 2022c). Integrating financial understanding with ecological knowledge ensures that initiatives are not only environmentally effective but also economically viable and scalable.

78. IPBES (2024b) underscores that when the objective is to achieve systemic transformation, capacity will need to be built to shift societal norms, institutional practices and policy frameworks. By strengthening the capabilities of governments, civil society, indigenous peoples and local communities, these capacity building efforts would ensure that biodiversity conservation is integrated into broader development strategies. This holistic approach helps ensure that biodiversity is safeguarded while advancing sustainable development objectives.

79. Annex II lists some relevant tools and guidance on raising awareness and building capacity.

## **E. Stepwise approach to design and implementation**

### **Introduction**

80. Since the publication of the *Voluntary Guidelines* in 2019, there have been substantial developments in international policy and scientific understanding as it relates to nature-based solutions and/or ecosystem-based approaches. In a CBD context, the KMGBF includes Targets 8 and 11, which call for: (i) minimizing climate and disaster risks to biodiversity, including through inclusive nature-based solutions and/or ecosystem-based approaches; and (ii) restoring, maintaining and enhancing nature's contributions to people through nature-based solutions and/or ecosystem-based approaches. These targets underscore the need for well-designed, context-specific ecosystem-based interventions that are both effective and equitable, with robust safeguards. Evidence has also grown that the effects of climate change often interact with local pressures such as nutrient enrichment, pollution, habitat modification and overexploitation, producing net impacts beyond the predictable sum of their parts. This reinforces the need for the stepwise approach to diagnose cumulative and interactive stressor pathways, not only individual pressures.

81. UNEA Resolution 5/5 defines nature-based solutions as '*actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits*'. The adoption of this definition marked a pivotal advancement in global environmental policy, reinforcing the credibility and coherence of nature-based solutions and/or ecosystem-based approaches, while recognizing that they do not replace the need for rapid, deep and sustained reductions in greenhouse gas emissions across all sectors, alongside significant developments in REDD+ standards that enhanced safeguards, transparency, and alignment with climate and biodiversity goals (TNC, 2022). Although the terms are often used interchangeably, nature-based solutions and ecosystem-based approaches are not fully synonymous:

ecosystem-based approaches, such as ecosystem-based adaptation and ecosystem-based disaster risk reduction, are rooted in the ecosystem approach of the Convention on Biological Diversity, while nature-based solutions, as defined by UNEA, provide a broader umbrella concept that encompasses them.

82. The *Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6)* highlights that safeguarding high-integrity ecosystems is essential to achieving the 1.5°C target under the Paris Agreement, reinforcing the need for integrated approaches that deliver co-benefits for both biodiversity and climate. *Working Group III* of AR6 summarizes scientific knowledge on climate change mitigation, including its issues, costs, synergies with adaptation measures, co-benefits, and links to sustainable development (IPCC, 2022). It highlights the importance of multi-objective policies and projects that target mitigation, combining accelerated mitigation actions with shifts in development pathways. The report emphasizes the policy, governance and institutional capacity, finance, behaviour and lifestyles, and innovation and technology as key enabling factors to accomplish such combined objectives.

83. Meanwhile, the *IPBES Transformative Change Assessment* highlights the need to address the underlying drivers of biodiversity loss in a way that respects certain principles (IPBES, 2024b). These are justice and equality, pluralism and inclusion, respectful and reciprocal human-nature relationships, and adaptive learning and action. According to the assessment, attention should be paid to power asymmetries and governance tailored to the local and national context. The assessment suggests that a just distribution of the costs and benefits associated with biodiversity conservation and sustainable use will ensure inclusive outcomes. Socioeconomically marginalized populations who are disproportionately affected by biodiversity loss may contribute minimally to its drivers. These populations often maintain close interdependencies with ecosystems and play significant roles in biodiversity stewardship. Consequently, minimizing adverse social impacts and enhancing benefit-sharing mechanisms can support both ecological integrity and human well-being. Integrating socially responsive approaches into biodiversity strategies will help to achieve resilient, equitable and enduring conservation outcomes.

84. The steps below are intended to complement the existing *Voluntary Guidelines*, further developing the concepts introduced above and identifying specific additions that will be needed when nature-based solutions and/or ecosystem-based approaches are used to provide climate change mitigation co-benefits.

## **Step A: Understanding the social-ecological system**

### **Purpose**

85. This step focuses on understanding the social-ecological system through the lens of nature-based solutions and/or ecosystem-based approaches that provide co-benefits for climate change mitigation, adaptation and disaster risk reduction, as well as for biodiversity and ecosystem integrity. The KMGBF reaffirms the importance of context-specific, inclusive approaches that address multiple objectives while embedding climate action in complex human–nature systems. This step establishes the foundation for defining challenges and objectives within relevant ecological, social, and governance dynamics. By respecting the principles set out in the IPBES Transformative Change Assessment (IPBES, 2024b) and recognising the benefits of a just transition, initiatives can target the root causes of biodiversity loss and ensure that climate and nature action does not perpetuate inequities.

### **Outcomes**

86. This step supports a holistic appraisal of the ecological characteristics and human relationships that shape the feasibility and potential of nature-based solutions and/or ecosystem-based approaches. It enables a deeper understanding of the systems that interventions aim to influence, helping to identify drivers of degradation and greenhouse gas emissions, as well as the livelihoods, rights, and knowledge systems of those who depend on or manage ecosystems. It also sets the stage for interventions that address the root causes of biodiversity loss, are aligned with the principles outlined by IPBES (2024b), and feed into system-wide change.

**Key Actions**

87. Undertake an in-depth diagnosis of the social-ecological system to define the opportunity and set realistic, equitable objectives. This requires early attention to power asymmetries, the distribution of benefits and responsibilities, and the institutions that can support or undermine the intended outcomes, including for transformative change (IPBES, 2024b; IPCC, 2022). Key areas of focus for nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits include:

*Mitigation potential*

- Analyse the history of the target ecosystem, current degradation pressures, and the rate and drivers of greenhouse gas emissions from ecosystem loss or degradation. This will feed into an estimate of potential emissions reductions and removals from proposed activities (Step D). The implications of ecosystem change for water availability, quality and hydrological regulation should also be assessed, including potential trade-offs and synergies between mitigation and water outcomes. Furthermore, the impact of future climate scenarios on the rate of ecosystem change, biodiversity loss and ecosystem degradation and subsequent greenhouse gas emissions and water outcomes should also be considered.
- Assess the level of confidence in estimates of carbon stocks, losses and sequestration capacity. Establish a proportionate baseline for relevant wildlife populations and ecological functions alongside information on habitat and carbon, identifying the wild species or groups most relevant to the intended climate or disaster-risk outcome and the functions they perform. Diagnose local environmental modifiers that may locally determine or moderate whether interventions succeed, such as nutrient status, hydrology, soil condition, fire regime and the presence of invasive species.

*Social context*

- Assess the dependence of local jobs, industries, livelihoods, and cultures on natural and managed or modified ecosystems. Assess the impacts of ecosystem loss or degradation.
- Where relevant, consider differences between women and men, including within indigenous peoples and local communities, in their dependence on ecosystems, livelihoods, roles and responsibilities, and in the impacts arising from ecosystem loss or degradation, so as to avoid reproducing or deepening existing inequalities.
- Identify barriers to ecosystem protection, restoration and sustainable use.
- Elicit the aspirations of local populations, including indigenous peoples and local communities.
- Assess social dynamics, reflecting diversity and power imbalances and recognizing intersecting identities, social layers and structures (Haines-Matos et al., 2025).

*Market and non-market approaches*

- Clarify existing policy or agreements on benefit-sharing, including any monetization of emission reductions and removals, as well as assessment of who bears costs, risks, opportunity costs and restrictions on resource use.
- Assess whether carbon rights are tied to land or sea tenure, how they are recognised in policy and practice, and whether there is pre-existing clarity on which stakeholders would benefit from monetization.
- Ensure that land and resource tenure rights are clearly defined as part of both market and non-market approach assessments.

- Understand local attitudes toward payments for ecosystem services and other non-market approaches.
- Consider, according to the legal or customary context, possible differences between women and men in the recognition of carbon rights and land and sea tenure, and in access to and control over the benefits derived from monetization, whether individual or collective.
- Where carbon-market finance is used to monetize mitigation co-benefits from nature-based solutions and/or ecosystem-based approaches, project design and monitoring should also safeguard adaptation and resilience outcomes for producers and local communities, alongside carbon integrity, safeguards, tenure and equitable benefit-sharing (FAO, 2025).

#### *Stakeholders and rights-holders*

- Understanding the social-ecological system requires identifying rights-holders (those with legal or customary rights to the ecosystem) and stakeholders (those who may influence or be affected by its management). This may include indigenous peoples and local communities, private sector actors and multiple levels of government. Participatory mapping exercises can help to uncover overlapping claims, potential conflicts and synergies. The diagnostic work carried out in this step has direct downstream consequences for the safeguards addressed in section III.C: mapping existing land and resource tenure, and identifying legitimate, pre-existing governance structures for benefit-sharing and decision-making, provides the foundation on which later equity, permanence and additionality safeguards depend. In identifying rights-holders and stakeholders, the needs, interests, knowledge and capacity to participate of both women and men should be considered, recognizing that institutional or community representation may not reflect all perspectives; inclusive participatory mapping can help to reveal internal power dynamics.
- Insecure, unclear or unrecognized land and resource tenure has repeatedly been identified as an underlying driver of weakened outcomes across multiple dimensions of nature-based solutions and/or ecosystem-based approaches simultaneously, including reduced permanence of results, contested additionality, and unresolved equity and rights concerns. Tenure assessment and clarification, where necessary, should therefore be treated as a cross-cutting risk factor to be addressed at the outset of project design, rather than as a consideration specific to any single safeguard or step. Carbon rights should not supersede existing customary, collective or legally recognized resource rights.

88. The IPBES Transformative Change Assessment (IPBES, 2024b), Values Assessment (IPBES, 2022), Nexus Assessment (IPBES, 2024a) and IPCC AR6 stress the importance of inclusive governance and recognition of diverse worldviews. Inclusive governance is tailored to local realities, addresses historical injustices, and embraces plural forms of knowledge and authority. Inclusive governance should ensure representation and decision-making authority for rights-holders, including indigenous peoples and local communities, women, youth, persons living with disabilities, pastoralists, smallholder producers and other groups disproportionately affected by climate change and biodiversity loss. Early engagement with stakeholders and rights-holders is essential not only to inform the diagnosis but also to co-define mitigation objectives in ways that reflect shared priorities and negotiated trade-offs.

89. Annex II profiles a suite of tools for addressing participation, rights and equity across the stepwise approach.

### **Step B: Assessing vulnerabilities and risks**

#### **Purpose**

90. This step examines the vulnerabilities and risks of nature and people to climate change, disasters and other hazards, as discussed in the *Voluntary Guidelines*. Where climate change mitigation co-benefits are sought, this includes assessing the risk of reversals, where carbon benefits and biodiversity gains achieved by interventions may be lost due to future climate impacts, degradation, or governance failures. The

assessment may also reflect how different communities and ecosystems experience vulnerability and incorporate traditional knowledge into risk identification. It may also consider risks to water availability, quality and hydrological regimes, including changes in freshwater flows, droughts, floods and other water-related hazards, as well as how these risks affect freshwater ecosystems and water-dependent communities. Risk assessment should also cover governance-related and social risks to permanence and equity, including elite capture of benefits and unresolved tenure disputes, alongside climate and ecological hazards.

### **Outcomes**

91. A nuanced understanding of vulnerabilities and risks enables practitioners to design more robust, equitable, and long-lasting nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits while safeguarding biodiversity and ecosystem integrity. Where climate change mitigation co-benefits are sought, particular attention is given to the risk of reversals of the mitigation achieved and of associated losses of biodiversity. Risk framing should also consider risks arising from interactions among climate and local anthropogenic stressors, and compound and cascading risks in which hazards occur sequentially or together (for example wildfire followed by post-fire flooding) and propagate across infrastructure, food systems, health, water security and livelihoods. Where relevant to the intervention, risks to wildlife and to the ecological functions wildlife supports should be assessed explicitly, including habitat fragmentation, barriers to movement, disruption of ecological interactions, invasive species, disease and increased human-wildlife conflict.

### **Key Actions**

92. Risk assessment should consider both social and ecological vulnerabilities. On the ecological side, practitioners should assess the risk of negative impacts of climate change mitigation measures on biodiversity, including ecosystem integrity and ecosystem services, as well as the likelihood that restored or protected ecosystems may be damaged by future climate impacts. Social vulnerability analysis should identify groups that are particularly exposed or marginalized, ensuring that responses are sensitive to existing inequalities and structural disadvantages. This should consider, according to context, how existing inequalities, including gender and ethnic inequalities, may shape exposure, sensitivity and the capacity to adapt to and recover from climate risks.

93. Engaging early with indigenous peoples and local communities, and with other vulnerable groups, with full respect for knowledge sovereignty and indigenous data sovereignty, can strengthen assessments and reveal place-based strategies for managing risk. These processes help illuminate existing vulnerabilities and inform context-specific approaches to resilience and adaptation. Understanding the landscape of social and ecological risk is essential for shaping effective responses. This includes identifying areas of high climate exposure, degraded ecosystems with limited adaptive capacity, and communities facing systemic barriers to participation, access, or decision-making. The impacts assessed should include direct, indirect and cumulative impacts, impacts outside the intervention area, and impacts on vulnerable groups, tenure and resource rights, as well as risks to traditional knowledge and to cultural values. Where possible, climate risk and vulnerability assessments should combine the best available scientific evidence, including climate observations, projections and impact studies, with local and indigenous knowledge, lived experience and community perceptions. Integrating these complementary knowledge systems enables a more comprehensive understanding of current and future climate risks, vulnerabilities, and adaptation needs, priorities and opportunities.

94. Tools and resources for assessing vulnerabilities and risk include the [IPCC AR6 Working Group II report](#), [national climate projections](#), [UNDP Vulnerability Assessment Tools](#), participatory risk assessment approaches that integrate traditional knowledge (as outlined in [IPCC WGII Chapter 1](#) and [IPCC, 2022, Chapter 12](#)), safeguard screening tools designed to identify social and environmental risks and mitigation needs (frameworks referenced in section 2.2.4 above; see also [Climate Focus, 2022](#)), Free, Prior and Informed Consent protocols, which ensure meaningful participation and rights-based decision-making, and the FAO Climate Risk Toolbox (see Annex II).

95. If this step identifies potentially serious or irreversible harm that cannot be adequately avoided or mitigated, the option should be rejected rather than carried forward to Step D.

## Step C: Identifying options for nature-based solutions and/or ecosystem-based approaches

### Purpose

96. The goal of Step C is to identify potential nature-based solutions and/or ecosystem-based approaches that are contextually appropriate and ecologically feasible. This step builds on the understanding of the social-ecological system and vulnerabilities to explore suitable interventions. Nature-based solutions and/or ecosystem-based approaches that seek to address climate change mitigation as a co-benefit should also be capable of delivering wider benefits for biodiversity, water security, ecosystem integrity and people. The options identified will ideally be effective, equitable and scalable.

### Outcomes

97. Practitioners identify a range of feasible and desirable options that align with local goals and national targets, including those under the KMGBF (Targets 8 & 11, as well as Targets 2, 6 & 7). These options are informed by global databases, case studies and participatory engagement. They serve as the starting point for more detailed appraisal and prioritisation. Options should also be screened at this stage for the governance capacity needed to meet the safeguards addressed in section III.C, since comparative evidence indicates that otherwise similar options can produce markedly different ecological and social outcomes depending on the strength of governance and safeguards.

### Key Actions

98. For nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits, a series of steps to identify options could be:

*Identify broad options based on existing analysis*

99. In Step A, information about carbon storage, loss and removals by ecosystems is gathered. This step should consider options for action that will protect stored carbon, reduce losses and/or enhance removals. Various reports and platforms explore the potential of different nature-based solutions and/or ecosystem-based approaches, often drawing on the same global analyses to quantify the scope for reduced carbon emissions or increased removals. In forest ecosystems, options such as Continuous Cover Forestry (CCF) or Close-to-Nature Forestry (CNF) represent viable approaches. These methods aim to promote biodiversity-friendly and adaptive forest management for multifunctionality and climate resilience.

*Explore specific options undertaken in other similar geographies and similar socio-cultural systems*

100. As noted previously, there are many compilations of relevant case studies, sometimes hosted on platforms that allow filtering by categories such as location, primary objectives and ecosystem type. Analyzing successful case studies implemented in similar conditions (geographical, socio-political or ecological) may help to identify solutions that have not yet been envisaged in a local context. A review of 64 case study compilations has been undertaken as part of the Nature-based Solutions intergovernmental consultations (Valverde and Egbuwalo, 2023).

101. The IPBES Transformative Change Assessment identifies multiple strategies with high transformative potential. Options that address root causes of degradation, engage multiple sectors and promote integrated benefits across the biodiversity-climate-health nexus are particularly valuable. The Thematic Assessment Report on the Interlinkages among Biodiversity, Water, Food and Health (“Nexus Assessment”) of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services can help to identify the positive and negative feedbacks, spillovers, trade-offs and benefits of options across all of these elements (IPBES, 2024a). This should include identifying positive and negative feedbacks among biodiversity, water, food, health and climate objectives, and documenting where evidence is uncertain or context-specific. For example, urban interventions, such as urban green infrastructure, urban forests, green corridors, nature-positive stormwater management systems, green roofs and ecosystem-based heat island mitigation measures, can offer biodiversity, mitigation, adaptation and health benefits simultaneously (IPCC AR6 WGIII, Ch. 12; EEA, 2023).

*Work with stakeholders to identify favoured options*

102. Participatory work with the multistakeholder group anticipated in the *Voluntary Guidelines* will help to make sure that interventions are rooted in local concerns and aspirations. Locally owned actions often have a better chance of delivering long-term benefits for nature and people. This should require affected rights holders to participate in identifying and shaping alternatives, following the principles and guidelines of free, prior and informed consent. Where possible, the assessment and selection of options should consider potential differentiated effects on women and men in terms of benefits, costs and risks, drawing on the social vulnerability analysis in Step B.

103. Multiple sources can be used to identify potential options for action: global analyses and geospatial platforms such as Naturebase; national-level guidance such as the Guide for Including Nature in Nationally Determined Contributions; decision-support tools such as the Joint Nature Conservation Committee's Nature-based Solutions Triple Win Toolkit; and databases of case studies, such as those curated by the Nature-based Solutions Initiative (NbSI, n.d.), Oppla, Panorama, and others. It is also essential to engage local stakeholders to ensure that interventions respond to social priorities, build on local knowledge, and have long-term support. Nature-based solutions and/or ecosystem-based approaches can be implemented not only in natural ecosystems but also in sustainably managed production landscapes and seascapes, including agricultural lands, managed forests, Satoyama-type landscapes, coastal areas and urban green spaces, where they contribute simultaneously to biodiversity conservation, ecosystem services and climate objectives.

104. Additional key actions may include assessing feasibility and implementation requirements, such as technical, institutional, legal, financial and capacity requirements, and developing criteria for prioritizing options (e.g. through multi-criteria assessment).

**Table 4: Step C Toolbox - Identifying options for nature-based solutions and/or ecosystem-based approaches**

| Tool/Resource                                           | Purpose                                                                                                                                                                                                            | Reference or Link                                                                                                                                                         |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Naturebase platform                                     | Geospatial tool to model climate mitigation and co-benefits                                                                                                                                                        | <a href="#">Nature Base</a>                                                                                                                                               |
| Nature based Solution Triple Win Toolkit                | Decision-support toolkit to identify and assess nature-based solutions that deliver benefits for biodiversity, climate and people.                                                                                 | <a href="#">JNCC Nature-Based Solution Triple Win Toolkit</a>                                                                                                             |
| Oppla                                                   | Ranging from practical examples to research efforts                                                                                                                                                                | <a href="#">Oppla Case Study Finder</a>                                                                                                                                   |
| Participatory design workshops                          | Identifying socially and culturally acceptable options                                                                                                                                                             | <a href="#">IIED Locally Led Adaptation Principles</a>                                                                                                                    |
| IPBES Transformative Change strategies                  | Guidance for system-level change                                                                                                                                                                                   | IPBES (2024b)                                                                                                                                                             |
| Climate (Co)benefits Portal                             | Explore evidence on the climate co-benefits of different interventions                                                                                                                                             | <a href="https://priestleycentre.shinyapps.io/climatecobenefitsportal/">https://priestleycentre.shinyapps.io/climatecobenefitsportal/</a> ; doi: 10.1088/1748-9326/adf981 |
| CBD Knowledge Traditional Information Portal            | Guidelines and protocols adopted under Article 8(j), including the Akwé: Kon and Mo'otz Kuxtal Guidelines, for the recognition, protection and equitable participation of indigenous peoples and local communities | <a href="https://www.cbd.int/traditional/">https://www.cbd.int/traditional/</a>                                                                                           |
| Global Tree Knowledge Platform (The Landscape Alliance) | Supports the better use of tree species – the right tree in the right place for the right purpose – for greater benefits to people and the environment                                                             | <a href="https://www.landscapealliance.org/gtkp/">https://www.landscapealliance.org/gtkp/</a>                                                                             |
| GlobalUsefulNativeTrees (GlobUNT)                       | Use information on 14,014 tree species and their native distributions across 242 countries and territories, supporting the                                                                                         | <a href="https://patspo.shinyapps.io/GlobalUsefulTrees/">https://patspo.shinyapps.io/GlobalUsefulTrees/</a>                                                               |

|                                                                         |                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         | use of native species in planting, including matching species to baseline or future climatic conditions                                                                                      | <a href="https://www.nature.com/articles/s41598-023-39552-1">https://www.nature.com/articles/s41598-023-39552-1</a>                                                                                                                                                                                                   |
| EcoregionsTreeFinder                                                    | Native distribution of 48,129 tree species across 828 terrestrial ecoregions, supporting the selection of native species for restoration, including under different climate change scenarios | <a href="https://patspo.shinyapps.io/EcoregionsTreeFinder/">https://patspo.shinyapps.io/EcoregionsTreeFinder/</a> ;<br><a href="https://doi.org/10.1111/geb.70064">https://doi.org/10.1111/geb.70064</a>                                                                                                              |
| IUCN Global Standard for Nature-based Solutions                         | Evidence-based framework for the consistent and credible application of nature-based solutions across sectors and geographies                                                                | <a href="https://inbs.iucn.org/understand/global-standard-for-nature-based-solutions/">https://inbs.iucn.org/understand/global-standard-for-nature-based-solutions/</a>                                                                                                                                               |
| PANORAMA – Solutions for a Healthy Planet                               | Database of over 1,000 case studies, including on ecosystem-based adaptation, mitigation and disaster risk reduction                                                                         | <a href="https://panorama.solutions/en">https://panorama.solutions/en</a>                                                                                                                                                                                                                                             |
| IPBES Nexus Assessment response options                                 | Over 70 response options addressing interlinkages among biodiversity, water, food, health and climate                                                                                        | IPBES (2024a), Chapter 5:<br><a href="https://doi.org/10.5281/zenodo.13850309">https://doi.org/10.5281/zenodo.13850309</a>                                                                                                                                                                                            |
| Integrated Locally Led, Ecosystem-Based Adaptation Tool (Fauna & Flora) | Holistic assessment tool for planning and evaluation                                                                                                                                         | <a href="https://www.fauna-flora.org/publications/piloting-the-locally-led-ecosystem-based-adaptation-tool-insights-from-conservation-practice-in-nicaragua/">https://www.fauna-flora.org/publications/piloting-the-locally-led-ecosystem-based-adaptation-tool-insights-from-conservation-practice-in-nicaragua/</a> |

## Step D: Prioritizing, appraising and selection of options

### Purpose

105. Step D aims to prioritize and select among the identified nature-based solutions and/or ecosystem-based approaches by evaluating their relative feasibility and anticipated social and environmental benefits including for biodiversity, climate change adaptation, mitigation and disaster risk reduction. This includes the use of appraisal tools, participatory processes and transparent decision-making criteria.

### Outcomes

106. A shortlist of actionable, high-integrity interventions that are well matched to the local context and global objectives. The set of selected options will be robust in terms of additionality, permanence, equity and contribution to long-term nature and climate goals.

### Key Actions

107. Additional criteria should be considered when appraising nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits. Options can be prioritized using the mitigation hierarchy, mitigation potential, benefits for biodiversity and ecosystem integrity, wider co-benefit potential, social and socio-economic outcomes, human rights risks, resilience to climate change, environmental sustainability, and interaction risk and uncertainty, and capacity to implement over the long term (including any governance issues).

108. Both the protection of threatened intact ecosystems and the restoration of lost or degraded ecosystems may be pursued, as local circumstances allow. Relatively simple methods can be used to derive a first estimate of mitigation potential for many options, although countries should seek to improve their transparency reporting over time, including through the increased use of higher-tier data and methods. The IPCC distinguishes three tiers of data and methods: Tier 1 (default global values), Tier 2 (country-specific), and Tier 3 (more detailed models, more local data) in its framework for estimating potential emissions reductions or removals (IPCC, 2006). Spatial prioritization using geospatial analysis can help to identify suitable locations and can consider co-benefit potential alongside mitigation potential. Ideally decisions will also consider trade-offs and synergies across the biodiversity–climate–health nexus (IPBES, 2024a).

Our understanding of ecosystem resilience to climate change (Step B) is a factor in assessing the long-term viability of each option in delivering mitigation benefits. Capacity to implement will depend upon existing skills and knowledge, training opportunities and access to the enabling environment, financial and other resources needed to enable implementation through time.

109. A full evaluation of options may encompass ecological thresholds, opportunity costs, institutional capacity and risks of leakage or reversal. Siloed planning should be avoided by incorporating cross-sectoral perspectives. A participatory appraisal of the socio-economic benefits and trade-offs of specific options should also be undertaken, building on the understanding of the social-ecological system developed in Step A (Haines-Matos et al., 2025). The level of consultation, stakeholder engagement and safeguards required will also depend on the scale of the project. When assessing options in forest ecosystems, continuous cover forestry and close-to-nature forestry practices should be prioritized where appropriate, as they have been shown to enhance forest resilience to climate change and other environmental threats.

110. Options should not be prioritized solely on the basis of mitigation potential or implementation feasibility. The appraisal should consider the potential for adverse impacts on biodiversity, ecosystem integrity, human rights, tenure, livelihoods and cultural values, as well as the extent to which these risks can be avoided and mitigated. Where affected rights holders' consent is required, the absence of such consent should be treated as a condition affecting whether and how the option can proceed.

111. Table 5 suggests some tools and resources that may be useful during this step, while Annex II lists tools suitable for assessing climate change mitigation potential of different options.

**Table 5: Step D Toolbox - Prioritizing, appraising and selection of options**

| Tool/Resource                                                                                                                      | Purpose                                                                                                                      | Reference or Link                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IPCC Tiers (1–3)                                                                                                                   | Carbon accounting for mitigation potential                                                                                   | Annex II; <a href="#">2019 Refinement to the 2006 IPCC guidelines</a>                                                                                                                                                                                                                                                                                             |
| Mitigation hierarchy                                                                                                               | Prioritize amongst actions to reduce negative and increase positive impact                                                   | UNEP (2021); TNC (2023)                                                                                                                                                                                                                                                                                                                                           |
| UN-REDD GIS tutorials                                                                                                              | Build capacity to use spatial analysis tools for REDD+ planning, ecosystem service assessment and biodiversity conservation. | <a href="https://bit.ly/gistools-redd">https://bit.ly/gistools-redd</a>                                                                                                                                                                                                                                                                                           |
| Multi-criteria analysis tools                                                                                                      | Evaluate interventions across multiple dimensions                                                                            | <a href="#">ROAM</a> ; SEI Toolkits                                                                                                                                                                                                                                                                                                                               |
| Assessing the benefits and costs of nature-based solutions for climate resilience: a guideline for project developers (World Bank) | Assess and compare the benefits and costs of nature-based solutions for climate resilience                                   | <a href="https://www.worldbank.org/en/news/feature/2023/05/22/assessing-the-benefits-and-costs-of-nature-based-solutions-for-climate-resilience-a-guideline-for-project-developers">https://www.worldbank.org/en/news/feature/2023/05/22/assessing-the-benefits-and-costs-of-nature-based-solutions-for-climate-resilience-a-guideline-for-project-developers</a> |

## Step E: Project design, implementation and scaling up

### Purpose

112. This step focuses on the design, operationalization, and scaling of selected nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits, delivering verifiable carbon benefits alongside those for biodiversity, ecosystem integrity, freshwater systems and water security and society. Emphasis is placed on stakeholder inclusion, integration of safeguards and the technical rigour required for credible mitigation outcomes. One clear pathway to scaling up is the inclusion of nature-based solutions and/or ecosystem-based approaches within National Biodiversity Strategies and Action Plans (NBSAPs), Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs), National Disaster Risk Reduction Strategies, Freshwater Challenge targets, national development

plans and strategies, sectoral plans and policies. This will promote coherence across biodiversity and climate goals, alignment with broader development priorities and integration into Monitoring, Reporting and Verification (MRV) systems.

## Outcomes

113. Projects or initiatives emerging from this step will be fully prepared for implementation. They will have clearly defined boundaries, activities and governance structures that align with national biodiversity and climate strategies. Scaling up implies the integration of nature-based solutions and/or ecosystem-based approaches into national biodiversity and climate strategies and action plans, as well as broader development planning.

114. Nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits should be capable of delivering long-term, verifiable carbon benefits, alongside those for biodiversity, ecosystem integrity and society, demonstrated through robust baselines and an MRV framework that addresses additionality, permanence and leakage. Where regional or national carbon accounting systems exist, project-scale initiatives should be designed to be compatible with these, contributing data where this is feasible. At the same time, these initiatives should be proactively designed to deliver multiple co-benefits. In addition to biodiversity conservation and ecosystem resilience, these may include social outcomes such as well-being and improved quality of life, economic benefits to communities, community cohesion, gender equity, the empowerment of indigenous peoples and local communities, and the incorporation of diverse values and knowledge systems. Initiatives should identify the wildlife and ecological-function outcomes they expect to support and how these contribute to the intended adaptation, disaster risk reduction or mitigation benefit; these outcomes should be reflected in proportionate indicators and reviewed through adaptive management, and habitat area or tree survival should not be treated as sufficient evidence where the expected benefit depends on wildlife-mediated functions.

115. This includes not only adherence to accepted carbon standards for additionality and permanence, and the avoidance of leakage, but also the structuring of benefit-sharing and decision-making arrangements through pre-existing, legitimate community governance structures, and transparency regarding the financing model adopted, since effort-based financing not conditioned on verified outcomes has been associated with materially lower rates of both outcome quantification and direct benefit flows to rights-holders.

## Key Actions

### *Design*

116. Effective implementation of nature-based solutions and/or ecosystem-based approaches requires robust design, governance and monitoring frameworks. Key actions for nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits include establishing clear boundaries for the project or initiative, baseline and carbon accounting frameworks and M&E frameworks for carbon and non-carbon benefits for biodiversity and people. Developing counterfactual scenarios helps to assess additionality and avoid double counting. MRV frameworks should be aligned with IPCC guidelines and international standards, and with methodologies under the United Nations Framework Convention on Climate Change and the Paris Agreement, including the requirements of mechanisms related to Article 6 of the Agreement, as appropriate. MRV frameworks should build on, rather than duplicate, the national MRV arrangements that Parties have established for their Biennial Transparency Reports under the United Nations Framework Convention on Climate Change.

117. The integration of safeguards is essential to ensure credible mitigation outcomes (**Error! Reference source not found.**). Project implementation should address additionality to confirm that emissions reductions go beyond business-as-usual, following accepted carbon standards, including those agreed under the Paris Agreement, while recognizing that adherence to accepted standards alone has not consistently prevented substantial over-crediting in practice; plan for permanence by prioritizing long-lived ecosystems and native regeneration, with monitoring that continues after the crediting or payment period; and minimise leakage by identifying and mitigating the displacement of emissions or ecosystem loss to other locations or

sectors, as well as other potential harm to the environment, including negative impacts on biodiversity. As an example, New Zealand promotes native regeneration over exotic plantations for permanence and biodiversity goals (UNDP, 2021). Where planting or assisted regeneration is used, preference should be given to native species and diverse assemblages over monocultures, so as to avoid carbon-only restoration that undermines biodiversity. Independent verification of baselines and reference areas is recommended as a complement, particularly for large-scale or high-value initiatives.

118. Project and initiative designs should explicitly include spatial planning, nesting within national systems where appropriate. Tools such as scenario modelling, spatial analysis, and benefit-sharing frameworks should be adapted to context. Co-management with indigenous peoples and local communities will strengthen resilience and legitimacy, while incorporating traditional knowledge can enhance the ability to respond to changing conditions. Local and indigenous knowledge is also essential for understanding climate risks, particularly where observational records are limited, providing valuable insights into climate hazards, the impacts of extreme events, and changing environmental conditions.

119. Moreover, robust monitoring and evaluation at all stages is essential for project success and effective outcomes. Inclusive governance structures must ensure the active participation of key stakeholders and clear pathways should be established for adaptive management. Inclusive governance structures should ensure the equitable and effective participation of women and men, including indigenous and young people and members of local communities, in decision-making, taking into account their different needs, interests and capacities. Designs should identify thresholds or trigger points for management review, such as exceedance of heat-stress, water-quality, invasive-species, habitat-condition or safeguard indicators, so that actions can be adjusted before losses become difficult to reverse. Lessons learned from these activities should inform replication and scaling, ensuring that projects and initiatives remain resilient, deliver credible outcomes and generate multiple benefits. These outcomes will help to make the case for fully integrating nature-based solutions and/or ecosystem-based approaches into national and international climate and development frameworks. The more carefully nature-based solutions and/or ecosystem-based approaches are planned and implemented with social principles at the core, the more successful they are in generating direct and additional benefits. Inclusive, culturally appropriate and equitable stakeholder engagement is key to increasing their relevance, acceptance, effectiveness and overall impact, and positive outcomes can in turn strengthen trust and engagement, creating a feedback loop that reinforces both social and ecological performance (Haines-Matos et al., 2025; Kamar et al., 2026).

120. The design of every project should include a designated safeguards responsibility, a safeguards implementation plan, a grievance mechanism, a remedy process, procedures for suspension or redesign when safeguards fail, and safeguards requirements that remain applicable during scaling-up.

### ***Baselines and Scenarios***

121. Credible carbon accounting requires a robust baseline and well-articulated counterfactual scenarios. The baseline establishes the expected trajectory of carbon emissions or removals in the absence of intervention and serves as the reference point against which mitigation performance is assessed. Scenario development – based on spatial data, ecological models, and stakeholder-informed land-use trajectories – enables planners to compare options and assess sensitivity to future socio-economic and climatic conditions. In Cispatá Bay, Colombia, for instance, baseline and scenario modelling for a mangrove restoration initiative has integrated satellite imagery, local ecological knowledge, and hydrological modelling to forecast sequestration potential and co-benefits under alternative management strategies (NbSI, 2023). Using IPCC Tier 2 or 3 methodologies, where possible, improves the accuracy of carbon estimates and enhances confidence in reported outcomes.

### ***Scale, Leakage, and Jurisdictional Approaches***

122. A first step to scaling up is to quantify the jurisdictional potential for multiple benefits, including for biodiversity, ecosystem integrity and climate change adaptation, mitigation and disaster risk reduction, often through spatial analysis and planning.

123. The spatial and institutional scale of nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits is critical to managing risks and maximizing synergies. Site-level interventions can deliver measurable benefits but may be vulnerable to leakage, fragmentation or governance gaps. In contrast, jurisdictional approaches - such as those under REDD+ - offer a pathway to scale up and coordinate action across landscapes. This enables more effective leakage management and overall effectiveness. Nesting project-level interventions within jurisdictional accounting systems facilitates harmonized baselines, safeguards monitoring, and benefit-sharing, while reducing the likelihood of emissions displacement. Colombia's nested REDD+ model and Honduras' unified national safeguards framework offer some examples of how such integration can be achieved, with lessons on institutional coherence and accountability (UN-REDD Programme, 2021). Jurisdictional programmes also allow for more systematic spatial planning, ensuring that interventions are sited where they can deliver both high mitigation value and social-ecological co-benefits.

124. Overall, implementation must recognize that deductions for projected leakage reduce, but do not eliminate, the risk that displaced ecosystem loss goes unaccounted for outside project or accounting boundaries; and that, unlike carbon, biodiversity loss displaced through leakage cannot be offset elsewhere, so this asymmetry should be explicitly considered when applying accounting corrections.

125. A transition from pilot projects to large-scale initiatives may benefit from toolkits tailored to ecosystem types, planning levels or user groups. Co-created modules could cover design templates, safeguard protocols and participatory M&E, translating generic standards into accessible guidance across languages and contexts.

126. Table 6 suggests some resources relevant to design, implementation and scaling up. Annex II includes a list of tools and guidance on scaling up by integrating nature into NDCs and NAPs.

**Table 6: Step E Toolbox - Project design and implementation and scaling up**

| <b>Tool/Resource</b>                                 | <b>Purpose</b>                                                                                                                                                                                                    | <b>Reference or Link</b>                                                                                                                                                                          |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scenario modelling tools                             | Develop baselines and counterfactuals                                                                                                                                                                             | Annex II; NbSI (2023) for case study                                                                                                                                                              |
| Mitigation safeguard frameworks                      | Address additionality, permanence, leakage                                                                                                                                                                        | UNFCCC REDD+; ICVCM; Gold Standard                                                                                                                                                                |
| Project Finance for Permanence                       | Link finance to long-term protection                                                                                                                                                                              | BfN (Bundesamt für Naturschutz) (2025) Towards successful policy coherence for biodiversity and climate. Learning from case studies. Bonn: BfN. doi: 10.19217/hgr252en.<br>Bhutan for Life (2024) |
| Jurisdictional accounting systems                    | Coordinate across scales and reduce leakage and account for freshwater impacts and outcomes across catchments and river basins                                                                                    | UNDP (2021); UN-REDD Programme                                                                                                                                                                    |
| Adaptive co-management models                        | Support the participation of indigenous peoples and local communities and local stewardship and equitable management of freshwater resources and ecosystems                                                       | Seddon et al. (2020); IPBES (2024a)                                                                                                                                                               |
| Freshwater planning and basin-scale assessment tools | Integrate freshwater ecosystem objectives, water availability, environmental flows, connectivity and water quality into project design and scaling; support alignment across catchment, basin and national scales | Ramsar Convention; CBD; Integrated Water Resources Management (IWRM) approaches; basin-level planning frameworks                                                                                  |

|                                                                                                                                                                      |                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Guide on Sustainable Watershed Management: Practical Guide for Developing Projects with an Ecosystem-based Approach to Climate Change Adaptation (GIZ and BDE, 2025) | Integrate an ecosystem-based adaptation approach into watershed planning and investment (in Spanish) | <a href="https://www.adaptationcommunity.net/publications/gestion-sostenible-de-cuencas-hidrograficas-guia-practica-para-la-elaboracion-de-proyectos-con-enfoque-de-adaptacion-al-cambio-climatico-basada-en-ecosistemas/">https://www.adaptationcommunity.net/publications/gestion-sostenible-de-cuencas-hidrograficas-guia-practica-para-la-elaboracion-de-proyectos-con-enfoque-de-adaptacion-al-cambio-climatico-basada-en-ecosistemas/</a> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Step F: Holistic and transparent monitoring and evaluation mechanisms

### Purpose

127. This step ensures that nature-based solutions and/or ecosystem-based approaches deliver measurable and enduring benefits. Monitoring and Evaluation (M&E) frameworks will need to encompass these multiple benefits, as well as track any negative impacts. This should include monitoring reversal events and their impacts. This includes tracking emissions reductions or removals, benefits for biodiversity and people and the integrity of safeguards. Monitoring and evaluation should track not only whether a consultation, assessment or certification requirement was formally completed, but whether it produced the intended shift in decision-making power, benefit distribution and protection from harm.

### Outcomes

128. Transparent and adaptive M&E systems that align with international reporting frameworks and enable continuous improvement. The results will demonstrate that successful nature-based solutions and/or ecosystem-based approaches can deliver cost-effective, long-term, resilient benefits across multiple objectives.

### Key Actions

129. To strengthen M&E, Parties and stakeholders can invest in institutional capacities and inclusive governance structures. They can adopt integrated indicator frameworks that reflect biocultural and scientific knowledge systems, aligning the metrics with national and global reporting platforms. Finally, they can promote participatory processes that empower indigenous peoples and local communities in the design, implementation, and interpretation of M&E tools.

130. Effective M&E systems often use a combination of quantitative and qualitative indicators, that may incorporate both scientific metrics and biocultural indicators. These may include indicators that reflect the knowledge systems of indigenous peoples and local communities and track changes in ecological function, cultural integrity and community resilience. Tools will ideally be cost-effective, scalable and designed to reflect evolving socio-ecological realities. Metrics should align as much as possible with national and global systems (e.g. NBSAPs and national reports to the CBD, NDCs, Biennial Transparency Reports). Monitoring frameworks should rely on more than a single proxy indicator to assess ecosystem integrity or biodiversity outcomes, since assessments based on a single indicator have been shown to overstate positive outcomes; a multi-indicator approach is therefore recommended. Where feasible, monitoring, reporting and verification of biodiversity and climate outcomes can be strengthened through remote sensing, Earth observation systems, geospatial analysis and other digital monitoring technologies. Consistent monitoring across all sectors and indicators, both spatially and temporally, is vital to ensure that integrated benefits and costs are recorded. Biodiversity outcomes can be measured with reference to the monitoring framework of the KMGBF and other relevant nature metrics. Indicators may also be designed to identify differences in the impacts, benefits and outcomes of interventions for women and men, including indigenous and young people and members of local communities.

131. Monitoring systems should include predefined safeguard performance thresholds and triggers for corrective action. Where monitoring identifies significant deterioration in ecosystem condition,

biodiversity, rights, livelihoods or the integrity of safeguards, this should trigger review, redesign or, where necessary, suspension of the activity, together with remedial measures.

132. Projects or initiatives seeking results-based payments for greenhouse gas emissions reductions and removals must meet stringent monitoring standards, with emission reductions measured in line with methodologies under the United Nations Framework Convention on Climate Change and the Paris Agreement and in line with REDD+, the enhanced transparency framework and the requirements of mechanisms related to Article 6 of the Agreement, as appropriate. Multiple carbon-focused standards and protocols are available, though they do not cover all types of nature-based solutions and/or ecosystem-based approaches. They typically include guidance for credible baselines, MRV systems and third-party validation.

133. Where feasible, proponents and Parties are encouraged to complement certifier-assessed additionality and baselines with independent, quasi-experimental verification against comparable control areas or jurisdictions, particularly for high-value or high-risk interventions, since compliance with accepted carbon standards alone has not consistently prevented substantial over-crediting in practice.

134. REDD+ Safeguard Information Systems may provide a useful model for tracking benefits beyond carbon, including for biodiversity and ecosystem integrity, of nature-based solutions and/or ecosystem-based approaches that provide climate change mitigation co-benefits. Governments that deploy REDD+ actions develop these systems to transparently communicate how the Cancun safeguards are being addressed and respected. They must also provide summaries of information to the UNFCCC on the status of their country approach to safeguards. Both may detail the multiple benefits of actions to retain and restore forests.

135. Annex II includes a list of tools and guidance on the monitoring of multiple benefits, while Table 7 offers some example indicators for different potential benefits.

**Table 7: Step F Toolbox - Monitoring and Evaluation**

| <b>Metric Category</b> | <b>Example Indicators</b>                                                                                                                                                                                                                                                                               | <b>Reference or Link</b>                                                                                                              |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Carbon metrics         | Tonnes CO <sub>2</sub> e sequestered/reduced emissions; permanence; leakage                                                                                                                                                                                                                             | IPCC GPG LULUCF; VCS; Gold Standard                                                                                                   |
| Biodiversity metrics   | Habitat protected or restored; indicator species presence; species population abundance and trends; ecological connectivity; ecosystem integrity and functional condition; recovery of wildlife populations and ecological interactions                                                                 | KMGBF Monitoring Framework                                                                                                            |
| Freshwater metrics     | Freshwater ecosystem condition and integrity; water quality; environmental flows; freshwater connectivity; water availability and use; groundwater and surface-water status; pollution loads; freshwater-dependent species and habitats; progress towards restoration of degraded freshwater ecosystems | KMGBF Monitoring Framework; Ramsar Convention on Wetlands; CBD; relevant national water-resource and freshwater monitoring frameworks |
| Socio-economic metrics | Cost efficiency; benefit sharing; equity                                                                                                                                                                                                                                                                | UN-REDD; IIED; IPBES, 2024b                                                                                                           |

|                       |                                                               |                                                                                                            |
|-----------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Resilience metrics    | Adaptive capacity; early warning indicators                   | IPBES, 2024a; UNDRR; UAE Framework for Global Climate Resilience (decision 2/CMA.5), targets 9(b) and 9(d) |
| Governance indicators | Participation; free, prior and informed consent; transparency | UNDRIP; UNFCCC Safeguards; ICVCM Core Carbon Principles                                                    |

## Annex I: Sectoral contributions

Sectoral contributions of nature-based solutions and/or ecosystem-based approaches to global frameworks

| Sector/Issue                | Nature-based solutions and/or ecosystem-based approaches                                                                                                                                                                                                            | Relevant KMGBF Targets | Relevant SDGs | Key International Frameworks & Provisions                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Climate change mitigation   | Reduced emissions from reducing ecosystem loss and degradation; and ongoing carbon sequestration by forests, peatlands, wetlands, mangroves, seagrass meadows, tidal flats, kelp forests, macroalgal ecosystems and other coastal and marine habitats, among others | 2, 8, 10               | 13, 15        | <a href="#">Paris Agreement, Art. 5.1</a> (sinks & reservoirs); <a href="#">UNEA Res. 5/5</a> , para. 3; <a href="#">IPCC AR6</a> , Ch. 5                                                                                                                                                                                                                                                                                                                         |
| Climate change adaptation   | Ecosystem buffers for climate variability (e.g. floodplains, forests); microclimate regulation; genetic resources (in-situ) conservation                                                                                                                            | 8, 11, 1, 4            | 13, 6, 11     | <a href="#">Paris Agreement, Art. 7.1</a> (adaptation goal); <a href="#">UNFCCC Decision 1/CP.21</a> , para. 43 (ecosystem-based adaptation)                                                                                                                                                                                                                                                                                                                      |
| Disaster risk reduction     | Natural coastal barriers (e.g. mangroves), landslide buffers, ecosystem flood retention                                                                                                                                                                             | 8, 11, 12              | 11, 13, 3     | <a href="#">Sendai Framework, Priority 3</a> ; <a href="#">CBD Technical Series No. 93</a> , Sections II & IV                                                                                                                                                                                                                                                                                                                                                     |
| Food security & agriculture | Regenerative agriculture, agroecology, crop resilience, pollinator support, integrated land management                                                                                                                                                              | 10, 2, 11              | 2, 12, 15     | <a href="#">FAO Agroecology Guidelines</a> (2019), Pillars 1–3; <a href="#">UNEA 5/5</a> , para. 5(a); <a href="#">KMGBF, Target 10</a> ; <a href="#">Sharm el-Sheikh joint work on implementation of climate action on agriculture and food security</a> (decision 3/CP.27)                                                                                                                                                                                      |
| Forestry                    | Close-to-nature forest management; continuous cover forestry                                                                                                                                                                                                        | 2, 8, 9, 10, 11        | 15            | <a href="#">EC guidelines on close-to-nature forest management</a> ; <a href="#">Pro Silva principles on continuous cover forestry</a>                                                                                                                                                                                                                                                                                                                            |
| Water security              | Watershed restoration, riparian buffers, wetland rehabilitation, water purification                                                                                                                                                                                 | 1, 2, 11               | 6, 13, 15     | <a href="#">Ramsar Convention, Art. 3.1</a> ; <a href="#">UNCCD Land Degradation Neutrality (SDG 15.3)</a> ; <a href="#">SDG 6 Targets (6.6: protect water-related ecosystems)</a> ; <a href="#">UN System-wide Strategy for Water and Sanitation and its Collaborative Implementation Plan</a> (Contributing Actions 1.21 and 4.10); <a href="#">Paris Agreement, Art. 7.1</a> (adaptation goal; target 9(a)); <a href="#">UNECE Water Convention, Art. 3(i)</a> |
| Urban resilience            | Green spaces, urban forests, bioswales, heat reduction, flood buffering                                                                                                                                                                                             | 12, 1, 11              | 11, 3, 13     | <a href="#">New Urban Agenda</a> , para. 65–67; <a href="#">UNEP NbS Guidelines</a> , Section III                                                                                                                                                                                                                                                                                                                                                                 |
| Health & well-being         | Improved air/water quality, reduced disease vectors, mental health through green space access                                                                                                                                                                       | 11, 12, 10             | 3, 6, 11      | <a href="#">WHO Biodiversity &amp; Health Guidance</a> , Ch. 2; <a href="#">One Health Joint Plan of Action</a> , Pillar 1                                                                                                                                                                                                                                                                                                                                        |

|                      |                                                                                                             |           |           |                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------------------------------------------------------------------------------------------------------------------------------|
| Economic development | Green jobs, restoration economies, sustainable tourism, nature-positive value chains                        | 8, 10, 20 | 8, 9, 12  | <a href="#">ILO Just Transitions Guidelines</a> , Sec. 2.2; <a href="#">UNEA 5/5</a> , para. 6(a); <a href="#">LEAF Coalition</a> |
| Equity & governance  | Community stewardship, indigenous governance, gender-responsive design, rights-based nature-based solutions | 22, 8, 11 | 5, 10, 16 | <a href="#">UNGPs, Pillars I–III</a> ; <a href="#">OHCHR (2023)</a> Key Message 3; <a href="#">KMGBF, Target 22</a>               |

## Annex II: Tools and guidance

Selected tools and guidance on nature-based solutions and/or ecosystem-based approaches for climate change mitigation and adaptation

| Tool and/or guidance                                                                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Participation, rights and equity across the stepwise approach</b>                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <a href="#">Participatory Assessment of Climate and Disaster Risk tool</a> (Brot für die Welt, HEKS/EPER)                                    | A toolkit of seven modules for participatory risk assessment and community-led planning. It covers both climate change and disaster risks, with the end product being a community adaptation plan. It integrates nature-based solutions and/or ecosystem-based approaches without using this language.                                                                                                                                     |
| Free, Prior and Informed Consent <a href="#">Guidelines</a> (UN-REDD Programme)                                                              | Prepared for country teams working on REDD+ (reducing emissions from deforestation and forest degradation, ‘plus’ the conservation, sustainable management and restoration of forest carbon stocks). Sets out the requirements and process for free, prior and informed consent of indigenous peoples. Also advocates analysis to identify other forest-dependent communities who also have the right to free, prior and informed consent. |
| <a href="#">Mo’ otz Kuxtal Voluntary Guidelines</a> (CBD)                                                                                    | Guidelines focused on free, prior and informed consent for the access of traditional knowledge and practices. Also covers fair and equitable benefit-sharing when knowledge is used and preventing illegal appropriation of traditional knowledge.                                                                                                                                                                                         |
| <a href="#">Principles for just and equitable nature-based solutions</a> (SEI)                                                               | Details five principles for social justice and equity in nature-based solutions, focused on the conceptualization and design stage.                                                                                                                                                                                                                                                                                                        |
| <a href="#">Guidelines for co-creation and co-governance of nature-based solutions</a> (EC DGRI)                                             | Sets out a detailed approach to working with local communities and other actors to design nature-based solutions. Includes ‘building blocks of a successful co-creation process’ and an annex of practical methods for engagement. Draws on case studies from several European projects.                                                                                                                                                   |
| <a href="#">Human rights guide for working with indigenous peoples and Local Communities</a> (TNC)                                           | Features six modules on working with indigenous peoples and local communities, prepared for conservation practitioners. Includes templates and checklists. Features a narrative case study for Wenland, a fictitious European country, to bring the guide to life.                                                                                                                                                                         |
| <a href="#">The CARE Principles for Indigenous Data Governance</a> (Russo Carroll et al., 2021)                                              | Principles (Collective benefit, Authority to control, Responsibility, Ethics) complementing the FAIR data principles, guiding rights-based governance of data concerning indigenous peoples and local communities.                                                                                                                                                                                                                         |
| <a href="#">The First Nations Principles of OCAP</a> (FNIGC / CGIPN)                                                                         | This resource guide and short course outline principles on indigenous (First Nations) data – “Ownership, Control, Access and Possession”. Proposes approaches for collection, protection, use and sharing of data.                                                                                                                                                                                                                         |
| <a href="#">Key messages on business and climate change</a> (OHCHR)                                                                          | Explores the UN Guiding Principles on Business and Human Rights in a climate change context, detailing the responsibilities of states and of businesses. It advocates for ambitious climate action, transparent disclosure of climate impacts, meaningful participation in climate-related decisions, free, prior and informed consent and other rights-based measures.                                                                    |
| <a href="#">The Social Dimension of Nature-based Solutions: Guidance Report</a> (Haines-Matos et al., 2025)                                  | Guidance on integrating social considerations – rights, equity, participation, livelihoods and benefit-sharing – into the design and implementation of nature-based solutions (BfN, Germany).                                                                                                                                                                                                                                              |
| <a href="#">Inclusive Conversations report: advancing a human rights-based approach to biodiversity and climate action</a> (BES-Net)         | Report on advancing a human rights-based approach to biodiversity and climate action.                                                                                                                                                                                                                                                                                                                                                      |
| <a href="#">Carbon Markets, Forests and Rights: An introductory series for indigenous peoples and communities</a> (Forest Peoples Programme) | Introductory series for indigenous peoples and communities on carbon markets, forests and rights.                                                                                                                                                                                                                                                                                                                                          |

|                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Carbon toolkit</a>                                                                                                                                  | Toolkit module on carbon markets and rights.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <a href="#">Free, Prior and Informed Consent – Manual for project practitioners (FAO)</a>                                                                       | Manual for project practitioners on free, prior and informed consent, complementing the UN-REDD Free, Prior and Informed Consent Guidelines.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <a href="#">Biodiversity Loss and Climate Change are also Gender Issues (GIZ, 2024)</a>                                                                         | A series of thirteen stories exploring how women across Latin America, from Mexico to Bolivia, are asserting their rights and taking on leadership roles in ecosystem-based adaptation within their local communities.                                                                                                                                                                                                                                                                                                                                                                      |
| <a href="#">Toward gender-responsive Ecosystem-based Adaptation: Why it's needed and how to get there (GIZ / IISD)</a>                                          | Illustrates the importance of integrating gender considerations in ecosystem-based adaptation actions and provides concrete examples of how this can be done in practice.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Scaling up: integrating nature into Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs)</b>                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <a href="#">A Guide for Including Nature in Nationally Determined Contributions: 2<sup>nd</sup> Edition (Nature4Climate)</a>                                    | Designed for country teams aiming to embed nature-based solutions and/or ecosystem-based approaches into their NDCs. Outlines practical steps to do so, at the same time increasing national ambition for climate action. It provides recommendations on how to align climate actions with biodiversity conservation, health and the broader sustainable development agenda. It covers the NDC readiness phase, target-setting and implementation. It includes case studies, examples of policies and measures and links to further relevant resources, including on wider NDC development. |
| <a href="#">Natural Climate Solutions Handbook: A Technical Guide for Assessing Nature-Based Mitigation Opportunities in Countries (TNC)</a>                    | Offers a practical guide to assessing potential 'natural climate solutions' at country scale, including advice on establishing baselines, assessing uncertainty of mitigation potential and developing marginal abatement cost curves. Includes five country case studies.                                                                                                                                                                                                                                                                                                                  |
| <a href="#">Considerations for integrating Nature-based Solutions into Nationally Determined Contributions: Illustrating the potential through REDD+ (UNDP)</a> | Discusses considerations for the integration of nature into NDCs, focusing on lessons from REDD+ as a mitigation measure. It covers the UNFCCC policy context, carbon accounting, safeguards, multiple benefits, access to finance and the need for interministerial coordination. It aims to help countries to determine whether their REDD+ experience can be built upon to cover the broader land-use, forests and agriculture sector in NDCs.                                                                                                                                           |
| <a href="#">E-Course: Bringing Nature into National Adaptation Planning (UNEP)</a>                                                                              | A short online course on the benefits of integrating nature-based solutions into NAPs, and the risks of not doing so. Includes an interactive landscape that illustrates the role of nature in climate change adaptation.                                                                                                                                                                                                                                                                                                                                                                   |
| <a href="#">Building Resilience with Nature: Maximizing Ecosystem-based Adaptation through National Adaptation Plan processes (IISD)</a>                        | Reviews 19 NAPs to learn lessons on integrating ecosystem-based adaptation. On this basis, offers guiding principles and recommendations. Includes relevant tools and resources.                                                                                                                                                                                                                                                                                                                                                                                                            |
| <a href="#">Guidelines for Integrating Ecosystem-based Adaptation into National Adaptation Plans: Supplement to the UNFCCC NAP Technical Guidelines (UNEP)</a>  | A further resource on integrating ecosystem-based adaptation into NAPs. Also offers guidance on mainstreaming ecosystem-based adaptation into other plans and policies.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <a href="#">Land-based measures to mitigate climate change: Potential and feasibility by country (Global Change Biology)</a>                                    | Provides initial estimates for 200 countries of the climate change mitigation potential and cost-effectiveness of different actions, ranging from the protection, restoration and sustainable management of ecosystems through to demand-side measures such as reduction in food waste, clean cookstoves and dietary shifts. As such, the paper and its supplementary material can offer an initial guide to opportunities for incorporating nature-based solutions and/or ecosystem-based approaches into national mitigation strategies and commitments made in NDCs.                     |
| <a href="#">The Freshwater Challenge</a>                                                                                                                        | A country-driven initiative to restore degraded rivers, lakes and wetlands and protect freshwater ecosystems, providing a framework for scaling up freshwater-focused nature-based solutions.                                                                                                                                                                                                                                                                                                                                                                                               |

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| <a href="#">Nexus Assessment response options</a> (IPBES, 2024a)                                                                                                                            | Identifies response options that jointly address biodiversity, water, food, health and climate, with attention to synergies and trade-offs – supporting integrated option appraisal.                                                                                                                                                                                                                                                                 |
| <a href="#">PANORAMA – Solutions for a Healthy Planet</a>                                                                                                                                   | A platform documenting replicable case studies across ecosystems and themes, including ecosystem-based adaptation and nature-based solutions, enabling cross-country learning and option identification in Step C.                                                                                                                                                                                                                                   |
| <a href="#">Climate Risk Toolbox</a> (FAO)                                                                                                                                                  | A modular toolbox supporting climate risk screening and the integration of adaptation and nature-based measures into agriculture, forestry and land-use planning.                                                                                                                                                                                                                                                                                    |
| <a href="#">Making Ecosystem-based Adaptation Effective: Qualification Criteria and Quality Standards</a> (FEBA, 2017)                                                                      | FEBA criteria distinguishing genuine ecosystem-based adaptation from other approaches; used to assess whether interventions deliver adaptation, biodiversity and community benefits.                                                                                                                                                                                                                                                                 |
| <a href="#">IUCN Global Standard for Nature-based Solutions</a> , 2025, 2nd edition (IUCN)                                                                                                  | Updated framework of criteria and indicators for designing, verifying and scaling up nature-based solutions, addressing biodiversity, ecosystem integrity, climate, governance and social safeguards. Supersedes the 2020 first edition.                                                                                                                                                                                                             |
| <a href="#">VCM Access Strategy Toolkit</a> (VCMi)                                                                                                                                          | “Considerations for host countries when engaging in high-integrity voluntary carbon market”. Guides country teams in their thinking around whether or not to engage with voluntary carbon markets, including role within NDCs and legal / institutional frameworks needed.                                                                                                                                                                           |
| The <a href="#">Exponential Roadmap</a> for Natural Climate Solutions (Conservation International)                                                                                          | Proposes a bold plan to reach net-zero land sector emissions by 2030 and 5 GtCO <sub>2e</sub> of net negative emissions by 2040, doubling to 10 GtCO <sub>2e</sub> by 2050. Ranks and visualizes mitigation opportunities across countries.                                                                                                                                                                                                          |
| <a href="#">Nature-based Solutions Evidence Platform</a> (Conservation International and Nature-based Solutions Initiative)                                                                 | Designed to support decision-making by providing robust, accessible evidence on the effectiveness of nature-based solutions for climate change adaptation. Compiles peer-reviewed studies, case examples and data that demonstrate potential benefits for both people and nature.                                                                                                                                                                    |
| <a href="#">Understanding the scaling potential of Nature-based Solutions</a>                                                                                                               | Offers an assessment framework on the scaling potential of nature-based solutions for climate change adaptation and ecosystem restoration. Applies this framework to several European case studies.                                                                                                                                                                                                                                                  |
| <a href="#">Unlocking Nature for Disaster Resilience: A Policy Guide to Enable Nature-Based Solutions</a> (World Bank, 2026)                                                                | Practical guidance on enabling nature-based solutions through public policies to enhance climate and disaster resilience. Examines five key sectors, highlights the role of nature-based solutions and identifies policy gaps, opportunities and good practices.                                                                                                                                                                                     |
| <a href="#">Towards successful policy coherence for biodiversity and climate. Learning from case studies</a> (BfN, 2025)                                                                    | Recommendations and case studies for aligning national biodiversity and climate policies, including NDCs, NAPs and NBSAPs.                                                                                                                                                                                                                                                                                                                           |
| <a href="#">Locking Carbon in Wetlands: Enhancing Climate Action by Including Wetlands in NDCs</a> (Wetlands International)                                                                 | Guidance on including wetlands in NDCs; see also Glatzel and Fennessy on wetland inventories for wetland carbon assessments ( <a href="https://www.semanticscholar.org/paper/Wetland-inventories-for-wetland-carbon-assessments-Glatzel-Fennessy/959b25d24363ea6cddb16f4d4197bf00944b64ef">https://www.semanticscholar.org/paper/Wetland-inventories-for-wetland-carbon-assessments-Glatzel-Fennessy/959b25d24363ea6cddb16f4d4197bf00944b64ef</a> ). |
| <a href="#">Implementation of a Strategic Framework for Scaling Up Ecosystem-Based Adaptation: Success Factors and Lessons Learned from the EbA-LAC Program</a> (GIZ and IISD, 2026)        | Discusses success factors for scaling up ecosystem-based adaptation and summarizes case studies from Latin America (available in English and Spanish).                                                                                                                                                                                                                                                                                               |
| <a href="#">Ecosystem-based adaptation in the agriculture sector – A nature-based solution (NbS) for building the resilience of the food and agriculture sector to climate change</a> (FAO) | Outlines priority nature-based interventions for adaptation in the food and agriculture sector as articulated in countries’ NDCs, illustrated through good practices showcased during FAO’s EbA webinar series (2017–2018).                                                                                                                                                                                                                          |
| <a href="#">Urban Nature Atlas</a>                                                                                                                                                          | Collection of nature-based solutions case studies in cities.                                                                                                                                                                                                                                                                                                                                                                                         |

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| <a href="#">BioInfo Knowledge Platform and BioAtlas</a> (Caribbean Biological Corridor)                                                 | A spatial decision-support, learning and communication platform for countries in the Caribbean Biological Corridor, integrating the BioAtlas (GIS mapping, ecosystem demarcations and climate projections), BioEvea (virtual training) and BioMedia (knowledge resources). Supports baseline diagnosis of social-ecological systems, biodiversity assessment and cross-border ecosystem-based adaptation and nature-based solutions planning (Step A).                                                    |
| <b>Raising awareness and building capacity on nature-based solutions and/or ecosystem-based approaches</b>                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <a href="#">Nature-based Solutions for Sustainable Development</a> – micro-course (UNDP)                                                | A short online course introducing nature-based solutions concepts and their potential contribution to NDCs and national water plans.                                                                                                                                                                                                                                                                                                                                                                      |
| <a href="#">Ecosystem-based Adaptation: Working with nature to adapt to a changing climate</a> (SDG Academy)                            | A short online course on ecosystem-based adaptation, focused on design and implementation of initiatives, especially in sectors other than conservation. It covers principles, risk assessment, monitoring and governance.                                                                                                                                                                                                                                                                                |
| <a href="#">IUCN Global Standard for Nature-based Solutions</a> , 2025; second edition (IUCN)                                           | This Second Edition of the Global Standard for NbS includes eight criteria and 27 indicators. Provides a robust, evidence-based framework for the consistent and credible application of NbS across sectors and geographies. Structured as a systematic learning and quality assurance tool, the Global Standard for NbS ensures that NbS are applied effectively and sustainably, maximising their potential to address societal challenges, while delivering measurable benefits for people and nature. |
| <a href="#">Possible ways to foster the uptake of knowledge on Nature-based Solutions</a> (biodiversa+)                                 | Discusses approaches for mainstreaming nature-based solutions and/or drawing on scientific knowledge, through a common taxonomy, definition and metrics, knowledge sharing, collaboration and capacity building.                                                                                                                                                                                                                                                                                          |
| <a href="#">Financing for adaptation and resilience to climate change in Latin America</a> (INCAE, CLACDS, GIZ, CATIE)                  | Open course for professionals in the financial and insurance sectors on basic climate change concepts and how climate risk relates to financial risk, supporting the inclusion of climate risk in financial and insurance products (in Spanish).                                                                                                                                                                                                                                                          |
| <a href="#">E-course: Agricultural ecosystem-based solutions – Introduction</a> (FAO)                                                   | A two-lesson course providing an overview of agricultural ecosystem-based solutions (AgEbS), which can enhance production efficiency while protecting and restoring the productive capacity of environmental resources. Also introduces the AgEbS tool.                                                                                                                                                                                                                                                   |
| <a href="#">Observations and key messages on Nature-Based Solutions for agricultural water management and food security</a> (FAO)       | Focuses on the management of water for agricultural use and the transition to sustainable food and agriculture systems, with examples of nature-based solutions for agricultural water management and food security.                                                                                                                                                                                                                                                                                      |
| <a href="#">Nature-based solutions in agriculture: sustainable management and conservation of land, water and biodiversity</a> (FAO)    | Outlines how nature-based solutions can simultaneously address conservation, climate and socioeconomic objectives while maintaining healthy and productive agricultural systems.                                                                                                                                                                                                                                                                                                                          |
| <a href="#">Hand in hand with nature – Nature-based Solutions for transformative agriculture</a> (FAO)                                  | Overview and examples of nature-based solutions applied to agriculture in the Europe and Central Asia region, supported by Globally Important Agricultural Heritage Systems (GIAHS) examples.                                                                                                                                                                                                                                                                                                             |
| <a href="#">Nature-based solutions for agricultural water management and food security</a> (FAO)                                        | Calls for a shift in water management paradigms through nature-based solutions that enhance the availability and quality of water for productive purposes and human consumption, while preserving the integrity and intrinsic value of ecosystems.                                                                                                                                                                                                                                                        |
| <a href="#">G20 South Africa 2025. Compendium of case studies on Ecosystem-Based Approaches for DRR/Nature-based solutions</a> (UNESCO) | Case studies and tools highlighting good practices in financing, policy and cost-benefit analyses of nature-based solutions for disaster risk reduction.                                                                                                                                                                                                                                                                                                                                                  |
| <a href="#">EU Voluntary Guidelines on Closer-to-Nature Forest Management</a> (European Commission, 2023)                               | Promotes biodiversity-friendly and adaptive forest management for forest multifunctionality and climate resilience, with region-specific chapters on challenges and opportunities.                                                                                                                                                                                                                                                                                                                        |

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| Ecological Silvicultural Systems (Palik and D'Amato, 2023)                                                                             | Provides detailed case studies on ecosystem-based approaches to forest management from North America, South America, Europe and Australia (Wiley, ISBN 978-1-119-89090-4).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Assessing climate change mitigation potential</b>                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| NEXT (Nationally Determined Contribution Expert Tool) and ABC-Map (FAO)                                                                | Focuses on estimating the mitigation potential of actions in agrifood systems (Agriculture, Forestry and Other Land Use (AFOLU), waste and energy sectors) over a 30-year annual time series. Fully in line with the Enhanced Transparency Framework, it follows IPCC guidance and integrates IPCC default values on emissions and removals, and can be customized with country-specific data. Mandatory for FAO-supported GEF and GCF projects, and serves as the carbon engine of the FAO Adaptation, Biodiversity and Carbon mapping tool (ABC-Map), which captures carbon and biodiversity indicators within a single framework. EX-ACT remains valid for project-level ex-ante appraisal. |
| <a href="#">naturebase</a>                                                                                                             | Geospatial platform that models twenty 'natural climate solutions' at a national to subnational scale, estimating the climate change mitigation benefit and selected ecosystem service benefits. Incorporates a screening tool for human rights due diligence.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <a href="#">NbS Benefits Explorer</a>                                                                                                  | Aims to inform those intending to invest in nature-based solutions. Includes an interactive tool that develops a quantitative and monetary valuation of benefits of actions to protect, restore and manage ecosystems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <a href="#">Blue Carbon Manual</a> (CI/UNESCO/IUCN)                                                                                    | Outlines "methods for assessing carbon stocks and emissions factors in mangroves, tidal salt marshes and seagrass meadows".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <a href="#">Blue Carbon Explorer</a> (TNC)                                                                                             | Supports prioritization for restoration or protection in mangroves and other coastal wetlands. Draws on remotely sensed spatial data to explore changes in ecosystem condition. Designed for use in the Caribbean, Indonesia and Papua New Guinea but also includes global data.                                                                                                                                                                                                                                                                                                                                                                                                               |
| <a href="#">Carbon Benefits Project toolkit</a>                                                                                        | Toolkit for estimating the carbon benefits of land management interventions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <a href="#">Sustainable Forest Management (SFM) Toolbox</a> (FAO)                                                                      | Collates tools, case studies and other resources, organised in modules, giving forest owners, managers and other stakeholders easy access to resources for implementing sustainable forest management.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Monitoring across multiple benefits</b>                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <a href="#">Evaluating the impact of nature-based solutions – a handbook for practitioners</a> (EC DGRI)                               | Brings together methods and indicators on M&E for nature-based solutions, compiling these across multiple European projects.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <a href="#">Planning, Designing and Monitoring of Nature-based Solutions: guidelines to urban transformations</a> (Instituto Humboldt) | Offers a planning, design and monitoring framework for urban nature-based solutions, with case studies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <a href="#">Good Practice Guidance for Land Use, Land Use Change and Forestry</a> (IPCC)                                               | Provides formal guidance on the monitoring of carbon stocks and greenhouse gas emissions and is intended for use in national inventories. Together with its refinements and supplements, this guidance is a key reference drawn upon by other methodologies.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <a href="#">Carbon Standards for Natural Climate Solutions (NCS) Credits</a> (WBCSD)                                                   | Through a collection of factsheets, documents the approach and uptake of different carbon standards. Includes their requirements on additionality, permanence, leakage and multiple ('core') benefits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <a href="#">Guidebook for Monitoring and Evaluating Ecosystem-based Adaptation Interventions</a> (GIZ)                                 | Covers the design and implementation of M&E for ecosystem-based adaptation. Includes approaches to develop a results framework, indicators, and baseline, to operationalize the M&E system and to communicate the results.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <a href="#">Delivering Transformative Change and Multiple Benefits: The evidence base of nature-based</a>                              | Outlines the evidence base for the ability of nature-based solutions and ecosystem-based adaptation to deliver multiple benefits and transformative change, with forward-looking recommendations on scaling up implementation and support.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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| <a href="#">solutions and ecosystem-based adaptation</a> (GIZ, IISD)                    |                                                                                                                                                                                                    |
| <a href="#">Protected Areas Benefits Assessment Tool + (PA-BAT+)</a> (IUCN)             | Technical guidance to assess the benefits from protected areas.                                                                                                                                    |
| <a href="#">ALivE – Adaptation, Livelihoods and Ecosystems Planning Tool</a> (IISD)     | A computer-based tool to support users in organizing and analysing information to plan effective ecosystem-based adaptation options within a broader planning process.                             |
| <a href="#">Integrated Locally Led, Ecosystem-Based Adaptation Tool</a> (Fauna & Flora) | A holistic assessment tool to support adaptation planning and monitoring, evaluation and learning at the local level, strengthening the evidence base for locally led, ecosystem-based adaptation. |

## Annex III: References

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