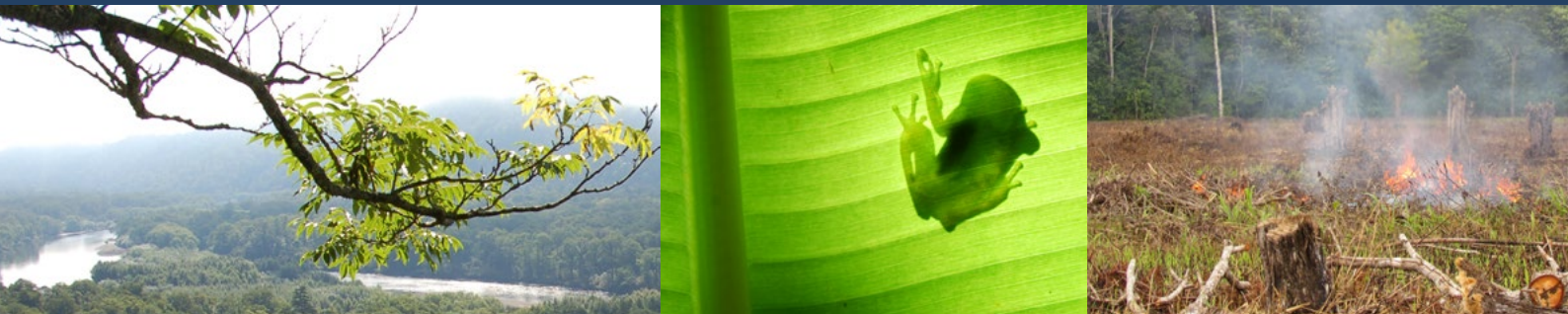


Addressing climate change: Why biodiversity matters



KEY MESSAGES

- Climate change mitigation and adaptation can be supported by biodiversity conservation actions, enabling the permanence of mitigation and adaptation efforts.
- Biodiversity loss and ecosystem degradation undermines the supply of ecosystem services vital for mitigation and adaptation.
- Adaptation and mitigation actions that do not consider the role of, and potential impacts on, biodiversity can have adverse consequences; therefore, such impacts must be assessed, and measures put in place to address them.
- Application of biodiversity criteria and safeguards to climate change interventions can enhance the benefits and minimise the risks for biodiversity without jeopardising mitigation or adaptation objectives.
- Multiple international agreements and national processes relevant to climate change and biodiversity should be implemented in ways that are coordinated, mutually supportive and enhance synergies.

1. Introduction

Climate change and biodiversity loss are two of the greatest global threats to human well-being. An urgent and coordinated response is needed to avoid catastrophic impacts on the environment and the many benefits and services that humans derive from it.

This policy brief describes the interconnections between climate change and biodiversity. It highlights the importance of considering biodiversity within climate change policies, programmes and projects, and presents potential opportunities for doing so. The brief has been informed by a 2.5 year research and development project on biodiversity criteria for the design, selection and evaluation of climate change adaptation and natural carbon sinks/REDD+ projects in forests and wetlands under the German International Climate Initiative (IKI)¹. When developing such criteria and related safeguards for climate change policies, programmes and projects, consideration of social and environmental aspects is vital. This brief focuses on environmental issues.

2. Biodiversity, ecosystem services and their importance

The term biodiversity encompasses: **genetic diversity**, the variability within a species; **species diversity**, the variety of different species; and **ecosystem diversity**, the variety of different ecosystems. Ecosystems are areas where communities of living organisms interact with each other and their non-living environment.

Intact ecosystems provide multiple services to humans, including provisioning services, such as supply of food and natural resources, and regulating services, that modify climate and hydrology, as well as cultural services like spiritual fulfilment and recreation. Ecosystem conservation, restoration and management can play a crucial role in climate change mitigation, for example through carbon sequestration and the reduction of greenhouse gas emissions. Likewise, such practices can be important for climate change adaptation, buffering societies from the impacts of climate change. For example, flood plains and mangroves can provide natural protection against extreme weather events and rising sea levels.

Biodiversity loss and ecosystem degradation can undermine the provision of valuable services. Ecosystems can only withstand pressure up to a certain threshold. Once such a threshold has been surpassed, the damage to the ecosystem may be irreversible. The combined effects of different pressures, such as climate change, harmful land-use change, and over-exploitation, can lower the thresholds which can be withstood. Generally speaking, the more diverse an ecosystem, the more resilient it is

to different stresses. More diverse ecosystems are likely to include species with a greater range of tolerances and sensitivities, increasing the likelihood that some species will continue to contribute to ecosystem functioning under different stresses and decreasing the possibility that irreversible thresholds are crossed. The way ecosystems are managed as part of climate change mitigation and adaptation activities can have significant impacts on biodiversity and ecosystem services, and therefore the long term effectiveness of these actions.



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3. Interconnections between climate change and biodiversity and ecosystem services

An effective climate change response requires consideration of the role of, and potential impacts on, biodiversity and ecosystem services.

Forest and wetland ecosystems house important carbon stocks. Terrestrial vegetation alone is estimated to store approximately 450-650 gigatonnes of carbon (GtC).² However, ecosystem conversion and degradation caused by unsustainable management release carbon dioxide to the atmosphere. Gross emissions from tropical deforestation and degradation, for example, averaged 2.8± 0.5 GtC per year in the 2000s.² **Sustainable management of ecosystems curbs greenhouse gas (GHG) emissions and therefore contributes to mitigating climate change.**

Biodiversity and **ecosystem services support people to adapt to climate change** through approaches collectively called **ecosystem-based adaptation (EbA)**. Conservation, restoration and sustainable management of ecosystems can help reduce vulnerability to climatic hazards such



Policy reviews and gap analysis can help ensure consistent and coherent policy development that takes account of the importance of biodiversity and ecosystem services to people

The IUCN-led IKI project 'Mangrove Ecosystems for Climate Change Adaptation and Livelihoods', involving several Pacific country governments, has contributed to the development of climate change and biodiversity policy by completing policy and legislation reviews.



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as hurricanes, rising sea levels, floods and droughts. Furthermore, such approaches improve the resilience of ecosystems to climate change so that they can continue to deliver ecosystem services, supporting the provision of alternative livelihood options in the face of climate change.

The United Nations Framework Convention on Climate Change (UNFCCC) has, through the Cancun Adaptation Framework, adopted in 2010 affirmed that enhanced action on adaptation should take into consideration vulnerable ecosystems and integrate adaptation into relevant social, economic and environmental policies and actions. The list of adaptation actions that countries are invited to consider includes building the resilience of ecological systems through sustainable management of natural resources.

While there are numerous opportunities to simultaneously promote climate change mitigation, adaptation and biodiversity benefits, **poorly conceived climate change interventions may harm biodiversity and even reduce resilience to climate change.** For example, an exclusive focus on carbon benefits in the implementation of REDD+³ could displace land use pressures to non-forest ecosystems or lead to negative impacts on biodiversity elsewhere. This could have **detrimental impacts on biodiversity and ecosystem services, and the local communities that depend on them for their livelihoods and resilience to climate change.** Governments have recognised this through the UNFCCC, where decision 1/CP.16 affirmed that the implementation of REDD+ activities should promote and support the 'Cancun Safeguards'. These are a series of social and environmental safeguards that cover issues such as avoiding the conversion of natural forests, incentivising the protection and conservation of natural forests and their ecosystem services, and enhancing other social and environmental benefits.

Climate change adaptation actions that do not consider the role of, and potential impacts on, biodiversity can have adverse effects – increasing rather than reducing climate change vulnerability. For example, building a dam to prevent flooding could have negative impacts on river

ecology, disrupting fishing, reducing food security and ultimately reducing climate change resilience in local communities. The restoration of floodplains could be a suitable alternative approach that addresses flooding in the first place, while promoting nutrient retention, biodiversity conservation and potentially climate change mitigation.

4. How to achieve climate change and biodiversity objectives

4.1. Ensure policy coherence

Many countries have established or are establishing specific policies or strategies on climate change mitigation, adaptation and biodiversity. Policy design and implementation occurs through a range of legislation, strategies, plans, programmes and projects. It occurs at local, regional, national and international levels, and is enacted and financed by a range of actors. The links between climate change and biodiversity mean that there is great potential for policies, and the programmes and projects they inform, to achieve multiple objectives. There is also the potential risk for activities striving for one objective to have unintended impacts on other objectives.

In order to avoid conflicts and enable more effective implementation, **policies, programmes and projects must be coordinated and consistent.** Coherence can be facilitated by understanding the different processes involved in national implementation, and achievement of the objectives, of the UNFCCC, the Convention on Biological Diversity (CBD), the Ramsar Convention on Wetlands and other multilateral environmental agreements. Identifying the links can help to ensure effective and cohesive policies, programmes and projects for climate change and biodiversity.

Specifically, many developing countries are establishing their **Nationally Appropriate Mitigation Actions (NAMAs)**. Considering biodiversity within NAMAs can help ensure their long term effectiveness, and harness synergies between biodiversity and climate change mitigation at the



national level. Many developing countries have established or are establishing **national REDD+ strategies or action plans**, including the design of country approaches to REDD+ safeguards.

In 2013, at UNFCCC COP19 in Warsaw, Poland, seven decisions were adopted finalizing the governance framework for REDD+. The decisions included an agreement that developing countries should demonstrate how the Cancun Safeguards are being addressed and respected before receiving result-based finance (Decision 9/CP.19). This is a particularly important process for ensuring that national REDD+ activities benefit rather than harm biodiversity.

National adaptation planning can also benefit from the integration of biodiversity considerations. For instance, several countries include projects that involve the use of biodiversity and ecosystem services for helping communities adapt to climate change in their **National Adaptation Programmes of Action (NAPAs)** – designed by least developed countries to address immediate adaptation needs. For example, the first project outlined in Rwanda’s NAPA is ‘Conservation and protection of lands against erosion and floods at district level in vulnerable regions’, which includes actions to restore degraded ecosystems as a means of addressing climatic hazards.

The development of **National Adaptation Plans (NAPs)** – mid- to long-term adaptation planning in developing countries – provides another good opportunity to harness the synergies between climate change adaptation, mitigation and biodiversity conservation. The technical guidance for NAPs acknowledges ecosystem-based adaptation as one adaptation approach.

Examples of Aichi Biodiversity Targets addressing climate change, under the Strategic Plan for Biodiversity of the CBD

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

The **National Biodiversity Strategy and Action Plan (NBSAP)** is the principal instrument for national implementation of the CBD Strategic Plan for Biodiversity 2011-2020 and the 20 Aichi Biodiversity Targets. Climate related targets are likely to be supported by ensuring coherent policy development between NBSAPs and climate change policies. Therefore, climate change policy development should support the recognition of NBSAPs content in national mitigation and adaptation policies, and the recognition of adaptation policies and objectives in the development of NBSAPs. Incorporating actions to facilitate adaptation of biodiversity and ecosystems can help ensure the ongoing provision of ecosystem services important for climate change mitigation and adaptation.

Identifying areas important for biodiversity in climate change projects can help deliver multiple benefits

WWF Germany, WWF Russia, the indigenous peoples of the Udege and Nanai and the Government of Russia, together with Kreditanstalt für Wiederaufbau (KfW), have worked to protect more than 460,000 hectares of threatened forest for climate change mitigation in Bikin, Russia. The IKI project targets an area of outstanding conservation importance (habitat of Amur tigers) and involves the development of alternative livelihoods for the local community. It has been certified by the Verified Carbon Standard (VCS) and the Climate, Community and Biodiversity Alliance (CCBA) to assess and demonstrate the carbon, biodiversity and livelihood benefits simultaneously delivered by the project.



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Assessment and monitoring can help to ensure that biodiversity benefits are achieved in climate change projects

The pilot REDD+ IKI project 'Forests for Life', implemented by OroVerde, Defensores de la Naturaleza, Consejo Nacional de Áreas Protegidas (CONAP) in Sierra del Lacandón National Park, Guatemala, has considered its potential impact on biodiversity and, as a result, is reforesting only with native species. The impact on biodiversity is being monitored through flagship species (e.g. the Jaguar, the Tapir and the Scarlet Macaw) data and habitat quality indicators.



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4.2. Assess biodiversity impacts, avoid harm and enhance benefits

It is important to identify and assess the potential direct and indirect impacts on biodiversity of policies, programmes and projects during their design and implementation. This can facilitate positive impacts, help ensure multiple objectives are achieved, and avoid unintended negative impacts. Potential impacts on biodiversity will vary greatly depending on the type of policies and interventions; essential considerations include their interaction with **areas important for biodiversity**, the **introduction of species** and **use of natural resources**.

In addition, considering the impacts across the entire landscape, and the interactions with other land uses such as agriculture, human settlements and infrastructure can improve policy coherence and effectiveness.

Once potential positive and negative impacts have been identified, **measures are needed to reduce risks and, if feasible, enhance benefits to biodiversity and ecosystem services**, and their role in supporting climate change mitigation and adaptation. As an example, during wetland restoration measures could be taken to ensure only native species are used, to avoid the risk of introducing potentially invasive species which can have detrimental impacts



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Projects can simultaneously provide adaptation, mitigation and other sustainable development benefits

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is implementing an ecosystem-based adaptation project, funded by IKI, which promotes sustainable use of resources and preservation of biodiversity in Vietnam's Bac Lieu Province as a way of improving the protective function of the coastal forests. It advises the responsible government departments and trains relevant personnel to develop a land-use plan adapted to the anticipated consequences of climate change. It focuses particularly on reforesting and diversifying the coastal protective mangrove forest in order to increase its resilience to climate change and reduce erosion. The project further supports small-scale farmers living in the mangrove forests in diversifying their aquaculture production. By preventing the conversion of mangrove forest to shrimp farms and settlements, this project also provides climate change mitigation benefits.



on local biodiversity and ecosystem service provision. Assessing the impacts of policies, programmes and projects is important not just before they are implemented, but also during implementation to allow for adaptive management and to inform evaluation and reporting. For instance, ongoing monitoring can help in providing information on how the Cancun Safeguards are being addressed and respected, and on the actual impact of REDD+ activities. To assess how policies, programmes and projects are performing, it can be helpful to develop indicators to monitor performance.

4.3. Realise synergies within actions

Careful design and implementation of climate change interventions can enable synergies to be harnessed between mitigation, adaptation and biodiversity conservation. For example, restoring mangroves could enhance and protect the carbon stocks within them and could also benefit biodiversity if the appropriate steps are taken (for example planting of native species). Furthermore, if carefully planned, the restoration could also enhance other ecosystem services important for adaptation, including improved protection of local communities from coastal storms.

5. The role of biodiversity criteria

Criteria, safeguards, principles, standards and guidance (collectively referred to here as 'biodiversity criteria' for brevity) play an important role in helping climate change mitigation and adaptation policies, programmes and projects avoid or minimise risks to biodiversity and maximise potential benefits, whilst being mindful of any trade-offs with the ultimate mitigation or adaptation goal. Biodiversity criteria need to cover all of the issues outlined in section 4. For an example, see proposed biodiversity criteria (p.7).

Biodiversity criteria contribute to:

- **enhancing the climate change mitigation and adaptation benefits of policies, programmes and projects**
- **avoiding unintended impacts of climate change policies, programmes and projects on biodiversity**
- **enhancing the biodiversity benefits of climate change policies, programmes and projects**
- **guiding monitoring and evaluation for continual improvement in the design and implementation of climate-related policies, programmes and projects**
- **informing selection processes for disbursing climate finance in a responsible and effective way.**

To be effective, criteria should be concise and simple, and accompanied by guidance targeted to the main users and specific uses. A number of criteria and related tools for assessing the impact of different types of interventions on biodiversity and ecosystem services have been developed and utilised by financing institutions, governments, international agencies and NGOs. The World Bank, for

example, has detailed safeguard processes for projects they support. The UN-REDD Programme has established UN-REDD Social and Environmental Principles and Criteria (SEPC) for supporting REDD+ safeguard development within national REDD+ programmes. The REDD+ Social and Environmental Standards (SES) have been developed by the Climate, Community and Biodiversity Alliance (CCBA) and CARE International.

The Adaptation Fund under the UNFCCC has a social and environmental safeguards policy to ensure that projects and programmes do not result in unreasonable environmental and social harm, and the Green Climate Fund (GCF) – a funding body set up for finance actions to achieve the objectives of the UNFCCC – has established an expert panel on environmental and social safeguards with a view to developing the GCF's safeguards policy.

Governments, NGOs, the private sector, development agencies and communities may apply criteria throughout the policy development and project cycles, to increase mitigation and adaptation benefits whilst safeguarding biodiversity. In deciding on the application of criteria, it is important to decide whether the intention is to simply avoid negative impacts, or also to enhance benefits. It is also important to ensure that potential impacts identified are acted upon.

Recognition is needed so that biodiversity conservation can support the achievement of climate change mitigation and adaptation aims, and reduce risks to the permanence of climate change mitigation and adaptation benefits. Potential trade-offs between all three objectives (climate change mitigation, climate change adaptation and biodiversity conservation) do exist, but consideration of all impacts should enable a balance to be reached that meets multiple policy objectives and the needs of different stakeholders.

Endnotes

¹From 2008 until the end of 2013, IKI has funded more than 370 projects involving a range of organisations in 97 partner countries amounting to approximately 1.2 billion Euros. For more information on IKI visit: <http://www.international-climate-initiative.com/en/>

²IPCC. (2013) Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

³Reducing Emissions from Deforestation and Degradation, plus the conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks.



Proposed biodiversity criteria for climate change projects

Developed within the research and development project "Options for the incorporation of biodiversity criteria in IKI projects in forests and wetlands"

A. Policies, laws, regulatory frameworks and international conventions

- A.I. Projects must comply with relevant local, national and international policies, laws, regulatory frameworks and legally binding agreements linked to the conservation of biodiversity and ecosystem services.
- A.II. Projects must aim to contribute to the implementation of international treaties/conventions with regard to the conservation of biodiversity at the national level.

B. Impacts on biodiversity

Identify impacts

- B.I. Projects should identify direct and indirect impacts (including displacement) of the project, to avoid harm to and, where possible, to enhance biodiversity and ecosystem services
Include the following where relevant to the project activities:
 - B.I.a Identify the positive and negative impacts on areas important for biodiversity within the project boundaries.
 - B.I.b If organisms are to be introduced within a project, including as part of restoration/reforestation or as a biological pest (and plant) management solution, their potential invasiveness and detrimental impact on biodiversity needs to be assessed in order to avoid negative impacts on native species and ecosystem services.
 - B.I.c Identify the impact of any planned use of natural resources or ecosystem services within the project (e.g. extraction of non-timber forest products).

Response to impacts

- B.II. Measures must be taken to avoid or reduce all of the potential negative impacts identified in criterion B.I, in line with a precautionary approach. Positive impacts identified in B.I should be enhanced where possible.
Include the following where relevant to the project activities:
 - B.II.a Projects must prevent the conversion or degradation of areas important for biodiversity and ecosystem services.
 - B.II.b Projects should give preference to the use of native assemblages of species.
 - B.II.c Projects must not establish large monoculture plantations within the project boundaries.
 - B.II.d Projects must ensure they do not use genetically modified organisms.
 - B.II.e Projects should strategically locate planting activities (including restoration, reforestation and afforestation) within the landscape to avoid the degradation of areas important for biodiversity, and to actively enhance biodiversity.
 - B.II.f If relevant, projects should aim to use native biological solutions to pest and problematic plant management, as opposed to chemical solutions.
 - B.II.g Projects should aim to maintain, and where possible increase, the resilience of forest and wetland ecosystems to disturbances and pressures, including those caused by climate change (e.g. by increasing the connectivity between habitats, preventing unsustainable use, and protecting known refugia for species at the edge of their climatic range).
 - B.II.h When developing climate change adaptation projects, ecosystem-based approaches for adaptation should be considered as an alternative to the construction of 'hard-engineered' defences.
 - B.II.i Projects must aim to ensure the sustainability of any use of biodiversity/ecosystem services/natural resources within the project.

C. Joint climate change mitigation and adaptation

- C.I. Projects should aim to maximise the synergies between adaptation to climate change and mitigation of climate change and sustainable development that may be achieved through avoiding harm to, and where possible, enhancing biodiversity and ecosystem services.



Suggested further reading

- UNEP-WCMC (2014) Using criteria to strengthen biodiversity consideration: Recommendations for the International Climate Initiative (IKI), Results of the research and development project for BfN: "Options for the incorporation of biodiversity criteria in IKI projects in forests and wetlands".
- SCBD (2009) Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change Montreal: SCBD. Retrieved from www.cbd.int/doc/publications/cbd-ts-41-en.pdf
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- Millennium Ecosystem Assessment (2005) Ecosystems and Human Well-being: Wetlands and Water. Synthesis. Washington, DC: World Resources Institute.

The United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) is the specialist biodiversity assessment centre of the United Nations Environment Programme (UNEP), the world's foremost intergovernmental environmental organisation. The Centre has been in operation for over 30 years, combining scientific research with practical policy advice.

BirdLife International is the world's largest nature conservation partnership, comprising 122 BirdLife Partners worldwide, 13 million members and supporters, over 7,000 local conservation groups and 7,400 staff. The Partnership's unique local-to-global approach delivers high impact and long-term conservation for the benefit of nature and people. BirdLife's work is grounded in rigorous science informed by practical feedback from projects in important sites and habitats.

The German Federal Agency for Nature Conservation (Bundesamt für Naturschutz – BfN) is the government's departmental research agency with responsibility for national and international nature conservation. It provides the German Environment Ministry (BMUB) with professional and scientific assistance in all nature conservation and landscape management issues and performs important enforcement work under international agreements.

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Available online at:

<http://unep-wcmc.org/resources-and-data/biodiversity-criteria-in-iki>

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