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THE ROLE OF BIODIVERSITY IN CLIMATE MITIGATION

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The variety of life on Earth, from genes and microbes to complete ecosystems like forests or coral reefs, is known as biological diversity, or biodiversity. Today's biodiversity is the product of 4.5 billion years of evolution, with human influence growing over time.

The web of life that provides us with food, water, medicine, a stable climate, economic growth, and many other necessities is made possible by biodiversity. Nature contributes more than half of the world's GDP. The livelihoods of almost 1 billion people depend on trees. Additionally, almost half of all carbon emissions are absorbed by land and the ocean.[1]

There is increasing recognition of the need for a more integrated approach to tackle the climate and biodiversity crises.

Below, there are six ways in which the protection, conservation, and restoration of biodiversity can improve climate-change mitigation-

Conservation of carbon stocks and sinks

If native ecosystems are replaced by exotic monospecific stands and biodiversity and ecosystem functioning are not included in planning, the existing methodologies are unlikely to provide the climate benefits they claim. *Tropical forests, savannas, and grasslands are lost to exotic stands of Pinus or Eucalyptus when natural flora is mistakenly replaced with tree plantations as carbon sinks.* This is a grave error; every ecosystem has a unique significance and needs to be maintained in its current state, particularly since soil stores a large amount of carbon instead of trees. For instance, a grassland's protected soil serves as a sink for carbon, but it can turn into a source when vegetation is eliminated or replaced by a monospecific planting. To encourage the preservation of carbon stores, we must increase the conservation of natural ecosystems.

Protecting carbon stocks in ecosystems must be the first priority both for carbon stocks and for

[1] Biodiversity conservation | United Nations Development Programme

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biodiversity. *Native forests in the Amazon, the Congo Basin, and Southeast Asia are particularly important because of the co-occurrence of high carbon and biodiversity.* Priorities vary among locations and at each moment in history at any given region. Because financial and human resources are always limited, these resources must be used to stem further losses before the restoration of degraded lands becomes a priority, since the carbon and biodiversity benefits of avoiding deforestation are very much greater than those of planting trees both per hectare and per dollar invested.

Biodiverse restoration

Where restoration is the appropriate priority, the way that it is done has important consequences. Many countries have committed to restoring degraded land, with promises totalling millions of hectares by 2030. But restoration takes much more than planting trees and covering bare land with any type of vegetation. Restoration projects have generally used a standard for all types of ecosystems, with little species diversity and without even knowing the vegetation neighbouring the location where the restoration takes place. *We are creating new ecosystems that fail to meet one of the most important objectives of restoration: increasing environmental connectivity. By introducing a limited number of non-native species into a given region, we can inadvertently reduce the ecological functionality of the environment, making it more homogeneous and less diverse.* Only restoration with a diverse array of native species can more quickly promote environmental connectivity and restore the benefits that ecosystems can provide to humans.[2]

Integrated conservation of local fauna and flora

One of the most important aspects of natural solutions to climate change is the conservation of wild animals and their roles in ecosystems. These solutions have the capacity to sequester of carbon annually and improve the ability to prevent climate warming. This could happen as a result of animal's role in mitigating and adapting to climate change, which alters the microclimate and fire regime and increases carbon stocks, trophic complexity, habitat heterogeneity, and plant pollination, dispersal, and propagation.

[2] Scientists' warning: six key points where biodiversity can improve climate change mitigation | Bio Science | Oxford Academic

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Use only existing areas of agriculture, pasture, and silviculture

Despite the importance of various kinds of plantations for human livelihoods, one must recognize that the expansion of plantations is among the main drivers of fragmentation, loss of biodiversity and habitat, soil degradation, and impacts on non-climate ecosystem services, such as water supply. Forest loss is disproportionately affecting biodiversity in landscapes around the world. Improved land management in existing areas of agriculture, ranching, and silviculture could sequester. The world's existing areas of plantations are sufficient for the human population to subsist, and there is no need to devastate new natural areas for cultivation. However, a lack of food can result from poor land-use choices, from economic inequalities impeding food purchase, and from transport barriers imposed by wars and natural disasters.

Incorporate biodiversity into business models

Solutions to the joint climate–biodiversity crises may partly lie in the private sector. Decades of experience have helped governments and corporations understand how to incorporate climate change into their business models, but economic incentives for socio-biodiversity conservation lag far behind. A high-level analysis shows that 83% of companies have climate-related goals, particularly in the transportation sector, whereas only 51% of companies recognize biodiversity loss in some way, and only 5% have set quantified targets beyond mere recognition. *Businesses and financial institutions need to define sustainability more precisely in terms of biodiversity conservation, and incentives must be provided to do so. The Global Environment Facility is on the right track by allocating essential resources to the Convention on Biological Diversity. Likewise, the private sector can achieve a Net Positive Impact, which, over a quantified timescale, can outweigh the biodiversity disturbances and damage.*

Joint biodiversity–climate conferences of the parties

To achieve net-zero emissions, it is necessary to align policies and actions across sectors and scales. In 2021, the *first joint report produced by the Intergovernmental Panel on Climate Change and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services concluded that the world must tackle climate change and biodiversity loss together if either issue is to be successfully addressed.* In this sense, the integration of environmental conferences would increase synergies between multilateral environmental agreements and international institutions. This would foster collaboration between experts on related topics, aligning methods and models and leading to a better assessment of trade-offs and interactions

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between different types of environmental impacts and policies.[3]

Recent experience shows that while the carbon market approaches have progressed methodologies and standards for carbon accounting, they frequently do not address biodiversity conservation and wider sustainability issues adequately. Based on a global review of the current state of these approaches one has identified five major issues that contribute to these concerns: (a) a lack of biodiversity assessment in the design phase, and monitoring in the operational phase of carbon mitigation programs, (b) inappropriate pricing for carbon credits from nature-based carbon offset projects, (c) gaps in various accounting systems of nature-based carbon mitigation projects, (d) inadequate allocation of carbon taxes and direct finance revenues for biodiversity conservation, and (e) lack of appropriate policies and regulations for benefit sharing among stakeholders.

Conclusions

To save the planet, conservation and the restoration of ecosystems must be considered to keep global warming in order to ensure a liveable future. To achieve a sustainable future, one urgently need to commit to the key points presented above. Protecting a liveable future will require rapid commitment not only from countries through actions in their national territories but also from emerging coalitions and governance models at all levels.

In most sectors, a paradigm shifts in the practice of planning and implementing carbon mitigation projects is necessary to address biodiversity and ecosystem management issues alongside climate objectives. Since carbon regulation is one of the key ecosystem services provided by nature, one should maintain ecosystem integrity and support biodiversity conservation as a first priority that takes precedence over opportunities to harness carbon credits. At the same time, it is critical that carbon mitigation projects are designed to support social well-being. Improved systems for the monitoring, evaluation, and reporting of project outcomes towards these three objectives (carbon mitigation, biodiversity conservation, and social wellbeing) are necessary to ensure the accountability of individual projects.[4]

[3] The Role of Biodiversity Conservation in Climate Change Mitigation
[4] World Bank. (2022). State and Trends of Carbon Pricing 2022. World Bank, Washington, DC. DOI: 10.1596/978-1-4648-1895-0

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Key Recommendations

Key recommendations to address the biodiversity and sustainability concerns in carbon mitigation projects and market mechanisms:

- Upgrade current policies and regulations for carbon crediting and carbon trading systems to incorporate biodiversity enhancement and conservation issues.
- Develop full-cost accounting and pricing methods for carbon mitigation projects and programs.
- Develop and implement fit-for-purpose biodiversity assessments for the evaluation and monitoring of carbon mitigation projects.
- Avoid or minimize impacts on biodiversity hotspots.
- Allocate more funds from the carbon tax and ETS revenues from ETS to biodiversity conservation and ecosystem management with a focus on addressing legacy issues and future threats to the integrity of key ecosystems.
- Incorporate equitable and well-defined benefit-sharing mechanisms in the design and implementation of carbon mitigation projects.[5]

[5] IUCN COP 28 Technical Brief - CEM - Climate mitigation and biodiversity conservation