

The Crucial Role of Biodiversity in Sustaining Life and Economies

Biodiversity is the cornerstone of life on Earth, nurturing ecosystems that are vital for environmental resilience and economic well-being. Yet, the rapid decline in species, genetic diversity, and ecological richness threatens to destabilize these essential systems. This pressing challenge highlights the need for urgent action to protect and restore biodiversity - a mission with profound benefits for both the planet and the global economy.



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The Three Pillars of Biodiversity: Species, Genetic, and Ecosystem Diversity

Biodiversity encompasses the variety of life at three interconnected levels: species diversity, genetic diversity, and ecosystem diversity. Each level plays a vital role in maintaining the balance and resilience of the biosphere.

- 1. Species Diversity:** This includes the variety of species within a habitat or a region. It encompasses the number of different species and the balance of species populations in an ecosystem. High species diversity often indicates a healthy ecosystem because it fosters stability and resilience against disturbances.
- 2. Genetic Diversity:** Refers to the variety of genetic information within and between populations of species. This diversity in genes allows species to adapt to changing environments, resist diseases, and maintain healthy populations. Genetic diversity is essential for a species' survival and resilience.
- 3. Ecosystem Diversity:** Refers to the variety of ecosystems within a particular area or on Earth as a whole. Different ecosystems - like forests, deserts, wetlands, grasslands, and oceans - support different communities of species and contribute to overall environmental health. Ecosystem diversity is crucial for ecosystem services, such as climate regulation, nutrient cycling, and water purification.

The Biodiversity Crisis

Biodiversity is closely linked to the concept of ecosystem services, that support life on Earth. High biodiversity levels increase ecosystem resilience and productivity, which in turn provide humans with vital resources such as food, medicine, and clean water. However, the ongoing biodiversity crisis threatens these essential services and nature contributions to populations. This crisis is alarming considering that an estimated one million species of plants and animals are at risk of extinction[1]. Since the 1700s, 85% of the world's wetlands have disappeared[2], while 75% of the Earth's surface has been significantly altered by human activities. Additionally, 50% of coral reefs have been lost since the 1870s[3].

One major concept is the notion of "Planetary Boundaries," which defines nine critical thresholds for the Earth's systems. Six of these boundaries, including two related to biodiversity, have already been crossed[4]. The main drivers of biodiversity loss include land and sea use change, over exploitation of natural resources, climate change, pollution, and the spread of invasive species[5].

The Economic Dependence on Biodiversity

More than half of the world's GDP, approximately USD 44 trillion, is directly tied to nature and its services[6]. Sectors such as agriculture, forestry, and fisheries are directly reliant on healthy ecosystems. For instance, pollinators like bees are crucial for food production, contributing between USD 235 and USD 577 billion annually to global food production[7]. The decline in pollinators can lead to crop failures, food insecurity, and economic losses.

To address these risks, some frameworks like the Taskforce on Nature-related Financial Disclosures (TNFD) are emerging. The TNFD provides businesses and financial institutions with standardized methods to assess and disclose their dependencies and impacts on nature. Alongside tools like ENCORE, the TNFD aims to help organizations make informed decisions, promoting the protection and restoration of biodiversity as part of their operations[8].

The Biodiversity Finance Solutions – opportunities and challenges

Biodiversity finance, though still in its early stages, holds significant potential to fund biodiversity conservation, addressing these boundaries, and steering economies towards nature-positive pathways. At national level for example, Conservation Trust Funds (CTFs) are used in over 60 countries to finance biodiversity conservation and protected areas management (among other domestic financial instruments).

International funding mechanisms already exist such as the Global Environment Facility (GEF) which recently reinforced its instruments for biodiversity financing with the Global Biodiversity Framework Fund (GBFF)[9].

[1] United Nations Environment Programme. (2020). *Biodiversity: The Foundation of Life*. Retrieved from <https://www.unep.org/news-and-stories/story/biodiversity-foundation-life>.

[2] United Nations Environment Programme. (2020). *Biodiversity: The Foundation of Life*. Retrieved from <https://www.unep.org/news-and-stories/story/biodiversity-foundation-life>.

[3] Convention on Biological Diversity. (2020). *Introduction to the Global Biodiversity Framework*. Retrieved from <https://www.cbd.int/gbf/introduction>.

[4] Potsdam Institute for Climate Impact Research (PIK), "Planetary Boundaries," <https://www.pik-potsdam.de/en/output/infodesk/planetary-boundaries>.

[5] World Economic Forum. (2023). *Why nature and biodiversity loss is as urgent as climate change – and what we can do about it*. Retrieved from <https://www.weforum.org/agenda/2023/02/biodiversity-nature-loss-cop15>.

[6] WWF Statement on WEF's New Nature Economy Report. (2020). WWF. https://wwf.panda.org/wwf_news/?358423/WWF-statement-on-WEFs-New-Nature-Economy-Report.

[7] The Global Value of Nature. (n.d.). Nature4Climate. <https://nature4climate.org/about/nature-positive-recovery/the-global-value-of-nature/>.

[8] ENCORE. "Exploring Natural Capital Opportunities, Risks, and Exposure." Accessed November 15, 2024. <https://www.encorenature.org/en>.

[9] Potsdam Institute for Climate Impact Research (PIK), "Planetary Boundaries," <https://www.pik-potsdam.de/en/output/infodesk/planetary-boundaries>.

Other funding sources have been recently developed and were announced at the 2024 [United Nations Biodiversity Conference of the Parties \(COP16\)](#) to the UN [Convention on Biological Diversity \(CBD\)](#), including:

- The Nature Investment Facility
- The Kunming Biodiversity Fund

COP 16 decisions also pointed out the importance of developing revenues from digital sequence information (DSI)[10], a very promising avenue to significantly increase resources available for biodiversity conservation.

Critical developments are also emerging on impact investing for biodiversity with more and more asset managers developing impact strategies for biodiversity positive outcomes. [LL3]

To ensure that conservation efforts have a genuine impact, it is essential to guard against greenwashing – when companies or projects falsely claim environmental benefits. Measures, such as spot checks, inspections, and independent audits are critical for verifying the authenticity of biodiversity protection efforts. Innovative startups are emerging to monitor biodiversity and ecosystem services, providing valuable data and insights through satellite technology[11].

The Convention on Biological Diversity (CBD)

The CBD has three fundamental objectives: conserving biological diversity, sustainable use of its components, and fair and equitable sharing of benefits from genetic resources. Despite the alarming situation, there is hope if appropriate measures are taken to preserve biodiversity[12]. This is the overall objective of the Kunming-Montreal Global Biodiversity Framework.

In Luxembourg, the CBD objectives are implemented following the “Plan National Concernant la Protection de la Nature” (PNPN) that outlines the country’s strategy for protecting nature and biodiversity[13].

Insights from Experts

At the LuxFLAG Biodiversity Breakfast Seminar on July 3, 2024, two key speakers, Ludwig Liagre, Managing Director at Rio Impact, and Dr. Oliver Heiland, Managing Director at Finance in Motion Asset Management Luxembourg, provided valuable insights into the challenges and opportunities on biodiversity and its conservation.

Ludwig Liagre emphasized the importance of genetic, species, and ecosystem diversity. He highlighted that 75% of terrestrial biodiversity resides in forests, and that climate change significantly impacts biodiversity, requiring adaptation strategies, including through nature-based solutions. He also pointed out the critical role that Conservation Trust Funds (CTFs) play in financing protected areas and mobilizing capital for long-term conservation efforts, among a wide range of possible biodiversity finance solutions.

[10] International Institute for Sustainable Development, *COP 16 Will Hinge on Who Benefits from Nature’s DNA*, October 8, 2024, <https://www.iisd.org/articles/insight/what-expect-CBD-cop16-nature>.

[11] Convention on Biological Diversity, “Global Biodiversity Framework,” <https://www.cbd.int/gbf/introduction>.
[12] United Nations Environment Programme (UNEP). “Fact Sheet: Convention on Biological Diversity.” <https://leap.unep.org/sites/default/files/2020-09/undb-factsheet-cbd-en.pdf>.

[13] Ministère de l’Environnement, du Climat et du Développement durable, *Le Plan national concernant la protection de la nature (PNPN)*, <https://environnement.public.lu/fr/natur/biodiversite/pnnpn.html>

Ludwig also mentioned the importance of scientific metrics, reporting methodologies and organizations innovating for the monitoring of biodiversity impacts, creating the conditions for the emergence of nature-positive investments.

Dr. Oliver Heiland discussed the concept of Planetary Boundaries, noting that out of nine boundaries, six have already been transgressed. He stressed the economic challenge of measuring biodiversity's financial value, noting that 55% of the global economy depends on biodiversity systems. Dr. Heiland highlighted the EU's target to conserve 30% of natural lands by 2030 and the critical role of pollinators in food security. He also discussed biodiversity credits as tradable instruments, and the prominence of funds dedicated to biodiversity protection.

Looking forward – Conservation Goals and Strategies

The EU has set ambitious biodiversity targets for 2030, including to conserve 30% of natural lands[14]. Achieving this goal will require both, financial investment and effective conservation strategies. By aligning national and international biodiversity and development strategies and fostering biodiversity financing solutions at scale significant progress can be made in halting biodiversity loss, while fostering nature-positive economies

Conclusion

Biodiversity is essential to life on Earth, underpinning the ecosystems that provide critical services to both the environment and the global economy. The ongoing biodiversity crisis calls for urgent action, robust conservation strategies, and a significant raise in the ambition of biodiversity finance mechanisms. Only by understanding and valuing biodiversity and related ecosystem services, we can create a sustainable future for all life on our planet.

[14] European Commission. "Biodiversity Strategy for 2030." Publications Office of the European Union, 2022. <https://op.europa.eu/en/publication-detail/-/publication/32a9a4e5-2155-11eb-9ac9-01aa75ed71a1/language-en>