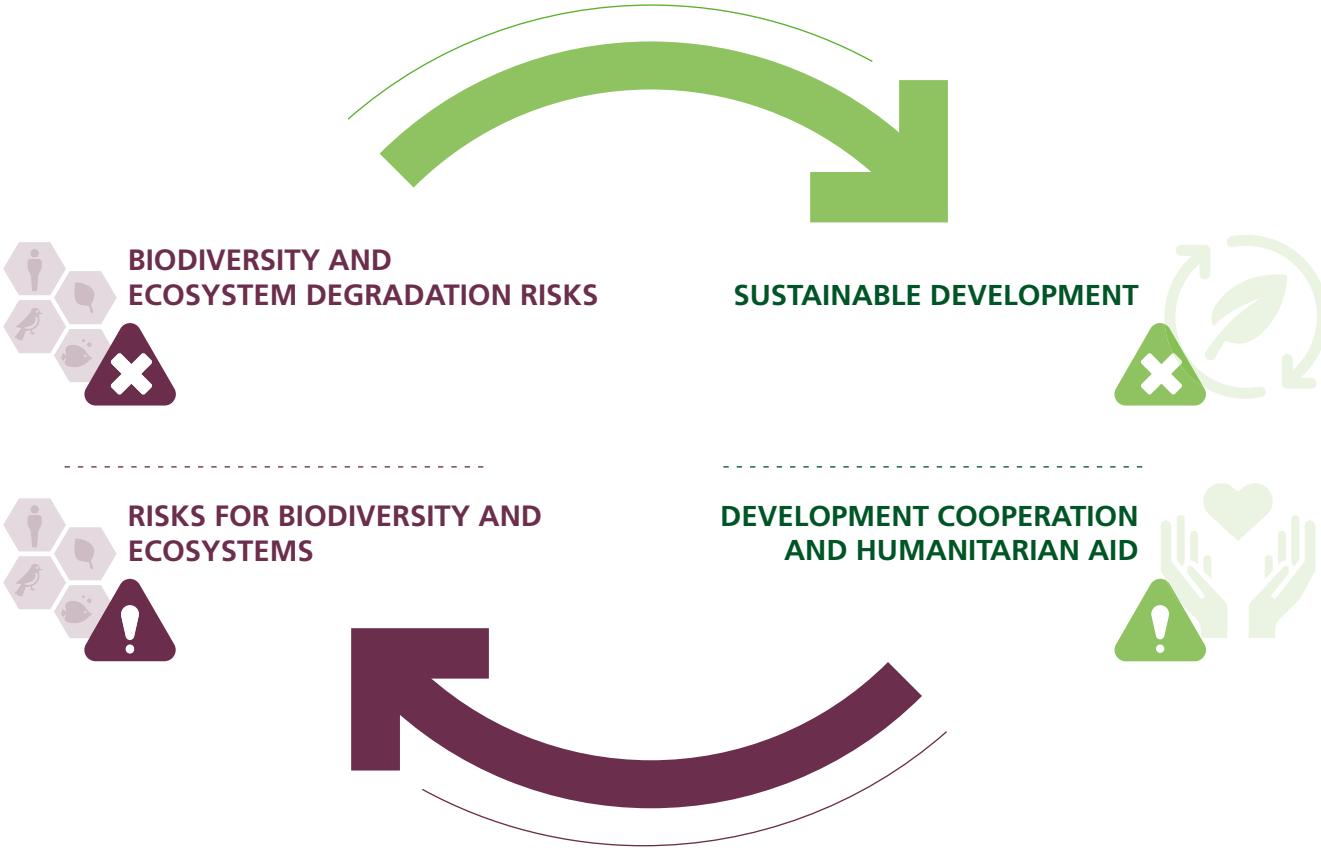
SDC Network **Climate, DRR & Environment**

Thematic Integration Brief (TIB)

Development Cooperation and Humanitarian Aid …and **Biodiversity**



With over 50% of the world's GDP reliant on nature, biodiversity loss and ecosystem degradation affect sustainable development in various ways, not least in terms of health, food security, and livelihoods. In turn, how development and humanitarian aid is planned and managed interacts with and may negatively affect the drivers of biodiversity loss. Biodiversity and ecosystem mainstreaming can help development cooperation and humanitarian aid pursue specific development goals without undermining other goals, and can create valuable co-benefits.

This Thematic Integration Brief (TIB) provides a non-exhaustive overview of the interrelations between biodiversity and ecosystems, development cooperation and humanitarian aid.

This brief:

- Helps explain the potential risks for sustainable development caused by biodiversity loss and ecosystem degradation
- Highlights possible adverse impacts of development cooperation and humanitarian aid on biodiversity and ecosystems
- Offers practical advice on how to integrate biodiversity and ecosystems into development cooperation and humanitarian aid in order to add value to and risk-proof programming and interventions.

SDC's Climate, DRR & Environment Network welcomes feedback to continuously improve this Thematic Integration Brief (TIB).

Interconnections at a Glance

Biodiversity loss and ecosystem degradation risks for sustainable development

Biodiversity loss and ecosystem degradation negatively impact lives and livelihoods in general, and disproportionately affect vulnerable societies. This non-exhaustive list of risks for sustainable development shows how reliant we are on biodiversity and ecosystem services.

- Over 50% of the world's GDP is highly or moderately dependent on nature.[1]
- Over 90% of the people living in extreme poverty depend on forests for some part of their livelihoods.[2]
- While over 75% of global food crop types rely on insects and animal pollination, the degradation of this ecosystem service puts at risk up to USD 577 billion in annual crop output.[3]
- An estimated 4 billion people rely primarily on natural medicines, and 70% of the drugs used for cancer are natural or synthetic products inspired by nature.[4]
- 26% of employed women work in agriculture and many more informally rely on ecosystem services as part of their household responsibilities – such as collecting water and fodder for animals.
- If tipping points are crossed, i.e. when ecosystems degrade beyond a critical threshold, abrupt and often irreversible changes to the climate and the environment are triggered. The dieback of the Amazon rainforest, for example, could cause the release of vast amounts of CO_2, impacting global temperature rise by up to 0.2°C.[5]

Development cooperation and humanitarian aid risks for biodiversity and ecosystems

If not done cautiously, development cooperation and humanitarian aid can have a negative impact on the drivers of biodiversity loss and ecosystem degradation. A non-exhaustive list of impacts follows.

- Agriculture and our global food system are the primary drivers of biodiversity loss, notably due to land use change (e.g. deforestation for agricultural production), pollution (e.g. use of synthetic fertilisers and pesticides) and unsustainable and over-exploitation of ecosystems (e.g. intensive monoculture).
- The diversity of species in cropland areas is about 40% lower than in primary vegetation.[6]
- About 60 billion tonnes of resources, or about 50% more than 30 years ago,[7] are extracted from nature every year. While economic development initiatives improve the livelihoods of those affected in the short term, strengthening resource-based sectors also contributes to climate change, land use change, pollution and overexploitation in the mid to long terms, if done unsustainably.[8]
- Energy production still relies heavily on fossil fuels and therefore contributes to climate change and biodiversity loss through greenhouse gas emissions. Renewable energy can also damage species and ecosystems when poorly located. Infrastructure development – for housing, transportation, energy or mining – can destroy natural habitats, disrupt migration routes, isolate populations, and alter landscapes.[9]

1 PWC, Managing nature risks: From understanding to action, 2023; World Economic Forum, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy, 2020.

2 IPBES: Summary for policymakers of the global assessment report on biodiversity and ecosystem services, 2019; UNEP, Becoming #GenerationRestoration: Ecosystem restoration for people, nature and climate, 2021; IIED, Biodiversity loss is a development issue, 2019.

3 IPBES, Summary for policymakers of the global assessment report on biodiversity and ecosystem services, p. 11, 2019.

4 IPBES, Summary for policymakers of the global assessment report on biodiversity and ecosystem services, 2019.

5 OECD, Climate Tipping Points: Insights for Effective Policy Action, 2022.

6 Ortiz et al., A review of the interactions between biodiversity, agriculture, climate change, and international trade: research and policy priorities, 2021.

7 Nature Fund, Natural Resources, 2024.

8 OECD, Natural resources and development, 2024.

9 WWF, Biodiversity and Infrastructure: A better nexus?, 2017.

1. Introduction to Biodiversity and Ecosystems

Biodiversity refers to the "variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."[10] A typical biodiversity hotspot, for instance, is the Amazon rainforest with its high diversity of plants and animals.[11]

An **ecosystem** is "a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit."[12] Ecosystems may be terrestrial (forests, grasslands and deserts), aquatic (rivers, lakes, and wetlands) or marine (oceans, coral reefs, and mangroves).

Ecosystem services are the benefits people obtain from ecosystems. The Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) uses the term "nature's contributions to people" to describe ecosystem services. Examples include food provision, water purification, or flood control.[13]

Biodiversity is **essential for maintaining ecosystem services**. Biodiverse ecosystems are more resistant and resilient to environmental changes, such as climate change or disasters. In biodiverse ecosystems, for example, if one species is affected by a disease, the others can continue to fulfil ecological functions and ecosystem services, such as pollination.[14] In monocultural systems with low biodiversity, on the other hand, nutrients in soils are reduced, decreasing the variety of bacteria and microorganisms that are needed for soil fertility.[15]

Biodiversity and ecosystems underpin **all aspects of life**. The pharmaceutical industry, for example, relies heavily on plants and natural products for medicines,[16] and 200 million jobs globally are tied to the fisheries value chain, which depends on healthy marine ecosystems.[17] Freshwater ecosystems – such as wetlands, rivers, mangroves and aquifers – supply, purify and protect freshwater resources essential for economic growth, food security and health.[18]

As acknowledged by the international community when adopting the **Convention on Biological Diversity** (CBD) in 1992, neglecting to address the biodiversity challenge in a comprehensive manner will jeopardise the basis of our lives and achievements in development cooperation and economic development. The convention's main goals are the conservation of biodiversity, the sustainable use of the components of biodiversity, and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.[19] The **Kunming Montreal Global Biodiversity Framework** and the **Long-Term Strategic Approach to Mainstreaming**, adopted by the parties to the CBD in 2022 and 2018 respectively, underline the importance of biodiversity and set targets for mainstreaming.[20] Another milestone for biodiversity was the adoption of the 2030 Agenda for Sustainable Development and the 17 **Sustainable Development Goals** (SDGs) in 2015, recognising that economic development must go hand in hand with tackling social issues, such as health, education and inequality as well as protecting the climate and preserving biodiversity and ecosystems. While SDGs 14 and 15 are explicitly focused on biodiversity and ecosystems, SDG 6 and 13 are additional biosphere-related SDGs. As Figure 1 shows, these four SDGs provide the basis for achieving social justice and economic development. Biodiversity is also either included in targets or can otherwise be related to all other SDGs.[21]

10 Convention on Biological Diversity, Art. 2.

11 WWF, About the Amazon, 2024.

12 Convention on Biological Diversity, Art. 2.

13 IPBES Glossary, nature's contribution to people, 2024.

14 Nature & Culture International, Biodiversity: Understanding its Significance and Conservation, 2024.

15 EOS Data Analytics, Monoculture Farming Explained: What Are The Pros And Cons?, 2024.

16 Convention on Biological Diversity, Pharmaceuticals and Biodiversity: To protect ourselves we must safeguard our planet, 2021.

17 World Bank, Biodiversity, 2024.

18 UN Water, Water and Ecosystems, 2024; World Bank, Quality Unknown: The Invisible Water Crisis, 2019.

19 Convention on Biological Diversity, Art. 1.

20 Convention on Biological Diversity, Biodiversity Mainstreaming, 2023.

21 United Nations, Transforming our World: The 2030 Agenda for Sustainable Development, 2015. Sida, Agenda 2030, Biodiversity and Ecosystems, 2022.

Figure 1: The SDG "wedding cake"

Source: Azote for Stockholm Resilience Centre, Stockholm University

Even though the adoption of the CBD and other international treaties related to biodiversity[22] present important steps towards the protection of global biodiversity and ecosystems, **biodiversity is currently declining faster than ever**. Our current way of life exceeds the rate of renewal of global natural resources, and we need the equivalent of 1.6 Earths.[23] The degradation of forests, farmlands, freshwater, savannahs and coasts is already affecting the wellbeing of an estimated 3.2 billion people – 40% of the world's population.[24] The average size of wildlife populations has shrunk by 73% over the last 50 years, out of which freshwater populations are most heavily affected, followed by terrestrial and marine populations.[25] The World Bank estimates that the collapse of selected ecosystems and their services, such as wild pollination, marine fisheries or timber from native forests, could reduce global GDP by USD 2.7 trillion annually by 2030.[26]

22 Such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) or the International Treaty on Plant Genetic Resources for Food and Agriculture.

23 UNEP, Becoming #GenerationRestoration: Ecosystem restoration for people, nature and climate, 2021.

24 UNEP, Becoming #GenerationRestoration: Ecosystem restoration for people, nature and climate, 2021.

25 WWF, Living Planet Report 2024. A System in Peril, 2024.

26 World Bank, Accounting for the diverse values of nature to inform biodiversity policies, 2024.

2. Biodiversity and Sustainable Development

The following sections provide an overview of the risks that biodiversity loss and ecosystem degradation pose to sustainable development, and on how development cooperation and humanitarian aid may negatively impact biodiversity and ecosystems.

Risks of biodiversity loss for sustainable development

Direct risks

Biodiversity loss and ecosystem degradation affect all lives and livelihoods, but those most affected are **communities highly dependent on ecosystem services**. These are primarily countries of the Global South.[27] Furthermore, a disproportional share of the impact is carried by already disadvantaged groups, including poor and vulnerable communities, women and girls, indigenous communities and displaced people,[28] as well as people with disabilities and people with chronic diseases. Many of these people are dependent on ecosystem services, an important component of which is biodiversity. In rural areas, for instance, women often collect water and firewood. When biodiversity loss reduces an ecosystem's ability to purify water, they must walk longer distances, leaving less time for paid work and increasing their risk of experiencing sexual harassment.[29]

Biodiversity loss and ecosystem degradation can directly affect the following development sectors.[30] Importantly, however, the relative risk of biodiversity loss is shaped by the economic, political and societal context.

Health

Biodiversity loss reduces the availability of traditional **medicines** and the opportunities for drug development,[31] weakens the buffer zones that ecosystems provide in isolating zoonotic viruses from humans, and can change the composition of ecosystems to favour species that more frequently spread diseases to humans.[32] The degradation of ecosystems includes the loss of the ecosystem services related to air quality, such as the capacity of forests to remove air pollution.[33] Losing access to natural environments can have negative effects on mental health.[34]

Water

Biodiversity loss contributes to the degradation of **freshwater ecosystems**, affecting both quantity and quality. The 1.1 billion people who lack access to freshwater face an increased effort required to collect water and huge economic losses annually.[35] Freshwater scarcity results in inadequate sanitation for 2.4 billion people, and increases their exposure to diseases and waterborne illnesses and, consequently, their health care expenses.[36] Water scarcity and pollution also reduce agricultural productivity impacting livelihoods, in particular for economies relying heavily on water-intensive crops such as rice and cotton.[37]

27 Swiss Re, A fifth of countries worldwide at risk from ecosystem collapse as biodiversity declines, reveals pioneering Swiss Re index, 2020.

28 IPBES, Summary for policymakers of the global assessment report on biodiversity and ecosystem services, 2019; UNEP, Becoming #GenerationRestoration: Ecosystem restoration for people, nature and climate, 2021; IIED, Biodiversity loss is a development issue, 2019.

29 UN Women, Gender and Biodiversity Data Brief, 2024; IIED, Biodiversity loss is a development issue, 2019.

30 Analysis focusing on the following domains: Agriculture and food security, Health, Fragility, conflict and human rights, Migration/forced displacement, Governance, Gender equality, Climate, disaster risk reduction and environment, Water, Basic education and vocational skills development, Private sector development and financial services.

31 IPBES, Summary for policymakers of the global assessment report on biodiversity and ecosystem services, 2019.

32 Bedenham, G et al., The importance of biodiversity risks: Link to zoonotic diseases, 2022.

33 Nowak, G J et al., Forest ecosystem services: Carbon and air quality, 2017.

34 UNESCO, Why is biodiversity important for human mental health and emotional well-being?, 2024.

35 WWF, Water Scarcity: Impacts, 2024; water.org, An Economic Crisis, 2024.

36 WWF, Water Scarcity: Impacts, 2024; European Climate and Health Observators, Drought and water scarcity, 2024

37 FAO, Water Scarcity – One of the greatest challenges of our time, 2019; World Bank Group, Quality Unknown: The Invisible Water Crisis, 2019.

Food systems

Food and nutrition security depends on a variety of crops and animals, which in turn depend on healthy ecosystems for pollination, clean water, and healthy soils. The decline of the ecosystem service of pollination, for example, puts at risk up to USD 577 billion in annual crop production at risk.[38] Reduced biodiversity leads to fewer species in agriculture and increases the vulnerability of agro-ecosystems to pests, diseases, and extreme weather events.[39]

Over 3 billion people, mainly in the Global South, rely directly or indirectly on **healthy oceans**.[40] Reduced fish diversity, along with marine plastic pollution, threaten food security and health.[41] Furthermore, 70% of global fish catch comes from small-scale fisheries, and marine fisheries directly or indirectly employ over 200 million people worldwide. The loss of marine biodiversity is a risk to the livelihoods of those people.[42]

Climate, DRR, and Environment

Biodiversity is highly relevant for **climate mitigation**. The global land and ocean ecosystems absorb more than 50% of all carbon emissions. The destruction of these ecosystems, such as through deforestation, not only destroys these natural carbon sinks but might even turn carbon sinks into carbon sources.[43] When **tipping points** are crossed, ecosystems degrade beyond a critical threshold triggering abrupt and often irreversible changes. The dieback of the Amazon rainforest, for example, could cause the release of vast amounts of CO_2, impacting global temperature rise by up to 0.2°C.

Degraded ecosystems decrease the opportunities to protect people from the consequences of climate change through **ecosystem-based approaches, nature-based solutions and similar approaches**. For instance, biodiversity loss has weakened the storm protection of coastal ecosystems like mangroves and the flood control provided by lakes and swamps.[44]

Indirect risks

Biodiversity loss and ecosystem degradation may indirectly put development gains in the following areas at risk.[45]

Gender equality

Biodiversity loss and ecosystem degradation can exacerbate gender inequalities. Of employed women, for example, 26% work in agriculture, with many others informally relying on ecosystem services for household tasks, such as collecting water and fodder, or producing charcoal. Furthermore, women engaging in fisheries are less likely to own boats or sophisticated fishing gear and are therefore dependent on coastal ecosystems. As these ecosystems degrade, women often experience increased amounts of unpaid labour and income loss. This may alter economic and societal structures in ways that impact gender equality.[46]

Studies show that rising aridity correlates with higher rates of **child marriage**, as families marry off their daughters to save income. The same studies show that in times of food scarcity, women tend to reduce their own food intake in favour of other household members.[47]

Migration

Biodiversity loss and ecosystem degradation add another layer to the complex interaction of factors contributing to **migration**.[48] The loss of ecosystem services, for example in the form of available freshwater or productive soils, threatens livelihoods that are already under pressure. This might contribute to the decision to migrate as an adaptation strategy in search of better livelihoods.[49]

38 IPBES, Summary for policymakers of the global assessment report on biodiversity and ecosystem services, p.11, 2019.

39 IPBES, Summary for policymakers of the global assessment report on biodiversity and ecosystem services, p.12, 2019.

40 CBD, People Depend on Marine and Coastal Biodiversity for their Livelihoods, 2018.

41 Talukder B. et al., Climate change-accelerated ocean biodiversity loss & associated planetary health impacts, 2022. The Journal of Climate Change and Health, 6, 2022; IPBES, Summary for policymakers of the global assessment report on biodiversity and ecosystem services, 2019.

42 Talukder B. et al., Climate change-accelerated ocean biodiversity loss & associated planetary health impacts, 2022. The Journal of Climate Change and Health, 6, 2022; CBD, People Depend on Marine and Coastal Biodiversity for their Livelihoods, 2018.

43 UN, Biodiversity - our strongest natural defense against climate change, 2024.

44 Talukder B. et al., Climate change-accelerated ocean biodiversity loss & associated planetary health impacts, 2022. The Journal of Climate Change and Health, 6, 2022; Convention on Biological Diversity: Biodiversity: Our Natural Safety Net.

45 Here as well, it is crucial to recognise that biodiversity loss is one of many factors affecting these aspects of sustainable development.

46 UN Women, Gender and Biodiversity: a Data Brief.

47 UN Women, Gender and Biodiversity: a Data Brief.

48 For more information, see the Shareweb page on Migration and the forthcoming TIB Migration.

49 Caritas Switzerland, Migration and Climate Change: Caritas' holistic understanding and approach, 2023; IDMC, No matter of choice: Displacement in a changing climate, 2018.

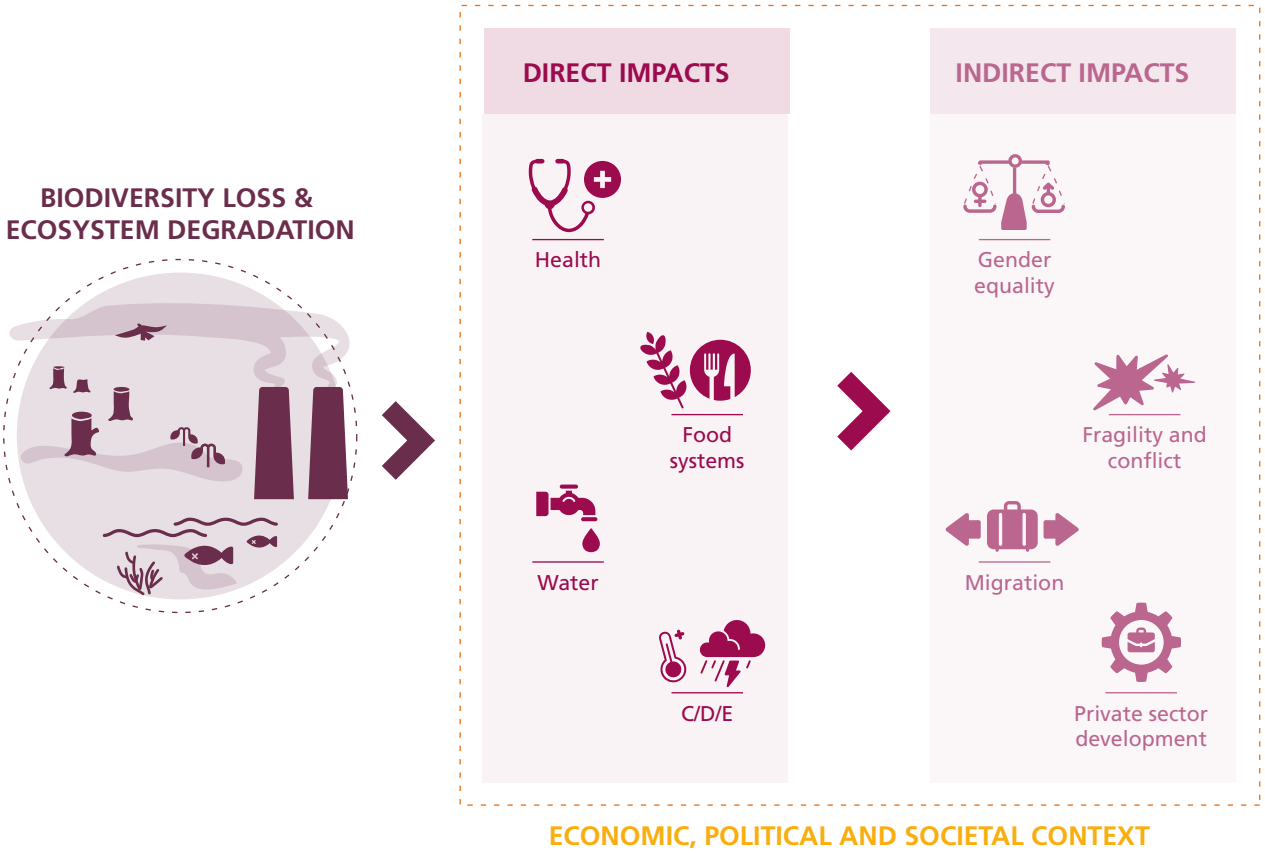
Fragility and conflict

Biodiversity loss may indirectly contribute to **conflict and fragility**, particularly in situations already facing tensions. Biodiversity loss reduces the availability of ecosystem services, and puts pressure on people's livelihoods. In stable societies, a reduced availability of resources might be dealt with in a constructive and peaceful way, whereas in conflict-prone areas, it may contribute to escalation.[50]

Private sector development and financial services

According to the World Economic Forum, over **50% of the world's GDP** – USD 44 trillion – is highly or moderately dependent on nature and therefore at risk with regard to biodiversity loss.[51] This is true not only for resource-based sectors such as construction or agriculture, but also for most other sectors because they depend on ecosystem services through their supply chains.[52] Heavy rainfall and flooding, for example, can cause severe damage to transportation infrastructure and interrupt supply chains. Or the drying out of large waters, such as the Aral Sea, along with significantly reducing numbers of fish, have led to the collapse of a large fishing industry and the leaving of many people from attached cities.[53]

Figure 2: Risks of biodiversity loss for sustainable development



50 SIPRI, Biosphere Security: Understanding the connections between conflict and biodiversity, 2023; United Nations Peacekeeping, Conflict and natural resources, 2024.

51 World Economic Forum, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy, 2020.

52 GIZ, Integrating Ecosystem Services into Development Planning. A stepwise approach for practitioners, 2018; Mirabaud, Biodiversity loss is also a risk for businesses, 2023.

53 United Nations Convention to Combat Desertification, Witnessing an environmental catastrophe: Reflections from the dried-up Aral sea. Zhursin (2023): No Water, No Fish, No Future: The Disappearing Little Aral Sea, 2024.

Impact of development cooperation and humanitarian aid on biodiversity and ecosystems

According to the United Nations Environment Programme,[54] the five main threats to biodiversity are the following:

Changes in land and sea use, including conversion of forests, wetlands and other natural habitats for human use – more than 40% of the world's deforestation, for example, is driven by the expansion of pastures for beef production.[55]

Overexploitation of natural resources – overuse of water resources, logging, unsustainable hunting and overfishing threaten the survival of one million species around the world.[56]

Rising temperatures due to climate change, mainly caused by burning fossil fuels, deforestation, increasing livestock farming, nitrogen-containing fertilisers and the emission of fluorinated gases,[57] affect species and ecosystems such as coral reefs, mountains and polar ecosystems.

Pollution, including from chemicals and waste, has particularly bad effects on marine and freshwater habitats, but also on plant and insect populations, and more often than not ends up in the food chain.[58]

Invasive alien species that establish themselves in environments outside their natural habitat, threaten native species and bring ecosystems out of their natural equilibria. Development cooperation and humanitarian aid can unintentionally affect these drivers and thereby contribute to biodiversity loss and ecosystem degradation.

The following overview discusses the sectors that are most relevant regarding such potentially negative impacts.

Food systems

The growth of **industrial agriculture** with large-scale monocultures and yield maximisation increases farming intensity and contributes to global food security, but at the same time, decreases biodiversity.[59] Agriculture directly affects biodiversity and ecosystems through land use change, pollution and unsustainable exploitation of natural resources. Tropical regions are generally more affected than other regions.[60]

Fish farming is a crucial element of the response to increasing demand for food due to global population growth,[61] but the high risk of overfishing and taking large quantities of bycatch threatens marine organisms and ecosystems.[62]

Activities related to **food systems** – land use, crop production, livestock and fisheries management, global supply chains, and transport systems[63] – account for 31% of the world's greenhouse gas emissions. These emissions contribute to climate change and accelerate biodiversity loss.[64] A significant amount of food waste along the supply chain and in households also contributes to emissions.[65]

Millions of tonnes of **plastics** are used in food systems each year – for packaging or fishing gear, for example. These do not degrade quickly or, in some cases, at all, ending up as litter in natural environments. Chemicals from the packaging materials, including inks and dyes from labelling, can leach into groundwater and soil, negatively affecting human health and the environment.[66]

Natural resource extraction

The **extraction of natural resources**, such as timber, oil, gas, or minerals, is about 50% higher than it was 30 years ago. With the global expansion of renewable energy, the exploitation of minerals such as cobalt or tantalum is becoming increasingly important for the economies of the Global South.[67] While this expansion and exploitation can help reduce poverty, they also threaten biodiversity if poorly managed. Beyond causing carbon emissions, resource extraction contributes to land-use change through deforestation and mining, pollution through oil leakage or the release of hazardous chemicals into air and soil, and overexploitation.[68]

54 UNEP, Five drivers of the nature crisis, 2023.

55 Our World in Data, Drivers of Deforestation, 2024.

56 UNEP, Five drivers of the nature crisis, 2023.

57 European Commission, Causes of climate change, 2024.

58 UNEP, Five drivers of the nature crisis, 2023.

59 FiBL, Agriculture and biodiversity. Impacts of different farming systems on biodiversity, 2023.

60 Zhao et al., Biodiversity responses to agricultural practices in cropland and natural habitats, 2024.

61 UNEP, Mainstreaming of biodiversity across sectors including agriculture, forests and fisheries, 2016.

62 Biovision, Food Waste & Biodiversity, 2020.

63 Global food-miles are responsible for almost 20% of total food system emissions: Li, M., Jia, N., Lenzen, M. et al. 2022: Global food-miles account for nearly 20% of total food-systems emissions. Nat Food 3, 445–453, 2022.

64 FAO, Greenhouse gas emissions from agrifood systems. Global, regional and country trends, 2000-2020, 2022.

65 United Nations, Food Loss and Waste Reduction, 2024.

66 Yates and Deeney, Policy Brief: Impact of plastics across the food systems, 2024.

67 Nature Fund, Natural Resources.; SDC 2021: Natural Resources and Development, 2024.

68 OECD, Natural resources and development, 2024.

Health

The large amounts of **medical waste** produced each year can contain hazardous substances and have a polluting effect if they are not disposed of properly as is often the case in countries that lack consistent regulations on waste disposal.[69] The health sector – health care delivery, facilities, operations and supply chains – accounts for 4.4% of global greenhouse gas emissions.[70]

Water management

If not done wisely, **water management** can negatively affect biodiversity.[71] The construction of water and sanitation infrastructure can disrupt habitats and ecosystems. The over-extraction of groundwater for irrigation in arid regions can deplete aquifers, affect water availability, cause seawater intrusion, and increase the likelihood of natural hazards, such as sinkholes and flooding. Finally, the use of chemicals can negatively affect aquatic ecosystems.[72]

Energy

Strengthening **energy production systems** supports development goals by improving livelihoods, and can help developing countries diversify their economies, but energy production still relies heavily on fossil fuels, driving climate change and biodiversity loss. Renewable energy does not emit any greenhouse gas during production, but can still have negative impacts on biodiversity if not carefully planned. The construction of a hydropower dam, for example, can change land use and destroy natural habitats.[73] The actual impact of renewable energy on biodiversity, however, depends on the specific technologies and on the environmental and political context – unlike fossil fuels, which always have negative environmental effects.[74]

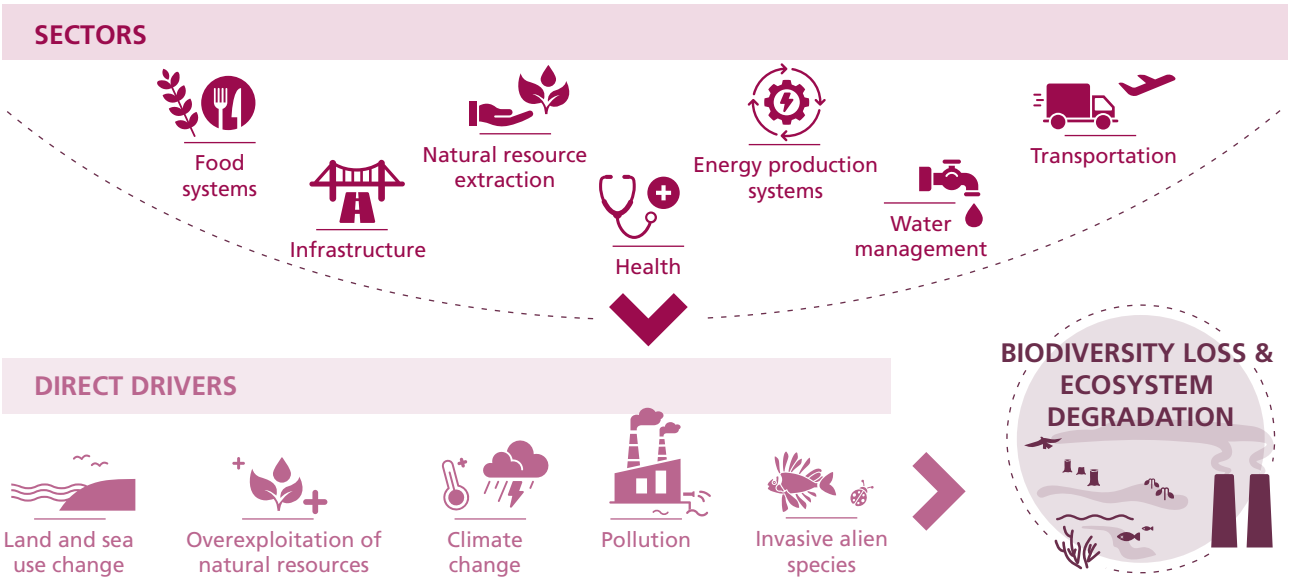
Infrastructure

Infrastructure development, if not thought through from an ecosystems point of view, can destroy natural habitats, disrupt migration routes, isolate human and animal populations, and alter landscapes.[75] The construction of roads might interrupt natural habitats, the expansion of urban areas sometimes results in deforestation or the draining of wetlands, and the existence of some infrastructure increases light pollution from street lamps or air pollution from traffic.

Transportation

The **operation of road, marine or air transportation systems** can negatively impact biodiversity. The anchors of marine vessels, for example, can create physical damage to coral reef or seagrass, and the transfer of ballast water increases the risk of releasing invasive species.[76]

Figure 3: Impact of development cooperation and humanitarian aid on biodiversity



69 WHO, Healthcare Waste, 2024.

70 TIB Health

71 See also TIB Water

72 TIB Water.

73 SLR Consulting, Offshore wind turbines and underwater noise: Impacts and mitigation for marine fauna, 2024.

74 Gasparatos et al., Renewable energy and biodiversity: Implications for transitioning to a Green Economy, 2017. Renewable and Sus-tainable Energy Reviews 70: 161-184, 2017.

75 WWF, Biodiversity and Infrastructure: A better nexus?, 2017

76 European Commission, Maritime transport & Marine protection and restoration, 2024.

3. Key Areas for Action

This chapter proposes actions, tools and approaches to facilitate a systemic approach from the planning stage up to the implementation of projects and programmes based on strategy and policy documents.

Biodiversity and ecosystem mainstreaming

Know your context, risks and impacts: Conduct a context analysis that identifies the current state of biodiversity and the most important drivers of biodiversity loss and ecosystem degradation. Then conduct a risk and impact assessment to identify potential risks from biodiversity and ecosystem losses and potential negative impacts of the intervention on biodiversity and ecosystems. Depending on the size or type of the intervention, conduct this work through desk research, a workshop or by engaging an expert to conduct the assessment. Finally, consider the various options.

Minimize risks: Take measures to reduce the risks that biodiversity loss and ecosystem degradation pose to the intervention. Planting trees along hillsides, for example, can reduce surface runoff and floods in displacement camps.

Avoid negative impacts: Avoid having a negative impact on biodiversity and ecosystems by developing different scenarios for an intervention and identifying the one that affects the environment the least. When supporting SMEs, for example, encourage alternate solutions to single-use packaging. In livestock projects, if feasible, favour goats over sheep as the former browse on leaves without damaging tree trunks.

Create positive impacts: Add value to the intervention by having a positive impact on biodiversity and ecosystems.[77] This can be done by applying one of the following approaches:

- **Making use of co-benefits**: Do not think about nature, climate, and development as separate issues, but recognise their interconnectedness.[78] Sustainably managed agroforestry systems, for example, protect biodiversity, renew the protective role of forests, and increase carbon sinks while simultaneously contributing to food and nutrition security, providing livelihoods for communities, and reducing the risks of illegal logging. Similarly, agroecology contributes to food security while promoting biodiversity-friendly farming by integrating ecological principles into agricultural practices, reducing reliance on chemical inputs, and maintaining diverse landscapes. And intensive agricultural projects can protect biodiversity through islands of near-natural habitats, such as wildlife corridors or hedgerows. A recent report by IPBES highlights that integrating biodiversity, water, food, health, and climate change leads to the most favorable outcomes for achieving the SDGs. In contrast, tackling challenges in isolation – whether in food, biodiversity, or climate change – significantly reduces the likelihood of success.[79]

- **Seeking nature-based solutions**: Develop nature-based solutions to simultaneously address global societal goals related to food, water, health, energy, job creation, climate change and more.[80] Nature-based solutions are highly cost-effective: every USD invested can yield returns of up to 27 USD.[81] Nature-based solutions to wastewater treatment, for example, can consist of willow systems using wastewater for irrigation while producing biomass that can be used for local heating.[82] The protection and restoration of grasslands protects the diversity of animals living in grasslands, strengthens the role of grasslands of protecting the groundwater, while protecting the pastoralist lifestyle of indigenous communities.[83]

- **Fostering community engagement**: Take into account the specific local ecosystem services people and communities rely on. Make use of local knowledge, such as customary institutions or management systems.[84] Educate local communities on biodiversity risks, and involve them in addressing these risks. Ensure accessibility and meaningful participation of groups at risk of exclusion, such as women and men with disabilities, older people, the poor and other groups facing gender, social and cultural discrimination. This will ensure that the principle of "leave no one behind" is respected.

77 See, e.g. Final WWF IISD Study-mainstreaming biodiversity into infrastructure sector.pdf on mainstreaming biodiversity into infrastruc-ture projects.; IIED, Mainstreaming Biodiversity in Development Cooperation. Lessons learned from donor agency experience, 2023.

78 IIED, Mainstreaming Biodiversity in Development Cooperation. Lessons learned from donor agency experience, 2023.

79 IPBES, The thematic assessment report on interlinkages among biodiversity, water, food and health. Summary for policymakers, 2024.

80 See, e.g., the Nature-based Solutions to Climate Change guidelines.

81 Thomas et al., Economics of drought - Investing in nature-based solutions for drought resilience – Proaction pays, 2024.

82 UNEP, Becoming #GenerationRestoration: Ecosystem Restoration for People, Nature and Climate, 2021; Cross K et al., Nature-Based Solutions for Wastewater Treatment, 2021.

83 Earthly, Grasslands, 2024.

84 IPBES, Summary for policymakers of the global assessment report on biodiversity and ecosystem services, 2019.

Tools and approaches to mainstreaming

CEDRIG systematically integrates climate change, natural hazards and environmental issues at the project or programme level. Based on a comprehensive context analysis, the tool assesses whether or not a planned or ongoing intervention is at risk from climate change, natural hazards or environmental issues and whether the intervention may have an adverse impact on the climate or on the environment, or create new or exacerbate existing risks. The tool helps define measures to integrate Climate, DRR and Environment in project activities, programmes and strategies.

The Sustainable Development Analysis Grid (AFD) is a simple framework for assessing a project's contribution to biodiversity.

The Green Toolbox (SIDA) contains methodological guidance and e-learning modules for assessing and integrating environmental and climate change issues into operations and financing, and focuses on targeted interventions, the integration of a climate and environment with other thematic areas, strategic dialogue, and the mobilisation of capital.

The ValuES Methods Navigator (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) offers a searchable database of tools, methods and project examples for specific types of problems across policy areas, and provides a step-by-step manual to integrate ecosystem services into development plans.

Global biodiversity maps and risk filters

The Integrated Biodiversity Assessment Tool (IBAT) is a one-stop shop for rapid visual screening for biodiversity risks.

Restor is a geospatial tool that enables data sharing for individuals and organisations engaged in restoration projects.

The WWF Risk Filter Suite identifies biodiversity and water risks and prioritises action with a focus on the private sector and financial institutions.

WOCAT provides decision support systems for Land Degradation Neutrality.

Good practice projects

The SDC Biodiversity website provides a list of good practice projects.

Policy and institutional measures

Development cooperation and humanitarian aid have opportunities to promote the current range of policy and institutional measures through advocacy and other avenues of support.

Biodiversity and ecosystem mainstreaming

Global commitments include international treaties and frameworks on biodiversity, such as the Convention on Biological Diversity and its Kunming-Montreal Global Biodiversity Framework. Opportunities may include collaboration with national Focal Points for the CBD, the UNFCCC or the UNCCD, and support for the development and implementation of National Biodiversity Strategies and Action Plans (NBSAPs) at national levels.

The Sustainable Development Goals consider a range of measures, and biodiversity and ecosystems are relevant in the achievement of all the SDGs.[85]

Policy frameworks on biodiversity, the environment, climate change and sustainable development offer opportunities for advocacy for integrated co-benefits and support for multiple objectives that avoid negative consequences on one area when addressing another.[86]

Stakeholder engagement and cross-sectoral collaboration provide development cooperation the opportunity to act as a catalyst to encourage stakeholders from policy, science, civil society and the private sector to address context-specific challenges jointly.

Funding mechanisms

Financial Mechanisms of the Rio Conventions include the Global Environment Facility (GEF), the Global Biodiversity Framework Fund for the implementation of the Kunming-Montreal Global Biodiversity Framework, and climate-specific funds such as the Adaptation Fund where nature-based solutions serve as an entry point for biodiversity.

Multilateral Development Banks such as the World Bank, the Asian Development Bank, African Development Bank and the European Bank for Reconstruction and Development provide the biggest share of funding for environmental projects.

Specialised Multi-Bi[87] Trust Funds include the Blue Action Fund, which is funded by several European countries and aims at enhancing "the management and use of coastal and marine ecosystems to conserve marine biodiversity for future generations while improving the lives of local people today."

National and local funding mechanisms such as Conservation Trust Funds, National Climate Funds, and National Forest Funds can act as intermediaries between national and international levels if they are accredited by global funds (see overviews of funds at Latin American and Caribbean Network of Environmental Funds and the Consortium of African Funds for the Environment).

85 Sida 2022.

86 IPBES-IPCC, IPBES-IPCC co-sponsored workshop report on biodiversity and climate change, 2021.

87 Multi-bi aid contains of earmarked voluntary contributions to multilateral agencies.

Further reading

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