

Briefing

Biodiversity

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Policy pointers

Biodiversity loss has reached crisis levels. Yet it is not just an environmental issue. The development community needs to act now to prevent biodiversity loss undermining hard-won development gains.

Biodiversity is not just about the wealth of nature but also about the health of nature. Biodiversity loss undermines the ability of ecosystems to function effectively and efficiently, which is critical for humanity.

Regions with high biodiversity loss are home to many of the poorest people and those likely to be hardest hit by climate change. There is little hope of achieving the Sustainable Development Goals and the Paris Agreement without also tackling biodiversity loss.

Development organisations must: ensure their investments are not exacerbating biodiversity loss, recognise the value of biodiversity as a prerequisite for ecological and social resilience, and tackle biodiversity loss in ways that empower the poor and prioritise their needs.

Biodiversity loss, development crisis?

Biodiversity — the variety of life on Earth — is being lost at increasing and alarming rates. To date, this has been treated as an environmental problem. Yet the so-called biodiversity crisis is also a development crisis. Biodiversity loss threatens to undermine hard-won development gains, including in health, resilience, food security and GDP earnings. Poor people are particularly dependent on biodiversity — both to meet day-to-day livelihood needs and to enhance resilience to climate change and other threats. So they are hardest hit by its loss, especially when coupled with climate change. In 2020, the international community will agree a new 10-year strategy for biodiversity management. Ensuring this works for both biodiversity and for people requires much more coordinated thinking and action than has happened to date. It is time for the development community to step up to this challenge and engage in the debate.

Biodiversity is a scientific term to describe the variability of life on Earth. It is about the abundance of different species, genetic variation within and between species, and the extent and variety of natural habitats and ecosystems. This diversity is being lost at increasing and alarming rates.

Why does it matter? Because humanity depends on the goods and services generated by nature, and the ability of nature to deliver these goods and services over the long term is underpinned by biodiversity (see Box 1). What's more, poor people are particularly dependent on biodiversity — both for their livelihoods and their ability to withstand climate change and other threats — so they are hardest hit by its loss, especially when coupled with climate change.

The biodiversity 'crisis' is not new. In 1992, the UN Convention on Biological Diversity was

adopted in response to an already recognised crisis, and 25 years ago a stark paper warned of the danger of 'Empty Forest Syndrome'.¹ This referred to seemingly healthy forests, full of trees, but increasingly devoid of any animal inhabitants. Now, improved evidence and analyses, as well as 'shock' revelations such as the impact of plastics on ocean life and the collapse of insect populations, have heightened awareness of the rate and scale of the degradation of nature and associated biodiversity loss. This loss has severe implications for human development, including escalating threats to food and water security, climate change adaptation, disaster risk, pollution control and human health. This is not to mention reduced options for future innovations as the 'library of life' — as biodiversity is sometimes described — is lost. Biodiversity loss is an environmental crisis. But more significantly, it is a major barrier to future

development and risks undermining already hard-won development gains.

What's so different about diversity?

The term biodiversity is, or should be, used to describe the variety of life. But it is often

conflated with wildlife species or particular habitats. When the popular media tells stories of biodiversity loss, it most often refers to the demise of iconic wildlife species such as rhinos or orangutans, or iconic ecosystems such as the

Amazon rainforest or the Great Barrier Reef. But biodiversity is much more than this. It includes not just well-known wild mammals and birds, but also plants, fish, fungi, insects and microorganisms, as well as crop and livestock varieties. It is this diversity of species, ecosystems and genes, and the interactions between them, that underpins the resilience, productivity and functioning of ecosystems. Biodiversity is thus a fundamental **property** of the natural world, not specific elements of the natural world itself.

Biodiversity loss and the risk to development gains

It is because of the importance of biodiversity in maintaining and enhancing stable, productive and resilient natural ecosystems — and the resources and services they provide — that

biodiversity loss is an important development issue. Biodiversity loss undermines the ability of ecosystems to function effectively and efficiently, and thus undermines nature's ability to provide us with a healthy environment on which development depends.

While some loss of species is perfectly normal — extinction is an essential part of the evolutionary process — the current rate of loss is not normal.² The main causes of loss are the conversion of forests and other ecosystems for agriculture, infrastructure and urban development, as well as over-exploitation, including through fishing and hunting. It is also increasingly linked to climate change with the distribution of species and extent and quality of ecosystems changing as climatic conditions change.

Biodiversity loss is often measured in terms of losses of particular species.³ But it is also about loss of ecosystems and loss of genes. Mangrove forests, for example, are highly productive ecosystems on which millions of coastal communities depend and they are being lost at a rate of 1% per year, which is double that of forests found on land.⁴ But restoring mangroves, without paying due attention to the diversity of mangrove species being planted, has already proven to be a short-lived solution to coastal degradation.⁵ Meanwhile, loss of genetic diversity within our global food system has huge implications for its future sustainability. Only 30 crops provide 95% of human food energy needs, and just four of them — rice, wheat, maize and potatoes — provide more than 60%.⁶ This homogenisation of agricultural production has resulted in a significant loss of genetic diversity, with farmers worldwide replacing multiple local varieties with genetically uniform, high-yielding varieties.⁷ Yields may be high, but it only takes one pest or disease outbreak, or change in climatic conditions, to wipe out the entire crop.

There is a lot we don't know about the impacts of biodiversity loss but the evidence we do have suggests that biodiversity loss will present challenges to achieving many development goals — from health to food security to disaster risk reduction (Table 1).

Some first steps to protect development gains from biodiversity loss

1. 'Nature-proof' development investments. For many years, development professionals have recognised the need to climate-proof their investments or risk seeing

Biodiversity loss has severe implications for food and water security, climate change adaptation, disaster risks and human health

Box 1. Evidence that diversity matters

There is a substantive body of evidence which shows that diversity confers both social and ecological resilience — particularly under a changing climate.^{11,12,13} Specifically, evidence¹⁴ shows that, more so than climatic or nutrient influences:¹⁵

- Crop genetic diversity increases the yield of commercial agricultural crops
- Tree species diversity stabilises production of wood in plantations
- Plant species diversity enhances the production of fodder in grasslands
- Fish species diversity is associated with greater stability of fisheries yields.

Beyond these productivity impacts, plant biodiversity increases resistance to climatic shocks and invasion by exotic plants, reduces prevalence of plant pathogens, increases above-ground carbon sequestration and increases nutrient mineralisation and soil organic matter.^{16,17,18,19}

In the short term, many of the benefits poor people obtain from nature rely as much on the amount, extent, condition and functions of specific resources or ecosystems as they do on diversity. But it is diversity that underpins the abundance, extent and condition of nature, natural resources and ecosystems, and secures the flow of benefits to people over the long term, particularly in the face of changing environmental conditions.

Table 1. Risks to development priorities from biodiversity loss

Development priority	Implications of biodiversity loss
Food systems and food security	Reduced availability of wild foods, reduced productivity of agricultural systems, reduced nutritional security
Health	Nutritional deficiencies, exposure to chemicals to compensate for reduced agriculture productivity, reduced access to traditional medicines, reduced options for future drug development, increased disease burden, reduced protection against pollution
Climate change mitigation	Reduced carbon storage and sequestration capacity, and reduced resilience of these functions
Climate change adaptation and disaster risk reduction	Reduced climate resilience and adaptation, exacerbation of natural disasters, increased vulnerability
Gender equality	Increased time and labour burden — different genders and ages affected by different types of losses — with knock-on effects on the availability of time for other activities
Private sector development	High risk to doing business — in terms of likelihood and severity of impact — particularly in the Least Developed Countries (LDCs)

their work undone because of climate change. Similarly, it is important to understand the risks of biodiversity loss and build biodiversity safeguards into development projects, particularly investments in infrastructure, extractive industries, large-scale agriculture and tourism.

2. Invest in biodiversity for development and climate change resilience. There is increasing international interest in 'nature-based solutions' to development and climate change challenges.⁸ These need to emphasise diversity within nature. Some interventions that seem to be nature-based solutions inadvertently undermine biodiversity; for example, support for low-cost monocultures (plantations involving single, usually non-native, species) over diverse natural ecosystems or agroforestry. This is particularly important in the context of the Paris Agreement, whereby some countries have pledged to plant forests but without pledging to use diverse and indigenous species. In the short term this may lead to increased forest coverage and carbon storage benefits, but there is concern about the sustainability of this practice in a rapidly changing world.⁹

As well as investing in ways that do not undermine biodiversity, more attention needs to be given to investing in ways that maximise the potential of biodiversity. Biodiversity directly supports export earnings, GDP and jobs in a variety of economic sectors from tourism to agriculture. Investments should reflect the critical role of biodiversity in contributing to — and sustaining — development priorities.

3. Invest in biodiversity conservation and restoration in ways that empower rather than disenfranchise the poor. State owned,

strictly protected areas have been a cornerstone of international conservation policy for the last century. However, a huge body of research has documented the negative impacts that many of these areas have had on neighbouring rural communities, in the form of evictions or restricted access to land and resources. Indigenous people and local communities own or manage an estimated 25% of the world's land area — far greater than the amount of land under formal protected areas.¹⁰ Yet they often are unable to protect these areas due to weak rights and tenure regimes, inadequate resources and a lack of economic opportunities. Supporting and strengthening policy and practice that recognise rights, enhance equity and draw on local knowledge and stewardship are key to achieving advances in human wellbeing through conservation.

4. Invest in those components of biodiversity and those sites that are important to poor people. While the world's attention is focused on charismatic megafauna — such as elephants, tigers and other animals targeted in the illegal wildlife trade — it is also important to prioritise the more uncharismatic species that matter most to poor people. These include pollinators, soil microbes, traditional crop varieties and species that are important for food, fibre or medicines.

A new deal for nature and people — making development sustainable again

In 2020 the international community will agree a new 10-year framework for biodiversity management. Developing this new framework into one that works for both biodiversity and

people requires much more coordinated thinking and action than has happened to date. Many of the drivers of biodiversity loss — notably in the agriculture and infrastructure sectors — are also drivers of development gains, but in the long term, biodiversity loss threatens to undermine these gains. The biodiversity crisis is thus a development crisis and demands an engaged response from the development community.

It is critical that increased effort is put into tackling biodiversity loss, in the same way that climate change has become a political priority. In 2015, the global community agreed the Sustainable Development Goals (SDGs), setting a policy framework for development to 2030. Pursued in isolation, some of the SDGs could have serious negative impacts on biodiversity, while some biodiversity conservation or restoration strategies could

undermine the achievement of the SDGs. The Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) has emphasised the concerted efforts that are required to strengthen coordination between responses to biodiversity loss, climate change and sustainable development, rather than treating them in isolation. The new deal for nature needs to do the same. Now is the time to put the word 'sustainable' back into the development agenda, but also to make sure that people are included in any new agenda for nature and biodiversity.

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Notes

¹ Redford, KH (1992) The empty forest. *BioScience*, Volume 42, Issue 6, pages 412-422. <https://doi.org/10.2307/1311860> / ² Pimm, SL (2014) The biodiversity of species and their rates of extinction, distribution, and protection. *Science*, 344, 1246-752. / ³ Biodiversity loss is manifested as a reduction in abundance or the outright extinction of individual species or groups of species. Species losses and extinctions are often measured and reported at the global level (such as in the IUCN Red List of Threatened Species or the Living Planet Index). But they also occur at the local level, particularly, for example, if a species geographical distribution changes because of climate change. 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The Nature-based Solutions Initiative is a programme of research, policy advice and education aimed at understanding the potential of Nature-based Solutions (NbS) to global challenges and increasing their sustainable implementation through the application of science.

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