Nature & Biodiversity—show me the money!

Is Nature & Biodiversity the Next Climate Change?

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(to be written later)

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Nature covers 100% of our planet, yet somehow, we've managed to turn discussions about it into abstract theoretical frameworks that put most people to sleep. But the reality is clear: we haven't taken as good care of nature as we could and are not as attuned to it as our forefathers while we live in concrete jungles.

When I founded Accrona, I envisioned creating a space where innovative thinking meets deep expertise in sustainability and sustainable finance—where we push boundaries and create meaningful value for our customers. Addressing the nature and biodiversity challenge represents exactly the kind of complex opportunity we exist to solve.

We live in an era where business and nature are at a critical inflexion point. While biodiversity loss and climate challenges are well documented, practical guidance on transforming these challenges into opportunities remains scarce. The question isn't whether to act but how to act—to understand the risks, identify the opportunities, and devise solutions—institutional investors and entrepreneurs alike.

This Accrona Biannual Blueprint on Nature & Biodiversity helps fill this guidance gap. Our goal isn't to be correct in every detail—this is a fast-evolving space—but to provide perspectives, share our knowledge, have opinions, and better support our clients in navigating this emerging field.

Don't worry; we won't bore you with yet another report full of fancy frameworks and buzzwords. Instead, we focus squarely on value creation for your business and nature. Rather than dwelling on abstract concepts, we provide actionable insights based on where investments are flowing, which technologies are gaining traction, and how forward-thinking organisations are positioning themselves in the transition to a nature-positive economy.

Our perspectives, opinions, and recommendations result from extensive work with businesses, financial institutions, and sovereigns. This has helped connect the dots between nature, biodiversity, and other sustainability themes typically treated in isolation—everything is interconnected. We have designed multi-awarded sustainable finance methodologies, seeing what fails, the importance of failing, what works, and most importantly—where the real opportunities lie that others miss.

Inside this Blueprint, you'll find:

- Investment opportunities that generate both financial returns and positive environmental impact
- Practical approaches for integrating nature considerations into corporate strategy and operations
- Essential frameworks, standards, and metrics that matter for decision-making
- Current investment trends across funds, venture capital, and labelled finance

- Emerging technologies that leading investors are backing

The Blueprint is designed for flexibility. You can skim the executive summaries for quick insights or dive into detailed analyses and case studies for deeper understanding. Each section stands independently based on your specific needs.

Today, we have an opportunity to prevent further nature and biodiversity loss, thereby reducing credit and investment risk while discovering innovative solutions that benefit both business and ecology. Together, we're committed to revealing the paths where business success and nature's restoration go hand in hand.

Nature and biodiversity represent the next frontier of sustainability and a significant business opportunity. Those who act early will be in the best position to thrive. The question isn't if this transition happens but when and how effectively you'll capitalise on it.

Welcome to the Accrona Biannual Blueprint on Nature & Biodiversity. Let's move beyond viewing nature as a risk to be managed. It's time to seize the opportunities ahead.

Bjarni Herrera

Founder & CEO

3 Foundations of nature and biodiversity

Nature and biodiversity are inherently interconnected and play a vital role as the foundations of life. In addition, they drive value for businesses, societies, and ecosystems. Biodiversity is important because it provides us not only with a beautiful place to live but also with clean air, water, food, and fuel, and even supports our mental and physical health.[1]

Nature encompasses both living organisms and non-living components such as geological features (e.g., mountains, valleys, canyons), water resources (e.g., lakes, rivers, oceans), and climate. It provides the foundation that sustains all life on Earth.[2] Biodiversity, which is related but more specific, refers to the variability of life on Earth—from genes to ecosystems.[3] This diversity is critical in enabling nature to be productive, resilient, and adaptable to changing conditions.

"Human activities are driving unprecedented biodiversity loss, which mirrors the mismanagement of a diversified financial portfolio where the overexploitation of a single asset makes the entire system vulnerable. When biodiversity is reduced, ecosystems lose their ability to absorb shocks, regulate adverse effects, and maintain balance, jeopardising both nature and human well-being." DasGupta report

Ecosystem services

Ecosystem services are the benefits nature provides to people, supporting human well-being, economic stability, and environmental health. They are the conditions and processes through which natural ecosystems and the species that make them up, sustain and fulfil human life. There are four broad categories of ecosystems:[4]

- **Provisioning services** – The direct material benefits of nature, including food, fresh water, timber, and medicinal resources.
- **Regulating services** – Natural processes that maintain environmental balance, including climate regulation, water purification, disease control, and pollination.
- **Cultural services** – Non-material benefits contributing to human well-being, including recreation, spiritual enrichment, aesthetic value, and education.
- **Supporting services** – The foundational processes that sustain life and all other services, such as soil formation, nutrient cycling, and photosynthesis.

[1] Natural History Museum. n.d.
[2] Convention on Biological Diversity. n.d.
[3] Convention on Biological Diversity. n.d. American Museum of Natural History. n.d.
[4] Millennium Ecosystem Assessment. 2005.

The health of ecosystems on which we and all other species depend is deteriorating more rapidly than ever. We are eroding the foundations of our economies, livelihoods, food security, health and quality of life worldwide.[5]

Figure SPM 1 **Global trends in the capacity of nature to sustain contributions to good quality of life from 1970 to the present, which show a decline for 14 of the 18 categories of nature's contributions to people analysed.**

Data supporting global trends and regional variations come from a systematic review of over 2,000 studies [2.3.5.1]. Indicators were selected on the basis of availability of global data, prior use in assessments and alignment with 18 categories. For many categories of nature's contributions, two indicators are included that show different aspects of nature's capacity to contribute to human well-being within that category. Indicators are defined so that an increase in the indicator is associated with an improvement in nature's contributions. [6]

This chart illustrates the global trends in nature's contributions to people (NCP) over the past 50 years. 14 of the 18 categories show a decline in nature's ability to contribute globally to human well-being, showcasing the deterioration of natural systems.

This ecological crisis already impacts millions of people, affecting food supplies and livelihoods. Air pollution contributes to 7 million deaths annually, and human disturbance of ecosystems

[5] IPBES, n.d.
[6] Image: IPBES. 2019.

increases the transmission of infectious diseases. The loss of coastal habitats also increased the risk of floods and hurricanes.[7]

Five key drivers of biodiversity loss: a cascading system

Biodiversity decline is primarily human-induced and driven by five major direct threats that vary across regions and ecosystems. These direct drivers don't exist in isolation—they stem from deeper societal forces and interact with each other, creating complex feedback loops that accelerate biodiversity loss.

For instance, land-use change causes tropical deforestation, while overfishing threatens marine environments. **These direct drivers, the immediate threats**, are interconnected, with climate change worsening habitat loss and pollution weakening species' resilience.

Direct driver	Impact	Key insights	Striking examples
Habitat destruction 🪚 Changes in land use and sea use	~50%	Natural ecosystems are converted to agricultural, urban, or industrial areas.	- Agriculture drives 90-99% of tropical deforestation - Industrial fishing covers 55% of the ocean's surface.[8]
Overexploitation 🐟 Direct exploitation of organisms	~20-25%	Unsustainable extraction exceeds natural replenishment rates.	- Overfishing has pushed bluefin tuna populations near extinction - Global wood production has reached 4 billion m³ per year[9]
Climate change 🌡️	~10-15%	Rising temperatures and extreme weather disrupt habitats and migration patterns.	Wildfire emissions in 2023 doubled the EU's fossil fuel emissions.[10]
Pollution 🏭	~10%	Chemicals, plastics, and waste contaminate ecosystems.	Plastic pollution has reached even the Mariana Trench, Earth's deepest point.[11]
Invasive species 🐸	~5-10%	Non-native species, introduced intentionally or accidentally by human activities, outcompete or prey on native species.	The introduction of cane toads in Australia decimated native predator populations.

These five direct drivers are symptoms of deeper systemic issues. **The indirect drivers—the root causes**—shape human activities and create the conditions for biodiversity loss:

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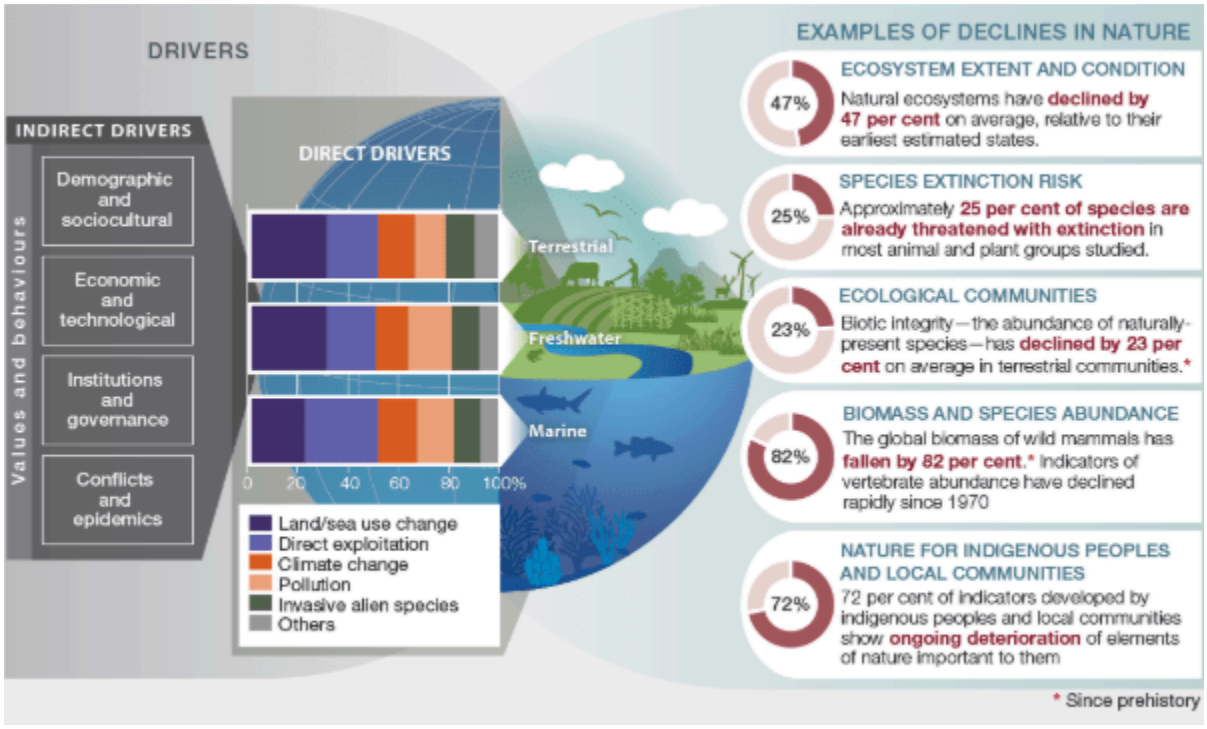
[7] Natural History Museum. n.d.
[8] Stockholm Environment Institute. 2022.- IPBES. 2019 - Science. 2018.
[9] FAO. 2024 - National Geographic. N.d. - Pew Trusts. 2017. - IUCN. 2021.
[10] FAO. 2024.
[11] UNEP-WCMC. 2018.

- **Demographic growth** – Population growth and urbanisation increase demand for land, food, and resources.
- **Economic systems** –Trade, market demand, and financial incentives shape resource exploitation, whereas industrialisation and global trade accelerate resource exploitation.
- **Sociocultural behaviours** – Consumption patterns and lifestyle choices influence production.
- **Technological advances** – Innovations impact resource extraction and environmental management.
- **Governance and policy failures** – Weak regulations and the lack of enforcement enable unsustainable and destructive practices to persist.[12]

These indirect drivers stem from deep-rooted societal values often prioritising short-term economic gains over long-term environmental sustainability.



The graph illustrates the relative global impact of each direct driver across terrestrial, freshwater, and marine ecosystems. The coloured bands represent the resulting impacts, based on a systematic review of global studies, helping to visualise how different ecosystems are affected by human activities.[13]

[12] IPBES. 2019.
[13] IPBES. 2019.

This cascading system creates an ongoing biodiversity crisis, from societal values to indirect drivers to direct threats. Understanding this interconnected chain is essential for developing effective interventions at all levels.

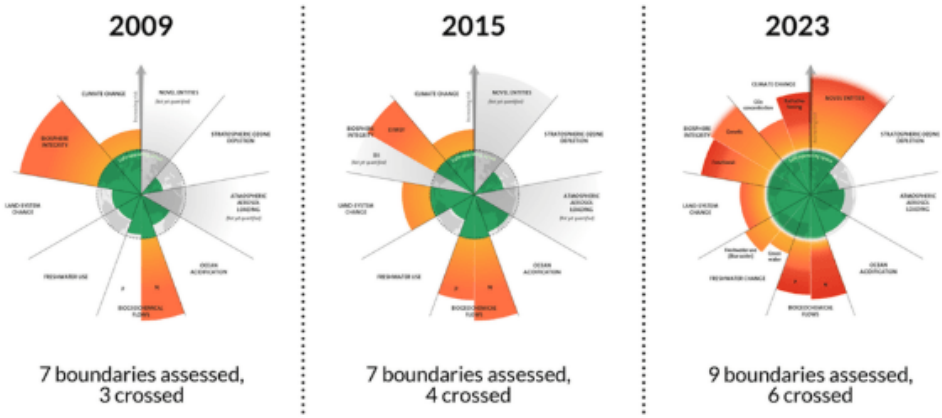
Indigenous knowledge integration

The Global South leads in recognising traditional ecological knowledge. For instance, the 2024 Environmental Code of Bolivia grants legal standing to Indigenous conservation practices across 39% of the national territory.[1] Similarly, Namibia's communal conservancy model covers 20% of the land area, generating USD 10.3 million annually through community-managed wildlife tourism.[2] In contrast, only 12% of EU member states formally recognise Indigenous land management practices in protected area legislation.

The OACPS-EU Partnership Framework (2025-2030), established between the Organization of African, Caribbean, and Pacific States and the EU, allocates EUR 800 million for biocultural heritage documentation, addressing the 73% loss of indigenous languages containing critical ecological knowledge.[14] The Traditional Knowledge Act of Papua New Guinea establishes digital sovereignty protocols, requiring bioprospecting entities to deposit 30% of intellectual property revenues into community trust funds.[15] [16]

The 9 Planetary Boundaries: biodiversity is breached

The concept of planetary boundaries defines the environmental limits within which humanity can safely operate.[17] These boundaries identify key Earth system processes that regulate planetary stability. When crossed, they can trigger abrupt and irreversible environmental changes.[18]



[14] IISD (International Institute for Sustainable Development). n.d.
[15] GEF (Global Environment Facility). n.d.
[16] United Nations. n.d.
[17] Nature. 2009.
[18] Science Advances. 2023.

Six out of nine planetary boundaries have now been crossed, pushing Earth into an increasingly unstable state.[19] [20] These boundaries are interconnected, with breaches in one accelerating the transgression of others. These cascading effects threaten food security, economic stability, and human health worldwide. For example:

- Climate change intensifies biodiversity loss through habitat alteration and extreme weather events
- Deforestation worsens climate change by reducing carbon storage capacity
- Pollution and ocean acidification weaken marine ecosystems, compromising their carbon sink function
- Land-use changes in one region can disrupt water cycles globally

Planetary Boundary	Description	Current status (2024)[21]
Climate change	Excessive nutrient runoff from agriculture leading to soil degradation, water pollution, and ocean dead zones.	BREACHED - CO_2 exceeds 419 ppm (safe limit: 350 ppm).
Biosphere integrity	Loss of genetic diversity weakens ecosystems and disrupts critical services.	BREACHED - Over 1 million species at extinction risk.
Land-system change	Conversion of natural ecosystems for agriculture and urbanisation.	BREACHED - Forest cover below safe threshold.
Freshwater change	Water overuse and pollution affect ecosystem health.	BREACHED - Severe depletion of water resources globally.
Biogeochemical flows	Agricultural nutrient runoff causes water pollution and ocean dead zones.	BREACHED - Nitrogen and phosphorus exceeding safe limits.
Introduction of novel entities	Synthetic chemicals and plastics posing unknown risks to ecosystems.	BREACHED - Chemical pollution beyond safe thresholds.
Ocean acidification	CO_2 absorption lowers ocean pH and threatens marine life.	APPROACHING BREACH - Marine ecosystems are increasingly compromised.
Atmospheric aerosol loading	Airborne pollutants alter weather patterns and air quality.	REGIONALLY BREACHED - Exceeding limits in some regions.
Stratospheric ozone depletion	Ozone layer thinning increases harmful UV radiation.	UNDER CONTROL - Recovering due to Montreal Protocol.

[19] Planetary Health Check. 2024.
[20] Stockholm Resilience Centre. n.d.
[21] IPCC. 2024. - IPBES. 2019. - Stockholm Resilience Centre. 2024. - Planetary Health Check. 2024. - (Steffen et al., 2015) - (Richardson et al., 2023)

Climate change as a driver of biodiversity loss

Climate change is no longer just an environmental issue but a systemic threat multiplier, accelerating biodiversity loss across ecosystems. It ranks as the second-largest driver of ocean biodiversity loss and the fourth on land, following habitat destruction, overexploitation, and invasive species.[22] Its impact is growing rapidly and is expected to overtake other drivers in the coming decades.

Climate change affects biodiversity through multiple interconnected pathways. These impacts are already visible—and economically consequential—across terrestrial, freshwater, and marine environments.[23]

Factor	Description	Key Consequences
Habitat Alteration	Shifting temperature and rainfall patterns transform ecosystems.	Loss of carbon sinks and water regulation; risks to food and water security.
Species Range Shifts	Species migrate to track climate suitability.	Fragmentation leads to local extinctions and disrupts ecosystem services like pollination.
Extreme Weather Events	More frequent floods, fires, droughts, and storms.	Direct habitat destruction and species mortality; damages natural infrastructure.
Ocean Acidification	CO_2 absorption lowers ocean pH.	Weakens marine life (e.g., corals, molluscs); disrupts fisheries and food webs.[24]
Temperature Rise	Species exceed thermal limits.	Collapse of temperature-sensitive populations (e.g., amphibians, corals).
Phenological Changes	Timing of biological events (e.g., flowering, migration) disrupted.	Mismatches in ecological relationships (e.g., pollinators and plants).

These disruptions are not isolated—they reinforce each other. Species migration, ecosystem tipping points, and extreme weather events intersect, eroding the resilience of nature. The resulting instability spills into economic systems through reduced agricultural yields, fishery declines, and increased infrastructure costs.

The interaction between climate change and biodiversity loss is cyclical. Each drives and exacerbates the other:[25]

- **Deforestation & land degradation:** Forests, wetlands, and peatlands store vast amounts of carbon. When destroyed, they release CO_2 and eliminate critical carbon sinks.

[22] Natural History Museum. 2022.
[23] IPCC. 2022.
[24] NASA Earth. n.d.
[25] American Meteorological Society. n.d.

- **Soil & ocean degradation:** Healthy soils and oceans absorb carbon. Pollution, industrial agriculture, and overfishing diminish this function, accelerating climate change.
- **Coral reef collapse:** Coral systems regulate CO_2 and anchor food webs. Their destruction weakens marine biodiversity and threatens coastal livelihoods.

These feedback loops are economic time bombs. For example, wetland loss raises flood insurance costs, while forest decline increases temperature volatility that harms agriculture. Without intervention, these trends will undermine long-term financial and social stability.

Addressing climate change and biodiversity loss as separate issues is ineffective. Deforestation increases emissions and reduces biodiversity. Heatwaves kill pollinators and crops. Ocean acidification reduces fish stocks and jobs. Each link reveals how ecological collapse translates into rising costs, disrupted supply chains, and reduced resilience.[26]

A climate strategy that overlooks nature is incomplete. Ensuring healthy forests, wetlands, grasslands, and oceans is essential for buffering climate shocks and maintaining economic value chains. Natural ecosystems must be treated as infrastructure—crucial to risk mitigation and economic continuity.

Consequences of biodiversity loss

As species disappear and ecosystems degrade, essential natural functions fail—compromising food security, public health, and economic stability.

Nature offers interconnected, irreplaceable services and is foundational to human wellbeing. When biodiversity declines, we don't just lose species—we lose resilience, innovation potential, and cost-effective ecosystem services. Human-made systems can replicate some natural functions but are often costly, incomplete, or inefficient. For example:

- **Water purification** – Wetlands filter pollutants and support aquatic life. Replacing them with treatment plants requires significant financial and energy investments.
- **Coastal protection** – Mangroves buffer storm surges, store carbon, and sustain fisheries—services that seawalls and dikes cannot replicate.
- **Genetic resources** – Wild species hold untapped potential for medicine and agriculture. Their extinction means permanent loss of future innovation.

Built infrastructure, while useful, often introduces new risks, lacks long-term adaptability, and fails to deliver the systemic value of healthy ecosystems. As degradation accelerates, cascading consequences emerge across society and the economy:

- **Weakened food security** – Pollinator decline and soil degradation undermine global agriculture.

[26] UK Government. 2024. Climate-Biodiversity Report.

- **Increased disaster vulnerability** – Deforestation and wetland loss intensify flooding and amplify extreme weather risks.
- **Public health threats** – Disrupted disease regulation raises the likelihood of pandemics and pollution-related illnesses.
- **Economic instability** – Nature-dependent sectors like agriculture, fisheries, and pharmaceuticals face mounting operational and financial risks.

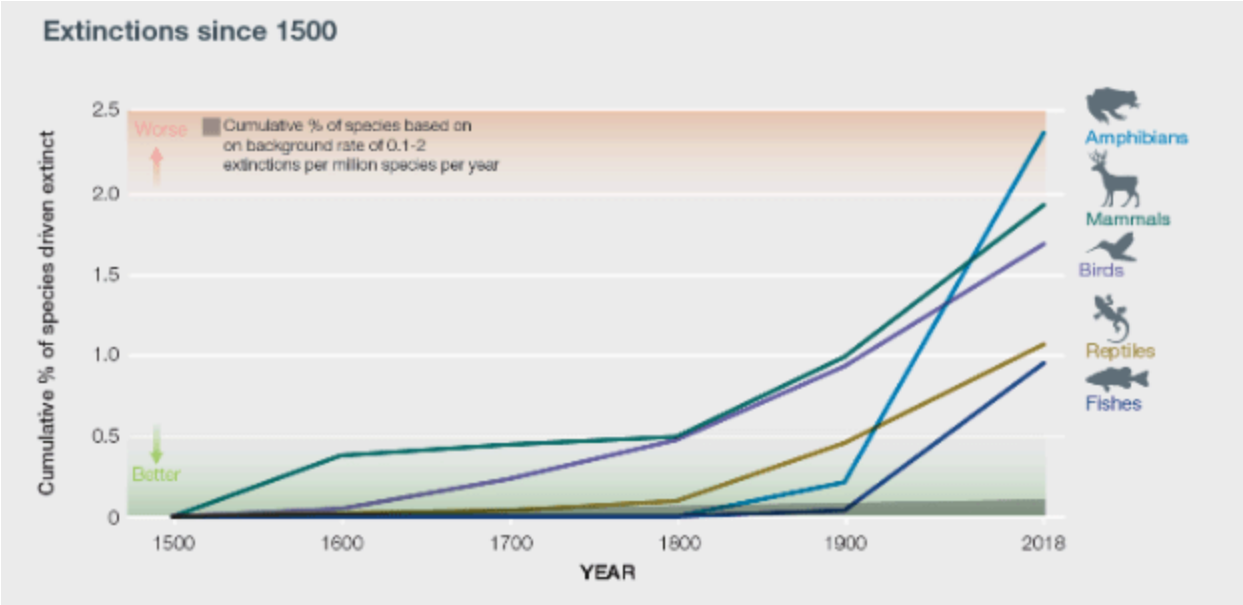
Losing biodiversity means losing security, stability, and future opportunities—for people, economies, and the planet.

The rising curve of extinction: sixth mass extinction

How quickly are we losing nature? It's a critical question—and a difficult one to answer precisely. But the available data paints a clear picture: species are disappearing at a rate far beyond natural background levels. This acceleration is one of the most alarming signals of ecological breakdown—and one of the clearest signs that our global systems are out of balance.

Estimates of global species diversity range from 2 million to over 100 million, with the most accepted approximation being around 10 million species. Yet, scientists have only described about 1.4 million of them. That means most species remain undocumented—some are likely disappearing before we even know they exist.

Scientists estimate that the natural—or "background"—extinction rate is around 0.01% of species per year. In other words, without human influence, roughly one in 10,000 species would go extinct annually. This slow turnover is part of the evolutionary cycle. But today, extinction rates are estimated to be 100 to 1,000 times higher than that baseline. All major studies agree biodiversity is vanishing at an unprecedented pace, driven primarily by human activity.



This visual shows cumulative extinction trends for vertebrates across taxonomic groups, confirming the accelerating loss of species—especially since the industrial era.[27]

In the past 500 million years, Earth has experienced five mass extinction events—periods when species were wiped out at dramatically higher-than-normal rates. The most recent, 66 million years ago, eradicated the dinosaurs. These events were triggered by catastrophic events: asteroid impacts, volcanic eruptions, and climate shifts.[28]

But today's extinction crisis is different. It is not being driven by geophysical catastrophe—we are driving it. Habitat destruction, overexploitation, pollution, climate change, and invasive species push ecosystems beyond their limits.

Scientists now suggest that we may live through a Sixth Mass Extinction, often called the Holocene or Anthropocene extinction. Unlike the past, this one is unfolding in real-time—and it is the product of human decisions, consumption, and inaction.

If this trend continues, up to one million species could face extinction within the coming decades. The consequences will be far-reaching for ecosystems and food systems, public health, economic resilience, and the future of life on Earth.

Box: The Dodo – a caution in verse	
The dodo, native to Mauritius, vanished less than a century after it was discovered to extinction by hunting, habitat loss, and invasive species. It has since become a symbol of human-driven extinction.[29] As captured in Hilaire Belloc's poem:[30] *The Dodo used to walk around,* *And take the sun and air.* *The sun yet warms his native ground—* *The Dodo is not there!* *The voice which used to squawk and squeak* *Is now forever dumb—* *Yet may you see his bones and beak* *All in the Mu-se-um.*	**(add an image of the Dodo bird)**

[27] IPBES. 2019. Global Assessment Report on Biodiversity and Ecosystem Services.
[28] ?
[29] BirdLife International. 2016
[30] The Dodo" is reprinted from The Bad Child's Book of Beasts. Hilaire Belloc. London: Simpkin, Marshall, Hamilton, Kent & Co., 1896.

4 Economic impacts and cost of biodiversity loss

The economic implications of biodiversity loss are profound but consistently underestimated. Traditional economic models treat nature's contributions as externalities or public goods—essential to our survival and prosperity, yet absent from market prices. This disconnect drives systemic undervaluation, incentivising degradation over preservation and threatening long-term economic resilience.

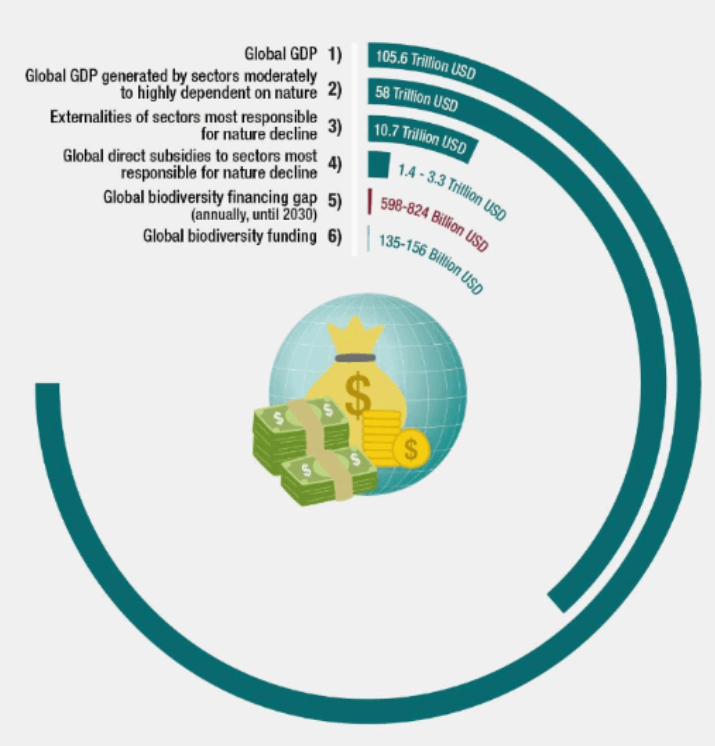
Unlike carbon, which can be priced per ton, biodiversity spans complex and place-based relationships among species, ecosystems, and communities. This diversity resists uniform valuation, yet it underpins services we depend on—pollination, water purification, climate regulation, and food security. The failure to reflect these values in economic decision-making distorts incentives and leads to unchecked resource exploitation.[31]

Gross Domestic Product (GDP), still the dominant metric for economic progress, reinforces this blind spot. It tracks market activity but ignores the depletion of natural assets that underpin it. A country can grow its GDP by logging a forest, but the long-term value of the forest's ecosystem services—like water retention, flood control, or carbon storage—vanishes from the ledger. In this way, GDP growth can mask ecological decline and ultimately undermine true prosperity.

Alternative indicators, such as Inclusive Wealth—which accounts for natural, human, and produced capital—offer a more holistic view. These frameworks show how biodiversity loss erodes wealth, not just well-being. Studies increasingly link ecosystem degradation to slower growth, instability, and even credit risk, particularly in nature-dependent economies.[32] [33]

The financial disconnect is stark. Roughly $58 trillion of global GDP depends heavily on nature, yet the sectors driving biodiversity loss create externalities valued at $10.7 trillion annually. Despite this, biodiversity funding remains critically low, with an estimated $598–824 billion annual financing gap through 2030.

[31] Dasgupta, Partha. 2021. *The Economics of Biodiversity: The Dasgupta Review.*
[32] (IPBES 2024 Report)
[33] AIIB 2023 report



This is not just a market failure—it's a failure of imagination. Reframing biodiversity not as a free good but as a foundational infrastructure would unlock new approaches to risk management, value creation, and investment.

Indigenous communities have long understood this. Their stewardship systems reflect a worldview where nature's value is not separated from economic, cultural, or spiritual life. Embedding this perspective into mainstream economics won't just correct a technical error—it can help rebuild the relationship between people, profit, and the planet.

Short-term financial thinking vs long-term biodiversity and financial Loss

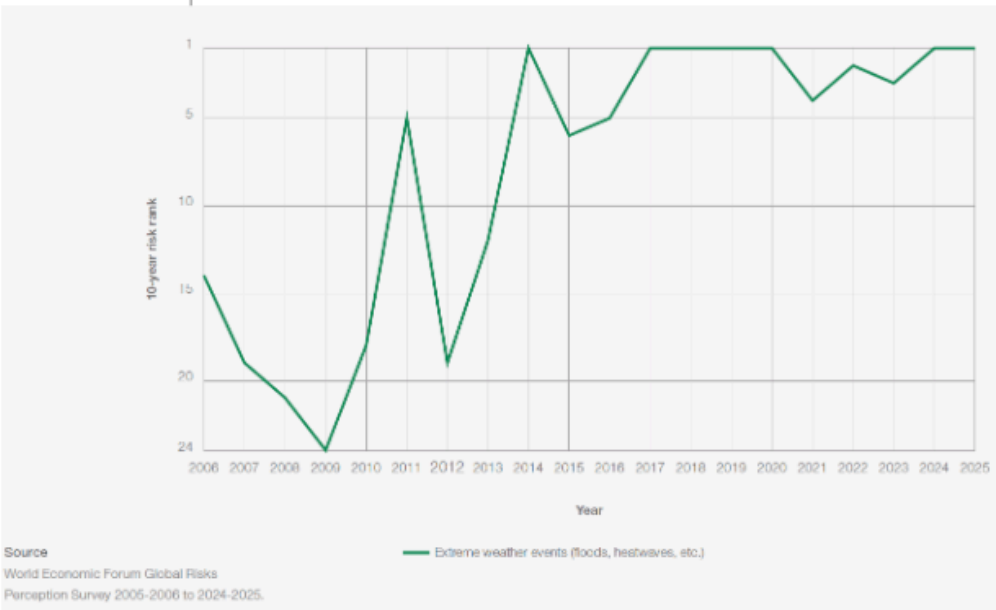
Financial markets are wired for short-term results—quarterly earnings, annual growth targets, and fast returns. Biodiversity, by contrast, operates on ecological timescales: decades for forests to regenerate, centuries for coral reefs to form, and millennia for soil systems to stabilise. This mismatch creates a persistent blind spot.

The consequences are clear. Conservation projects often struggle to attract funding because their payoffs are delayed or hard to quantify. Slow ecological benefits like soil regeneration or pollinator recovery are ignored in investment decisions. In their place, we see quick fixes—rapid tree planting with low species diversity, carbon offsets with questionable integrity, and biodiversity funds with unclear outcomes.[34]

[34] WEF (World Economic Forum). 2024. Global Risks Report.

This shortsightedness spills over into risk assessment. Extreme weather events—many amplified by biodiversity and ecosystem degradation—have risen in frequency and cost. Since 2014, they've consistently ranked among the top global risks. Inflation-adjusted, their per-event cost has increased by 77% over the past five decades. Yet, financial models still struggle to quantify how biodiversity loss translates into systemic instability.

FIGURE 2.18 **Extreme weather events: Evolution in ranking, 2009-2025**



Source
World Economic Forum Global Risks Perception Survey 2005-2006 to 2024-2025.

Nature-dependent sectors—agriculture, fisheries, forestry, tourism—face long-term volatility if ecosystems degrade. In biodiversity-rich countries, these risks are now material: sovereign credit ratings are affected by the erosion of forests, reefs, and water systems. When natural capital declines, so too does the economic foundation for entire industries—and sometimes, nations.[35]

Systemic failures in biodiversity valuation and investment

Despite its foundational role in sustaining economies, biodiversity remains nearly invisible to markets. This is not a coincidence—it's a structural failure.

Why the market fails

First, biodiversity lacks standardised metrics. Investors struggle to assess ecosystem health, measure risk, or compare projects. Even when natural capital is accounted for in economic planning and valuation tools are improving, they remain incomplete, fragmented, or highly context-specific. Many services—like pollination or coastal protection—have no market equivalent, making them difficult to price.

[35] Asian Infrastructure Investment Bank (AIIB). 2023. Annual Report.

Second, financial incentives often work against nature. Market failures are further reinforced by policies that unintentionally promote biodiversity loss. Subsidies for intensive agriculture, fossil fuel use, or destructive fishing practices reduce the cost of harmful activities and crowd out investment in sustainable alternatives. These distorted incentives encourage ecosystem degradation, even in the face of long-term economic and ecological risks.

Since ecosystem services are not directly monetised, they remain largely invisible to financial markets. This invisibility means that investments in biodiversity-positive outcomes often lack clear financial returns, making them unattractive in conventional risk-return frameworks. Without deliberate efforts to integrate nature's value into pricing and capital flows, conservation will continue to be underfunded.[36]

What it costs

The economic cost of this failure is staggering. While $58 trillion of global GDP depends heavily on nature, sectors driving its destruction generate negative externalities worth over $10 trillion annually. Meanwhile, the biodiversity financing gap is $598–824 billion annually through 2030.

Investors, rating agencies, and governments are beginning to recognise that this is more than an ecological crisis—a macro-financial risk. But without better pricing mechanisms and stronger market signals, change remains slow.

Where solutions are emerging

Progress is happening at the margins. New instruments like biodiversity-linked bonds, biodiversity credits, and debt-for-nature swaps are starting to shift incentives. These tools connect finance to measurable ecological outcomes and offer pathways to bridge the funding gap.

Policy intervention is key. Regulatory frameworks, such as those evolving under the TNFD and CSRD, can compel better disclosure and create more informed capital allocation conditions. But tools alone won't solve a systemic problem. A fundamental shift is needed—from viewing biodiversity as a cost to treating it as an asset central to long-term value creation.

[36] Dasgupta, Partha. 2021. The Economics of Biodiversity: The Dasgupta Review.

5 Global Governance: Frameworks, Challenges, and Pathways

Framing the governance landscape

Governments and international institutions have responded to accelerating biodiversity loss by developing a growing web of treaties, legal frameworks, and policy tools. These aim to protect ecosystems, integrate biodiversity into national development strategies, and align nature goals with broader sustainability efforts.

Since 2020, **78% of countries have introduced new biodiversity-related laws**, marking an unprecedented legislative shift. This surge reflects rising awareness of nature's decline—but also reveals a deeper truth: implementation remains patchy, underfunded, and unequal.

International biodiversity governance is shaped by a complex mosaic of treaties and collaborative mechanisms—each designed to reverse ecological degradation while balancing competing development needs. The Convention on Biological Diversity is at its centre, complemented by other global agreements focused on species, wetlands, and land restoration. Together, they form an evolving but fragmented architecture for action.

Yet governance remains a systemic challenge. Biodiversity loss is deeply entangled with climate instability, inequality, and unsustainable economic models. Tackling it will require technical reform, political will, structural coordination, and more inclusive, well-financed systems.

Systemic challenges in biodiversity governance

Despite increased global attention, structural and financial barriers undermine the implementation of biodiversity commitments. The funding gap remains staggering—**an estimated USD 700 billion annually**, with the shortfall most acutely felt in developing nations. Only **35% of countries** have systems in place to monitor species populations effectively, weakening accountability and undermining progress.[37]

Institutional fragmentation is another major hurdle. In over half of national biodiversity plans, critical sectors such as agriculture and finance are excluded—leaving nature policy siloed and disconnected from broader economic and development strategies. The global convention framework relies heavily on voluntary reporting, limiting enforcement and consistency.[38]

[37] Convention on Biological Diversity. N.d.
[38] UN Decade on Ecosystem Restoration. N.d. - IISD (International Institute for Sustainable Development). n.d.

Addressing these gaps also requires more inclusive governance. **Indigenous peoples and local communities** manage roughly **25% of the world's land**, yet their voices remain largely absent from policy design. Only **18% of national biodiversity strategies** formally recognise Indigenous land tenure, despite overwhelming evidence that community stewardship leads to stronger conservation outcomes.[39] [40] In Nepal, for instance, local forest management programs have improved both biodiversity recovery and conflict resolution.[41]

Innovative legal models offer new possibilities. Ecuador's "Rights of Nature" framework, which grants legal standing to ecosystems and their protection, signals a shift toward equity-based environmental governance that could be replicated elsewhere.[42]

Gender inclusion is another missing piece. While **women make up 70% of the global poor** and rely heavily on natural resources for their livelihoods, they occupy just **15% of leadership roles** in forestry ministries.[43] Cultural barriers and insufficient funding for gender-responsive programs continue to limit women's participation in biodiversity governance—particularly in more patriarchal societies.

Innovative implementation mechanisms

Bridging the gap between global biodiversity commitments and national action requires effective implementation tools—and countries are increasingly experimenting with innovative approaches.

National Biodiversity Strategies and Action Plans (NBSAPs) remain the primary mechanism for translating international goals into domestic policy. While the NBSAP Accelerator Partnership supports 11 countries in addressing capacity constraints, challenges persist. **Two-thirds of countries fail to integrate biodiversity into sectoral budgets**, limiting cross-government accountability. Rwanda stands out with a decentralised governance model that embeds biodiversity metrics into district-level performance contracts—strengthening alignment and oversight at the local level.[44]

Cross-treaty coordination is also evolving. The **Ramsar Convention's joint work plan** with the Convention on Biological Diversity has created shared indicators for wetland conservation that reinforce both frameworks.[45] Similarly, the Global Environment Facility's *Integrated Approach Pilots* fund multi-issue projects tackling desertification, climate change, and biodiversity loss.

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[39] CITES. 2024.
[40] CITES. 2024.
[41] IIED (International Institute for Environment and Development). 2023.
[42] VKM (Norwegian Scientific Committee for Food and Environment). n.d.
[43] IIED (International Institute for Environment and Development). 2023.
[44] UNFCCC (United Nations Framework Convention on Climate Change). n.d.
[45] Convention on Biological Diversity. n.d.

Technological innovation is making biodiversity governance more dynamic and transparent. AI-powered platforms like the **Biodiversity Indicators Partnership** synthesise species data across countries, while **satellite monitoring** enables real-time tracking of deforestation in the Amazon.[46] Citizen science initiatives, such as **iNaturalist**, broaden engagement by enabling the public to contribute to biodiversity data collection.[47]

Sovereign policy trends

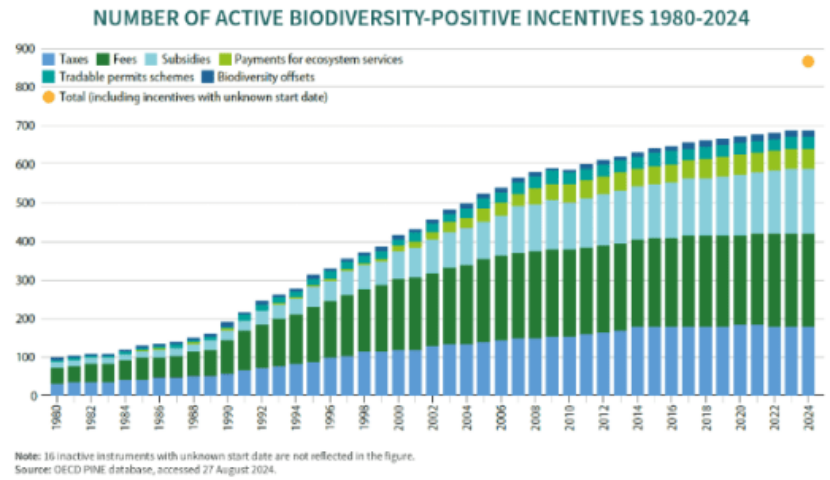
Since 2020, 78% of nations have implemented biodiversity laws, reflecting a growing governmental commitment to addressing nature loss. A parallel growth in sovereign sustainable finance accompanies this policy surge. In 2023, thirty-five nations issued USD 169 billion in green, social, and sustainability (GSS) bonds—a significant increase from USD 141 billion in 2022. Market projections anticipate GSS bond issuance reaching USD 950 billion to one trillion in 2024, with emerging markets contributing 25%.[48] This expansion demonstrates policy commitment and tangible financial mobilisation, as evidenced by strong investor demand for recent bonds from Hungary and Italy in early 2025.

Beyond finance, nations are increasingly deploying economic incentives to drive biodiversity conservation. According to the OECD PINE database, the number of biodiversity-positive incentives has grown steadily since 1980, though progress slowed following the 2008 financial crisis.[49] By 2024, 869 active incentives were in operation globally, with agricultural, forestry, and fishing sectors accounting for nearly one-third (30.8%) of all mechanisms. Water management (12.2%) and manufacturing (8.2%) represent other significant intervention points (Figures 1 and 2).

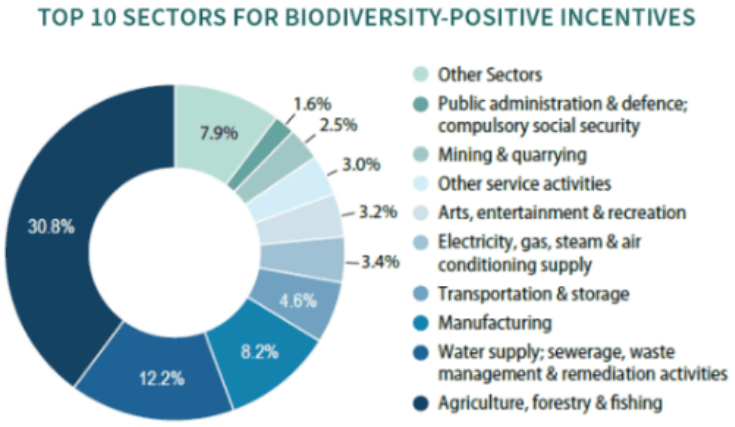
[46] CITES. n.d.
[47] SPREP (Secretariat of the Pacific Regional Environment Programme). n.d.
[48] The amount of GSS bond issuance in 2024 is projected by Moody's to reach approximately $950 billion, slightly exceeding the $946 billion issued in 2023.

[49] OECD. 2024.

Figure 1



Note: 16 inactive instruments with unknown start date are not reflected in the figure.
Source: OECD PINE database, accessed 27 August 2024.



Note: Industry sectors refer to the UN's International Standard Industrial Classification of All Economic Activities (ISIC) REV.4.
Source: OECD PINE database, accessed 27 August 2024.

Implementation of these policies varies widely across nations. Leading approaches include protected area expansion, ecosystem service payments, and integrated planning frameworks. Countries with robust enforcement show significantly better biodiversity outcomes. Policy innovation clusters in three areas: rights-based approaches, market-based instruments, and cross-sectoral mainstreaming across agriculture and infrastructure sectors.

For tracking these national biodiversity commitments and implementation trends, the following resources offer the most comprehensive insights (in order of policy relevance):

1. **CBD Clearing-House Mechanism** - The authoritative source for National Biodiversity Strategies and official implementation reporting.
2. **OECD Environmental Policy Database** - Tracks economic instruments and policy effectiveness across countries.

3. **World Database on Protected Areas** - Maps the global protected area network, enabling analysis of conservation coverage.
4. **IUCN Red List of Threatened Species** - Provides species extinction risk assessments that inform conservation priorities.
5. **Global Biodiversity Information Facility** - Offers open-access biodiversity data supporting evidence-based policy development.
6. **Environmental Performance Index** - Ranks countries on environmental health and ecosystem vitality metrics.
7. **Ramsar Sites Information Service** - Provides detailed information on internationally important wetlands.
8. **Climate Action Tracker** - Monitors climate policies, including nature-based solutions.
9. **ENVIS Centre on Wildlife & Protected Areas** - India's central database for conservation efforts and wildlife data.

National implementation frameworks and disparities

The Convention on Biological Diversity requires nations to develop National Biodiversity Strategy and Action Plans (NBSAPs) that outline how they will fulfil conservation objectives based on their specific circumstances. Implementation of these plans reveals significant global disparities.

Monitoring and accountability

Conservation monitoring has undergone a technological revolution, with AI-enabled systems transforming data collection and analysis. The National Parks Board of Singapore demonstrates this advancement, using machine learning to analyse 12 million camera trap images annually with 94% accuracy. Similarly, Ghana's community-based initiative equips Indigenous groups with smartphone technology, increasing protected area reporting frequency by 300%.[50]

Despite these innovations, standardisation remains a challenge. Currently, 56% of nations use modified versions of the IUCN Ecosystem Health Index rather than the official Global Biodiversity Framework monitoring system. The OECD's 2025 Biodiversity Indicators Initiative aims to address this fragmentation through harmonised training programs across 89 countries.

North-South implementation gap

A clear divide exists in implementation capabilities. While Global North countries excel in biodiversity accounting systems and update their NBSAPs every 4.3 years on average, Global South nations—despite leading in community-based conservation models—typically revise their strategies only every 7.1 years.[51]

[50] GEF (Global Environment Facility). n.d.
[51] Natural England. 2024.

The most striking disparity appears in financing. The 2024 Biodiversity Finance Dashboard reveals an annual funding shortfall of USD 584 billion in developing nations, which host 80% of global biodiversity hotspots yet receive only 17% of the funding needed to meet targets. By contrast, OECD countries report a surplus of USD 112 billion.[52]

Technical assistance programs show mixed results in bridging this gap. Germany's GIZ-funded initiatives have improved NBSAP implementation rates by 22% in partner countries, but the 2025 UNEP Technology Transfer Audit identifies intellectual property barriers blocking 68% of marine monitoring technologies from reaching Small Island Developing States, highlighting the need for more equitable technology transfer mechanisms.[53] [54] [55] [56]

How key industries are addressing biodiversity

Integrating biodiversity priorities into the operations and policies of major industries is essential for effective conservation. This approach recognises that biodiversity protection cannot succeed in isolation but must become a standard practice in agriculture, infrastructure, energy, and other sectors that impact nature.

Agricultural practices and policies

Agricultural integration of biodiversity concerns has gained momentum globally, with 41% of nations now mandating crop diversification ratios—a significant increase from 17% in 2020.[57] The EU leads this transformation through its 2025 Farm to Fork revision, which introduces mandatory biodiversity impact statements for all agricultural subsidies based on environmental impact assessments.

However, implementation remains uneven. While diversification practices advance, pesticide regulation lags, particularly in developing nations where neonicotinoid use is increasing by 14% annually.[58] This trend reveals a critical gap in integrated pest management frameworks and highlights the challenge of balancing agricultural productivity with biodiversity protection.

Infrastructure development approaches

Infrastructure development is increasingly incorporating biodiversity considerations through innovative policy mechanisms:

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[52] UK Government. 2024.
[53] UK Government. n.d.
[54] United Nations. n.d.
[55] Environment & Resources Authority (ERA) Malta. n.d.
[56] Department of Conservation New Zealand. n.d.
[57] FAO (Food and Agriculture Organization). n.d.
[58] GEF (Global Environment Facility). n.d.

- Chile's 2024 Sustainable Infrastructure Law mandates wildlife corridors in all highway projects exceeding USD 50 million, reducing habitat fragmentation by 43%.[59]
- China's Ecological Civilization initiative requires an 8% biodiversity uplift for Belt and Road projects, enforced through cross-border environmental courts.[60]
- The World Bank's 2025 Blue Economy Framework allocates USD 2.1 billion for nature-positive port infrastructure, prioritising mangrove restoration in 14 developing coastal states.

Approaches to marine infrastructure show particularly stark regional differences. UK requirements for marine mammal monitoring in offshore wind development exceed IUCN standards by 40%, while Southeast Asian nations generally lack comprehensive turbine placement guidelines that consider ecosystem impacts.[61] [62]

Mangroves: A Case Study in Policy Failure

(add image of Indonesian mangroves affected by shrimp farming conversion)

The decline of Indonesia's mangrove forests illustrates the consequences of inadequate industry regulation. Indonesia holds 20% of the world's mangroves but has experienced the greatest losses globally, primarily due to aquaculture expansion. In the Mahakam Delta, mangrove cover fell from 98% in 1989 to just 45% in 2020, replaced by shrimp ponds.

This transformation was driven by conflicting policy incentives: global seafood demand, domestic aquaculture promotion, and a 1980 trawl ban that pushed fishing communities toward aquaculture. The consequences extend beyond local biodiversity loss—between 1996 and 2020, global mangrove loss released 139 megatonnes of carbon, equivalent to four times the CO_2 emissions from global cement manufacturing in 2018.

The mangrove case demonstrates how competing economic priorities can accelerate biodiversity decline. Effective biodiversity protection requires individual sector reforms and coherent policy alignment across agriculture, fisheries, infrastructure, and trade.

Despite promising innovations in these sectors, significant implementation gaps remain. Advances must match progress in agriculture and infrastructure in marine and urban planning. The financial dimension remains critical—closing the biodiversity funding gap requires innovative multilateral mechanisms, including recent proposals for a Global Biodiversity Bank that could channel resources toward implementation.

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[59] Natural England. 2024.
[60] OECD. n.d.
[61] Local Government Association. n.d.
[62] Department of Conservation New Zealand. n.d.
[63] UNEP. 2023.
[64] Global Mangrove Watch, UNEP. 2023.

Technology transfer reforms, particularly for AI monitoring tools, are essential for equitable implementation across regions. The ongoing biodiversity policy evolution points toward cautious optimism if current innovation rates and financial commitments can be sustained and expanded across all economic sectors that impact nature.

6 Corporate strategies and integration: standards and market practices

The global governance frameworks discussed in the previous chapter provide the foundation for action, but translating these high-level commitments into corporate practice requires specific standards, metrics, and disclosure mechanisms. For businesses, biodiversity rapidly shifts from a peripheral environmental concern to a financial issue that demands strategic attention.

As investors, regulators, and consumers increasingly recognise ecosystem decline as a systemic risk, companies face growing pressure to assess, disclose, and address their biodiversity impacts. The business case is compelling: biodiversity loss threatens supply chains, increases operational costs, and creates regulatory exposure, while proactive management opens new market opportunities and strengthens resilience.

The Kunming-Montreal Global Biodiversity Framework (GBF) established twenty-three targets and four 2050 goals that serve as the foundation for corporate biodiversity action.[65] This framework operationalises conservation through several mechanisms:

1. National Biodiversity Strategies and Action Plans (NBSAPs) requiring policy alignment with GBF targets, including integration of Indigenous knowledge systems and gender-responsive approaches.[66] [67]
2. Resource mobilisation targets mandating USD 200 billion in annual biodiversity financing by 2030, with USD 30 billion flowing from developed to developing nations through instruments like biodiversity credits.[68]
3. A monitoring framework with twenty-four indicators tracking progress on genetic diversity, ecosystem integrity, and sustainable use, increasingly powered by Earth observation technologies and AI-driven habitat modelling.[69]

The concept of being "nature-positive" emerged alongside these goals—aiming to halt and reverse nature loss by 2030 and achieve recovery by 2050. Financial innovation has followed, with nature-positive performance bonds enabling governments to link debt repayment terms to conservation outcomes, as demonstrated in Belize's USD 364 million debt-for-nature swap.

However, significant implementation barriers persist. Companies struggle with data limitations, inconsistent metrics, and reconciling short-term financial pressures with long-term ecological

[65] Convention on Biological Diversity. n.d.
[66] ESG Today. 2024.
[67] European Commission. 2024.
[68] IFRS. n.d.
[69] Revisjon & Regnskap. 2024.

commitments. These challenges have spurred the development of standardised frameworks to guide corporate action and disclosure, which we examine next.[70] [71]

Taskforce on Nature-related Financial Disclosures (TNFD)

The Taskforce on Nature-related Financial Disclosures (TNFD) is at the forefront of corporate biodiversity frameworks. Launched in 2021, this market-led, science-based, and government-supported initiative has rapidly emerged as the gold standard for how businesses should assess, manage, and report on their interactions with nature.

TNFD addresses a fundamental gap in corporate reporting. While financial risks from climate change have been increasingly incorporated into business planning, biodiversity-related risks have remained largely invisible on balance sheets. The framework provides a structured approach for organisations to evaluate their dependencies on natural systems, impacts on ecosystems, resulting financial risks, and potential opportunities. The cornerstone of TNFD implementation is its LEAP approach:[72] [73]

- **Locate** exposure to nature-related dependencies and impacts
- **Evaluate** material risks and opportunities
- **Assess** responses and prepare to act
- **Prepare** to disclose and report

This methodology enables companies to systematically map their interactions with nature across operations and supply chains. By 2024, over 150 companies, including major corporations in the financial services, consumer goods, and resource extraction sectors, were actively piloting the TNFD framework.

The TNFD disclosure recommendations are structured around four integrated pillars that mirror the established TCFD climate framework:

1. **Governance** - How the organisation oversees nature-related risks and opportunities
2. **Strategy** - Actual and potential impacts on business, strategy, and financial planning
3. **Risk & Impact Assessment** - Processes used to identify, assess, and manage risks
4. **Metrics & Targets** - Measurement approaches and performance targets

[70] Earth Blox. n.d.
[71] NatureMetrics. n.d.
[72] Stanford Social Innovation Review. n.d.
[73] Aligned Incentives. n.d.

Figure 1: TNFD's recommended disclosures

Figure: The TNFD framework showing disclosure pillars and their relationship to the assessment of impacts, dependencies, risks, and opportunities. Source: TNFD (2023).

TNFD complements other nature-focused initiatives, particularly the Science Based Targets for Nature (SBTN). While TNFD provides the disclosure framework, SBTN offers the methodological guidance for setting specific, measurable targets.[74] For example, agribusinesses using SBTN guidelines can establish targets for soil health improvement and pollination services enhancement, then use TNFD to disclose their progress and associated financial implications.[75] [76]

Despite promising momentum, implementation challenges persist. A 2024 analysis of early adopters revealed that 60% of TNFD-participating firms lack time-bound targets for nature-positive outcomes, and 45% incorrectly equate carbon offsetting with substantive biodiversity restoration.[77] [78] The voluntary nature of the framework also permits inconsistent

[74] Aligned Incentives. n.d.
[75] IUCN. n.d.
[76] UNCCD (United Nations Convention to Combat Desertification). n.d.
[77] Aligned Incentives. n.d.
[78] Stanford Social Innovation Review. n.d.

application—companies like palm oil producer Wilmar have made public sustainability commitments while satellite data continues to link their supply chains to deforestation.[79] [80]

As TNFD moves from early adoption to mainstream implementation, the focus is shifting toward standardisation and verification. Forward-thinking companies recognise that robust nature-related disclosures not only mitigate risks. Still, they can also unlock competitive advantages through enhanced stakeholder trust, supply chain resilience, and access to growing markets for nature-positive products and services.

GRI 101: Biodiversity 2024

While TNFD provides a framework for nature-related financial disclosures, the Global Reporting Initiative (GRI) offers the world's most widely adopted sustainability reporting standards across environmental, social, and governance topics. For companies already using GRI standards for sustainability reporting, the recent update to biodiversity-specific guidance represents a significant advancement.

GRI 101: Biodiversity 2024 substantially updates and expands the previous GRI 304: Biodiversity 2016 standard to align with the Kunming-Montreal Global Biodiversity Framework. This revision reflects the growing recognition that biodiversity loss requires the same level of corporate attention as climate change. The new standard helps organisations identify which business decisions and practices contribute to biodiversity loss and provides structured guidance for disclosure. Key improvements in GRI 101 include:

- Expanded scope beyond protected areas to consider impacts across all ecosystems
- Requirements to report on direct, indirect, and cumulative biodiversity impacts
- Guidance on assessing dependencies on ecosystem services
- Explicit connection to the mitigation hierarchy (avoid, minimise, restore, offset)
- Disclosure requirements for biodiversity-related targets and performance

Recognising the potential reporting burden of multiple frameworks, GRI and TNFD published a joint interoperability mapping in July 2024. This collaborative effort helps companies understand the correspondence between GRI Standards and TNFD Disclosure Recommendations, enabling more efficient reporting processes. Companies can leverage existing GRI disclosures to fulfil many TNFD requirements, reducing duplication while ensuring comprehensive reporting.

For businesses, GRI 101 provides a practical pathway to incorporate biodiversity considerations into existing sustainability reporting processes. Organisations already familiar with GRI's approach can extend their reporting to address biodiversity more systematically. In contrast, companies new to biodiversity disclosure can utilise GRI's established methodology and wide acceptance among stakeholders.

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[79] IUCN. n.d.
[80] UNCCD (United Nations Convention to Combat Desertification). n.d.

As regulators increasingly move toward mandatory sustainability reporting, aligning voluntary frameworks like GRI and emerging compliance requirements positions companies to adapt more efficiently to the evolving disclosure landscape.

CSRD (Corporate Sustainable Reporting Directive)

While frameworks like TNFD and GRI represent voluntary standards, the EU's CSRD marks a decisive shift toward mandatory biodiversity disclosure. This regulatory approach recognises that voluntary reporting alone has not catalysed sufficient action to address biodiversity loss at scale.

The CSRD requires in-scope companies to report on the impact of their activities on the environment and society with independently assured information. At its core lies the European Sustainability Reporting Standards (ESRS), which include three topical pillars: Environment (E), Social (S), and Governance (G).

For biodiversity specifically, ESRS E4 (Biodiversity and Ecosystems) represents one of the most comprehensive regulatory standards globally. It requires companies to disclose:

- Policies, targets, and action plans related to biodiversity
- Material impacts on terrestrial and aquatic ecosystems (freshwater and marine)
- Effects on species (fauna and flora) and genetic diversity
- Dependencies on ecosystem services that could create business risks or opportunities
- Transition plans toward biodiversity-positive business models

A distinguishing feature of the CSRD is its "double materiality" principle. Unlike frameworks focused primarily on financial materiality (how environmental factors affect a company), double materiality also considers impact materiality (how a company affects the environment). This broader scope reflects the recognition that companies must be accountable not only for biodiversity risks to their business but also for their contribution to systemic ecological decline.

To reduce the reporting burden on companies already implementing TNFD, TNFD and EFRAG jointly published a mapping between the European Sustainability Reporting Standards (ESRS) and TNFD's recommended disclosures and metrics. This mapping illustrates the high commonality achieved between the frameworks—all fourteen TNFD-recommended disclosures are reflected in the ESRS. Key areas of alignment include:

- **Concepts and definitions**: Both frameworks recommend disclosing nature-related impacts, risks, and opportunities, including dependencies on nature that generate material risks.
- **Approach to materiality**: While ESRS requires disclosures based on double materiality, TNFD's flexible approach accommodates this principle, allowing companies to use consistent approaches across frameworks.

- **Assessment methodology**: The ESRS explicitly recognises that companies may use TNFD's LEAP approach (Locate, Evaluate, Assess, Prepare) to conduct materiality assessments on sustainability matters, including biodiversity and ecosystems.[81]
- **Reporting structure**: Both frameworks organise their disclosures around the four pillars established by the Task Force on Climate-related Financial Disclosures (TCFD): Governance, Strategy, Risk Management, and Metrics and Targets.

This harmonisation enables companies to efficiently address multiple framework requirements simultaneously, significantly reducing duplication of effort while ensuring comprehensive biodiversity reporting.

The impact of CSRD extends well beyond EU borders. Non-European companies with significant EU operations or subsidiaries may fall under its scope, creating a ripple effect of enhanced biodiversity reporting globally. This extraterritorial effect is accelerating the development of biodiversity disclosure capabilities even in regions without similar regulations. Companies that develop robust biodiversity assessment systems will now be better positioned as similar regulations emerge in other jurisdictions, transforming a compliance challenge into a potential source of competitive advantage.

Omnibus: simplifying EU reporting requirements

Recognizing implementation challenges, the European Commission proposed significant simplifications to the CSRD framework in February 2025. These changes aim to balance robust sustainability reporting with pragmatic business considerations.

The revised approach focuses on reporting obligations to the largest companies with the greatest environmental impact, removing approximately 80% of previously in-scope companies from mandatory requirements. This targeted approach means that about 10,000 large companies will still report under CSRD rather than the original 50,000, concentrating efforts where impacts are most significant.

For biodiversity reporting, key simplifications include:

- Postponing reporting requirements until 2028, providing companies more time to develop data collection systems
- Reducing reporting templates by approximately 70%, streamlining disclosure requirements
- Introducing a financial materiality threshold to focus on the most significant impacts
- Creating an option for reporting "partially aligned" activities, fostering incremental progress
- Simplifying complex "Do No Significant Harm" criteria related to chemicals and pollution

[81] LEAP = Locate, Evaluate, Assess. TNFD (Taskforce on Nature-related Financial Disclosures). 2022.

These adjustments reflect a maturing understanding that effective biodiversity reporting requires balancing comprehensive disclosure with practical implementation. Companies beginning their biodiversity assessment journeys can now use this extended timeline to develop more robust internal systems while focusing first on their most material impacts.

These simplifications will likely increase adoption rates while maintaining the directive's core purpose. By creating a more accessible on-ramp for companies at different stages of biodiversity readiness, the Commission aims to accelerate the integration of nature considerations into business decision-making. Forward-thinking companies use this recalibration not as an excuse to delay action but as an opportunity to build more sustainable business models that align ecological and economic performance.

International Sustainability Standards Board (ISSB)

While the EU advances its regulatory approach, the International Sustainability Standards Board (ISSB) is developing standards in the public interest that will result in a high-quality, comprehensive global baseline of sustainability disclosures focused on the needs of investors and financial markets.

As part of its 2024-2026 work plan, the ISSB will explore information on sustainability-related risks and opportunities associated with biodiversity, ecosystems, and ecosystem services (BEES), which are intrinsically linked. Efforts to preserve, conserve and restore BEES can help manage risks or give rise to opportunities for companies. These risks and opportunities can affect a company's prospects as described in IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information.

In recent years, authorities have tried to define 'green' or environmentally sustainable finance by introducing taxonomies defining what should be considered 'green' or sustainable economic actions or assets. The EU taxonomy is the best-known, most detailed, and comprehensive. Countries like China, Indonesia, South Africa, and Colombia have similar but different green taxonomies. A Global Biodiversity Expenditure Taxonomy is being developed by the United Nations Development Programme (UNDP) to classify conservation-related financial flows.[82]

As ISSB finalises its BEES standards by 2026, the convergence of financial and ecological reporting will likely catalyse greater capital flows toward nature-positive business models, potentially transforming what has been perceived as a regulatory burden into a strategic business opportunity.

ISO/TC 331 Biodiversity: standardising biodiversity metrics

ISO/TC 331's 18-workstream program addresses measurement and verification gaps:

[82] BIOFIN (Biodiversity Finance Initiative). n.d.

- Biodiversity net gain (ISO 17620) requires a 10% net improvement in habitat distinctiveness, monitored via remote sensing and DNA metabarcoding.
- Food sector guidelines (ISO/TS 18244): Life cycle assessment (LCA) methods quantify agri-biodiversity impacts.
- Financial taxonomy (ISO 21720) classifies biodiversity-positive investments, enabling HSBC to launch a USD 1.5 billion Nature Performance Bond linked to wetland restoration metrics.[83]

TC 331 Biodiversity works closely with related committees (e.g., ISO/TC 190 Soil Quality, ISO/TC 147 Water Quality, ISO/TC 276 Biotechnology, and ISO/TC 34 Food Products) to identify standardisation needs and gaps and collaborate with other organisations to avoid duplications and overlapping standardisation activities.

The standardisation of biodiversity metrics through ISO enables significant market growth in biodiversity-linked financial products. With reliable measurement protocols, biodiversity markets are projected to reach USD 30 billion by 2030—a tenfold increase from 2023.

By aligning TNFD's risk assessment approach, GRI's comprehensive disclosure metrics, CSRD's regulatory requirements, and ISO's technical standards, companies can unlock economic potential in nature-positive business models that could generate up to USD 4.5 trillion in annual value by 2030 across sectors like sustainable forestry, regenerative agriculture, and nature-based solutions.

[83] Global Reporting Initiative (GRI). 2024.

7 The Role of the Financial Sector: What Is It Up To?

While asset owners ultimately make investment decisions, the financial sector plays a critical role in making these decisions viable. Financial institutions, including banks, development finance institutions, and asset managers, are not merely intermediaries—they actively structure and de-risk biodiversity investments, enabling the flow of capital to biodiversity projects.

By developing and offering financial products such as biodiversity bonds, blended finance models, and nature-based funds, the financial sector creates the mechanisms that link biodiversity projects with mainstream investment strategies. Financial institutions help manage the risks by offering innovative financial instruments that provide measurable outcomes, such as performance-based payments, making these projects more attractive to investors. Therefore, the financial sector does more than facilitate transactions; it shapes the market, builds confidence, and establishes the necessary infrastructure for biodiversity investments to thrive.

Pricing nature: challenges and approaches

The global economy relies on ecosystem services, with estimates suggesting they contribute over $125 trillion annually.[84] Despite their immense value, biodiversity remains largely unpriced. While strides have been made with carbon pricing and credit markets, biodiversity's contribution is often treated as an externality. This creates a significant gap - biodiversity loss has profound economic consequences, yet its costs are rarely incorporated into financial decision-making.

As the financial industry seeks more sustainable investment opportunities, addressing biodiversity loss presents challenges and significant opportunities. If ecosystem services are priced correctly, we can unlock the potential to preserve and restore critical biodiversity while generating economic value. Properly pricing ecosystem services can lead to positive economic growth, transforming ecosystem conservation into a viable financial strategy that benefits both long-term financial returns and the environment.

Biodiversity valuation frameworks and methods

Natural capital accounting provides a foundational framework to assign monetary value to ecosystems and their services. Businesses and governments can make informed decisions about land use, policy, and investments that reflect biodiversity's long-term value by quantifying these contributions. The UN's System of Environmental-Economic Accounting (SEEA)[85] and the Natural Capital Protocol[86] offer structured approaches that support the integration of biodiversity into financial models and corporate disclosures.

[84] UK Government. 2021. *The Economics of Biodiversity: The Dasgupta Review.*
[85] SEEA (System of Environmental-Economic Accounting). n.d.
[86] Capitals Coalition. n.d.

Several economic valuation techniques help quantify biodiversity's financial impact:

- **Cost-Benefit Analysis (CBA)** - Compares the economic benefits of preserving biodiversity with degradation costs. For instance, preserving forests or wetlands can avoid significant costs in disaster mitigation, carbon emissions, and public health. By incorporating these avoided costs into financial projections, businesses can adjust calculations to account for ecosystem services' long-term value.[87]
- **Replacement Cost Method** - Estimates the cost of replacing biodiversity services with human-made alternatives. This replacement cost can be added to a company's capital expenditure model, influencing project ROI and long-term asset depreciation rates. Companies might underestimate biodiversity loss risks without considering these costs, impacting long-term financial performance.
- **Market-based Approaches** - Use observed market behaviour to assign monetary value. Travel cost methods leverage tourism revenue from natural sites as a proxy for ecosystem value. Hedonic pricing calculates how proximity to natural amenities affects property values. Both methods influence property valuations and revenue projections when assessing investments near protected natural areas.[88]

A tangible application of these approaches is Stanford's InVEST software,[89] which enables companies to quantify environmental benefits and integrate them into financial decision-making. When considering land use changes, InVEST can model the economic consequences of ecosystem service loss versus the benefits of maintaining those services, directly influencing financial valuation and ROI calculations.

The real-world impact of these valuation methods is exemplified by mangrove ecosystems, which reduce wave energy by up to 66%, preventing an estimated $65 billion in flood damage annually while protecting 15 million people.[90] Without these ecosystems, governments must invest in costly artificial flood defences, significantly altering financial projections for at-risk areas. These avoided costs directly influence public-sector investments and private companies' ROI in disaster mitigation.

Biodiversity Measurement and Integration into Financial Models

Beyond traditional economic valuations, ecological indicators like species abundance, habitat quality, and ecosystem integrity are crucial proxies for biodiversity's financial value. These biological measurements provide insights into natural asset health that can be translated into financial terms. Financial institutions increasingly adopt specialised tools to incorporate these metrics into their decision-making processes.

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[87] TEEB (The Economics of Ecosystems and Biodiversity). n.d.
[88] Ecosystem Valuation. n.d.
[89] Natural Capital Project. n.d.
[90] Nature. 2020.

Morgan Stanley's Biodiversity IQ[91], NatureFinance's Portfolio Nature Assessor[92], and the World Wildlife Fund's biodiversity risk assessment guide[93] help firms integrate ecological data directly into financial modelling. These platforms provide asset managers with real-time ecosystem health information that affects investment decisions, risk assessments, and long-term portfolio construction.

The integration of biodiversity data into financial models relies heavily on technological advancements. Satellite imagery provides landscape-level monitoring, AI-driven systems detect ecosystem changes, and blockchain solutions enhance transparency in biodiversity impact verification. These technologies enable more accurate modelling of the financial implications of ecosystem degradation and conservation.

An innovative application of this integration is the development of biodiversity-adjusted sovereign credit ratings. By incorporating environmental data into sovereign debt assessments, investors can better evaluate country-level risks, adjust investment strategies accordingly, and potentially avoid future losses from ecological degradation. This approach recognises that a country's economic stability is fundamentally linked to the health of its natural capital.

Financial mechanisms for biodiversity conservation

The financial sector has developed several mechanisms to channel capital toward biodiversity protection while delivering returns:

- **Biodiversity credit markets** - Like carbon markets, biodiversity credits allow businesses to offset their environmental impacts by investing in conservation. The standardisation and scaling of these markets will be crucial in enabling investors to assess biodiversity's long-term financial value more accurately.[94]
- **Debt-for-nature swaps** - These innovative arrangements allow governments to restructure sovereign debt in exchange for commitments to conserve biodiversity. The Seychelles' pioneering swap redirected sovereign debt repayments toward marine conservation, demonstrating how financial restructuring can deliver both economic stability and ecological benefits.[95]
- **Payments for ecosystem services (PES)** - Programs like Costa Rica's PES compensate landowners for maintaining biodiversity through sustainable land-use practices. These payments incentivise biodiversity conservation investments while improving the ROI of land-based projects by avoiding ecosystem degradation costs.[96]
- **Biodiversity bonds** - These financial instruments are tied to measurable improvements in biodiversity outcomes, rewarding investors based on conservation success. Goldman

[91] Morgan Stanley. 2025.
[92] ESG Today. 2024.
[93] Climate & Company. 2023.
[94] Nature Finance. n.d.
[95] Climate Policy Initiative. n.d.
[96] UNFCCC (United Nations Framework Convention on Climate Change). n.d.

Sachs' SDG-focused Biodiversity Bond Fund, launched in March 2025, exemplifies the growing market demand for investment opportunities that combine environmental and financial returns.[97]

Supportive policy frameworks enhance the effectiveness of these mechanisms. Government policies that integrate biodiversity metrics into national accounting frameworks guide economic planning and ensure environmental considerations in financial strategies. Evolving corporate disclosure requirements now include biodiversity impact assessments, compelling businesses to quantify and report their environmental footprints.

Public-private partnerships are crucial catalysts in biodiversity finance, bringing together financial institutions, governments, and conservation organisations to design and scale market-based solutions that drive sustainable investment and biodiversity protection. These collaborative approaches help bridge funding gaps and align incentives across different stakeholders in the biodiversity value chain.

Challenges and future directions in biodiversity finance

While biodiversity finance offers promising pathways for conservation, it presents important ethical and practical challenges that must be addressed. The movement toward the financial valuation of nature exists in a delicate balance between enabling investment and risking inappropriate commodification. There is a fine line between using financial markets for conservation and reducing nature to a tradable asset that enables further exploitation. Economic valuation frameworks must be carefully designed to balance resource use with regeneration, ensuring that biodiversity pricing aligns with ecological sustainability and community well-being.[98]

Equity considerations are equally crucial. Biodiversity loss disproportionately impacts developing nations, yet these countries often lack the financial resources to participate in conservation markets. While the economic benefits of mangrove protection are highest in countries like the US, China, and India, human protection benefits are most critical in vulnerable nations like Vietnam, Bangladesh, and the Philippines. Creating inclusive financing structures that address these disparities is essential for equitable biodiversity conservation that benefits those most dependent on nature's services.[99]

Looking ahead, several developments will be necessary to scale biodiversity finance effectively:

- **Standardised Valuation Frameworks** - Global standards for biodiversity valuation must be developed and widely adopted to create comparable metrics across regions and ecosystems.

[97] ESG Today. 2025.
[98] ScienceDirect. 2015.
[99] TWN (Third World Network). 2024.

- **Technology Integration** - Expanded use of AI, remote sensing, and blockchain will improve valuation accuracy and enhance verification mechanisms, building trust in biodiversity markets.
- **Mainstreaming Biodiversity Finance** - Biodiversity credit markets need integration into conventional financial systems, offering investors viable ways to fund conservation while achieving appropriate returns.
- **Policy Alignment** - Regulatory frameworks must evolve to recognise nature's value, remove harmful subsidies, and create positive incentives for biodiversity protection.

As with carbon pricing, establishing a structured approach to biodiversity valuation can shift global finance toward a more sustainable future. By refining valuation methods, developing robust financial mechanisms, and creating supportive regulatory environments, we can transform biodiversity from an overlooked externality into an integral part of economic and financial decision-making. This transition will require concerted collaboration among financial institutions, governments, civil society, and communities to ensure biodiversity finance delivers both ecological integrity and equitable benefits.

Making Biodiversity Bankable: From Valuation to Investment

Translating biodiversity's value into investable opportunities represents a critical challenge for scaling nature finance. While pricing biodiversity is an essential first step, the greater hurdle lies in developing "bankable" projects capable of attracting capital by offering acceptable risk-return profiles to investors with varying appetites.

Bankability fundamentally refers to a project's ability to secure investment based on its financial characteristics. The biodiversity finance landscape spans diverse investor profiles: institutional investors seek stable, long-term returns, venture capital pursues high-growth potential, while development finance institutions play a crucial role in de-risking projects that commercial banks might otherwise avoid. For biodiversity projects to attract mainstream capital, they must address the fundamental requirements of these financial stakeholders.

The balance between equity upside and credit downside represents a key consideration in structuring biodiversity investments. Equity investors focus on potential financial gains from biodiversity-positive ventures, while lenders primarily concern themselves with repayment risks and credit protection. This dynamic creates different sets of expectations that biodiversity projects must simultaneously satisfy.

Biodiversity as a financial asset

Framed effectively, biodiversity offers distinct financial value propositions:

- **Risk Mitigation** - Protecting ecosystems enhances resilience against climate-related physical risks, resource scarcity, and supply chain disruptions. Companies with strong

biodiversity practices demonstrate greater operational stability during environmental shocks.

- **Direct Financial Returns**—Nature-based solutions such as ecotourism, regenerative agriculture, and sustainable forestry have demonstrated positive financial outcomes alongside their ecological benefits. As measurement improves, the correlation between biodiversity protection and financial performance becomes increasingly evident.
- **Integration with Established Markets** - Biodiversity finance progressively connects to mainstream capital markets through instruments like biodiversity bonds, offset mechanisms, and specialised investment funds. The World Bank's Rhino Bond exemplifies this integration, using performance-based payments to link conservation outcomes directly to financial returns.

Barriers to Bankability and Solutions

Despite growing recognition of biodiversity's value, several significant challenges limit the flow of capital into nature-positive investments:

- **Measurement and Data Limitations** - The complexity of quantifying biodiversity benefits and standardising impact metrics creates uncertainty for investors. Without reliable, comparable data, assessing risk-return profiles becomes problematic. Emerging technologies and standardised frameworks like TNFD are beginning to address this fundamental barrier.
- **Regulatory Uncertainty** - The evolving policy landscape introduces complexity and potential instability for investors. However, initiatives like the Global Biodiversity Framework clarify future regulatory directions, gradually enhancing investor confidence.
- **Market Liquidity and Scale Constraints** - Biodiversity finance remains relatively niche, with limited transaction volumes and benchmark data. For mainstream capital to flow at scale, the market requires more precise signals, proven returns, and financial products that can operate at an institutional scale while offering appropriate liquidity.

Overcoming these barriers requires coordinated innovation across the financial ecosystem. Financial product development (biodiversity credits, blended finance models, conservation bonds), policy interventions (tax incentives, subsidies, green lending requirements), and public-private partnerships are essential in building the infrastructure necessary for biodiversity bankability.

The path forward demands a fundamental shift—moving biodiversity finance from specialised impact investing into mainstream capital allocation. This transition requires developing scalable financial mechanisms that align ecological integrity with risk-return expectations. By addressing measurement challenges, regulatory uncertainties, and market limitations, stakeholders can build investment-ready opportunities that attract capital while ensuring long-term environmental sustainability.

8 Investment Frontier—show me the money!

As biodiversity loss accelerates, capital markets are responding with a diverse array of investment vehicles. Investors increasingly seek opportunities that generate financial returns and contribute to nature conservation and restoration. This chapter maps the current investment landscape, analyses market trends, and evaluates the performance of biodiversity-focused financial products.

This chapter examines each investment category, evaluating current market offerings, financial performance, and genuine ecological impact. We analyse recent trends, explore market gaps, and identify emerging opportunities for investors seeking financial returns and meaningful biodiversity outcomes.

The biodiversity finance ecosystem encompasses multiple investment approaches, each with distinct characteristics and ecological impact potential:

Type of fund	Key characteristics	Nature & biodiversity relevance
Public Market ETFs & Mutual Funds	Liquid, accessible to retail investors; invest in public equities.	Often indirect impact; screens companies for biodiversity commitments.
Thematic Public Equity Funds	Sector-specific focus (e.g., sustainable agriculture, water).	Targeted exposure to nature-positive sectors.
Private Equity/VC	Illiquid, higher risk-return; early-stage investments.	Direct funding for nature tech and conservation projects.
Private Debt Funds	Fixed income returns; project-based lending.	Finances restoration with structured impact measurement.
Blended Finance	Combines public/philanthropic with private capital.	Targets high-impact projects with challenging returns.
Biodiversity Credits	Market instruments quantifying biodiversity improvements.	Creates market incentives for ecosystem protection.
Sovereign Biodiversity Bonds	Government-issued debt tied to biodiversity outcomes.	National-scale conservation; debt-for-nature mechanisms.

ETFs and mutual funds

Biodiversity-focused ETFs and mutual funds are liquid, publicly traded investment vehicles that allow investors to gain exposure to companies addressing biodiversity challenges. These funds remain a nascent segment of sustainable finance, representing a small fraction of ESG assets.

These funds typically invest in public equities of companies expected to benefit from or contribute to biodiversity preservation and restoration. Most employ screening methodologies to identify companies with biodiversity commitments or those providing solutions to biodiversity challenges.

The biodiversity public fund market has grown to include 149 thematically-aligned funds representing $60bn in assets. Of these, only fifteen are pure-play biodiversity-labeled funds, totaling just over $1bn AUM, indicating significant room for growth as biodiversity awareness increases.[100]

Many funds struggle to achieve sufficient scale, with several high-profile closures highlighting the difficulty in attracting investor capital. Defining truly biodiversity-positive investments remains challenging, with many funds including companies whose impact on biodiversity is indirect or limited. Similarly, Fidelity's Sustainable Biodiversity Fund closed due to insufficient AUM and lack of growth potential, further highlighting the difficulty in scaling biodiversity investments.[101]

Fund name	AUM (EUR m)	Investment focus	Status
UBAM Biodiversity Restoration[102]	421	Direct biodiversity restoration projects	Active (Article 8)
AXA IM ACT Biodiversity Equity ETF[103]	60	Companies with ecosystem preservation impact	Active (Article 8)
Robeco Biodiversity Equities[104]	7	Transition to a nature-positive economy	Active (Article 9)
Federated Hermes Biodiversity Equity[105]	8	Biodiversity conservation-aligned companies	Active (Article 8)
HSBC World ESG Biodiversity ETF[106]	5	ESG screening with biodiversity tilt	Liquidated 2024
Fidelity Sustainable Biodiversity Fund	N/A	Sustainable businesses with a biodiversity focus	Closed 2025

[100] ETF Stream. 2024.
[101] Fidelity. 2025.
[102] UBP (Union Bancaire Privée). n.d.
[103] AXA IM
[104] Robeco. n.d.
[105] Hermes Investment. n.d.
[106] HSBC Asset Management. n.d.

Private equity funds

Private equity funds focused on biodiversity are gaining traction as investors seek impactful solutions and long-term sustainability. These investments typically involve direct ownership stakes in non-public companies, allowing for more strategic influence over biodiversity-related business models.

These funds typically focus on companies directly working in biodiversity-related sectors such as agriculture, water management, and land restoration. The emphasis on direct impact differentiates them from many public market funds that may primarily use screening approaches.

While still emerging as an investment category, biodiversity-focused private equity represents a growing opportunity for investors seeking deeper engagement with nature-positive businesses. Several pioneering funds have launched in recent years, targeting specific ecological outcomes alongside financial returns.

The performance of private equity funds in the biodiversity space remains to be fully evaluated, as most are relatively new and have yet to complete their investment cycles or exit portfolio companies.

Fund name	AUM (EUR m)	Investment focus	Status
Eurazeo Planetary Boundaries Fund[107]	750 target	Small and mid-sized companies contributing to biodiversity solutions	Announced March 2025
Mirova Sustainable Land Use Fund[108]	350	Forest decarbonisation and land restoration projects	Raised 2023
Mirova Sustainable Land Use Fund[109]	500	Land restoration and biodiversity protection	Fundraising

Private debt funds

Private debt funds targeting biodiversity aim to leverage fixed-income investments to support biodiversity-focused projects. These funds typically invest in bonds or other debt instruments issued by companies and projects with positive biodiversity impacts. The private debt market for biodiversity is emerging as a clear trend in the finance sector, with major institutions now prioritising biodiversity in their investment strategies.

[107] Eurazeo. 2025.
[108] Mirova. 2023.
[109] Mirova. n.d.

These funds provide capital to companies and projects directly involved in biodiversity conservation and restoration through debt financing. Focusing on fixed-income instruments offers investors exposure to biodiversity outcomes with potentially more stable return profiles than equity investments in the same space.

The biodiversity private debt market has seen notable recent activity, with several prominent financial institutions launching dedicated offerings in 2025. This development indicates growing institutional recognition of biodiversity as an investment consideration, even in more traditionally conservative fixed-income portfolios. As the market evolves, these pioneering funds will likely establish important precedents for impact measurement and financial structuring.

While still in the early stages, these funds face challenges typical of emerging sustainable finance segments, including establishing standardised impact metrics and building sufficient scale. However, establishing players' entrance suggests growing confidence in the viability of biodiversity-focused debt instruments as both financially sound and environmentally impactful investment vehicles.

Fund name	AUM (EUR m)	Investment focus	Status
Goldman Sachs Biodiversity Bond Fund[110]	500 target	Corporate green, social, and sustainability bonds focusing on biodiversity conservation and remediation projects	Announced March 2025
Sienna Biodiversity Private Credit Fund[111]	200	Private debt supporting biodiversity restoration and conservation projects	Active (Article 9), launched January 2025

Biodiversity funds: investment reality and performance

The challenge of authentic biodiversity investment

One of the biggest challenges in biodiversity investing is distinguishing between funds with genuine impact and those merely adopting the label. Many self-described "biodiversity funds" fail to prioritise companies whose core business revolves around ecosystem restoration or protection. This parallels a well-established pattern in sustainable finance where funds claim environmental focus but primarily invest in large corporations with general sustainability commitments rather than businesses directly addressing ecological challenges.

This "biodiversity-washing" occurs when funds market themselves as biodiversity-focused while investing in companies that have made general ESG commitments without biodiversity as a central business priority. For instance, HSBC's recently liquidated Biodiversity ETF and

[110] ESG Today. 2025.
[111] Sienna IM. 2025.

Robeco's Biodiversity Equities Fund claimed biodiversity focus, yet their portfolios contained many holdings in sectors like information technology and consumer goods. While these companies may have sound general sustainability practices, they rarely deliver direct, measurable biodiversity outcomes.

By contrast, funds like UBAM's Biodiversity Restoration Fund represent a more authentic approach. Rather than simply investing in companies with general ESG credentials, UBAM prioritises businesses directly contributing to ecosystem restoration and biodiversity conservation, including sustainable land use and forestry projects. This distinction between indirect ESG screening and direct biodiversity impact becomes crucial for investors seeking genuine exposure to nature-positive outcomes.

Financial performance of biodiversity investments

The financial performance of biodiversity funds presents a mixed picture as the market matures. Recent analyses indicate that many biodiversity-labeled funds have delivered lower risk-adjusted returns than their thematic peers. This underperformance stems partly from significant allocations in cyclical sectors like information technology, which experienced pronounced sell-offs in 2022.[112]

However, these performance challenges should be viewed in context. Many biodiversity funds have existed for less than two years, with long-term ecological outcomes prioritised over immediate returns. As we noted in our ETFs and mutual funds analysis, several offerings have struggled to achieve sufficient scale, with high-profile closures highlighting the difficulty in attracting and maintaining investor capital.

The performance story differs across investment vehicles. While public market biodiversity funds have shown disappointing results, private equity and debt vehicles focused on biodiversity remain in earlier stages. Private equity funds have yet to exit their investments and realise returns, while the recently emerged private debt funds offer potentially more stable financial products. As highlighted in our examination of these fund types, their long-term success will depend on achieving scale, diversification, and balancing financial returns with meaningful biodiversity impact.

This performance picture reinforces our earlier observations about biodiversity finance's challenges: the difficulty in defining genuinely biodiversity-positive investments, establishing standardised impact metrics, and building sufficient market scale. However, the entrance of established players across multiple fund types suggests growing institutional confidence in the viability of this investment category despite its early struggles.

[112] MSCI. 2023.

Market overview and investment landscape

Growth trends in biodiversity investment

The biodiversity investment space has shown strong growth momentum, particularly in venture capital funding for nature tech startups:

Period[113]	Funding (USD m)	Deals	Growth (vs. previous period)
2022	1,560	162	Baseline
2023	1,850	205	18% funding increase, 27% more deals
H2 2023	581	71	(H2 2023 data)
H1 2024	878	96	51% funding increase, 35% more deals from H2 2023

This consistent growth trajectory demonstrates increasing investor confidence in nature-focused technologies and solutions. Several key factors are driving this investment momentum:

- More investors are recognising the interdependence of biodiversity and climate change, directing funding toward solutions that deliver both climate mitigation and biodiversity restoration
- Regulatory frameworks such as TNFD and the EU Nature Restoration Law are accelerating biodiversity investments
- Voluntary carbon markets and corporate sustainability mandates (including Scope 3 emissions requirements and nature-based solutions in ESG reporting) create market pull
- Startups focusing on Measurement & Verification (MRV) technologies are attracting significant capital, addressing a critical gap in the nature of finance markets.

Investment ecosystem

The biodiversity investment landscape features a diverse set of active investors across the specialisation spectrum:

Investor category	Key players	Growth (vs. previous period)
Nature-Specific VCs	Superorganism, Sand River, The First Thirty, Symbiotic Projects, Naia Trust, Katapult Ocean	Dedicated biodiversity and ecosystem restoration investments
Climate & Nature VCs	2150, Planet A Ventures, Systemiq	Broader sustainability portfolio with

[113] Nature4Climate - Serene Capital

	Capital, Ananda Impact Ventures, AENU, Carbon13, Pollination	significant biodiversity allocation
Generalist VCs with Biodiversity Investments	Beringea, Octopus Ventures, Serena Ventures, Green Angel Syndicate	Selective biodiversity opportunities within traditional portfolios

Thematic investment focus areas

Biodiversity investment is concentrating around six primary themes, each with representative companies attracting capital:

Investor category	Key players	Growth (vs. previous period)
1. Environmental Data & Monitoring	Technologies for measuring and tracking biodiversity and ecosystem health	NatureMetrics, Space Intelligence, Xilva
2. Ecosystem Restoration & Reforestation	Projects and technologies focused on restoring degraded ecosystems	Restor, Rhizocore Technologies, Coral Vita, Highlands Rewilding
3. Nature Finance & Biodiversity Credits	Financial mechanisms and marketplaces for biodiversity value	The Landbanking Group, Single Earth, GoodCarbon, Rainforest Connection
4. Soil Carbon & Regenerative Agriculture	Solutions for sustainable farming and soil health improvement	Agricarbon, Ruumi, Propagate, Boomitra
5. Blue Economy & Ocean Tech	Marine ecosystem conservation and sustainable use	Oceanium, Kelpi, Samudra Oceans, ARC Marine
6. Alternative Proteins & Sustainable Food	Food system innovations reducing ecosystem impacts	Meatable, Upside Foods, Bosque Foods, Planet A Foods

Market faps and future opportunities

Despite growing investment, several promising areas remain underfunded relative to their potential biodiversity impact:

Underfunded area	Current status	Key barriers	Opportunity
Biodiversity Credit Markets	Emerging but fragmented	Lack of standardisation and uncertain long-term returns	Could become a major asset class with improved verification standards

Urban Biodiversity Solutions	Niche investment segment	The complexity of urban planning integration and long development cycles	Growing urban populations increase the need for nature-positive city infrastructure
Agroforestry & Sustainable Land Use	Underinvested compared to potential impact	Higher complexity and longer time horizons than traditional carbon projects	Offers multiple ecosystem services beyond carbon sequestration
Consumer-Facing Biodiversity Tech	Limited B2C solutions	The dominance of B2B focus in the current funding	Potential to engage broader market through consumer applications and marketplaces

Key market drivers

Four interconnected trends are shaping the biodiversity investment landscape:

1. **Regulatory Evolution**: The EU's Nature Restoration Law and TNFD implementation creates compliance-driven demand for biodiversity solutions and disclosure capabilities.
2. **Carbon Market Integration**: As voluntary carbon markets evolve to emphasise co-benefits, biodiversity-positive carbon projects attract premium pricing and increased investment.
3. **Corporate Value Chain Focus**: Global companies embed biodiversity considerations into supply chain resilience strategies, creating market pull for nature-positive agriculture and conservation finance.
4. **Technology Enablement**: Advances in satellite imaging, AI-driven monitoring, and eDNA sequencing enhance impact verification, addressing a critical barrier to investor confidence.

This evolving landscape suggests biodiversity investment will continue its growth trajectory, with increasing integration between climate and nature finance creating a more holistic approach to environmental markets. The underfunded areas likely represent the next frontiers for investment as measurement capabilities improve and market structures mature.

The way forward: positioning biodiversity funds for success

As biodiversity finance evolves from niche to mainstream, fund managers face the critical challenge of attracting and retaining investment capital. The analysis throughout this chapter has revealed both promising opportunities and significant obstacles in the current market landscape. Moving forward, successful biodiversity funds will need to address three interconnected priorities:

1. Demonstrating tangible impact

Investors increasingly demand measurable biodiversity outcomes, not merely sustainability claims. Successful funds will:

- Establish clear connections between investments and specific biodiversity goals
- Select portfolio companies whose core operations directly contribute to ecosystem restoration
- Implement robust, quantifiable biodiversity metrics that track real-world outcomes
- Provide transparent reporting on how capital deployment translates to ecological improvement

The most compelling funds will move beyond vague ESG credentials to showcase concrete ecosystem benefits through land restoration, species protection, or sustainable resource management.

2. Balancing risk and return

While impact is essential, biodiversity funds must also deliver competitive financial performance to attract mainstream capital. This balance requires:

- Developing sophisticated risk management strategies that account for both financial and ecological factors
- Diversifying across sectors and geographies to mitigate concentration risks
- Exploring innovative financial structures that align returns with biodiversity outcomes
- Leveraging emerging stability-focused products like biodiversity bonds and credit instruments

Our performance analysis revealed that funds that can demonstrate this balance will overcome one of the primary barriers to scaling biodiversity investment.

3. Educating the market

The final piece of the puzzle involves building a deeper market understanding of biodiversity's financial relevance:

- Highlighting the materiality of biodiversity to climate resilience and supply chain stability
- Quantifying the economic value of ecosystem services in portfolio valuation
- Connecting biodiversity health to long-term risk mitigation across multiple sectors
- Demonstrating the competitive advantages of nature-positive business models

By effectively communicating these connections, fund managers can expand their investor base beyond impact-focused investors to mainstream capital allocators.

The future of biodiversity finance will belong to funds that successfully integrate these three elements—creating investment vehicles that deliver measurable ecological impact, competitive financial returns, and clearer market education. As regulatory frameworks mature and measurement technologies advance, the path to successful biodiversity investing will continue to evolve. However, these fundamental principles will remain essential to bridging the gap between capital markets and ecosystem health.

9 Key takeaways

(to be developed)