PRI PRINCIPLES FOR RESPONS BLE INVESTMENT

NATURE-RELATED RISKS AND FINANCIAL IMPLICATIONS FOR INVESTORS

Investor briefing

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ABOUT THE PRI

The Principles for Responsible Investment (PRI) works with its international network of signatories to put the six Principles for Responsible Investment into practice. Its goals are to understand the investment implications of sustainability and governance-related issues and to support signatories in integrating these issues into investment and ownership decisions. The PRI acts in the long-term interests of its signatories, of the financial markets and economies in which they operate and ultimately of the environment and society as a whole.

The six Principles for Responsible Investment are a voluntary and aspirational set of investment principles that offer a menu of possible actions for incorporating sustainability and governance-related issues into investment practice. The Principles were developed by investors, for investors. In implementing them, signatories contribute to developing a more sustainable global financial system. For more information, visit www.unpri.org

ABOUT THIS BRIEFING

This investor briefing examines how nature-related risks are materialising into financial risk for investors, giving particular attention to short-term risks. Section one summarises the state of nature loss and the macro-economic implications. Section two explores evidence relating to nature-related physical, transition and system-level risks and their financial implications for issuers and their investors. Section three highlights how institutional investors can mitigate nature-related risks and leverage opportunities.

The briefing is aimed at asset owners, investment managers and policy makers in all regions seeking to understand how responsible investment can account for increasing nature-related risks.

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Executive summary

Long-term value creation relies on the world operating within stable and safe environmental limits. Worsening impacts of climate change and unprecedented rates of biodiversity loss put economic stability and value creation opportunities at risk globally. While the financial risks posed by climate change (many of which are the result of impacts on natural systems) are well documented, evidence of nature-related financial and economic losses is still emerging. However, as evidence accumulates the case for addressing nature-related risks in investment portfolios is growing stronger.

Key insights from this briefing

- **The unprecedented, global loss of nature – interlinked with and compounded by climate change and driven by social issues – is impacting companies, economies and portfolio value due to their dependence on healthy and resilient ecosystems.** Investors, governments and central banks recognise and are starting to respond to the macro- and micro-economic implications of nature-related risks, and the need to deliver on the goals of the Kunming-Montreal Global Biodiversity Framework.

- **There is clear evidence of the effect of nature loss on financial flows, yet gaps remain in data and evidence related to some impacts and sectors.**

- **Physical risks** result from the degradation of ecosystem services that underpin economic activities. For example, floods in Thailand in 2011 led to US$10 billion of insured damages and a 2.5% reduction in global industrial production, particularly impacting Japanese automotive companies.[57]

- **Transition risks** result from regulatory shifts and increased scrutiny by governments, civil society and investors. For example, multi-billion-dollar settlements and multi-year share price drops have resulted from litigation related to chemical use and pollution.

- **System-level risks** result from the breakdown of entire natural or financial systems. For example, at a single ecosystem level, the climate impacts of extensive deforestation in the Amazon have reduced key commodity production (soybean and maize) by over US$1 billion.[89]

- **Integrating nature into investment strategies allows investors to achieve risk-adjusted returns, in accordance with their fiduciary obligations.** Investors that proactively identify exposure to high-risk sectors, prioritise analysis of issuer-level impacts and dependencies on nature, quantify nature-related risks and engage with issuers are better positioned to navigate and mitigate existing and emergent effects on long-term value creation. To support evolving nature-integration practices, it is essential for investors to engage with industry stakeholders and disclose nature-related issues.

- **Public policies enabling investor action on nature improve market certainty and support investment opportunities.** Engaging directly with policy makers has emerged as a key tool for investors in managing the risk of a disorderly transition.

- **Investors are increasingly looking at nature investment opportunities, with an elevenfold increase in private nature finance from 2020 to 2024, to US$102 billion.**[105] Investors can overcome existing barriers (such as perceived high risks, long investment horizons and unclear returns) through diversification of investment instruments – such as labelled debt, thematic equity funds, real assets and blended finance – to meet different investor mandates and strategies.

- **The PRI offers a wide range of opportunities through which signatories can strengthen their ability** to assess and manage nature-related risks and opportunities and engage with critical stakeholders.

1. Nature and its relationship to the financial system

Nature and biodiversity are critical to our economies but are in decline.

The interdependencies between nature and the economy have received increasing attention across the public and private sectors over recent years.[1,2,3] While different economic approaches will portray the relationship between natural systems and the economy differently, systems thinking approaches hold that the economic system sits within and is dependent on natural systems. This is emphasised in the context of planetary boundaries.[4,5]

All life on earth is dependent on the healthy functioning of ecosystems and the services they provide. For example, the provision of potable water, crop pollination and air purification rely on the equilibrium of ecosystems and their biodiversity. Therefore, it can be seen that nature and the services provided by ecosystems are the foundation of our economies. In addition to the economic value derived from ecosystem services, nature and natural areas hold intrinsic and spiritual value recognised by many communities.

Biodiversity loss is occurring at an unprecedented rate globally, with close to a third of assessed plant and animal species under threat of extinction.[6] Global wildlife populations have declined by 73% since 1970, with the fastest declines recorded in Latin America and the Caribbean (95%), and higher declines in freshwater ecosystems (85%) compared to terrestrial (69%) and marine (56%) ecosystems.[7]

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has identified five anthropogenic drivers of nature and biodiversity loss:

1. **land and sea use change;**
2. **exploitation of resources;**
3. **climate change;**
4. **pollution;**
5. **invasive alien species.**[5]

These drivers can all be related back to how economic and financial systems value and incorporate nature into decision-making. For example, global food systems play a significant role in biodiversity loss, with agricultural expansion driving deforestation and ecosystem conversion[5] and fisheries overexploiting at least one third of fish stocks.[8]

Nature loss, climate change and human rights are interconnected issues.

In 2009, Earth system scientists introduced the planetary boundaries framework in response to growing concerns that global environmental governance lacked scientific grounding.[9] The framework identifies scientific thresholds that determine a "safe operating space for humanity" and avoid large scale-systemic disruption. **With seven of the nine planetary boundaries transgressed as of September 2025, our economic system is currently operating outside of safe environmental limits.**[10]

Climate change and nature impact on and are impacted by one another. For example, the impacts of climate change, such as increasing temperatures and extreme weather events, affect species' distribution, reproduction and survival.[5] The dieback of the Amazon rainforest has been identified as a tipping point that

[1] Natural Capital Finance Alliance (2018), Exploring Natural Capital Opportunities, Risks and Exposure: A practical guide for financial institutions

[2] Network of Central Banks and Supervisors for Greening the Financial System (NGFS)-INSPIRE (2021), Biodiversity and financial stability: exploring the case for action

[3] Dasgupta (2021), The Economics of Biodiversity: The Dasgupta Review

[4] Doughnut Economics Action Lab (2025), About Doughnut Economics

[5] IPBES (2019), Global Assessment Report on Biodiversity and Ecosystem Services

[6] International Union for Conservation of (2025), The IUCN Red List of Threatened Species. Version 2025-1

[7] World Wide Fund for Nature (WWF) (2024), Living Planet Report 2024 – A System in Peril

[8] Food and Agriculture Organization (FAO) (2025), Review of the state of world marine fishery resources

[9] J Rockström, W Steffen, K Noone et al. A safe operating space for humanity. *Nature* 461, 472–475

[10] Planetary Boundary Science (2025), Planetary Health Check 2025

could be triggered at 1.5°C of warming.[11,12] Inversely, the loss of natural ecosystems which act as important carbon sinks, such as healthy oceans, primary forests and peatlands, leads to increasing greenhouse gas emissions, with deforestation and peatland burning contributing 13% of global CO_2 emissions.[13] Recent research has shown that the remaining land ecosystems may also have declining capacity to store carbon due to record warming and associated forest fires or plant water stress.[14]

Nature loss and climate change generate compounding impacts that threaten human rights, including health and wellbeing.[15] For example, increased air and water pollution caused around nine million premature deaths in 2019, and extreme weather-, climate- and water-related events in the last 50 years have led to two million deaths and US$4.3 trillion in total costs globally.[15] The Food and Agriculture Organization (FAO) has recognised biodiversity as being indispensable to food security and sustainable development and has highlighted associated threats posed by biodiversity loss, for example 24% of recorded livestock breeds being at risk of extinction[16,17] and soil erosion potentially leading to a 10% loss in crop production by 2050.[18]

The financial materiality of nature loss is recognised by governments, central banks and investors.

In December 2022, 196 Parties at the UN Biodiversity Conference COP15 adopted the Kunming-Montreal Global Biodiversity Framework (GBF), setting out a roadmap to halt and reverse biodiversity loss by 2030. The GBF contains 23 targets to address the drivers of biodiversity loss and ensure a whole-of-society approach, acknowledging the roles of governments, businesses and civil society and the need to integrate biodiversity into decision-making at all levels.[19] In the years ahead, National Biodiversity Strategies and Action Plans (NBSAPs) hold the potential for governments to deliver concrete, costed, national biodiversity plans, which in turn can provide markets with signals on how nature risks will be managed.[20]

Investors have called out nature-related risk and opportunity as being material to their ability to generate long-term financial returns where portfolio companies and their supply chains rely on natural capital. For example, Blackrock Investment Stewardship's approach to engagement highlights nature as an investment issue and fiduciary obligation which should be addressed through the robust management of companies that are most clearly linked to components of natural capital. Blackrock prioritises engagement on land use, water and biodiversity where they are likely to be material to portfolio companies in the future. These issues were chosen because of their interconnectivity, which affects the availability of natural capital on which companies and economies globally depend.[21]

Central banks have begun to assess exposure to nature-related risks within their loan books as well as the macroeconomic environment within which they operate. Sectors across the economy are dependent on nature and its ecosystem services, with over half of the world's gross domestic product (GDP) (US$58 trillion) moderately or highly dependent.[22] Several central banks globally have assessed the material dependencies of sectors and economic activities on nature, including high or very high dependence on at least one ecosystem service, such as soil health or access to clean water. For example 36% of Dutch financial institutions have such a dependency,[23] 42% of French financial institutions,[24] 75% of bank loans in the Euro area,[25] 54% of Malaysian commercial loans[26] and at least 75% of the Zambian

[11] Armstrong McKay *et al* (2022), Exceeding 1.5°C global warming could trigger multiple climate tipping points. *Science* 377, 6611

[12] Intergovernmental Panel on Climate Change (IPCC) (2023), AR6 Synthesis Report - Climate Change 2023

[13] IPCC (2022) Special Report on Climate Change and Land

[14] P Ke *et al* (2024), Low latency carbon budget analysis reveals a large decline of the land carbon sink in 2023. *National Science Review* 11, 12

[15] IPBES (2024), Thematic Assessment Report on the Interlinkages among Biodiversity, Water, Food and Health

[16] FAO (2019), The State of the World's Biodiversity for Food and Agriculture

[17] Reduced variability of breeds increases pressure on remaining breeds to sustain existing revenues despite increased risk exposure due to lower diversity.

[18] FAO (2022), Healthy soils for a healthy people and planet: FAO calls for reversal of soil degradation

[19] For more information on the GBF, see https://www.cbd.int/gbf

[20] While the GBF provides an agreed global pathway to reverse biodiversity loss, the failure of most parties to submit updated, aligned NBSAPs by COP16 in 2024 undermined the framework's implementation and sent a weak signal to investors about the level of commitment by national governments in confronting nature loss. See Carbon Brief (2024), COP16: More than 85% of countries miss UN deadline to submit nature pledges

[21] Blackrock (2025), Our approach to engagement on natural capital

[22] PwC (2023), Managing nature risks: From understanding to action

[23] De Nederlandsche Bank (2020), Indebted to nature

[24] Banque de France (2022), Biodiversity loss and financial stability

[25] European Central Bank (ECB) (2023), The economy and banks need nature to survive

[26] World Bank and Bank Negara Malaysia (2022), An Exploration of Nature-Related Financial Risks in Malaysia

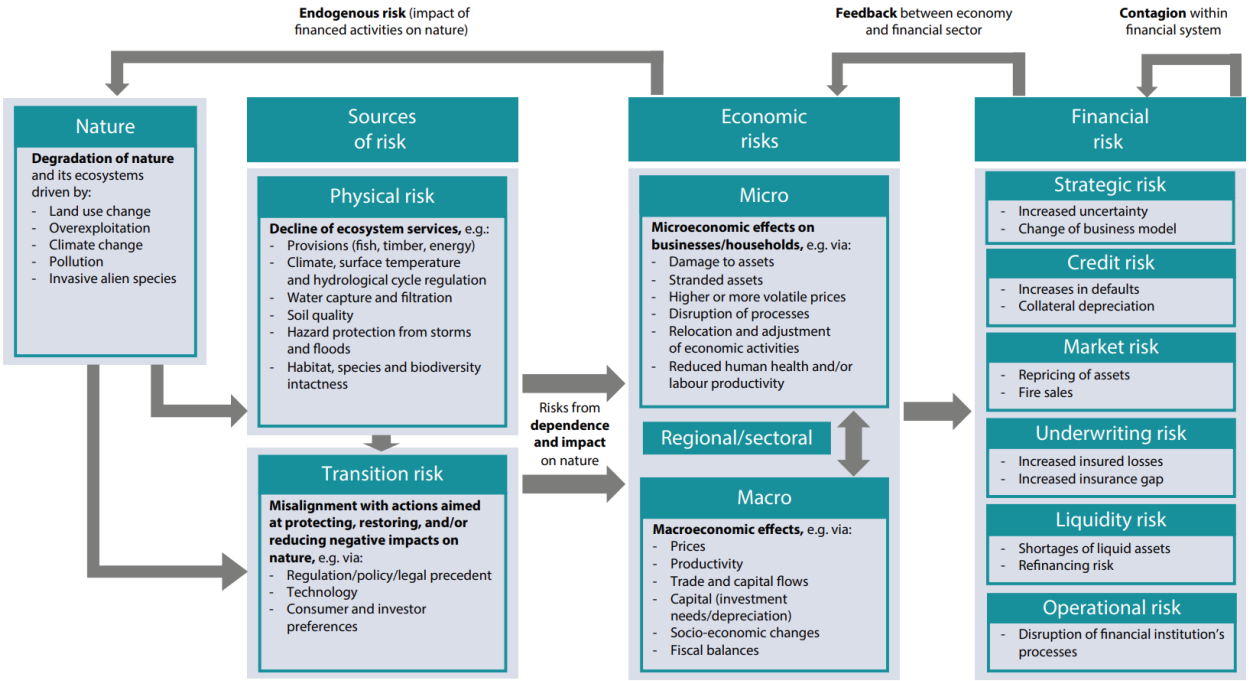
banking sector.[27] In the UK, £3.8 trillion in assets of banks and insurers are estimated to be dependent on supply chains to the value of £5.8 trillion. Of those assets, 56% of the total upstream exposure is highly to very highly dependent on nature.[28]

The Network of Central Banks and Supervisors for Greening the Financial System (NGFS), with over 145 members in 90 countries, has acknowledged that nature-related risks could have "significant macroeconomic implications, and that failure to account for, mitigate, and adapt to these implications is a source of risks relevant for financial stability."[29]

Economies' dependence on healthy ecosystems has macro- and micro-economic consequences, such as damage to assets, reduced productivity, volatile prices and socio-economic changes, which can lead to stranded assets. Financial risks, such as credit, strategic and liquidity risks can arise as the impacts of nature degradation are transmitted across the economic system (Figure 1), with material implications for institutional investors.[30]

Long-term value creation relies on the world operating within stable and safe environmental limits.[9,10] Nature-related risks have already impacted the business operations, supply chains and valuations of many companies across sectors and regions globally; far more companies will be affected if action is further delayed.[31, 32]

Figure 1. Transmission channels across nature and financial risk by NGFS.[31]



Source: Adapted from Svartzman, R. et al. (2021) A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France.

[27] United Nations Development Programme (UNDP) (2025), Study on Nature-Related Financial Risks in Zambia

[28] Green Finance Initiative (GFI) (2024), Assessing the Materiality of Nature-Related Financial Risks for the UK

[29] NGFS (2022), Statement on Nature-related financial risks

[30] CISL (2021), Handbook for nature-related financial risks: key concepts and a framework for identification

[31] NGFS (2024), Nature-related Financial Risks: a Conceptual Framework to guide Action by Central Banks and Supervisors

[32] University of Oxford's Environmental Change Institute as part of the Resilient Planet Finance Lab, the Taskforce on Nature-related Financial Disclosures (TNFD) & Global Canopy (2025) Evidence review on the financial effects of nature-related risks

2. How nature-related risks can impact investors

It is clear that current and future nature-related physical, transition and system-level risks will have financial implications for investors.

As the biodiversity and climate crises deepen, investee companies are facing compounding impacts of multiple nature loss drivers, intensifying and extending the financial effects on supply chains and valuations. One example of this is the loss of pollinators, driven by:

- intensive farming practices (e.g. high pesticide use);
- climate change;
- invasive species.

Three quarters of crops producing fruit and seed for human consumption benefit from animal pollination.[33] The loss of pollinators increases the cost of crop production and sourcing, with US$235–577 billion of annual market value having been estimated to be at risk in 2015.[33]

To put this in a regional context, in the US, 59% of honeybees were lost between 1947 and 2005.[34] With almost all wild colonies now eradicated, crops rely on commercial pollination services, which are costly and are themselves facing increasing pressures. 2024 saw a 62% loss in commercial US bee colonies as a result of a shortage of pollinator forage (food sources) and viruses from pesticide resistant mites. This caused a direct financial loss of US$224.8 million for surveyed beekeepers.[35,36]

Honeybee die-offs have cascading effects on investors that extend beyond the physical risk posed by the loss of pollination as an ecosystem service: higher dependence on commercial pollination drives higher costs to consumers and increases supply chain risk, resulting in contagion across economic and market transmission channels for the three quarters of crop production reliant on those services.

There remain several barriers to and gaps in current understanding of the extent to which nature loss is financially material to investors, though evidence is emerging. A 2025 review looked at over 600 pieces of evidence and found that the majority focused on the economy-wide effects of nature loss. There were comparatively few examples of the impact of nature loss at the company level.[32] The available examples of how companies are affected by nature loss help to crystalise the financial implications of nature risks for financial institutions, but whether they are financially material to investors will depend on two factors; investors' level of exposure to companies facing physical and transition risks and whether investor returns are impacted by those risks.

The lack of corporate valuation of nature[37] and the failure to price nature's value into markets[38] have limited understanding and the ability to track how company-level financial effects transmit to investors, and have made it difficult for investors to assess their exposure to nature-related risks. However, this is a developing area.

Data disclosed by CDP shows that only one in three environmental risks can be financially quantified by large corporates, and only one in ten by small to medium enterprises (SMEs).[32] Theoretical frameworks have been developed to help investors identify risks and opportunities in their portfolios by understanding:[30]

- the type of risk;
- how it manifests;
- its effect on portfolio companies;
- the resulting financial risk.

Physical nature-related risk

Nature loss is leading to chronic and acute physical risks for companies and their investors.[39] As ecosystems degrade, so do the ecosystem services – such as pollination, water provision and flood protection – which underpin economic activities. Below are examples of economic disruption to company operations, assets and value chains, caused by physical risks. This disruption can, in turn, result in credit and market risks.

[33] IPBES (2016), Summary for policymakers of the IPBES assessment report on pollinators, pollination and food production

[34] Dasgupta (2021), The Economics of Biodiversity: The Dasgupta Review

[35] Project *Apis m.* (2025), Colony Loss Information

[36] Lamas *et al* (2025), Viruses and vectors tied to honey bee colony losses. *Preprint*

[37] Mohr & Thissen (2022), Measuring and Disclosing Corporate Valuations of Impacts and Dependencies on Nature. *California Review Management*

[38] BlackRock Investment Institute (2024), Capital at risk: nature through an investment lens

[39] Calice *et al* (2023), Biodiversity and Finance: A Preliminary Assessment of Physical Risks for the Banking Sector in Emerging Markets

WATER SCARCITY

Water scarcity and other water-related risks are already impacting production costs across sectors, including agriculture, technology and manufacturing.

In December 2024, Brazil Arabica coffee production estimates were downgraded for the fifth year in a row (down by 11 million bags for 2025/26) due to intensifying droughts in the region. This downgrading triggered predictions of a future price surge of 80%.[40,41,42]

Taiwan Semiconductor Manufacturing has estimated that water scarcity could impact US$550–625 million in annual revenue due to the manufacturing process' dependence on ultrapure water.[40]

Water-related risks are among the most well-recognised nature-related risks by financial institutions, with references to drought in annual reports and US mandatory financial statements increasing from 682 in 2019 to 1,739 in 2024 across Bloomberg World Large and Mid-Cap companies.[40] In 2022, 69% of listed equities reporting to CDP stated that they faced water-related risks, putting US$225 billion of value at risk.[43]

A hypothetical stress test on credit risk was simulated by the Cambridge Institute for Sustainability Leadership (CISL) and HSBC. The aim was to highlight the potential impact of water curtailment in areas of extreme water stress.[44] Fifty companies in heavy industry across East Asia were tested for shock impacts. All companies showed a 20% increase in risk-weighted assets in the year immediately following a curtailment shock, with a significant proportion being downgraded from "investment" to "speculative" grade.

Water stress could cause impacts of up to US$80 billion across sectors and their value chains, with demand for freshwater expected to surpass supply by 40% in the next five years.[40] Companies in passive indexes are particularly exposed to this risk due to their concentration in select industries such as information technology (IT) and technology which have very high dependence on water and are less sensitive to external factors such as water-scarcity.[45]

INVASIVE SPECIES

The cost of the introduction of invasive alien species, with impacts on human health and native species populations, has quadrupled every decade since 1970, exceeding US$423 billion in 2019.[46] Ninety-two per cent of those costs relate to the undermining of good quality of life for people, with invasive alien species leading to disease, allergies and food and water insecurity. In North America, the agriculture and forestry sectors have been severely impacted by cumulative costs associated with the introduction of invasive species, with estimates of US$527 billion in damages and US$35 billion in management costs across public and private entities between 1960 and 2017.[47]

For example, millions of dollars' worth of state and federal funding have been invested in protecting the agriculture and forestry industries from the invasive spotted lanternfly, but producers are still facing significant impacts on their yields.[48] If the spotted lanternfly were to spread to New York State (for example, through human transportation of infested materials), the result has been forecast to be up to US$1.5 million of production losses in the first year and US$8.8 million in subsequent years.[49] In Africa, the invasive fall armyworm leads to annual crop losses between US$7.7–12.1 billion, with yield in some regions declining by over 50%.[46]

PATHOGENS AND ANTIMICROBIAL RESISTANCE

Increased exposure to pathogens and antimicrobial resistant microorganisms, due to land use change, urban sprawl and overuse of antimicrobial

[40] Bloomberg Intelligence (2025), Water risk 2025 Global Outlook

[41] Bloomberg News (2024), Volcafe Cuts Brazil Arabica Coffee Outlook on Severe Drought

[42] Nasdaq (2024), Coffee Prices Close Higher on Dry Conditions in Brazil

[43] CDP & Planet Tracker (2022), High and Dry – How water issues are stranding assets

[44] CISL & HSBC (2022), Nature-related financial risk: use case. Impact of water curtailment on credit rating of heavy industry companies in East Asia

[45] J.P Morgan Asset Management (2025), Understanding the shifting risks of passive investing

[46] IPBES (2023), Invasive Alien Species Assessment: Summary for Policymakers

[47] Crystal-Ornelas *et al* (2021), Economic costs of biological invasions within North America. *NeoBiota* 67, 485–510

[48] Route Fifty (2018), Spending Millions to Stop the Spread of a Destructive Insect Invader

[49] Pinto *et al* (2025), Assessing the potential economic impacts of spotted lanternfly (Hemiptera: Fulgoridae) infestations on grape production in New York State. *Journal of Integrated Pest Management* 16(1), 2

medicines, can impact human health and the production and trade of animal products.[3,50,51] The degradation of forests and other natural ecosystems to make way for agriculture and urbanisation is bringing wildlife closer to communities, thereby increasing transmission risk for zoonotic diseases such as coronaviruses.[3,46] The spread of infectious diseases among livestock also has significant financial effects. For example, Germany's outbreak of foot-and-mouth disease in 2025 – the first in 40 years – led the United Kingdom, South Korea and Mexico to implement import bans on German meat and dairy products. Financial losses for farmers and suppliers were estimated to exceed €1 billion.[52]

The overuse and misuse of antimicrobial medicines in agriculture, healthcare and animal husbandry is driving increased antimicrobial resistance.[51] In addition to the social impact of antimicrobial resistance, which is responsible for 700,000 deaths annually, it is also estimated that by 2050 up to 11% of livestock loss in low-income countries could be due to antimicrobial resistance.[53, 54]

EXTREME WEATHER EVENTS

The impacts of extreme weather events, including those driven by climate change, are further exacerbated by the degradation of ecosystems which weakens their resilience.

Urban development in river valleys and land degradation restricted water runoff during the October 2024 floods in Spain, which resulted in an estimated €150 million in crop losses and total insurance losses in excess of €3.5 billion.[55] While the majority of the insurance costs were taken on by a dedicated public fund, the economic sustainability of the system has been challenged due to the increasing scale and frequency of seasonal flooding in Spain, with calls to improve public infrastructure and invest in community resilience.[56]

Globally, insurers are increasing premiums and scaling back policies due to heightened exposure to extreme weather events. For example Mercury General and Liberty Mutual raised premiums by 12% and 7.5% respectively following Californian wildfires in 2025.[32] In Thailand, urban development in Bangkok's floodplains, which removed natural waterways and wetlands, contributed to extreme flooding in 2011 as reservoirs overflowed following a 143% rainfall increase during the monsoon season.[57] In addition to affecting 1.8 million households and leading to 813 casualties, the floods resulted in US$10 billion of insured damages and a 2.5% reduction in global industrial production, especially in the automotive sector. Operations at one Honda Motor Company Ltd factory stopped for 174 days due to inundation, and the floods resulted in 150,000 cars being lost to damage or not being built and a 55% loss in operating profit (US$1.4 billion) globally for the company.

Responses to physical nature-related risks

Physical risks from nature loss have financially material effects on companies, investors and wider economies. They are further exacerbated by increasingly severe climate change impacts, pointing to the need for holistic action to mitigate risks.

Responding to nature-related physical risks can also have financial upsides. UK farmers participating in the regenerative agriculture cooperative First Milk, which looks to improve soil resilience, reduced their water consumption by 5.5% and energy use by 6% in 2023, and received a 7% price premium (based on the average income of dairy farms in England).[58] Sales from First Milk also increased by 38% in the same year, reflecting consumer preferences for sustainable farming practices.

Managing invasive species is much less costly (representing only 11% of the costs incurred) than repairing the damage from their spread, for example, wiping out crops or damaging infrastructure, highlighting that it is much more efficient to invest in prevention than damage control.[47]

[50] Keesing *et al* (2010), Impacts of biodiversity on the emergence and transmission of infectious diseases. *Nature* 468, 647-652

[51] MSCI Sustainability Institute, Farm Animal Investment Risk and Return (FAIRR) and Investor Action on AMR (2024), Health & Wealth: An Investor's Guide to Antimicrobial Resistance

[52] Reuters (2025), Farmers group fears billion-euro loss from German foot-and-mouth disease

[53] World Health Organization (WHO), FAO, World Organisation for Animal Health (OIE), UN Environment Programme (UNEP) (2021), Antimicrobial resistance and the United Nations Sustainable Development Cooperation Framework: guidance for United Nations country teams

[54] FAIRR (2020), Antimicrobial Resistance: An Unseen Crisis

[55] Insurance Journal (2024), Spain's Devastating Floods Will Cost Insurers Over $3.8 Billion

[56] Galvez-Hernandez , Dai and Muntaner (2025), The DANA disaster: unravelling the political and economic determinants for Valencia's floods devastation. Int J Equity Health. *International Journal for Equity in Health* 24, 64

[57] Haraguchi & Lall (2015), Flood risks and impacts: A case study of Thailand's floods in 2011 and research questions for supply chain decision making. *International Journal of Disaster Risk Reduction* 14, 256–272

[58] GFI and WWF (2025), Business Investment in Nature: Supporting UK Economic Resilience and Growth

Transition nature-related risk

Governments' and societies' responses to nature loss are leading to transition risks for companies and investors, including as a result of misalignment of economic activity with policy or changes in legal precedent, technology, investor sentiment or consumer preferences. Misalignment between economic activity and policy can lead to regulatory enforcement, legal action, market shifts and reputational damage.

The Inevitable Policy Response (IPR) found that the rate of material and credible national policy announcements for a transition in land- and nature-related policies doubled over the course of 2023,[59] and governments are continuing to update their NBSAPs and develop national targets in light of the GBF, albeit at a slower pace than it mandated.[60] The overall acceleration in policy announcements increases transition risks for investors as they attempt to keep pace with a rapidly evolving regulatory landscape.

A number of policies have been introduced for companies and financial institutions, requiring a heightened level of nature-related investment analysis, due diligence and compliance from investors, such as the EU Deforestation Regulation (EUDR), the UK Biodiversity Net Gain regime and the Brazil Ecological Transformation Plan. A policy transition is therefore playing out, but unevenly across sectors and geographies, and more slowly than required to rule out disorderly transition scenarios and associated risks.

EVOLVING REGULATION

Companies and investors face increased scrutiny regarding nature-related risks as regulation evolves. In Brazil, the sourcing or production of commodities from illegally deforested areas has incurred fines, with cattle ranches and meat packers such as JBS being fined US$64 million in 2024,[61] and a soybean supplier being fined US$933,000.[62] The EUDR[63] will require enhanced traceability, risk assessment and reporting obligations from operators and traders of seven commodities (coffee, cocoa, soy, timber, rubber, beef and leather) to ensure they are deforestation-free.[64] Studies suggest that business' compliance costs could range from 0.29% to 4.3% of commodity value,[65] or 0.1% of annual revenues for large companies and SMEs,[66] whereas non-compliance could incur fines of at least 4% of the company's total revenue.[67]

Regulatory shifts and scrutiny can result in stranded assets and transition costs. For example, Canadian mining major Barrick's Pascua-Lama gold mine in Chile entered a 10-year closing phase after environmental studies showed the mine's potential impact on glaciers nearby, with cumulative asset write-downs totalling US$7.5 billion.[68,69]

REPUTATION

In addition to liabilities, companies' failure to mitigate and adapt to risks can result in reputational damage and loss of investor confidence. Known as the first climate-change bankruptcy, US-power and gas company PG&E's Northern California utility was found responsible for forest fires between 2015 and 2018, due to poorly maintained infrastructure and sparking lines. [70] High temperatures and drought conditions due to climate change, in combination with inadequate vegetation management and urban-wildland development, led to the spread of fire and associated devastation. The company's liabilities exceeded the excess of its insurances of US$30 billion. The company pleaded guilty to 84 counts of manslaughter and, in 2019, filed for Chapter 11 bankruptcy. These reputational damages caused PG&E's share price to fall 91% between September 2017 and January 2019, with no substantial recovery to date. [71]

[59] Inevitable Policy Response (2024), Quarterly Forecast Tracker – Special Focus: Update of global land and nature policy developments

[60] See the CBD (2025) Online Reporting Tool

[61] Reuters (2024), Brazil fines meat packets $64 million for buying cattle from deforested Amazon land

[62] Business & Human Rights Resource Centre (2024), Brazil: Bunge soybeans supplier who received loans from John Deere and BNDES is fined for connections to illegal deforestation; includes companies' comments

[63] The implementation of the EUDR has been postponed twice, including due to pressure from trade organisations and trading partners. Inversely, investor groups have expressed support for a swift implementation.

[64] European Commission (2025) Regulation on Deforestation-free Products 2023/1115

[65] Wood E&IS GmbH (2021) Impact assessment on demand-side measures to address deforestation

[66] Profundo (2025), Analysis of EUDR compliance costs

[67] European Commission (2023), Frequently Asked Questions: Deforestation Regulation

[68] CDP (2019), In too Deep: Analysis for institutional investors of critical water security issues facing the metals and mining sectors

[69] Barrick (2018), Barrick Provides Update on Pascua-Lama Project'

[70] Columbia SIPA Centre on Global Energy Policy (2019), PG&E: Market and policy perspectives on the first climate change bankruptcy

[71] BloombergNEF (2023), When the Bee Stings: Counting the Cost of Nature-related Risks

LITIGATION

Increased scrutiny from governments, civil society and investors[72] is also raising the risk of environment-related litigation, in particular in the US, and especially in relation to chemical use and pollution.

US diversified technology company 3M settled with municipal water authorities for US$10.3 billion in 2023,[73] over pollution of water bodies with per- and polyfluoroalkyl substances (PFAS). This triggered the filing of 4,000 lawsuits by government entities, individuals and organisations, and a five-year share price drop of 66% between 2018 and 2023.[71] The company posted a -US$6.99 billion net income in its 2023 fiscal year financial results and total operating income of -US$9.13 billion.[74]

European pharmaceutical and crop science company Bayer has faced substantial legal challenges in relation to polychlorinated biphenyl (PCB) and glyphosate previously manufactured by Monsanto, which Bayer acquired in 2018. Bayer settled with 2,500 municipal entities in 2020 for US$650 million,[71,75] settled for US$160 million with the City of Seattle in 2024[76] and, as of May 2025, has settled over 100,000 cases (totalling approximately US$11 billion) linked to the 'Roundup' pesticide.[77] Bayer's CEO called out litigation as being "top of the agenda" for the company in 2024.[78]

The increase in climate litigation cases, from 884 in 2017 to 2,180 in 2022 across 65 jurisdictions,[79] may also stimulate growth in the number of nature-related litigation cases in the future.[80]

CONSUMER DEMAND

Companies need to adapt to shifts in consumer demand and wider transition expectations in light of climate change and nature loss. For example, a 2024 IPR scenario on beef consumption indicates that shifting diets will impact revenues for beef companies due to peak consumption forecasted for 2035.[59]

Shifting expectations on transition nature-related risk

Efforts are underway in the UK, with support from financial institutions and the UK Government, to establish national nature-positive transition pathways. Implications for policy makers and businesses could include the introduction of incentives, collaborations and policies which may affect the way they conduct their operations.[81]

Transition risks from nature loss are compounded by transition risks linked to climate change and human rights, with shifting expectations from society in light of global agreements and the recognition from the UN General Assembly of the right to a clean, healthy and sustainable environment.[82] Together, these risks have material effects on companies and their investors.

System-level nature-related risk

The ongoing and cumulative degradation of nature poses system-level, non-diversifiable, risks to investors.[83,84] These include systemic risks from the breakdown of entire natural systems and the financial systems they underpin, and systematic risks from inflation or recession. Reports such as the World Wide Fund for Nature's (WWF) Living Planet Report: A System in Peril,[7] the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report[12] and IPBES' Global Assessment Report on Biodiversity and Ecosystem Services,[5] serve as warnings to policy makers, investors and companies about the cascading effects of physical and transition risks which could generate environmental, social, geopolitical and economic crises.

Despite the greater body of evidence for and attention given to climate change and its impacts, climate-related risks have largely been underestimated, are materialising more rapidly than anticipated and are presenting material threats to the continued viability of the financial sector and the global economy more

[72] ShareAction (2025), Chemicals and Biodiversity Investor Statements 2025

[73] 3M (2024), 3M Settlement with Public Water Suppliers to Address PFAS in Drinking Water Receives Final Court Approval

[74] 3M (2024), Annual Report on Form 10-K for the Year Ended December 31, 2023

[75] Bayer (2025), Managing and Mitigating the U.S PCB Litigation Risk

[76] Bayer (2024), Settlement Agreement with the City of Seattle Over Alleged PCB Claims

[77] Lawsuit Information Center (2025), Monsanto Roundup Lawsuit Update

[78] Bayer (2024), Capital Markets Day 2024

[79] UNEP (2023), Global Climate Litigation Report: 2023 Status Review

[80] NGFS (2024), Nature-related litigation: emerging trends and lessons learned from climate-related litigation

[81] GFI (2025), Nature-Positive Transition Pathways for the UK

[82] UN General Assembly (2022), The human right to a clean, healthy and sustainable environment: draft resolution

[83] World Bank Group (2021), The Economic Case for Nature

[84] Impact Management Platform (2023), The Imperative for Impact Management

broadly.[85] It is highly likely that the impacts of nature loss, as part of the same environmental system, are being equally underestimated.

The passing of environmental tipping points brings about extreme disruptions that are difficult to anticipate even with the use of climate–economic models (so-called "green swans").[86] The unpredictability of the effects on financial markets and the economy reduces investors' ability to plan for and mitigate present and future climate- and nature-related risks to ensure long-term value creation.

Evidence of the company-level financial effects of system-level nature-related risk is currently limited. The focus of research to date has instead been on projections of economy-wide effects.[32] The World Bank has estimated that the collapse of three ecosystem services (global wild pollination, global provision of food from marine fisheries and timber provision from tropical forests) would result in a contraction in real GDP of US$2.7 trillion in 2030, particularly impacting low-income countries.[83] These system-level risks and impacts are highly likely to exacerbate the physical and transition risks described earlier in this briefing.

As an example at the level of a single ecosystem,[87] further deforestation of the Amazon could trigger a dieback as the system is unable to maintain its current function. This would cause higher temperatures and reduced rainfall as well as further reducing forest cover, which would result in the collapse of the environmental systems, such as water cycles, that the Amazon forest helps to regulate.[88]

In Brazil, crop productivity of soybean and maize has already been significantly impacted by deforestation-driven droughts and delayed rainy seasons, with implications for global value chains as the country supplies 50% and 10% of the global demand respectively.[89] From 2006 to 2019, Amazon deforestation has led to a loss of production and associated revenue amounting to US$761 million for soybeans and US$273 million for maize, representing 10% and 20% of the net revenues for each crop after deducting production costs.

If the Amazon dieback tipping point is crossed, it could place six million people at risk of extreme heat stress and contribute the equivalent of 15–20 years of global CO_2 emissions, with economic damages estimated at up to US$3.5 trillion over 30 years.[88] Inversely, policies addressing deforestation and supporting sustainable agriculture investments in five Amazon countries (Brazil, Peru, Colombia, Bolivia and Ecuador) could generate US$339.3 billion in additional wealth, a 4% increase in regional GDP in 2050, and a return on investment of US$29.5 billion.[90]

In the US, water scarcity in the Colorado River Basin is impacting agricultural production and energy generation with cascading effects on value chains.[31] About US$8 billion of agricultural income (including 90% of US winter vegetable production) depends on the Colorado river, and 1.3 million residents depend on its hydropower generation. Intensive water consumption – with nearly 80% being used for agriculture – and increasingly frequent droughts due to climate change have significantly reduced water levels and impacted local industries and their value chains. For example, cattle feed prices in Colorado rose by 45% during the 2010–2011 drought. The complete loss of freshwater supply from the Colorado River would generate direct losses of up to US$695 billion and a further US$230 billion in indirect losses, spread across the seven US states the river crosses.

The pace of nature loss accelerates once it is significantly degraded, due to the lowered resilience of ecosystems.[88] There is also a lag time between greenhouse gas emissions and the climate response, meaning the worst impacts of climate change may occur after a reduction in global greenhouse gas emissions.[91] The acceleration and escalation of the climate crisis, and uncertainty associated with crossing tipping points, further compound financially material risks associated with nature loss in the short-term and strengthen the need for urgent and meaningful action to mitigate those risks within investor portfolios.

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[85] PRI (2025), Institutional investor action on climate risk as the world approaches the 1.5°C limit of the Paris Agreement

[86] Bolton *et al* (2020), The Green Swan: Central Banking and Financial Stability in The Age of Climate Change

[87] While ecosystems globally are deeply interconnected, nature-related impacts and dependencies from economic activities are localised issues. The globalised nature of economic value chains will however lead to cumulative and cascading impacts from the collapse of individual ecosystems.

[88] Lenton *et al* (2023), The Global Tipping Points Report 2023

[89] Rainforest Foundation Norway & Universidade Federal de Minas Gerais (2024), Rainforest Payback: How Deforestation Fails Agriculture

[90] Banerjee O *et al* (2022), Can we avert an Amazon tipping point? The economic and environmental costs. *Environmental Research Letters,* 17, 125005

[91] Met Office (2019), Met Office Hadley Centre Climate Briefing Note: Links between emission pathways and time lags in Earth's climate system

3. How investors can respond

Integrating nature into investment strategies

Institutional investors have a financial interest in and fiduciary obligations to address nature loss, given the risks associated with the degradation of ecosystems and their services. The 2021 landmark study from the Legal Framework for Impact across 11 jurisdictions established that sustainability factors posing material risk to investors will generally fall within their legal obligations.[92] Addressing nature loss at the system-level can reduce the broader risks of economic disruption, supply chain shocks, stranded assets and market instability.

Integrating nature into investment strategies and associated documentation, such as responsible investment policies, allows investors to consistently identify, assess and manage nature-related risks (see Figure 1).[93] Since 2022, engaged investors have been making significant progress in identifying their exposure to sectors with high levels of nature-related risk (heatmapping), using publicly available tools and guidance.[94,95] From this initial identification, investors are prioritising specific nature-related risks (e.g. deforestation, water scarcity, pollution), sectors, asset classes and/or geographies for further analysis of the actual impacts and dependencies of issuers. Such analysis can draw on industry frameworks and guidance, for example the LEAP approach from the Taskforce on Nature-related Financial Disclosures (TNFD),[96] and requires collation of more granular and asset-level data alongside internal capacity building. As the next step, investors are beginning to develop and test proprietary models to quantify issuer-specific nature-related risks and integrate those into their financial analysis.

The lack of a commonly accepted methodology for translating nature-related impacts and dependencies into risk, or for valuing the time discount rate of nature and the services it provides, has been a key challenge for investors. Investors are therefore starting with sector-specific approaches, using the increasing literature and guidance on sector metrics, such as from the TNFD.[97] Scenario-analysis and stress-testing for nature-related risks remain nascent, with emphasis on exploratory and qualitative approaches[98] while normative scenarios, such as those from NGFS, are under development.[99]

Engagement with peers, issuers, industry stakeholders and academia, and disclosure of nature-related issues are essential to support evolving nature integration practices. Corporate engagement, discussed further below, is an important source of information for investor assessments, as disclosure of meaningful nature-related data is still an emerging practice. As of November 2025, 733 organisations have committed to report in line with the TNFD disclosure recommendations,[100] and the International Sustainability Standards Board (ISSB) has announced it will align its standard-setting on nature-related risks with the recommendations, metrics and guidance of the TNFD.[101] Currently, only 23% of financial institutions align to TNFD recommendations, this may be in part a flow-on effect of the low levels of alignment among investee companies (currently only 22%).[102] As nature-related disclosure practices develop, investors can anticipate improved access to more meaningful data.

[92] Freshfields Bruckhaus Deringer (2021), A Legal Framework for Impact: sustainability impact in investor decision-making Commissioned by The Generation Foundation, UNEP FI and PRI Association

[93] PRI (2024), Developing a biodiversity policy: a technical guide for asset owners and investment managers

[94] UNEP FI (2024), From Kunming-Montreal to Cali: Is the Financial System on Track?

[95] For example using sector lists (TNFD Annex 1), or materiality scores (SASB materiality map, ENCORE, IBAT and the WWF Risk Filter Suite) or biodiversity footprinting methodologies (TNFD guidance, analysis results from the Finance for Biodiversity Foundation).

[96] TNFD (2023), Guidance on the identification and assessment of nature-related issues: the LEAP approach

[97] More information on the TNFD additional guidance by sector

[98] TNFD (2024), Discussion paper on conducting advanced scenario analysis

[99] NGFS (2023), Recommendations toward the development of scenarios for assessing nature-related economic and financial risks

[100] TNFD (2025), TNFD welcomes ISSB decision on nature-related standard setting drawing on TNFD framework as adoption crosses 730 organisations and USD 22 trillion in AUM

[101] International Sustainability Standards Board (ISSB) (2025), ISSB welcomes TNFD's support as it advances nature-related disclosures

[102] EY (2025), How can reporting shape a nature-positive future? EY Global Nature Action Barometer

Figure 2. PRI's five-step process for developing an organisational approach to nature[93]

Asset owners' portfolio screening processes for nature will likely be similar to those applied to other sustainability-related risks, but their ability to carry out more granular analysis, including of financial risks, will be determined by their access to asset management and issuer information. Where assets are externally managed, integration of nature-related considerations into investment manager selection, appointment and monitoring supports the delivery of asset owners' investment strategies and mitigation of nature-related risks. Asset owners have started to engage on nature-related issues, with a focus on evaluating investment managers' capacity, strategy and alignment with their nature-related objectives.

Nature investment opportunities

Investors are increasingly looking to identify nature investment opportunities to generate value and improve the overall resilience of their portfolios, while also reducing system-level risks by improving the resilience of ecosystems. Financial mechanisms to scale up the adoption of nature-based solutions (NbS, actions intended to deliver co-benefits for nature and people and, potentially, climate)[103] have gained momentum, with a US$3 billion increase in private financial flows between 2021 and 2022.[104] However, this amount still represents less than 20% of total financial flows towards NbS, which themselves represent only a third of the finance levels required to deliver on global sustainability goals by 2030.

More recent estimates from the United Nations Environment Programme Finance Initiative (UNEP FI) pointed to an acceleration in private finance for nature more generally, with an elevenfold increase between 2020 and 2024 to reach US$102 billion.[105] A global transition to a nature-positive economy could generate over US$10 trillion in annual business value by 2030.[106] In the UK alone, in 2024, nature-related businesses employed over 21,000 people and generated revenues estimated at £2.2 billion.[58]

Barriers to private investment in nature and NbS persist, such as perceived high risks, long investment horizons and unclear returns;[107] but they can be overcome through the diversification of opportunities. Industry efforts are underway to define the variety of financial mechanisms that can contribute to the mission of the GBF,[108] thereby enabling a greater breadth of investors to consider nature investment opportunities within their mandate and associated strategies.

There is already a wide range of financial instruments with nature objectives or co-benefits that can cater to different investment strategies and risk appetite.[109] Examples include labelled debt, thematic equity funds and real assets, as well as more sophisticated blended finance mechanisms like debt-for-nature swaps and the upcoming Tropical Forest Forever Facility (TFFF).[110,111] Concessional capital and technical assistance from development finance institutions (DFIs) have addressed some of the aforementioned barriers, making DFIs instrumental in attracting private investment to nature and NbS. There is also an increasing number of initiatives looking to amplify pipelines of investable opportunities, especially in emerging markets and developing economies.[112]

[103] UNEA 5.2 defines nature-based solutions as "Actions aimed at protecting, conserving, restoring, and sustainably managing natural or modified terrestrial, freshwater, coastal, and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits."

[104] UNEP (2023), State of Finance for Nature 2023

[105] UNEP FI (2024), Private finance for nature surges to over $102 billion

[106] World Economic Forum (2020), The Future of Nature and Business

[107] CISL, Capitals Coalition, UNEP-WCMC, IDEEA Group and Tecnalia (2024) Scaling Finance for Nature: Barrier Breakdown

[108] For example from UNEP FI and the Finance for Biodiversity Foundation and from the Nature Positive Initiative.

[109] See examples within PRI case studies

[110] Sustainable Markets Initiative and GFI (2024), Investing in nature: Opportunities for institutional investors

[111] Flammer, Giroux and Heal (2025), Biodiversity Finance. *Journal of Financial Economics*, 164

[112] For example the Innovative Finance for the Amazon, Cerrado and Chaco (IFACC) and the NbS Investment Platform from Capital for Climate

Nature-related corporate stewardship

Stewardship is a key lever for institutional investors to gain a better understanding of nature-related risks in their portfolios and to ensure issuer alignment with their investment strategies. The use of direct, indirect or collaborative engagement for managing nature-related risks is important for setting expectations and upholding accountability. Based on their assessment of nature-related risks, investors can prioritise specific issues such as deforestation or water scarcity, and engage companies on their governance, risk management, use of certifications or other verifications, political engagement and disclosure practices in relation to those issues.[113] Investors can also use public expectations, benchmarks and research from collaborative initiatives to inform their direct engagement.

A growing number of investors globally are engaging companies to address their nature-related risks through collaborative stewardship initiatives (such as Spring, Nature Action 100, FABRIC and FAIRR). Such initiatives provide a unified investor voice and can increase access to key corporate decision-makers. For example, Spring is a PRI stewardship initiative endorsed by over 230 investors representing US$18.8 trillion of assets under management as of September 2025. It seeks to enhance corporate practices, with an initial focus on tackling forest loss and land degradation in priority geographies and encouraging responsible political engagement; ultimately generating positive, real world outcomes, while protecting and enhancing investment returns.

Policy engagement on nature

Policy engagement, as an extension of investors' stewardship and fiduciary duties, has emerged as a key lever to manage system-level risks, such as those stemming from nature loss, and ensure long-term value creation. By engaging with policy makers on financial and real-economy policies, investors help reduce the risk of a disorderly transition while improving market certainty and investment potential for nature. The regulatory environment fostered by NBSAPs and associated policies should be conducive to investors and the wider private sector meaningfully and effectively contributing to the targets of the GBF. The PRI's Nature Policy Roadmap explores how policies can:

- enable investor action for nature – such as by clarifying corporate and investor duties regarding nature-related issues and stewardship rights;
- introduce mandatory and standardised disclosure regimes, considering investor data needs;
- develop and implement environmental and human rights due diligence requirements;
- integrate nature-related issues into the design of classification instruments such as taxonomies and sectoral transition pathways.

Through public statements and direct engagement, investors have been voicing support for an enabling policy environment at global, regional and national levels. For example, in 2023 investors representing £2.7 trillion in assets under management called for mandatory due diligence in the UK,[114] while in 2024 pension funds across Europe and North America called for ambitious policy and regulatory action in the context of the UN Biodiversity Conference COP16.[115] Investors are also conducting direct engagement with policy makers, including collaboratively via the Investor Policy Deforestation Dialogue (IPDD). IPDD is a PRI-supported initiative, run by the Tropical Forest Alliance, to coordinate investor–public policy dialogue on halting deforestation in key geographies such as Brazil and Indonesia.

[113] See, for example, Nuveen's Nature Stewardship Initiative

[114] For more information, see Global Witness (2023), Aviva and LGIM join investors handling more than £2.7 trillion calling for new mandatory deforestation checks in UK law

[115] For more information, see The Church of England (2024), COP16: Investors worth USD 2.5 trillion call on governments to take bold action on biodiversity

Annex 1: key terms

Biodiversity: variability among living organisms from all sources. Biodiversity is an essential component of nature, critical to maintaining a functioning and resilient natural system that can continue to provide services, which benefit society.[116]

Ecosystem services: benefits people obtain from ecosystems and their biodiversity, such as the production of food and prevention of flooding.[117]

Nature: the natural world, with an emphasis on the diversity of living organisms (plants, animals, people) and their interactions among themselves and with their environment.[118]

Physical risk: risk resulting from the degradation of nature and consequent loss of ecosystem services on which economic activity depends. These risks can be chronic (e.g. a gradual decline in pollinators resulting in reduced crop yields, or water scarcity) or acute (e.g. natural disasters). These risks are usually location specific.[119]

System-level risks: a catch-all term for systematic risk and systemic risk, and their components, both of which have implications for investment performance.

Systematic risks: are transmitted through financial markets and economies, affecting aggregate outcomes, such as broad market returns. Because systematic risk occurs at a scale greater than a single company, sector or geography, it cannot be hedged or mitigated through diversification.

Systemic risks: arise from the breakdown of the entire system, rather than the failure of individual parts. Nature-related systemic risks are characterised by modest tipping points combining indirectly to produce large failures and cascading interactions of physical and transition risks – one loss triggers a chain of others and stops systems from recovering their equilibrium after a shock. Systemic risks encompass risks to the financial system (i.e. financial stability risk) and risks from the breakdown of natural systems (i.e. ecosystems).[120]

Transition risk: stemming from a misalignment of economic actors (e.g. companies, consumers and investors) with actions aimed at protecting, restoring and/or reducing negative impacts on nature. Transition risks can be prompted by, for example, changes in regulation and policy, legal precedent, technology or investor sentiment and consumer preferences. They can also arise when activities aimed at restoring nature longer align with revised policies.[120]

[116] Convention on Biological Diversity (2011) Text and Annexes

[117] Hassan, Scholes & Ash (eds.) (2003), Ecosystems and Human Well-being: A Framework for Assessment. Millennium Ecosystem Assessment. First Edition. Washington DC: Island Press.

[118] IPBES (2021) Core glossary

[119] TNFD (2025) Glossary of key terms V3.0

Annex 2: additional resources

Advisory committees and working groups

Advisory committees and working groups help to guide the PRI's work; many of them support the PRI's work on nature loss. A Nature Reference Group has been running since 2023 to build investor awareness, capacity and interaction through the discussion of evolving practice on nature and biodiversity loss.

Collaborative initiatives

PRI-led and supported initiatives create opportunities to protect and enhance long-term value for clients and beneficiaries, address systemic issues, demonstrate commitment and progress, learn from other responsible investors and engage with investees, policy makers and others. Signatories may advance their work on nature-related risk in PRI-led and PRI-supported initiatives including:

- Spring;
- Nature Reporting Preparer Forum;
- Investor Policy Dialogue on Deforestation (IPDD).

Information on joining and participating in initiative-related activities is available online.

Public policy engagement

Public policy critically affects institutional investors' ability to generate sustainable returns and create value. It also affects the sustainability and stability of financial markets, as well as social, environmental and economic systems. The PRI actively engages with public policy, where relevant, to promote our principles and mission across major markets and jurisdictions, including by responding to consultations and making recommendations to policy makers grounded in high-quality research.

The PRI involves signatories when developing new policy research, analysis and positions through dedicated reference groups, the Collaboration Platform and direct signatory engagement. Further information on how to get involved in policy analysis and positions is available online.

Tools and guidance

The PRI produces a range of tools and guidance on how to incorporate nature loss into investment decisions and ownership practices in a systematic way, within each asset class. These include introductory and technical guides for investors at all stages of responsible investment.

The examples highlighted in this briefing were drawn from a range of reports and academic papers, which are useful for building capacity and internal buy-in on material issues for investors.

General nature-related evidence

1. University of Oxford's Environmental Change Institute (as part of the Resilient Planet Finance Lab), TNFD and Global Canopy (2025), Evidence review on the financial effects of nature-related risks
2. NGFS-INSPIRE (2022), Beyond climate: addressing financial risks from nature and biodiversity loss
3. Dasgupta (2021), The Economics of Biodiversity: Dasgupta Review
3. CISL (2021), Handbook for nature-related risks: Key concepts and a framework for identification
4. Organisation for Economic Co-operation and Development (2019), Biodiversity: Finance and the Economic and Business Case for Action
5. National Bureau of Economic Research (2020), The Economic Case for Protecting Biodiversity

Thematic nature-related evidence

1. Bloomberg Intelligence (2025), Water risk 2025 Global Outlook
2. IPBES (2023), Invasive Alien Species Assessment: Summary for Policymakers
3. CDP & Planet Tracker (2022), High and Dry – How water issues are stranding assets
4. CDP (2019), In too Deep: Analysis for institutional investors of critical water security issues facing the metals and mining sector

Pathways

Pathways is our flagship educational tool offering practical, tailored guidance to help strengthen responsible investment approaches over time. Through Pathways, signatories can access the most relevant resources to advance from foundational steps to leading market practices.

PRI Academy

The PRI Academy is at the forefront of training and education in the global investment sector. Since 2014, the Academy has transformed the careers of nearly 30,000 professionals across 90 countries, creating a global community of responsible investment leaders. Further information, including on the PRI Academy dedicated nature and biodiversity course, is available online.

To inform this paper, the TNFD Secretariat and individual PRI signatories, including members of the PRI Nature Reference Group, were consulted.