



**HKGFA**  
香港綠色金融協會  
Hong Kong Green Finance Association

# Mobilising sustainable finance to halt and reverse nature loss



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# Executive Summary

The global effort to halt and reverse biodiversity loss requires a major shift in finance. Currently, public funding dominates nature-based solutions (NbS) financing with an estimated annual allocation of US\$165 billion—82% of total NbS financing in 2022. However, this is far below the US\$737 billion needed annually to meet climate and biodiversity targets by 2050. Private capital is largely absent from this space, with US\$5 trillion flowing into nature-negative sectors—140 times the amount invested in NbS. Bridging this gap demands urgent action to redirect private-sector finance towards nature-positive investments and halt nature degradation.

This paper explores the transformative potential of sustainable finance and instruments used in reducing and reversing biodiversity loss, emphasising the critical role of financial institutions in driving nature-positive investments. It draws on case studies to assess the regulatory

frameworks, risk management, and innovative financing mechanisms, that enables the financial sector to align economic growth with environmental sustainability. Hong Kong's adoption of the International Financial Reporting Standards (IFRS) Foundation's International Sustainability Standards Board (ISSB) Climate-related Disclosures S2 paves the way for the alignment of nature-related disclosures for Hong Kong listed companies.

Below is a summary of key actionable recommendations and roadmap for financial institutions to mitigate risks, seize opportunities, and contribute to global nature goals, in addition to case studies showcasing how nature and biodiversity are being integrated into financial decision-making, driving systemic change toward a resilient and sustainable economy.

## Key Recommendations for Financial Institutions to Facilitate Market-Wide Adoption of Nature-Positive Investments

1. Align with Global Standards	<ul style="list-style-type: none"> <li>Adopt TNFD disclosure recommendations, commit to the Finance for Biodiversity Pledge and support certifications like the Global Biodiversity Standard.</li> </ul>
2. Enhance Risk Monitoring and Capacity Building	<ul style="list-style-type: none"> <li>Use tools like IBAT to map assets against sensitive areas and ENCORE to assess ecosystem dependencies, and leverage other emerging and established resources and data sources</li> <li>Build capacity and knowledge for TNFD, Biodiversity</li> </ul>
3. Pilot Scalable Solutions	<ul style="list-style-type: none"> <li>Develop blended finance models (e.g., reforestation funds, green/blue/nature bonds) and leverage geospatial/eDNA technologies for monitoring.</li> </ul>
4. Mainstream Sustainable Financing Structures for Nature and Biodiversity	<ul style="list-style-type: none"> <li>Incentivise corporates via sustainability-linked loans (SLLs) and bonds (SLBs) tied to biodiversity KPIs.</li> <li>Implement blended finance facilities (e.g., green/blue bonds) and support landscape restoration aligned with the Kunming-Montreal Global Biodiversity Framework (GBF).</li> <li>Launch biodiversity-themed funds (e.g., equity/debt funds) and adopt TNFD's LEAP framework for risk and opportunity assessments.</li> </ul>

## Summary of Key Case Studies Showcasing the Application of Innovative Sustainable Financing Mechanisms in Practice

1. Mangrove Conservation Carbon-Collateralised Loans in China	<ul style="list-style-type: none"> <li>Chinese state-owned commercial bank, Industrial Bank Co., Ltd. partnered with Shenzhen Blue Carbon Jiahua Technology to issue loans collateralised by mangrove carbon credits.</li> <li>This initiative supports China's "dual-carbon" strategy, leveraging blue finance to conserve coastal ecosystems while providing liquidity for conservation projects.</li> </ul>
2. ADM Capital's Asia Climate-Smart Landscape Fund (ACLF) in Hong Kong	<ul style="list-style-type: none"> <li>Hong Kong-based US\$100 million private credit fund targets SMEs in sustainable forestry and agriculture, linking loans to measurable climate and nature.</li> <li>Demonstrates how tailored debt solutions can incentivise regenerative practices and habitat protection.</li> </ul>
3. Swire Properties' Urban Biodiversity Leadership	<ul style="list-style-type: none"> <li>Hong Kong property developer pioneered nature-integrated urban development at Taikoo Place, using biodiversity guidelines and nature-based solutions to create habitats for 260+ species while enhancing climate resilience (flood mitigation, urban cooling).</li> <li>Set industry benchmarks as a TNFD Taskforce Member, issuing integrated climate-nature financial disclosures and earning a 2024 Gold Award for biophilic design.</li> </ul>

4. The Natural Capital Initiative (NCI) in Indonesia	<ul style="list-style-type: none"> <li>Science organisation NCI transforms natural capital into financial assets by restoring degraded landscapes and quantifying outcomes via a “Natural Capital Index.”</li> <li>Pilot projects, like the 100-ha reforestation effort in Bintan, integrate blockchain for transparency and attract private investment.</li> </ul>
5. Southeast Asia Sustainable Agribusiness Finance	<ul style="list-style-type: none"> <li>Singapore’s RGE Group transitioned to sustainability-linked loans (SLLs), including a US\$ 1 billion facility with KPIs for No Deforestation, No Peat, No Exploitation (NDPE) supplier compliance and traceability verification for RSPO certification.</li> <li>RGE conserved/restored 350,000+ hectares of forest in Indonesia via the Restorasi Ekosistem Riau (RER) program, backed by a US\$ 100 million pledge and bank financing.</li> <li>The Zoological Society of London’s SPOTT initiative provides a critical transparency platform, using disclosure metrics to rate and rank agribusinesses for financial institutions and buyers.</li> </ul>
6. Sustainability-Linked Finance in Japan and Spain	<ul style="list-style-type: none"> <li><b>Japan:</b> Sumitomo Mitsui Banking Corporation (SMBC) linked KAO Corporation’s loan terms to CDP sustainability scores, rewarding triple-A performance.</li> <li><b>Spain:</b> BBVA’s €2.5 billion water footprint loan for Iberdrola ties interest rates to water consumption reductions and CDP Water Security Scores.</li> </ul>
7. Mirova’s Biodiversity Fund	<ul style="list-style-type: none"> <li>A €100 million fund invests in European SMEs with biodiversity-positive business models, using CDP data to screen and engage companies.</li> <li>Highlights the importance of data-driven impact investing and cross-sector collaboration.</li> </ul>
8. Etica Funds’ Sustainable Land-Use Finance	<ul style="list-style-type: none"> <li>Italian asset management company pioneered deforestation-focused engagement using CDP’s Forests data to assess and influence corporate target-setting on sustainable land use, while expanding efforts on landscape approaches.</li> <li>Strengthened stewardship by allocating dedicated resources for company engagement and driving transparency through CDP Forest questionnaire participation.</li> </ul>
9. Plaza Mayor’s Urban Biodiversity Oasis	<ul style="list-style-type: none"> <li>Spanish shopping center Plaza Mayor Málaga created a self-regulated Mediterranean garden, the “Senda Mediterraneum,” as a refuge for native flora and fauna.</li> <li>The project, awarded a Green Flag, uses eDNA sampling for cost-effective monitoring, identifying 245 species and optimising sustainable garden management.</li> </ul>
10. Manulife’s Deforestation Risk Engagement Using CDP Data	<ul style="list-style-type: none"> <li>Manulife Investment Management (CAD\$657B AUM) leverages CDP’s Forests data and Portfolio Assessment tool to analyse portfolio exposure to deforestation risks and identify company-specific engagement points.</li> <li>The firm uses CDP’s in-depth analysis to drive conversations with companies on supply chain risk management, focusing on traceability, certification, and revenue dependencies, aligning with growing investor demand for deforestation-free portfolios.</li> </ul>
11. IWC Asset Management+: Scaling Taxonomy-Driven Forest Investment	<ul style="list-style-type: none"> <li>Global timber investment management organisation (TIMO) manages US\$ 500M+ in global forestry assets with taxonomy-aligned strategies (EU, Asia-Pacific) and SFDR Article 9 funds, integrating IPCC-based carbon modeling and FSC-certified restoration.</li> <li>Pioneers “Signature Actions” to combat forest degradation/fragmentation while advising on US\$ 6 billion in natural capital assets for institutional clients.</li> </ul>
12. Corporate Leadership: Unilever and Mahindra Group	<ul style="list-style-type: none"> <li>Unilever’s deforestation-free supply chain and Mahindra’s “no net loss” biodiversity commitment show how corporates integrate nature into core strategies, leveraging metrics like land-use change and water stewardship.</li> </ul>
13. Vana’s Asian Community Reforestation Enterprise (ACRE) in Cambodia	<ul style="list-style-type: none"> <li>Reforestation program by Vana (sponsored by DFA), is designed to restore 50,000 ha of degraded community forest land in Cambodia adjacent to Key Biodiversity Areas.</li> <li>Provides financial returns for investors while creating jobs and immediate income for communities through salaries, revenue from timber as a byproduct of assisted natural regeneration, and benefits from longer-term carbon and biodiversity programs.</li> </ul>

# Unlocking Asia's Biodiversity: Potential Economic and Ecological Rewards

State of Nature: Biodiversity decline and its intersection with climate change

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## Introduction

### Asia's Transformative Potential

The Asia-Pacific region, covering over 60 countries, is home to 17 of 36 global biodiversity hotspots. Nearly 200 million people in the region directly depend on the forest for their non-timber forest products, medicine, food, fuel as well as other subsistence needs.<sup>1</sup> However, biodiversity loss poses a significant threat, potentially disrupting nature-reliant economies in low-income countries and impacting major shares of Asia-Pacific's GDP.<sup>2</sup>

The degradation of critical ecosystems, such as mangroves, seagrass beds, and coral reefs could trigger cascading effects across value chains that rely heavily on natural resources. For example, pollinator declines could directly impact annual crop production by between US\$235 billion and US\$577 billion<sup>3</sup> globally, with a significant share impacting Asia-Pacific agriculture. Meanwhile, these ecosystems also offer cost-effective solutions to achieving climate targets. They hold the potential to contribute to one-third of global greenhouse gas emissions reduction with an investment of US\$8 trillion by 2050<sup>4</sup>, highlighting the role of nature-based solutions (NbS).

Asia's ambitious restoration targets are expected to drive a significant increase in annual financing needs. Asia has the highest cumulative investment needs among regions, reaching US \$1.037 trillion by 2030, driven in part by developing and emerging economies such as China and India with large-scale tree planting and forest expansion goals.<sup>5</sup>

### Hong Kong's Opportunity

Hong Kong stands as a paradoxical marvel in terms of biodiversity, where towering skyscrapers coexist with ecological riches, such as 3,300 species of plants and 580 bird species, one-third of the total bird species in China.<sup>6</sup> Despite occupying less than 1% of Guangdong Province's land area, this global financial hub sustains over one-third of China's bird species and amphibian populations, while its marine ecosystems host greater hard coral diversity than the entire Caribbean Sea.<sup>7,8,9</sup> These extraordinary statistics underscore Hong Kong's disproportionate ecological significance within national and regional contexts, where 3,300 plant species, 540 avian varieties, and 86 reptile

types thrive alongside 7.5 million residents.<sup>10,11</sup> This biodiversity exists within one of the world's most densely populated urban landscapes, making its preservation both uniquely challenging and critically urgent.

China's designation as a top five global biodiversity funding priority in the 2024 Biodiversity Finance Factbook<sup>12,13</sup> amplifies Hong Kong's strategic importance. The Factbook identifies priority regions where biodiversity is simultaneously plentiful, economically valuable, and under threat—criteria that perfectly describe Hong Kong's position as both a conservation hotspot and a conduit for capital flows.<sup>14,15</sup> As an international financial center managing over HK\$4.9 trillion in banking assets, Hong Kong possesses unparalleled capacity to bridge sustainable finance mechanisms with nature restoration imperatives.<sup>16</sup> From green bonds financing wetland conservation to blue finance instruments protecting marine ecosystems, the city's financial infrastructure is well positioned to catalyse transformative investments in ecological resilience. This convergence of biological wealth and financial sophistication creates a unique opportunity to demonstrate how urban centers can leverage capital markets to reverse biodiversity loss while maintaining economic vitality—making Hong Kong's success crucial for modelling sustainable development paradigms worldwide.<sup>17</sup>

## Biodiversity as a Sensor of the State of Nature

In the Anthropocene epoch, biological diversity can be a sensor of the state of nature in all its dimensions and scopes: richness, condition, and capacity to renew itself and provide ecosystem services. Together, these indicators make clear how human activities both impact and depend on the environment.

Biodiversity and ecosystem health are closely linked to other environmental issues. The main direct drivers of changes in biodiversity and ecosystems include climate change, pollution, land use change, freshwater use change, marine use change, direct exploitation of organisms and invasive alien species.<sup>18</sup>

## Definitions

<b>Biodiversity</b>	(derived from "biological diversity") refers to the variety of living species that are available on Earth. It encompasses the diversity between and within, for example, all plants, animals, bacteria and fungi.
<b>Nature</b>	regroups all non-human living entities and their interaction with other living or non-living physical entities and processes. This definition recognises that interactions bind humans to nature, and its subcomponents (e.g. species, soils, rivers, nutrients), to one another. <sup>19</sup>
<b>Ecosystem services</b>	refer to the benefits that humans derive from natural ecosystems. These services are crucial for sustaining human life and well-being and can be categorised into four main types: <ol style="list-style-type: none"> <li><b>1. Provisioning Services:</b> products obtained from ecosystems, such as food, fresh water, fuel, fiber, and genetic resources.</li> <li><b>2. Regulating Services:</b> These services include the benefits obtained from the regulation of ecosystem processes, such as climate regulation, water purification, pollination of crops, and disease control.</li> <li><b>3. Cultural Services:</b> These encompass the non-material benefits people obtain from ecosystems, including recreational, aesthetic, spiritual, and educational experiences.</li> <li><b>4. Supporting Services:</b> These services are necessary for the production of all other ecosystem services and include processes such as soil formation, nutrient cycling, and primary production.</li> </ol>

1. <https://www.unep.org/news-and-stories/story/scientists-warn-dangerous-decline-asia-pacifics-biodiversity>
2. <https://www.weforum.org/agenda/2021/09/how-to-address-asia-pacific-s-biodiversity-crisis-and-encourage-nature-positive-growth/>
3. <https://documents1.worldbank.org/curated/en/927121625066013258/pdf/Unlocking-Nature-Smart-Development-An-Approach-Paper-on-Biodiversity-and-Ecosystem-Services.pdf>
4. <https://www.unep.org/resources/state-finance-nature-2021>
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16. <https://www.admcf.org/business-for-biodiversity/>
17. [https://www.oecd.org/en/publications/biodiversity-finance-and-the-economic-and-business-case-for-action\\_a3147942-en.html](https://www.oecd.org/en/publications/biodiversity-finance-and-the-economic-and-business-case-for-action_a3147942-en.html)
18. IPBES Global Assessment Report, <https://www.ipbes.net/global-assessment>
19. IPBES Global Assessment Report, <https://www.ipbes.net/global-assessment>

# 1. Regulatory Drivers

## The role of regulatory frameworks and policies on sustainable finance practices



Regulatory frameworks and policies play a crucial role in driving biodiversity-related sustainable finance practices and supporting investments in nature-positive sectors. By establishing clear requirements and standards, providing incentives and fostering systemic approaches, governments can facilitate the transition towards a more sustainable economy that values and protects biodiversity. As awareness grows of the importance of biodiversity and related risks and opportunities, the integration of these frameworks into financial systems will be essential for achieving both environmental and economic sustainability.

### 1. Kunming-Montreal Global Biodiversity Framework



During Climate COP28 in the UAE in 2023, countries under the joint leadership of the UAE and China (host of biodiversity COP15) adopted the Joint Statement on Climate, Nature and People, which affirmed there is no path to fully achieve the near- and long-term goals of the Paris Agreement or the 2030 goals and targets of the Kunming-Montreal Global Biodiversity Framework (GBF) without urgently scaling

finance and investments for climate and nature from all sources. The statement emphasised that such finance and investments must be synergistic, dedicated and progressive to ensure promotion of co-benefits and efficiency through nature-based solutions and/or ecosystem-based approaches and must facilitate access to finance in an inclusive and equitable manner.

The GBF, adopted at COP15, established 23 targets to halt biodiversity loss by 2030. It requires Parties to update their National Biodiversity Strategy and Action Plans (NBSAPs) and align them with the framework, while Target 19 of the GBF explicitly mandates mobilising financial resources for biodiversity initiatives. The GBF highlights resource mobilisation as essential for achieving its targets, encouraging governments and organisations to allocate funds for biodiversity conservation projects. This funding is crucial for protecting ecosystems, restoring habitats, and promoting sustainable practices.

In addition, Target 15 of the GBF requires governments to implement legal, administrative or policy measures to encourage and enable businesses, in particular large and transnational companies and

financial institutions, to regularly monitor, assess and transparently disclose their risks, dependencies and impacts on biodiversity, in order to progressively reduce negative impacts on biodiversity, increase positive impacts, reduce biodiversity-related risks to business and financial institutions and promote actions to ensure sustainable patterns of production.

For corporates, the GBF offers a structured approach to evaluate their impact on biodiversity. By aligning operations with the framework's targets, businesses are guided to reduce their pressures on nature through sustainable practices, minimised resource consumption and investments in restoration and pressure reductions. These practices promote corporate responsibility and accountability, prompting companies to incorporate biodiversity considerations into their business models.

Indicator Type	Purpose	Example Applications
Headline	Track progress toward core GBF goals	Ecosystem integrity (A.1), Genetic diversity (A.4)
Binary	Yes/No policy implementation indicators	National biodiversity plans, spatial conservation strategies
Component	Detailed metrics supporting headline indicators	Restoration area coverage (Target 2.2), species recovery rates
Complementary	Optional deep-dive metrics for advanced analysis	Living Planet Index, Biodiversity Habitat Index

## 2. National-level Policy Instruments and Frameworks

Governments worldwide are increasingly implementing biodiversity-related policies that shape sustainable finance. At the national level, frameworks such as NBSAPs, aligned with the GBF, mandate mobilising financial resources to protect ecosystems, restore habitats, and promote sustainable business practices. Distinct national approaches exemplify regulatory innovations incentivising conservation through mandatory compensation mechanisms for biodiversity loss.

Asia's regulatory landscape, though currently fragmented, is rapidly evolving, with stronger environmental laws that impose stricter controls on land use and pollution. Such policies translate into heightened due diligence and risk management requirements for financial institutions and corporates alike.

### National Biodiversity Strategy and Action Plans

NBSAPs are national-level policy instruments mandated by the UN Convention on Biological Diversity (CBD), intended to translate global biodiversity goals into country-specific actions. Most NBSAPs adopt time-bound targets, with many choosing to mirror the 10-year horizon of CBD frameworks.

Hong Kong's Biodiversity Strategy and Action Plan (BSAP) (2016-2021) serves as the city's key policy instrument under the CBD, to which China is a signatory. While initially aligned with the CBD's Strategic Plan (2011-2020), Hong Kong's BSAP emphasised habitat protection, invasive species management, and public engagement, though critics noted gaps in enforcement amid urban development pressures. As of July 2025, a revised BSAP is under review with views collected from public consultation, expected to align with the GBF and contribute to conservation efforts locally, in the Greater Bay Area and with the China National Biodiversity Conservation Strategy and Action Plan (2023-2030) (NBSAP 2023-2030). It is expected to address emerging priorities like climate resilience, corporate disclosure on nature-related risks and green finance integration. The update may introduce time-bound 2030 targets, stricter safeguards for marine ecosystems, and enhanced cross-border cooperation with Guangdong. However, challenges remain in balancing ecological goals with Hong Kong's dense urban growth. The revised BSAP could signal stronger commitments to biodiversity mainstreaming, particularly in infrastructure planning and private-sector accountability.

### EU Biodiversity Strategy

The EU Biodiversity Strategy, a cornerstone of the European Green Deal, leverages policy tools to direct finance toward nature conservation. The EU sustainable finance taxonomy (EU Taxonomy) prioritises investments in nature-based solutions, while the European Green Deal Investment Plan (EGD Investment Plan) channels funding into biodiversity protection. The Sustainable Finance Disclosure Regulation (SFDR) further reinforces this by mandating transparency on biodiversity risks through Principal Adverse Impacts indicators (PAIs), while the EU taxonomy and EGD Investment Plan incentivise positive investments in restoration. Supporting technical criteria classify economic activities that substantially contribute to sustainable water and marine resource use, circular economy transition, pollution control and ecosystem restoration. Recognising the climate-biodiversity nexus, the EU Biodiversity Strategy emphasises protecting vulnerable high-value ecosystems—including old-growth forests, peatlands, wetlands, and seagrass meadows—that provide both biodiversity habitat and critical carbon storage.<sup>20</sup>

### Country-specific frameworks

Many countries have implemented their own policies and frameworks in addition to NBSAPs and global or regional frameworks. In Malaysia for example, the Ministry of National Resources and Environmental Sustainability (NRES) has published a National Policy on Biological Diversity that includes five goals to enhance biodiversity conservation and sustainable use of natural resources in Malaysia, addressing both ecological and socio-economic dimensions. Please refer to **Appendix 1** for details on this policy.

The Network for Greening the Financial System (NGFS) is a global coalition of central banks and financial regulators that collaborates to enhance understanding and management of environmental risks within the financial sector.

In response to the growing risks of biodiversity loss and nature-related financial threats, NGFS established the Taskforce on Biodiversity Loss and Nature-related Risks in 2022. The objective of the Task Force, which provides a principle-based risk assessment framework, is to help mainstream the consideration of nature-related financial risks across the NGFS and provide greater clarity on the meaning of key concepts. To help operationalise the understanding of nature-related financial risks, the NGFS launched the report "Nature-related Financial Risks: A Conceptual Framework to guide Action by Central Banks and Supervisors"<sup>21</sup> in July 2024, creating an impetus for financial institutions to take action.

In Hong Kong, the Hong Kong Monetary Authority (HKMA) is actively involved in NGFS workstreams and serves as a co-chair of the NGFS supervision workstream, underscoring its leadership role in driving green and sustainable finance, aligned with NGFS and international best practice. It is anticipated that these frameworks will pave the way for early inclusion of nature-related risks into business operations and consideration, thereby enabling an institutional infrastructure to help banks assess value, price risk and allocate capital.

### 3. Environmental Regulations

While policy instruments provide the strategic vision for sustainable finance, regulations translate these ambitions into actionable requirements. Environmental regulations and disclosure frameworks operationalise accountability, ensuring financial flows align with nature-positive outcomes. From direct environmental safeguards for nature financing to transparency mechanisms, binding rules are critical in bridging the gap between commitment and implementation.

### Environmental regulation for nature financing

In some countries, regulatory obligations to compensate for biodiversity degradation led to the apparition of national compensatory compliance frameworks. Europe is emerging as a center of such regulations, with England's Biodiversity Net Gain (BNG) and France's *sites naturels de compensation, de restauration et de renaturation* (SNCRR) legislation. Please refer to **Appendix 2** for details on these and other compensation models.

In Asia, most compensation schemes are voluntary or in early stages. Vietnam, for instance, mandates biodiversity offsets for projects impacting protected areas or endangered species as of 2022, though long-term outcome monitoring is not assured.<sup>22</sup> Meanwhile, China is piloting ecological damage compensation in certain provinces, where polluters and developers must pay for restoration or buy credits from government-sanctioned reserves.<sup>23</sup>

Such mechanisms are useful at the asset level as part of the mitigation hierarchy<sup>24</sup> but cannot constitute a whole of nature strategy as land use change is only one of the five drivers of biodiversity loss.<sup>25</sup> Regulators therefore increasingly require companies to assess and disclose their exposure to sensitive areas and their nature-related risks and impacts.

### 4. Reporting and Disclosure Initiatives

Reporting and disclosure initiatives, some mandatory in certain jurisdictions and others voluntary, provide strong incentives for companies to assess and report relevant datapoints related to the drivers of biodiversity loss and geographical exposures to sensitive areas.

#### Hong Kong ESG Reporting Code for Listed Companies and ISSB

Existing ESG reporting requirements for Hong Kong listed companies already include "comply or explain" on environmental aspects including emissions, use of resources, environmental and natural resources. Hong Kong's adoption of the International Sustainability Standards Board (ISSB) Climate-related Disclosures S2 under the International Financial Reporting Standards (IFRS) Foundation effective 1 January 2025 enhances transparency, comparability and consistency in ESG reporting on climate-related risks and opportunities. Moreover, it is aligned with international best practice and supports regulatory and market expectations.

The formal collaboration between IFRS Foundation and the Taskforce on Nature-related Financial Disclosures (TNFD) whereby both parties have committed to building upon the TNFD recommendations to develop ISSB's Biodiversity, Ecosystems and Ecosystem Services (BEES) disclosures for use by capital markets paves the way for enhanced nature-related reporting and disclosures in Hong Kong, similar to how climate-related issues have been addressed through the adoption of ISSB S2.

The adoption of TNFD into corporate sustainability disclosures and reporting requirements is expected to focus the attention of corporate boards on nature-related issues as matters of material risk and strategic opportunity that require proactive corporate risk management frameworks and processes.

### Mainland China's Corporate Sustainability Disclosure Standards

Key disclosure developments in China that relate specifically to nature and biodiversity are primarily found in Corporate Sustainability Disclosure Standards (Ministry of Finance, May 2024). These standards

apply to all Chinese companies (public and non-public) and aim to establish a unified national sustainability disclosure system by 2030.

#### Key Features:

- Covers governance, strategy, risk management, and sustainability targets, emphasising double materiality (see page 37 for more on double materiality).
- Encourages supply chain data collection, with estimations allowed if data is unavailable.
- Exempts sensitive business or national security information from disclosure.
- Aligns with ISSB's IFRS S1 (general sustainability) and S2 (climate-related) standards but adapts to Chinese priorities (e.g. "common prosperity").

### European Union Corporate Sustainability Reporting Directive (CSRD)

In the European Union, already-enforced CSRD requirements led to the publication of new datapoints enabling identification of investments benefitting nature. Please refer to Table 1 below for details on CSRD.

**Table 1. The European Corporate Sustainability Reporting Directive (CSRD)**

The European sustainability reporting standard n°4 (ESRS E4, available <a href="#">here</a> ), as part of standard under the CSRD, requires companies who deem it material to disclose:	The geographical exposure to sensitive areas	How their activities lead to the deterioration of natural habitats and any associated mitigation measures
	Transition plan and strategy	How biodiversity influences business strategy
		Example: Assessment of resilience to biodiversity-related risks
	Policies related to biodiversity	What policies are adopted for managing biodiversity impacts
		Example: Number of policies addressing biodiversity and ecosystems Compliance with recognised standards or certifications
	Actions and resources	What actions are taken to support biodiversity objectives
		Example: Financial resources allocated to biodiversity initiatives Number of biodiversity offsets implemented
	Targets related to biodiversity	What biodiversity-related targets are set and disclosed
Example: Specific targets for habitat restoration (e.g., hectares restored) Percentage of agricultural land under sustainable practices		

20. EU Biodiversity Strategy for 2030, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1590574123338&uri=CELEX:52020DC0380>

21. <https://www.ngfs.net/system/files/import/ngfs/medias/documents/ngfs-conceptual-framework-nature-risks.pdf>

22. World Bank Vietnam Environmental Safeguards, <https://www.worldbank.org/en/country/vietnam/brief/environmental-and-social-framework>

23. <https://www.mee.gov.cn/>

24. Mitigation Hierarchy: A sequential framework to address environmental impacts, prioritising (1) avoiding harm, (2) minimising unavoidable damage, (3) restoring degraded ecosystems, and (4) offsetting residual impacts through compensatory measures (e.g., biodiversity credits). Adopted globally under standards like IFC Performance Standard 6 and the Kunming-Montreal Global Biodiversity Framework.

25. The other drivers of biodiversity loss, as defined by IPBES, are the overexploitation of species, pollution, invasive species and climate change.

# 2. Dependency Risks

## Nature-related risk as a main driver of nature considerations in financing activities

Biodiversity degradation introduces several risks for businesses and financiers, including physical risks and transition risks. Historically, financial institutions assess biodiversity through the International Finance Corporation (IFC) performance standards and environmental due diligence for project financing. This approach helped hedge against litigation and reputational risks while enhancing compliance with local regulations. Now, biodiversity is increasingly being considered by corporates and financial institutions through the exposure to potential disruption in ecosystem services known as physical risks.

### Physical risks

The global economy relies on ecosystems to provide essential services such as clean and abundant water, pollination and biomass production. Many companies, particularly those in sectors like agriculture and forestry that closely interact with nature, depend heavily on these ecosystem services for their production processes. Physical risks emerge from the potential loss of these ecosystem services, which can result from the company's own activities or broader environmental degradation. Refer to the following table, Ecosystem Services and Their Trends, for considerations in application.

**Table 2.**  
Ecosystem Services and Their Trends

Source: IPBES Global Assessment Report, available <https://www.ipbes.net/global-assessment>

	Nature's contribution to people	50-year global trend	Directional trend across regions	Selected indicator
REGULATION OF ENVIRONMENTAL PROCESSES	1 Habitat creation and maintenance	↓ ↓ ↓	○ ○ ○	• Extent of suitable habitat • Biodiversity intactness
	2 Pollination and dispersal of seeds and other propagules	↓ ↓ ↓	○ ○ ○	• Pollinator diversity • Extent of natural habitat in agricultural areas
	3 Regulation of air quality	↘ ↘ ↘	↕ ↕ ↕	• Retention and prevented emissions of air pollutants by ecosystems
	4 Regulation of climate	↘ ↘ ↘	↕ ↕ ↕	• Prevented emissions and uptake of greenhouse gases by ecosystems
	5 Regulation of ocean acidification	↘ ↘ ↘	↕ ↕ ↕	• Capacity to sequester carbon by marine and terrestrial environments
	6 Regulation of freshwater quantity, location and timing	↘ ↘ ↘	↕ ↕ ↕	• Ecosystem impact on air-surface-ground water partitioning
	7 Regulation of freshwater and coastal water quality	↘ ↘ ↘	○ ○ ○	• Extent of ecosystems that filter or add constituent components to water
	8 Formation, protection and decontamination of soils and sediments	↘ ↘ ↘	↕ ↕ ↕	• Soil organic carbon
	9 Regulation of hazards and extreme events	↘ ↘ ↘	↕ ↕ ↕	• Ability of ecosystems to absorb and buffer hazards
	10 Regulation of detrimental organisms and biological processes	↓ ↓ ↓	○ ○ ○	• Extent of natural habitat in agricultural areas • Diversity of competent hosts of vector-borne diseases
MATERIALS AND ASSISTANCE	11 Energy	↘ ↘ ↘ ↗ ↗ ↗	↕ ↕ ↕	• Extent of agricultural land — potential land for bioenergy production • Extent of forested land
	12 Food and feed	↓ ↓ ↓ ↗ ↗ ↗	↕ ↕ ↕	• Extent of agricultural land — potential land for food and feed production • Abundance of marine fish stocks
	13 Materials and assistance	↘ ↘ ↘ ↗ ↗ ↗	↕ ↕ ↕	• Extent of agricultural land — potential land for material production • Extent of forested land
	14 Medicinal, biochemical and genetic resources	↘ ↘ ↘ ↗ ↗ ↗	○ ○ ○	• Fraction of species locally known and used medicinally • Phylogenetic diversity
NON-MATERIAL	15 Learning and inspiration	↓ ↓ ↓ ↗ ↗ ↗	○ ○ ○	• Number of people in close proximity to nature • Diversity of life from which to learn
	16 Physical and psychological experiences	↓ ↓ ↓ ↗ ↗ ↗	○ ○ ○	• Area of natural and traditional landscapes and seascapes
	17 Supporting identities	↓ ↓ ↓ ↗ ↗ ↗	○ ○ ○	• Stability of land use and land cover
	18 Maintenance of options	↓ ↓ ↓ ↗ ↗ ↗	○ ○ ○	• Species' survival probability • Phylogenetic diversity

**DIRECTIONAL TREND**

Global trends: ↓ ↘ ↗ ↗ ↗

Across regions: ○ Consistent ↕ Variable

**LEVELS OF CERTAINTY**

- Well established
- Established but incomplete
- Unresolved

During the extraction, exploitation, processing and distribution phases of business activities, companies exert pressures that can degrade nature. This can lead to a vicious circle in which a company may degrade the ecosystems upon which it depends and exposes itself to physical risks.

As climate change and the biodiversity crisis worsen, the economy is increasingly exposed to ecosystem services disruptions that may impact production processes and financial stability. However, it is possible to find a balance in the interactions between the productive system and nature to ensure sustainable production models. Certain organisations are taking the lead in exploring this: the European Central Bank (ECB), for example, published a first attempt at nature-related stress testing, which is being updated over the course of 2025. Please refer to **Appendix 3** for details on this methodology.

### Transition risks

More visible than climate in a company's value chain, biodiversity degradation may lead to regulatory, litigation or reputational risks.

#### Regulatory risks

Regulatory risks refer to risks that a change in regulations or legislation will affect a security, company, or industry. In the case of nature, environmental codes, urban development planning or restrictions (such as bans on land use change, chemical components, pollutants or pesticides) for ecosystem protection have been impacting corporates in the way they produce or build and financial institutions in their effects on portfolios' performance and long-term viability. From stricter pollution controls to habitat conservation mandates, the regulatory landscape is evolving rapidly—and nowhere is this more apparent than in Asia, where biodiversity loss and climate pressures are driving urgent policy action.

Across Asia, governments are tightening environmental regulations to curb ecosystem degradation, though the region lacks a unified approach comparable to the EU's sweeping frameworks. In China, the Ecological Red Line Policy restricts development in protected

zones, forcing industries to adopt costly mitigation measures or relocate operations. Vietnam's revised Environmental Protection Law mandates biodiversity offsets for projects damaging critical habitats, while Indonesia's forest moratorium bans new palm oil and logging permits in primary forests—a move that has disrupted commodity-driven growth models. For financial institutions, these policies translate into heightened due diligence requirements, as loans to high-impact sectors like agriculture and mining now carry the risk of sudden regulatory penalties or stranded assets. While Asia's regulations remain fragmented, the direction is clear: businesses that fail to adapt will face escalating compliance costs, legal challenges, and reputational fallout.

Meanwhile in Europe, new regulations have emerged to combat sensitive ecosystem degradation, such as the EU Deforestation Regulation (EUDR). The EUDR represents one of the world's most stringent trade-linked environmental rules, requiring companies to prove that key commodities—including cattle, cocoa, coffee, palm oil, soy, and wood—are deforestation-free. To access the EU market, businesses must trace these goods back to their origins, ensuring they were not produced on land deforested after December 31, 2020. Crucially, the regulation effectively exports EU standards to supplier countries, many of which are in Asia.

By reducing the EU's contribution to deforestation, the EUDR supports global biodiversity goals by protecting forests essential for biodiversity and climate change mitigation. The regulation is expected to enter into force on 30 December 2025.

#### Litigation risks

Nature-related litigation and reputational risks have historically been concentrated on infrastructure exploitation and development, directly degrading ecosystems through land or sea use change, resource overexploitation or pollution. Companies operating in these sectors and others can face litigation over their impact on biodiversity either through direct operations or as a by-product.

Sector Case Study Examples of Litigation Risks

<p>1. Forestry and Palm Oil Companies</p>	<p>Companies involved in deforestation for agriculture, particularly palm oil production, have faced lawsuits for destroying habitats critical to biodiversity. Legal cases have been filed in countries like Indonesia and Malaysia, aiming to hold these companies accountable for illegal logging and the resultant loss of biodiversity.</p>
<p>2. Mining and Resource Extraction</p>	<p>Mining companies have faced litigation for their impact on biodiversity. For example, legal actions have been taken against operations that led to the destruction of habitats, affecting wildlife in areas like the Amazon rainforest and other ecologically sensitive locations.</p>
<p>3. Hydroelectric Projects</p>	<p>Legal challenges have been brought against hydroelectric projects that threaten river ecosystems and aquatic biodiversity. These cases often focus on the impact of dam construction on fish populations and broader ecosystem health.</p>

Financial institutions are not immune to nature-related litigation. By financing such infrastructure projects or sensitive commodity trading, they expose themselves to the attendant risks. Recently, NGOs have been analysing financial institutions’ policies related to deforestation, pushing them to be more ambitious.

**Reputational Risks**

All banks, investors and other businesses should be aware that incidents relating to adverse residual impacts on nature caused by, or directly or even indirectly affiliated with their activities – be it through lending, investing, advisory and/or supply chain relationships – may cause reputational risk and brand damage in the public perception. Examples abound, ranging from IPOs to right issuances and advisory mandates, and many have some linkage to unforeseen or poorly managed supply chain risks. Reputational, litigation and regulatory risks are linked: regulatory fines or action and legal challenges can have reputational fallout of their own.

**Financial Impacts of Ecosystem Service Dependency**

The evidence of financial effects of nature-related risks for businesses and the economy is extensive, according to the Discussion Paper of Evidence Review on the Financial Effects of Nature-related Risks<sup>27</sup> jointly authored by the TNFD, the University of Oxford and Global Canopy. The evidence spans sectors, scales, hazards, time horizons and types of effect, with high-quality analysis across evidence types.

**The Case of Samling Global**

Among notable cases of reputational damage to banks and investors is the story of the 2007 listing of Samling Global on the Hong Kong Stock Exchange. At the time Samling Global was among the largest logging businesses in Malaysia, operating primarily in the state of Sarawak on the island of Borneo.<sup>26</sup> In 2003, Greenpeace and other NGOs criticised the company for its destruction of tropical rainforests and illegal logging on land held by customary landowners in Papua New Guinea and Indonesia.

In 2007, 37 NGOs protested Samling’s IPO: according to Greenpeace, “Given its appalling track records and the likelihood that it would cause a disastrous impact to virgin rainforest, Samling’s move to tap money from Hong Kong investors was highly questionable.” HSBC, Credit Suisse and Macquarie, the joint bookrunners, were also named in the criticism and sustained reputational damage, as did the HKSE. The Greenpeace article specifically called attention to the HKSE’s role, drawing the conclusion that the lesson of this story is that the regulators of an IPO should be subjected to the same scrutiny as the underwriting banks and the company itself. Samling was delisted in 2012.

The strongest evidence of material financial effects covers:

- a. Water scarcity leading to greater capital and operational expenditures and operational disruption/shutdown as well as the effect of internalising water stress into credit analysis;
- b. Firm value effects stemming from liability risk (litigation resulting from the effects of pollution, marine degradation, wider environmental degradation as well as fines);
- c. Reputational risk related to deforestation, pollution, water scarcity and wider environmental degradation spanning a range of sectors; and
- d. Policy risk leading to negative effects on firm value, capital and operational expenditure, operational disruption and stranded assets.

Risk remains the strongest driver for financial institutions and corporates to integrate nature in their business models. Nature-related stress testing for financial institutions and insurers should drive corporate nature-related strategies in the future. Considerations for micro and macro level risks are critical for designing effective frameworks. At the micro level, this means assessing exposure to locational ecosystem degradation that threatens specific operations. At the macro level, it involves evaluating systemic vulnerabilities to the potential failure of ecosystem services, which can trigger market-wide volatility and threaten the stability of entire industries.

To effectively mitigate these risks, we must alleviate pressures on ecosystems worldwide across all interdependent value chains.

### Micro Level Example: Perrier

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An unfortunate example of biodiversity degradation leading to a disruption of ecosystem services is the production of bottled Perrier water in France.

The water source in Vergèze, France, is located in a degraded ecosystem as per the Biodiversity Intactness Index.<sup>28</sup> At the production facility and its surroundings upon which the water source depends, the integrity level is below 30%. This level of integrity is associated with a state of depletion of the ecosystem and severely decreased functionality.

In 2024, Perrier<sup>29</sup> stopped production in its Vergèze facility because it was unable to guarantee the good quality of its mineral water. Indeed, the water source had been repeatedly contaminated with bacteria and pesticides, according to the national health security agency.

Underground water contamination is caused by increased concentrated rainfall disabling soils' filtering capacity, degraded soils and pollutants. The extent to which the level of degradation of local ecosystems impacts the quality of the water source remains to be established more thoroughly.

The link between the level of degradation of the ecosystem and the quality of the water source is established through the capacity of the soil to filter water and other potential contaminants.

Nonetheless, three lessons can be drawn from such a case:

- a. Assets are exposed to nature-related physical risks beyond climate, which can have financial consequences;
- b. Corporates strongly dependent on one or more ecosystem service must engage in both conservation and restoration of ecosystems within their assets' remit and with stakeholders surrounding their assets to preserve ecosystem functionality through restoration and conservation projects;
- c. Medium-to-long-term strategies to preserve, enhance or reduce pressures on natural ecosystems are necessary to safeguard the economics of assets at risk of becoming stranded because of disruptions in ecosystem services.

### Macro Level Example: Pollinators and Global Water Crisis

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On a macro level, the loss of pollinators and disruption in pollination is putting the whole agricultural industry at risk with potential socioeconomic consequences cascading beyond the agrifood sector.

Beekeepers in the U.S. are alarmed by an unprecedented decline in honeybee populations, with commercial operators reporting an average loss of 62% from June 2024 to February 2025, which threatens agricultural production and could lead to higher food prices.<sup>30</sup> Contributing factors include pathogens, parasites, and a lack of nutrition, while theft of beehives has increased significantly, prompting calls for government support and community action to provide better forage for bees.

It is likely that a mix of drivers of biodiversity loss, including habitat loss, pollution, climate change and invasive species, are causing the pollinators' decline.

The global water crisis, driven by land use change, resource exploitation, pollution, invasive alien species and climate change, is worsening, and nearly 3 billion people and more than half of the world's food production are now in areas where total water storage is projected to decline, according to the Global Commission of the Economics of Water in 2024.<sup>31</sup>

The combined effects of changing precipitation patterns and rising temperatures due to climate change, together with declining total water storage and lack of access to clean water and sanitation imply that high-income countries could see their GDPs shrink by 8% by 2050 on average, while lower-income countries could face even steeper declines of between 10% and 15%. Disruptions of the hydrological cycle therefore have major global economic impacts.

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26. [https://www.greenpeace.org/cn/china/ReSizes/Large/Global/china/\\_planet-2/file/2008/6/ipo-review-the-samling-listin.pdf](https://www.greenpeace.org/cn/china/ReSizes/Large/Global/china/_planet-2/file/2008/6/ipo-review-the-samling-listin.pdf)

27. [https://tnfd.global/wp-content/uploads/2025/06/25-28225\\_Evidence-review-on-the-financial-effects-of-nature-related-risks\\_DIGITAL.pdf?v=1751358288](https://tnfd.global/wp-content/uploads/2025/06/25-28225_Evidence-review-on-the-financial-effects-of-nature-related-risks_DIGITAL.pdf?v=1751358288)

28. The Natural History Museum's Biodiversity Intactness Index (BII) estimates how much of a region's natural biodiversity is still left on average. The BII measures biodiversity change using abundance data on plants, fungi and animals worldwide. The Index shows how local terrestrial biodiversity responds to human pressures such as land use change and intensification. <https://www.nhm.ac.uk/our-science/services/data/biodiversity-intactness-index.html>

29. Perrier production under threat as report highlights health risks, Le Monde, December 2024. [https://www.lemonde.fr/en/health/article/2024/12/16/perrier-production-under-threat-as-report-highlights-health-risks\\_6736147\\_14.html#:~:text=A%20confidential%20report%2C%20obtained%20by,Verg%C3%A8ze%20site%20in%20southern%20France.](https://www.lemonde.fr/en/health/article/2024/12/16/perrier-production-under-threat-as-report-highlights-health-risks_6736147_14.html#:~:text=A%20confidential%20report%2C%20obtained%20by,Verg%C3%A8ze%20site%20in%20southern%20France.)

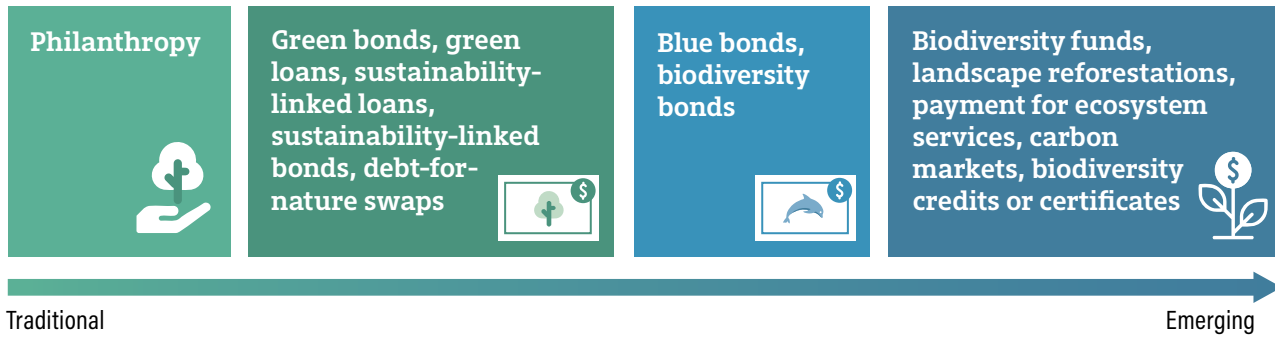
30. U.S. honeybee deaths soar, and grocery store bills could take the hit. <https://www.nbcnews.com/news/us-news/us-honey-bee-deaths-soar-grocery-store-bills-take-hit-rcna199066>

31. <https://www.ucl.ac.uk/bartlett/sites/bartlett/files/executive-summary-economics-of-water-2.pdf>

# 3. Opportunities

## Nature-related financing approaches

Table 3. Spectrum of nature financing mechanisms



For decades, nature-related financing has primarily focused on restoration and conservation efforts. However, the outcomes from COP15 and the GBF emphasise an urgent need to not only restore or conserve nature, but also to halt its loss. Despite this, much of the available nature financing still concentrates on the remedial aspects of nature conservation, rather than adopting a proactive and holistic approach that addresses the root causes of biodiversity loss. The following nature-related financing mechanisms provide an opportunity to halt or reverse nature loss by realigning financial flows towards sustainable outcomes, enabling long-term policy investment in natural capital and supporting policy and business shifts towards a nature-positive economy.

### Targeted Financing Beyond Philanthropy for Conservation



Historically, philanthropic giving has been the main source of funding for conservation and restoration. Yet, new financing instruments including sustainability-linked bonds, blue bonds and debt-for-nature swaps are now being used to mobilise funds to reach nature finance goals that would amplify beyond philanthropic giving alone. The International Capital Market Association (ICMA) has published “Sustainable Bonds for Nature,” providing guidance to issuers on financing projects that reduce ecosystem pressures while aligning with global biodiversity targets.

#### ICMA’s “Sustainable Bonds for Nature: A Practitioner’s Guide”

ICMA released the “Sustainable Bonds for Nature: A Practitioner’s Guide” at its general meeting in June 2025.

This document serves as a guide for market participants, focusing on the issuance of nature-focused green and sustainability-linked bonds in accordance with ICMA standards. It emphasises the global economic significance of nature and ecosystem services while acknowledging the negative impacts of human activities.

The guide recommends categories of projects that can be financed by these bonds, beyond preservation and conservation, enabling a reduction in pressures on ecosystems. It offers an indicative list of projects aligned with the GBF, including, for example, reducing resource consumption in construction, integrating nature-based solutions, and waste management.

Issuers of green bonds that exclusively finance nature-related projects have the option to give the secondary designation of “Nature Bonds”.

It also includes reporting indicators to measure environmental benefits and provides guidance for sustainable bonds. Additionally, it defines and suggests the use of nature-related KPIs for sustainability-linked bonds, legitimising the use of indicators beyond climate metrics.

The document references the Kunming-Montreal framework, which aims to mobilise annual funding to cease harming and regenerate biodiversity. Green, social, and sustainability bonds are thus presented as effective means to support the objectives of the GBF.



This evolution in nature financing reflects a shift toward more strategic and scalable solutions to protect biodiversity and ecosystems.

### Green Bonds and Loans

Thematic bonds and loans have had the capacity to address nature-related expenditures since the creation of the ICMA and the Loan Market Association’s green bonds and loans principles respectively. Now that the GBF explicitly calls to halt biodiversity loss, reduce

pollution, sustainably use water resources and manage terrestrial and marine ecosystems sustainably, the understanding of nature-related finance can go beyond philanthropic conservation and restoration.

Since 2022 and the GBF, a link can be established between the green bond and loans categories and the global objective to “halt and reverse biodiversity loss” as illustrated in the table below.

Table 4. Examples of Nature-related Eligible Categories for Green Bond or Loan Financings<sup>32</sup>

Types of Expenditures	IPBES Drivers	COP 15 Targets
Pollution prevention and control	Pollution	7, 19
Sustainable water and wastewater management	Resource exploitation	7, 19
Sustainable management of living natural resources and land/sea use	Land/ sea use change	1, 2, 3, 10, 19
Circular economy and waste management	Resource exploitation	7, 16, 19
Terrestrial and aquatic biodiversity conservation and restoration	-	1, 2, 3, 4, 11

### Sustainability-linked bonds

Sustainability-linked bonds (SLBs), unlike traditional green bonds limited to financing specifically green projects, can be used to finance initiatives or goals linked to the issuer’s overall sustainability performance. The bonds’ terms include specific sustainability performance targets (SPTs) that the issuer commits to achieving over a predetermined period. If these targets are met, the issuer may benefit from reduced borrowing costs or other incentives. If the targets are not met, there may be financial penalties, such as higher interest rates. Such financing incentivises issuers to improve their sustainability practices and demonstrate accountability to investors and stakeholders.

In this context, SLBs offer issuers a means to finance their nature-related objectives as part of their sustainability strategies. The Sustainability-Linked Bond Principles (SLBP) provide guidelines for developing effective SLBs, focusing on five essential components: selection of key performance indicators (KPIs), calibration of SPTs,

bond characteristics, reporting and verification. The SLBP emphasises the need for KPIs that are material to the issuer’s sustainability performance, ensuring they are relevant, measurable, verifiable, and consistent with the issuer’s overall business and ESG policies.

When addressing nature objectives, KPIs can focus on areas such as biodiversity conservation, reduction of biodiversity loss drivers (like land-use changes and pollution), integration of nature-based solutions, and implementation of supportive policies.

Issuers can link their KPIs to international biodiversity frameworks, such as the GBF and the UN’s Sustainable Development Goals (SDGs), while providing context on how these KPIs relate to their value chain’s state of nature. A typology of nature-related indicators can be used, including pressure-related indicators (e.g., water withdrawal), practice-based indicators (e.g., shifts to sustainable sourcing), state of nature indicators (e.g., biotope coefficients), and geospatial risk exposure metrics (e.g., deforestation-free certification).

## Sustainability-linked Nature Bonds

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Within ICMA guidance, indicators are considered Nature-related KPIs if they encompass the contribution of the entity to:

- a) the restoration and conservation of biodiversity and ecosystem services;
- b) The transformation of economic activities to reduce one or more of the direct drivers of biodiversity, ecosystems and ecosystem services loss;
- c) The integration of nature-based solutions across economic sectors;
- d) The implementation of initiatives (policies for sovereign issuers), tools, and activities that support the activities listed in (a) to (c) above.

### Corporate example:

If no sustainability-linked bond has been claimed as nature-related per ICMA's guidance yet, some already integrate nature-related KPIs.

KPIs related to recycling rates and reduction, pollution reduction or water consumption have widely been used within sustainability-linked bond frameworks. Nonetheless few made a link with the contribution of the target to nature-related objectives.

As an example, French water utility Saur<sup>33</sup> has set a target of water withdrawal per subscriber to decrease of 0.5% per year from 2021 to 2027. Conceptually, this is aligned with SDG 6: Ensure availability and sustainable management of water and sanitation for all.

The key levers to reach this target revolve around the enhancement of leak detection, cultural change and awareness campaigns, efficiency of drinking water production plants and water savings within industrial contexts.

## Blue bonds

Blue bonds, while still relatively rare, serve as important tools for financing and advancing objectives related to marine and freshwater ecosystems.

Blue bonds contribute to nature finance by funding projects that promote the sustainable management of aquatic ecosystems and water resources. They support initiatives aimed at addressing water-related challenges such as pollution, resource conservation, and climate change adaptation. For example, blue bonds financing water supply and wastewater treatment projects help protect water resources from degradation in quality and overconsumption in quantity.

## Biodiversity bonds

The first solely dedicated biodiversity bonds were issued at the end of 2024 by the International Finance Corporation (IFC), the Asian Development Bank and BBVA Colombia. They were mainly focused on conservation and restoration.




## Blue Bonds in Practice

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In 2018, the Republic of Seychelles issued the world's first sovereign blue bond, raising US\$15 million to support sustainable marine fisheries initiatives. The government has committed to protecting 30% of its Exclusive Economic Zones by expanding its Marine Protected Areas (MPAs). This increased protection is expected to enhance the Seychelles' resilience to climate change, particularly as the islands rely heavily on their marine resources for tourism, fisheries, and livelihoods.

More recently, in June 2024, the IFC supported the Southeast Asia Commercial Joint Stock Bank (SeABank) through a \$25 million investment in the first blue bond in Vietnam focused on aquaculture, fisheries and water supply.

On the corporate side, in Europe, water utility company Saur issued a blue bond focusing on the production and distribution of water, the collection and treatment of wastewater and water desalination, using technologies aimed at minimising environmental impact.

	Date/ Maturity	Amount	Use of Proceeds	Label
	July 2024	USD 70 million	The resources will be used to finance projects focusing on reforestation the regeneration of natural forests on degraded land, mangrove conservation on or restoration, climate-smart agriculture, wildlife habitat restoration, among others	Biodiversity bond
	Oct & Dec 2024 5 & 10 year	USD 184 million & USD 440 million	Reforestation, restoration and conservation projects	Biodiversity bond
	Oct 2024 10 year	USD 100 million	Protect, restore and enhance sustainable management of biodiversity and nature	Biodiversity and mature theme bond

### Biodiversity bond funds

New debt funds, such as Goldman Sachs Asset Management’s biodiversity bond fund, are taking significant steps toward financing solutions that not only conserve and restore but also actively reduce pressures on ecosystems. Such funds recognise that sustainable finance must extend beyond conservation to include mechanisms that fundamentally change the way we interact with nature.

- The fund invests in both labelled and unlabeled bonds, with labelled bonds required to fund biodiversity-related projects and comply with ICMA GSS Bond Principles. Unlabeled bonds are issued by companies whose activities support the conservation and restoration of biodiversity or a reduction of the drivers of biodiversity loss (ie, waste and water utilities).
- The selection of labelled bonds is based on company revenues supporting biodiversity conservation and alignment with Goldman Sachs’ sustainable investing framework and the UN’s Sustainable Development Goals (SDGs), specifically targeting clean water, responsible consumption, and biodiversity.

The IFC Biodiversity Finance Reference Guide<sup>34</sup> provides numerous examples of asset-related expenditures that can be classified as “biodiversity-related”. It also worked on a Biodiversity Finance Metrics for Impact Reporting document<sup>35</sup>. Both of these documents contribute to discussions on what can be understood as biodiversity finance,

towards a more holistic approach that addresses the drivers of biodiversity loss.

### Debt-for-nature swaps

Debt-for-nature swaps are financial arrangements in which a portion of a country’s foreign debt is forgiven or reduced in exchange for commitments to invest in environmental conservation or sustainable development projects.

The country commits to using the funds saved from the debt relief to finance specific conservation initiatives, such as protecting biodiversity, restoring ecosystems, or implementing sustainable land-use practices. Please refer to **Appendix 4** for examples of countries that have engaged in debt-for-nature swaps.

Debt-for-nature swaps and other outcome-based bonds have set a crucial precedent by linking financial incentives to measurable environmental outcomes.

Debt-for-nature swaps have limited scalability for the corporate universe without levers at hand to restore nature as for a sovereign. Conservation, protection and restoration of biodiversity indicators to which a sovereign commits cannot necessarily be used by corporates. Nonetheless, other nature-related outcome-based financial instruments could be used by private issuers to highlight their nature strategies.

## Landscape-scale Reforestation Opportunities for Financial Institutions

Financial institutions have a transformative opportunity to invest in landscape-scale reforestation projects that adhere to the highest biodiversity standards, aligning with the GBF adopted at COP15 and reinforced by frameworks like the Global Biodiversity Standard (TGBS) launched at COP16 in 2024. These investments not only support nature-positive outcomes but also bolster economic resilience by enhancing ecosystem services and natural capital, critical for sustainable development in Asia and beyond.

### COP15 and COP16 Alignment

Reforestation at scale directly supports COP15's Target 2, aiming to restore 30% of degraded ecosystems by 2030, enhancing biodiversity and ecosystem services. Building on this, COP16 introduced the TGBS, a voluntary certification developed by Botanical Gardens Conservation International and partners, which provides a rigorous framework for assessing and verifying biodiversity outcomes in restoration projects. This standard emphasises measurable gains in species diversity, ecosystem health, and community benefits, offering financial institutions a tool to ensure investments deliver credible nature-positive impacts.

### Biodiversity and Ecosystem Service Benefits

Landscape-scale reforestation, when guided by high biodiversity standards such as those in TGBS, can increase biodiversity by 15-84% compared to degraded lands, with vegetation structure improving by 36-77%. Projects like the Appalachian Region Reforestation Initiative, which restored 87,000 acres of former mine sites, demonstrate how native species planting and ecological connectivity can revive habitats and support species recovery. Ecosystem services—carbon sequestration, water regulation, and soil conservation—are valued at thousands of dollars per hectare annually, with carbon markets providing additional revenue streams at current prices of approximately \$50 per ton of CO<sub>2</sub>.

### Economic and Investment Potential

The economic case is compelling: restoration benefits often exceed costs by a 10:1 ratio, making reforestation a cost-effective investment. In Asia, where deforestation has degraded 30% of forest cover since 1990, projects aligned with COP15 and COP16 goals can tap into growing demand for nature-based solutions (NbS). For instance,

China's Grain-for-Green Program, the world's largest reforestation effort, shows mixed forests yielding biodiversity gains when adhering to diverse planting standards, offering a model for targeted financings. In Hong Kong, urban forests provide air quality and recreational benefits, suggesting local potential for similar investments, supported by regional willingness to pay for restoration (e.g., 238 yuan per mu yearly in Jiangxi, China).

### Implementation Best Practices

To maximise impact, investments should:

- Protect existing forests to prevent further loss, per the "Ten Golden Rules for Reforestation".
- Use native species and diverse plantings, as mandated by TGBS, to enhance resilience and biodiversity.
- Leverage landscape context, targeting areas with less fragmented habitats for greater ecological connectivity.
- Engage local communities to ensure sustainability, as seen in South Korea's reforestation success, which boosted forest cover by over 60% since the 1950s.

### Opportunities for Financial Institutions

Targeted financings in reforestation can include:

- Protection & Conservation: Funding to safeguard intact forests and restore degraded ones, reducing financed biodiversity footprints.
- NbS: Supporting projects that sequester carbon and improve water security, aligning with TNFD's disclosure framework for nature-related risks and opportunities.
- Debt-for-Nature Swaps: Structuring deals to fund reforestation in biodiversity hotspots, reducing sovereign debt while enhancing natural capital. Please refer to **Appendix 4** for examples of Debt-for-Nature Swaps.

By integrating the GBF from COP16, financial institutions can verify biodiversity outcomes, enhancing credibility with regulators, investors, and stakeholders. This positions reforestation as a flagship investment for COP15 and COP16-aligned portfolios, driving economic resilience and environmental sustainability in nature-positive sectors.

## Payment for Ecosystem Services



Payment for Ecosystem Services (PES) provide financial incentives to landowners or resource managers for managing their land in ways that enhance or preserve ecosystem services, which are the benefits that natural environments offer to society. These services can include clean water, carbon sequestration, biodiversity conservation, and flood regulation, among others. PES schemes typically involve voluntary agreements between service providers—such as farmers or landowners—and beneficiaries, such as governments, NGOs, or private companies. The beneficiaries compensate the providers for their efforts to maintain or improve these ecosystem services, helping to offset the opportunity costs that landowners may incur by altering their land-use practices.

PES programs can be implemented in various contexts, such as reforestation projects that generate carbon credits or watershed protection initiatives that pay landowners to adopt practices that improve water quality. By valuing and compensating for ecosystem services, PES can incentivise conservation, promote sustainable resource management, and contribute to biodiversity protection. However, challenges remain, including ensuring fair distribution of payments, accurately measuring and monitoring ecosystem services, and securing long-term funding for these initiatives. Overall, PES represents a promising approach to align economic interests with environmental stewardship, encouraging practices that benefit both people and nature.





## Voluntary Carbon Markets and Biodiversity Credit Markets: Mobilising Private Capital for Measurable Nature Outcomes

The fight to protect nature is finding new allies in voluntary carbon and biodiversity credit markets—innovative tools turning conservation into investable opportunities. While still evolving, these markets are proving that environmental action can align with financial rationale, creating pathways to fund everything from forest restoration to coral reef recovery.

The voluntary carbon market, worth US\$2 billion annually in 2023, shows how private finance can support nature-based climate solutions. Projects protecting mangroves or restoring peatlands don't just lock away carbon—they create havens for wildlife and strengthen ecosystems. Many of these initiatives now highlight biodiversity benefits, responding to growing demand from companies and investors who want their climate spending to do more. But carbon markets alone aren't enough.

In parallel, an emerging biodiversity credit market is being established to create explicit, measurable, and tradable units of positive biodiversity outcome — such as habitat restoration, species recovery, or avoided biodiversity loss. As defined by the Biodiversity Credit Alliance (2024), biodiversity credits are distinct from carbon credits: they are not linked to greenhouse gas accounting but focus directly on biodiversity gains and ecosystem integrity. Both markets can contribute to the goals of the GBF — but it is essential to maintain clear boundaries and scientific integrity between them. Biodiversity credits must not be treated as mere co-benefits within carbon markets, nor should biodiversity outcomes be offset against carbon emissions.

### Types of Biodiversity Credits

<p>Avoided Loss</p> 	<p>Credits maintain their value if biodiversity levels remain stable, with increases tracked when biodiversity indicators exceed those of a referenced site.</p>
<p>Preserving Loss</p> 	<p>Credits are utilised to minimise threats to biodiversity, ensuring its maintenance through sustainable management plans and financing.</p>
<p>Maintenance</p> 	<p>Credits focus on preserving intact biodiversity through conservation management actions that also protect Indigenous rights.</p>
<p>Uplift</p> 	<p>Credits are generated from ecosystems in need of restoration, necessitating increases in biodiversity indicators.</p>

To ensure credibility, both carbon and biodiversity outcomes must be measured against robust, well-defined baselines, with remote sensing playing a central role in verifying that credits represent verifiable, additional, and durable gains. Establishing a minimum requirement for biodiversity enhancement across both markets is critical to prevent the risk of biodiversity being treated as an incidental or secondary benefit. Biodiversity outcomes should be incorporated through dedicated methodologies and metrics, and explicitly recognised in credit frameworks. It is essential for the credibility of the market to ensure that biodiversity credits represent genuine, measurable, and durable improvements — not merely marketing claims.

Please refer to the table below for suggested pathways for voluntary trading, including carbon and biodiversity credits, and specific recommendations for credits to find success.

### Detailed Recommendations for Voluntary Biodiversity Credit Markets

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#### Opportunities in voluntary biodiversity credit markets:

The emerging biodiversity credit market enables capital to flow directly into biodiversity-positive actions, supporting GBF Targets 1, 2, and 8.

The carbon market, when implemented with strong safeguards, can also support projects that deliver both carbon sequestration and biodiversity gains — but biodiversity outcomes must be measured, reported, and valued independently.

Voluntary markets can finance nature-positive transition strategies in high-impact sectors (agriculture, forestry, fisheries), aligned with TNFD frameworks.

Integrated, landscape-scale projects can generate both carbon and biodiversity credits — with separate but complementary accounting and MRV systems.

#### To fully realise their potential:

Both carbon credit and biodiversity credit markets must adopt high scientific standards and align with GBF targets — not serve merely as marketing add-ons.

Where appropriate, blended finance structures or integrated projects can deliver both types of credits — with transparent separation of impacts and accountability in MRV.

Strong social safeguards must underpin both markets, respecting the rights of Indigenous Peoples and Local Communities (Biodiversity Credit Alliance, 2024).

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30. <https://www.nbcnews.com/news/us-news/us-honey-bee-deaths-soar-grocery-store-bills-take-hit-rcna199066>

31. <https://www.ucl.ac.uk/bartlett/sites/bartlett/files/executive-summary-economics-of-water-2.pdf>

32. Source: Authors

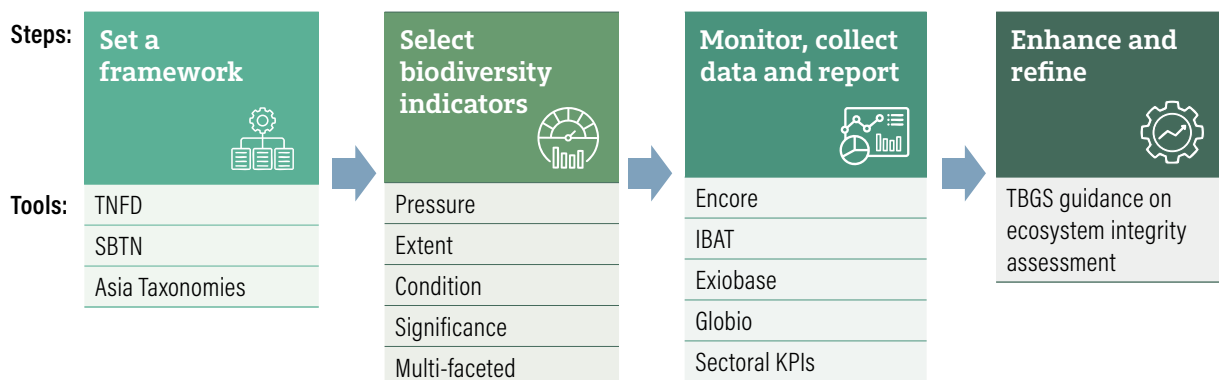
33. Saur sustainability-linked financing framework. <https://dnr54354splcz.cloudfront.net/publications/Saur-Sustainability-Linked-Financing-Framework-May-2024-update-v2.pdf?v=1715961464>

34. Biodiversity Finance Reference Guide, <https://www.ifc.org/content/dam/ifc/doc/mgrt/biodiversity-finance-reference-guide.pdf>

35. Biodiversity Finance Metrics for Impact Reporting: Supplement to IFC Biodiversity Finance Reference Guide <https://www.ifc.org/content/dam/ifc/doc/2024/ifc-biodiversity-finance-metrics-for-impact-reporting.pdf>

# Pathways to Biodiversity-Informed Financial Decisions

Standards, Metrics and Indicators in Sustainable Finance: Methods for measuring sustainability for finance and corporates and their application to nature



Regulations on disclosure standards are increasingly driving the market to integrate nature and biodiversity considerations into business operations and strategy. The adoption of global standards, targets and taxonomies is essential for effectively measuring and tracking biodiversity outcomes and managing related risks.

Biodiversity disclosure and target-setting standards are multiplying (TNFD, ISSB, GRI, SBTN, Cisl, ECB guide). The first release of a science-based targets for nature standard (SBTN, the equivalent of SBTi for climate) was published in 2023.

A few principles emerge as necessary for companies to fully understand their interactions with nature and biodiversity. Most of them refer to nature-related dependencies, impacts, risks and opportunities and are baked into disclosure frameworks. These principles and frameworks will be covered in detail in the section “Pathways to biodiversity-informed financial decisions, inclusive of taxonomies, TNFD and SBTi.”

## The Taskforce on Nature-related Financial Disclosure (TNFD): Bridging Finance and Biodiversity

In September 2023, the Taskforce on Nature-related Financial Disclosures (TNFD) released its final Nature-related Risk and Opportunity Management and Disclosure Framework (TNFD, 2023). Designed to mirror the Task Force on Climate-related Financial Disclosures (TCFD) for climate, this voluntary framework provides standardised metrics for corporates and financial institutions

to assess, report, and act on their biodiversity impacts and dependencies. Its core metrics, divided into global (cross-sector) and sector-specific (e.g., mining, agriculture), aim to enhance comparability and transparency in nature-related financial risks.

Over 500 companies and financial institutions have committed to getting started with voluntary reporting of their nature-related issues in line with the TNFD recommendations. Drawn from 54 countries or areas and across 62 of 77 the Sustainability Accounting Standards Board (SASB) Sustainable Industry Classification System (SICS) sectors, the publicly-listed companies represent over US\$ 6.5 trillion in market capitalisation. 129 financial institutions are now registered as TNFD adopters, representing US\$ 17.7 trillion in assets under management, including 25% of the world’s systemically important banks.

Following the TNFD framework launch in Hong Kong in April 2024, twelve local companies have committed to piloting the framework in their corporate reporting by the financial year 2024 (or earlier) or 2025. This demonstrates a growing recognition of the importance of integrating nature-related risks and opportunities into business strategy and decision-making.

Local capacity-building initiatives are also growing: the Hong Kong Green Finance Association and the Business Environment Council have jointly launched the TNFD Hong Kong Consultation Group as co-conveners, while the Institute of Finance and Sustainability has launched the Consultation Group in Mainland China, highlighting increasing interest and action on corporate reporting on nature.

## Core Elements of the TNFD Recommendations<sup>32</sup>



### Why TNFD Matters for Financial Institutions

The TNFD recommendations can be adopted by corporates assessing their own impacts and dependencies or by financial institutions applying the recommendations to their portfolio. For banks, insurers, and investors, TNFD adoption is not merely an extension of ESG reporting but a paradigm shift requiring new due diligence processes for their financed, facilitated, investment and/or insured activities and assets which may be most appropriate to assess by sector, geography and asset class. Unlike corporates, financial institutions must account for:

1. **Financed Impacts and Dependencies**
  - **Financed impacts:** The biodiversity damage caused by portfolio companies (e.g., deforestation linked to a loan to a palm oil producer).
  - **Financed dependencies:** The risks to portfolio value from ecosystem degradation (e.g., a fishery investment reliant on healthy coral reefs).
  - **Example:** A bank's agricultural loan book might face stranded asset risks if soil erosion reduces crop yields.
2. **The "Double Materiality" Challenge**  
TNFD requires institutions to assess both:
  - **Outward impacts** (how their financing harms nature) and
  - **Inward risks** (how nature loss threatens their portfolios).

### Applying TNFD: A Roadmap for Financial Institutions

The Taskforce has developed an integrated approach, called LEAP, for the assessment and management of nature-related issues for use by financial institutions. It is designed to be used by a team of analysts in an organisation and involves four phases of assessment:

- Locate the interfaces with nature across geographies, sectors and value chains;
- Evaluate dependencies and impacts on nature;

- Assess nature-related risks and opportunities to your organisation; and
- Prepare to respond to nature-related risks and opportunities.

To operationalise TNFD, financial actors can follow the below roadmap, while adapting as needed for different geographies and portfolio types. As organisations become more sophisticated in their understanding of nature-related impacts and dependencies, they should become more detailed and nuanced in their reporting, including things like scenario analysis and upstream and downstream supply chain analysis.

1. **Phase 1: Screening**  
Use tools like IBAT or ENCORE to map portfolio exposure to high-risk sectors (e.g., textiles, food systems).
2. **Phase 2: Deep Dive**  
Apply sector-specific TNFD metrics (e.g., water withdrawal ratios for apparel investments) to prioritise engagement.
3. **Phase 3: Disclosure & Strategy**  
Align TNFD reporting with SFDR (PAIs) and CSRD, while integrating nature into:
  - Credit risk models
  - Loan covenants (e.g., prohibiting deforestation-linked activities)
  - Thematic bonds (e.g., "nature-positive" debt instruments).

### Barriers to Implementation

- **Data gaps:** Most metrics suggested for disclosure by the TNFD require available data about the reporting organisation's operations and those of other entities in its value chain. Depending on the level of environmental consciousness of the organisation, they may have most, some or none of these figures available, and

some may not be available in their geography; this issue reflects both organisations' collection of their own data and lack of reliable global datasets geared to this purpose.

- **Methodological complexity:** Assessing biodiversity impacts lacks standardised approaches, and complexity increases when the impacts and dependencies are those of portfolio companies rather than a company's own.
- **Prioritising mandatory reporting:** Varying geographies require varied ESG-related disclosures, such as TCFD in certain locations. As this landscape shifts and becomes more robust in certain geographies, organisations with limited resources may devote those resources only to mandatory disclosures in order to ensure compliance, with voluntary reporting taking a backseat.

TNFD's true test will be its adoption into mandatory reporting regimes (e.g., EU CSRD, Singapore MAS guidelines). Early movers, however, can leverage it to:

- Reduce regulatory, reputational and other risks,
- Unlock nature-based investment opportunities
- Future-proof portfolios against ecosystem collapse.

In practice, some financial institutions may assess core global metrics, impacts, dependencies, risks and opportunities as outlined in the table below, which serves as a reference on practical application. In the table, the second column provides examples of ways to quantitatively measure the impacts, dependencies, risks and opportunities listed in the first column. TNFD sector-specific guidance materials delve deeper into sector-specific metrics as well, to ensure consistency and accuracy across reporting companies within the same sector.

Core global metrics: Impacts and dependencies	
Climate change	Scope 1, 2 and 3 GHG emissions
	Total spatial footprint (km <sup>2</sup> ): sum of: Total surface area controlled (km <sup>2</sup> ), Total disturbed area (km <sup>2</sup> ), Total rehabilitated/restored area (km <sup>2</sup> )
Land/freshwater/ocean-use change	Extent of land/freshwater/ocean use change, by type of ecosystem and business activity
	Surface conserved or restored: split into voluntary and compliance (km <sup>2</sup> ) by type of ecosystem and business activity
	Total pollutants released to soil, split by type
	Volume of water discharged and concentrations of key pollutants in the wastewater
Pollution/pollution removal	Extent of land affected by type and temperature of water discharge when relevant
	Quantity of hazardous waste generated, by type, disposed of or split into waste streams (e.g., landfill or other disposal, reused, recycled or other recovery operations)
	Plastic footprint (t)
	Total non-GHG air pollutants, by type (PM 5 to 10, NO, SO, NH <sub>3</sub> )
Resource use / replenishment	Quantity and share of natural commodities sourced from land/ocean/freshwater, split by types
	Quantity and share of natural commodities sourced from priority ecosystems
State of nature	Level of ecosystem condition by type of ecosystem and business activity, and species extinction risk
Core global metrics: Risks and opportunities	
Nature-related risks	Value of assets, liabilities, revenue and expenses that are assessed as vulnerable to nature-related transition and physical risks (total and proportion of total)
	Description and value of significant fines/penalties received/litigation action in the year due to negative nature-related impacts
Nature-related opportunities	Increase and proportion of revenue from products and services producing demonstrable positive impacts on nature with a description of impacts

Such metrics and reporting, gathering steam and adopters around the world, will help in better understanding the risks and opportunities for corporates and financial institutions and are intended not just as a compliance or reporting exercise, but also to inspire action. Reporting should not be seen as a substitute for action or a prerequisite but rather complementary: understanding one's impacts and dependencies on nature should be a first step of many, moving an organisation towards mitigating risks and capturing opportunities arising from its nature-related impacts and dependencies.

Please refer to **Appendix 5 and 6** for details on the TNFD's LEAP framework and its application for financial institutions, and LEAP core entry points for financial institutions.

## The Science Based Targets Network (SBTN)

The SBTN is an initiative aimed at helping companies establish science-based targets to reduce their impact on nature, focusing on key performance indicators (KPIs) related to land use and water resources.

### Addressing SBTN Targets through Landscape Approaches

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Achieving a vision of halted nature loss requires more than isolated conservation efforts or corporate emissions reductions. It demands systemic, landscape-scale change. A landscape approach offers a strategic and integrated pathway to align nature-based solutions (NbS) with broader environmental, social, and economic goals across diverse ecosystems and jurisdictions.

While NbS—such as reforestation, sustainable agriculture, and wetland restoration—are often implemented as small-scale projects, their impact is significantly enhanced when embedded within a coordinated landscape strategy. This approach ensures that actions are aligned with the ecological and socio-economic goals of the entire landscape and engaging multiple stakeholders in collective goal setting. By addressing interconnected issues like deforestation, water security, and biodiversity loss at scale, landscape approaches enable more effective and resilient outcomes.

Research shows that landscape-scale interventions are not only more cost-effective but also crucial for capturing a broader range of ecosystem services. They reduce environmental risks like leakage (where environmental harm is displaced elsewhere), project reversals, and lack of additionality, thereby increasing the integrity and longevity

Extending from the climate target setting standard SBTi, the SBTN proposes new nature-related target setting methodologies aligned with science. SBTi has been a key element in building robust corporate climate strategies over time.

#### 1. Land Use:

- **No Conversion of Natural Ecosystems:** Avoid any conversion of natural lands after a reference date (2020) and remediate prior conversions.
- **Reduction of Land Footprint:** Limit the area of agricultural land used by the company's activities by calculating the total agricultural footprint and setting reduction targets.
- **Landscape Engagement:** Participate in landscape initiatives that promote the regeneration and restoration of ecosystems, committing to projects covering at least 10% of the company's land impact.

of NbS. For businesses, this means that investments in NbS across landscapes can better reflect local priorities and deliver meaningful environmental outcomes.

Financial institutions have a vital role to play. By embedding landscape approaches into investment strategies, institutions can both manage their environmental risks and unlock new opportunities. Encouraging clients and investees to support landscape initiatives and high-quality NbS also amplifies the environmental and economic benefits across entire value chains.

Landscape approaches are also embedded in the Science Based Targets for Nature (SBTN), particularly under its guidance for setting landscape targets. These targets recognise that achieving meaningful environmental outcomes—such as halting ecosystem conversion or restoring degraded areas—requires landscape-level planning. For financial institutions, supporting landscape targets allows them to align portfolios with robust nature-related goals and reduce risks. Integrating SBTN-aligned landscape targets into financing strategies helps ensure that investments are not only nature-aligned at the asset level but also reinforce environmental outcomes at scale.

## 2. Water Resource Use:

- **Freshwater Quantity Target:** Measure and limit water withdrawals based on hydrological models specific to each watershed, establishing necessary reductions in water stress.
- **Freshwater Quality Target:** Focus on nutrient pollution, such as nitrogen and phosphorus, and set targets to reduce the load of these nutrients in aquatic systems.

These proposals aim to encourage companies to adopt sustainable practices and contribute to the preservation of ecosystems.

The thematic adds to the complexity of setting such targets that are not mainstream among corporates or can be complex to set as they may demand local assessments. Yet, they provide relevant indications on the pathways on which corporates should engage.

## Taxonomies

Taxonomies of sustainable economic activities have a significant role to play in channelling financings towards nature-related investments.

Taxonomies have multiplied globally. More than 40 taxonomies have been published or are in development so far. They have been heterogeneous in the way they design criteria for economic activities to be considered sustainable and the number of environmental objectives they cover: climate change mitigation / adaptation, biodiversity, water, pollution and circular economy. Very few have integrated all nature-related aspects, yet increasing efforts are being made to better identify activities contributing to halting and reversing nature loss.

## Representative Examples of Biodiversity Taxonomies in Asia

Jurisdiction	Status	Details
Hong Kong SAR	Under development	<p>The Hong Kong Monetary Authority (HKMA) is drafting phase 2 of Hong Kong's Sustainable Finance Taxonomy. Industry recommends the inclusion of biodiversity criteria aligned with:</p> <ul style="list-style-type: none"> <li>• China's green taxonomy (given cross-border financing links).</li> <li>• TNFD recommendations (e.g., mangrove restoration, blue bonds).</li> </ul> <p>Focus areas:</p> <ul style="list-style-type: none"> <li>• Marine ecosystems (e.g., coral reef protection in the Greater Bay Area).</li> <li>• Urban biodiversity (e.g., green infrastructure financing).</li> </ul>
People's Republic of China <sup>37</sup>	In force (partial inclusion in green taxonomy)	<p>The China Green Bond Endorsed Projects Catalogue (2021) includes biodiversity protection (e.g., wetland restoration).</p> <p>Ecological Civilisation policies mandate "red lines" for protected areas, influencing credit risk assessments.</p>
Singapore <sup>38</sup>	Under development	<p>The Singapore-Asia Taxonomy (MAS) will include biodiversity criteria alongside climate, likely referencing TNFD.</p> <p>Focus on marine/coastal ecosystems (aligning with ASEAN priorities).</p>
Japan <sup>39</sup>	In force (integrated into existing taxonomy)	<p>Japan's Green Transition Taxonomy (2023) includes "biodiversity conservation" as a qualifying activity (e.g., reforestation bonds).</p> <p>Criticism: Limited to terrestrial ecosystems (no marine criteria yet).</p>
Malaysia <sup>40</sup>	Under development (2025 target)	<p>Part of the ASEAN Taxonomy, with biodiversity safeguards for palm oil, forestry, and mining sectors.</p> <p>Pilot testing nature-positive loan frameworks.</p>

## The ASEAN Taxonomy for Sustainable Finance

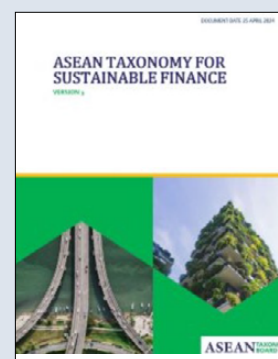
The ASEAN taxonomy for sustainable finance incorporates the protection of healthy ecosystems and biodiversity and paves the way for a comprehensive approach to nature, including both the reduction of the drivers of biodiversity loss and conservation and restoration. In the ASEAN taxonomy, biodiversity and nature are considered through the third environmental objective: Protection of Healthy Ecosystems and Biodiversity.<sup>41</sup>

Its principles include the following, while minimising or eliminating any direct or indirect adverse effects on the natural ecosystem and biodiversity:

- Enable ecosystem restoration and/or facilitate the protection of ecosystems
- Implement necessary measures to protect ecosystems and biodiversity, including but not limited to actions such as the adoption of sustainable logging practices and ensuring timber products are sourced from sustainably managed forests
- Enforce and empower existing policies related to the protection of natural areas

- Take into consideration the sustainable and equitable use of biodiversity and ecosystem services
- Substantially contribute to environmental protection from pollution by improving levels of air, water and/or land quality, including the cleaning up of litter and other pollution
- Substantially contribute to achieving good environmental status of bodies of water, through protection, preservation or restoration mechanisms; including improving water management and efficiency activities, as well as promoting the sustainable use of water through the long-term protection of available water resources

This approach not only focuses on enabling conservation or restoration of natural capital but also on the minimisation of negative impacts on biodiversity.



## Assessing and Measuring Biodiversity

As sustainable finance continues to grow, robust metrics and indicators are needed to effectively measure and report on the sustainability performance and nature-related impacts of financed activities. Several types of metrics and indicators are emerging, each with strengths and limitations depending on the use case. Here, we analyse key metrics and indicators, drawing on guidance from GBS to enhance their application to nature and the ways in which they can be applied.

### Biodiversity Indicators






When studying biodiversity, scientists often use various indicators to assess the health and status of ecosystems. Three important types of biodiversity indicators are Extent, Condition and Significance, each of which are described in the next section "Types of Biodiversity Indicators." These indicators are best used within a local context, however can be challenging to consolidate at corporate or portfolio levels.

Even if such metrics cannot be directly used at portfolio level to set a trajectory, their understanding is still necessary in order for organisations to select the right sectoral proxies and set target proxies. Such indicators can be categorised into two broad categories:

- Pressure-related indicators: These quantify drivers of nature loss, such as land-use change, pollution, overexploitation and invasive species. Examples include SO<sub>x</sub> or NO<sub>x</sub>, water withdrawals and rehabilitated surfaces. These metrics are often easier to measure at scale using geospatial and supply chain data, supporting portfolio-level assessments. A key limitation is that they measure pressures rather than the state of nature itself, requiring complementary indicators for a full picture.
- Indicators related to practices which reduce pressures on ecosystems, such as: regenerative agriculture practices and the integration of secondary raw materials in production processes provide a practicable proxy for organisations to assess, measure and engage on reducing their impacts on nature

The UN Environment Programme World Conservation Monitoring Centre (UNEP WCMC) sectorial materiality tool, and definition of pressure categories presented in the table below are often used in the field to measure and assess biodiversity and provide a practicable proxy for organisations to assess, measure and engage on reducing their impacts on nature.

Such indicators refer to the five drivers of biodiversity loss set forward by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). These five drivers can be monitored through a variety of indicators for which the relevance will depend on sector and geographical context.

Nature-related issue	Pressure category	Definition
Land/Water/Sea Change 	Terrestrial ecosystem use	Examples include area of agriculture by type, area of forest plantation by type, area of open cast mine by type, etc.
	Freshwater ecosystem use	Examples include area of wetland, ponds, lakes, streams, rivers or peatland necessary to provide ecosystem services such as water purification, fish spawning, areas of infrastructure necessary to use rivers and lakes such as bridges, dams, and flood barriers, etc.
	Marine ecosystem use	Examples include area of aquaculture by type, area of seabed mining by type, etc.
Resource Exploitation 	Water use	Examples include volume of groundwater consumed, volume of surface water consumed, etc.
	Other resource use	Examples include volume of mineral extracted, volume of wild-caught fish by species, number of wild-caught mammals by species, etc.
Climate Change 	GHG emissions	Examples include volume of carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), Sulphur hexafluoride (SF <sub>6</sub> ), Hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), etc.
Pollution 	Non-GHG air pollutants	Examples include volume of fine particulate matter (PM <sub>2.5</sub> ) and coarse particulate matter (PM <sub>10</sub> ), Volatile Organic Compounds (VOCs), mono-nitrogen oxides (NO and NO <sub>2</sub> ) commonly referred to as NO <sub>x</sub> , Sulphur dioxide (SO <sub>2</sub> ), Carbon monoxide (CO), etc.
	Water pollutants	Examples include volume discharged to receiving water body of nutrients (e.g., nitrates and phosphates) or other substances (e.g., heavy metals and chemicals).
	Soil pollutants	Examples include volume of waste matter discharged and retained in soil over a given period.
	Solid waste	Examples include volume of waste by classification (i.e., nonhazardous, hazardous, and radioactive) by specific material constituents (e.g., lead, plastics), or by disposal method (e.g., landfill, incineration, recycling, specialist processing).
Invasive Species 	Disturbances	Examples include decibels and duration of noise, lumens and duration of light, at site of impact.
	Biological alterations/interferences	Examples include number of non-native and invasive animals or plants released by species, area of agriculture with genetically modified organisms or reduced genetic diversity, number of animals at risk of catching cattle-transmitted disease by species, etc.

Source : UNEP WCMC Sectorial materiality tool, available [https://www.icmagroup.org/assets/documents/Sustainable-finance/2022-updates/Registry-SLB-KPIs\\_Final\\_2022-06-24-280622.xlsx](https://www.icmagroup.org/assets/documents/Sustainable-finance/2022-updates/Registry-SLB-KPIs_Final_2022-06-24-280622.xlsx)

## Key Biodiversity Indicators

Biodiversity indicators provide localised, direct measurements of biodiversity and ecosystem attributes. These metrics, assessed through field surveys and remote sensing, form the basis of TGBS assessments. They enable granular measurement of outcomes at the asset/project level; however, data collection can be resource-intensive, making these metrics harder to scale across portfolios. The following are key indicators for financial institutions' consideration. Please refer to **Appendix 7** for details on the GBF Indicators Platform.

### Extent Indicators

Extent indicators refer to measures that assess the size and distribution of biodiversity within a specific area. They help scientists understand how much of a particular habitat or ecosystem type exists and how it is distributed across the landscape.

Key points of extent indicators include:

- **Area Covered:** This includes measuring the total area of different ecosystems, such as forests, wetlands, or grasslands. For example, the extent of a rainforest might be quantified in square kilometers.
- **Fragmentation:** This measures how much a habitat is broken up into smaller, isolated patches. Increased fragmentation can lead to reduced biodiversity because it affects species' ability to move, find mates, and access resources.
- **Habitat Loss:** This looks at how much habitat has been lost over time due to human activities like urban development, agriculture, or deforestation.

### Condition Indicators

Condition indicators, on the other hand, assess the health and quality of ecosystems and the species within them. These indicators help scientists understand how well an ecosystem is functioning and whether it can support diverse life forms.

Condition indicators include:

- **Biodiversity Levels:** This includes measuring the number of species present (species richness) and their abundance. A healthy ecosystem typically has a high diversity of species.
- **Mean species abundance:** used to assess the overall health and biodiversity of an ecosystem by measuring the average abundance of species within a specific area or habitat. It reflects the number of individuals of different species present, providing insights into the richness and distribution of biodiversity in a given ecosystem.

- **Potentially disappeared fraction:** used to assess the risk of species extinction and the overall health of ecosystems. This indicator helps to quantify the proportion of species that are threatened or likely to be lost from a specific habitat or geographic area due to factors such as habitat destruction, climate change, pollution, and other anthropogenic pressures.
- **Biodiversity integrity index (BII):** a composite indicator used to assess the health and integrity of ecosystems by evaluating their biodiversity. It is particularly useful in conservation biology and environmental management (please see Box X below).
- **Ecosystem Health:** This can be assessed through various metrics such as the presence of native species versus invasive species, the quality of habitat, or the presence of key functional groups (like pollinators).
- **Environmental Quality:** This involves measuring factors like soil quality, water quality, and the presence of pollutants. Healthy ecosystems often have clean water and nutrient-rich soils.

### Significance indicators

Species significance indicators are metrics used to assess the importance of particular species within an ecosystem or for biodiversity as a whole. These indicators help researchers and conservationists understand the role that specific species play in their environments and the implications of their presence or absence.

- i. **Endemism:** The degree to which a species is native to a specific geographic area and not found elsewhere. Endemic species are often of high significance because their loss would mean extinction.
- ii. **Rarity:** This includes metrics like population size, distribution range, and habitat specificity. Rare species are significant because they may be more vulnerable to extinction and often indicate the health of their ecosystems.
- iii. **Keystone Species:** Some species have a disproportionately large impact on their environment relative to their abundance. Keystone species play critical roles in maintaining the structure of an ecological community. For example, predators, herbivores, and certain plants can regulate populations of other species and maintain biodiversity.

- iv. **Indicator Species:** These species serve as a proxy for the overall health of an ecosystem. Their presence, absence, or abundance can indicate the condition of the environment. For example, certain amphibians are sensitive to pollution and habitat change, making them valuable indicator species of ecosystem health.
- v. **Functional Groups:** This involves categorising species based on their ecological roles (e.g., pollinators, decomposers, primary producers). Understanding the diversity of functional groups can provide insight into the resilience of ecosystems and their ability to provide services.
- vi. **Cultural and Economic Significance:** Some species hold cultural, spiritual, or economic value for communities. This significance can drive conservation efforts and highlight the importance of maintaining biodiversity.

### Multi-faceted/synthetic indicators

These aggregate multiple biodiversity indicators into a single score. Examples include the STAR metric, Biodiversity Intactness Index, and the Singapore Biodiversity Accounting Metric. By simplifying complex data, these tools can help screen investments and track progress across diverse portfolios. However, the underlying models have limitations, and outputs can mask nuances, reducing their precision for site-specific decisions.

### The STAR Metric

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The STAR Metric (Species, Threat, Abundance, and Range) is a biodiversity assessment tool designed to provide insights into the status and trends of species populations and their habitats. It aims to quantify the health of biodiversity by examining multiple dimensions of species information, making it useful for conservation planning and policy-making.

The STAR Metric evaluates four main components:

- **Species:** Identifying the species of interest for assessment.
- **Threat:** Assessing the threats facing each species, such as habitat loss, climate change, or invasive species.
- **Abundance:** Measuring the population size or density of species within a specific area.
- **Range:** Evaluating the geographical distribution of species and any changes over time.

It provides a comprehensive framework for understanding species status, helping to identify those that are at risk and require conservation action. By integrating multiple dimensions of data, it allows for a more nuanced view of biodiversity.

The metric can be applied at various scales, from local to global, and can inform conservation strategies, policy decisions, and resource allocation. It helps prioritise species and habitats that need urgent attention based on their threat levels and population dynamics.

The STAR Metric can be visualised in various formats, such as maps or dashboards, making it accessible for stakeholders, including conservation organisations, policymakers, and the public. It is available in IBAT.

## The Singapore Biodiversity Accounting Metric

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Inspired by the emergence of the DEFRA Biodiversity Metric used to quantify a net gain in biodiversity for development projects in England, the Singapore Biodiversity Accounting Metric (SGBA) is a framework and method that quantifies the value of biodiversity of habitats within a given area.

Singapore's rapid urbanisation presents a significant challenge for biodiversity, as competing land-use demands put pressure on natural habitats and threaten local ecosystems. Traditional planning approaches have often struggled to effectively measure and integrate biodiversity value into decision-making, creating a gap between development needs and conservation objectives. Furthermore, with immediate action needed to reverse biodiversity loss to overcome the biodiversity crisis, it's clear that valuation and quantification approaches are required to help organisations to consider biodiversity in their decision making. The emergence of nature-related disclosure frameworks, such as the TNFD and nature markets, means that there is likely to be growing demand for such approaches as businesses start to consider their nature impacts and dependencies and require data to do so.

The metric provides a robust, science-based method for evaluating the impact of land-use changes and conservation actions on local biodiversity, using metrics aligned to Singapore's unique urban and ecological context. Whilst the framework was predominantly designed to measure, monitor, and report on the quantity and quality of biodiversity within development sites and natural areas in Singapore, it can also be used to quantify the biodiversity value of land or aid the prediction of quantified biodiversity gain of NbS or nature restoration projects.

The SGBA works by quantifying biodiversity using a combination of habitat area, condition, and ecological distinctiveness scores. The metric is grounded in the principle that maintaining and enhancing diverse and high-quality habitats supports ecosystem resilience and long-term sustainability in urban landscapes, which follows the definition of 'ecosystem condition' as defined by organisations such as TNFD.

Assessments are based on field data, habitat mapping, and ecological surveys. The metric compares current site conditions to a reference or baseline scenario, calculating changes in biodiversity value as a result of proposed developments or restoration efforts. Results are typically

expressed in 'biodiversity units' to facilitate like-for-like comparisons and track progress towards no net loss or net gain of biodiversity.

The two core components of the metric which produce the biodiversity unit values are:

- **Habitat Distinctiveness:** habitat distinctiveness values act as proxies for the average biodiversity value a given habitat type typically provides. The distinctiveness value of parcels of the same habitat type will always have the same distinctiveness value. The distinctiveness value of each habitat type has been derived using extensive survey datasets and expert judgement.
- **Habitat Condition:** the condition of a particular habitat type. This is the biodiversity value of the habitat relative to other parcels of habitat, of the same type. For example, three parcels of freshwater swamp forest, will share the same distinctiveness, but may be of varying condition. Condition values that can be selected in the Metric include Poor, Moderate, and Good.

The SGBA acts as a practical tool for planners, developers, and policymakers, supporting decisions that balance development needs with conservation priorities. It helps identify opportunities to avoid, minimise, or offset ecological impacts, and to direct investments towards areas and interventions that achieve the greatest biodiversity benefit.

Given the metric can be used at multiple spatial scales—from individual sites to precincts and across Singapore—the metric has been adapted and integrated into nature market approaches, such as the Natural Capital Index being designed for Napital's Natural Capital Initiative Projects across Southeast Asia.

Overall, the framework helps inform urban planning, environmental impact assessments, and corporate sustainability reporting, as well as predicting and quantifying biodiversity benefits in nature recovery projects, with the overall aim of transposing biodiversity value into a single, comparative, numerical form, to help decision makers with little to no knowledge of the natural world, understand conservation and restoration priorities.

### Example of the Habitat Distinctiveness Criteria that area applied to all habitat types

Distinctiveness Criteria - Terrestrial				
Criteria	High (3)	Medium (2)	Low (1)	Zero (0)
<b>Species Richness:</b> the total number of flora (vascular plant) and fauna (bird, butterfly, odonate, amphibian, reptile, mammal) species that can be encountered within the habitat, excluding introduced fauna species.	High flora and fauna species richness (>900 species)	Moderate flora and fauna species richness (300 to 899 species)	Low flora and fauna species richness (<300 species)	Very low flora and fauna species richness (0 species)
<b>Irreplaceability:</b> the difficulty of recreating, or replacing the habitat to its ecologically optimal structure and species composition via human intervention, natural or accelerated succession within 30 years. This also includes the degree of biodiversity, endemism, and ecological (biotic and abiotic) dynamics required to establish an effectively functioning habitat.	Impossible to recreate/replace (e.g., primary or old secondary rainforest dominated vegetation)	Difficult to recreate/replace (e.g., native-dominated secondary coastal forest)	Easy to recreate/replace (e.g., common habitat in Singapore, such as abandoned-land)	Not ideal to recreate/replace for biodiversity
<b>Rarity:</b> area of a particular habitat type remaining as a percentage of all terrestrial land mass in Singapore. For intertidal and marine habitats, this is taken as the proportion of land to sea surface area that the habitat covers across Singapore's total coastal area.	Habitat is rare in Singapore (primary forest, native-dominated secondary forest, freshwater swamp forest, (<1%)	In habitat uncommon in Singapore (e.g., abandoned-land, secondary forest, scrubland) (5% to 30%)	Habitat is common Singapore (e.g., urban parkland, farm, golf course, turf, skyline greenery) (>30% species are assumed to support biodiversity and therefore automatically fall under this category)	Habitat is ubiquitous in Singapore (e.g., buildings)
<b>Unique Species:</b> the total number of unique flora (vascular plant) and fauna (bird, butterfly, odonate, amphibian, reptile, mammal) species that can be expected to occur in the habitat. Unique species are those that are not typically found in other habitats.	Supports a high number of unique flora and fauna species (>10 unique species)	Supports some unique flora and fauna species (10 to 14 unique species)	Supports few unique flora and fauna species (<10 unique species)	Does not support any unique flora and fauna species

## The Biodiversity Intactness Index

The Biodiversity Intactness Index (BII) is a metric developed to assess the overall health and intactness of ecosystems in relation to their original biodiversity levels. It provides a way to measure the degree to which biodiversity has been preserved in a given area compared to a baseline or reference state, typically reflecting the conditions prior to significant human impact.

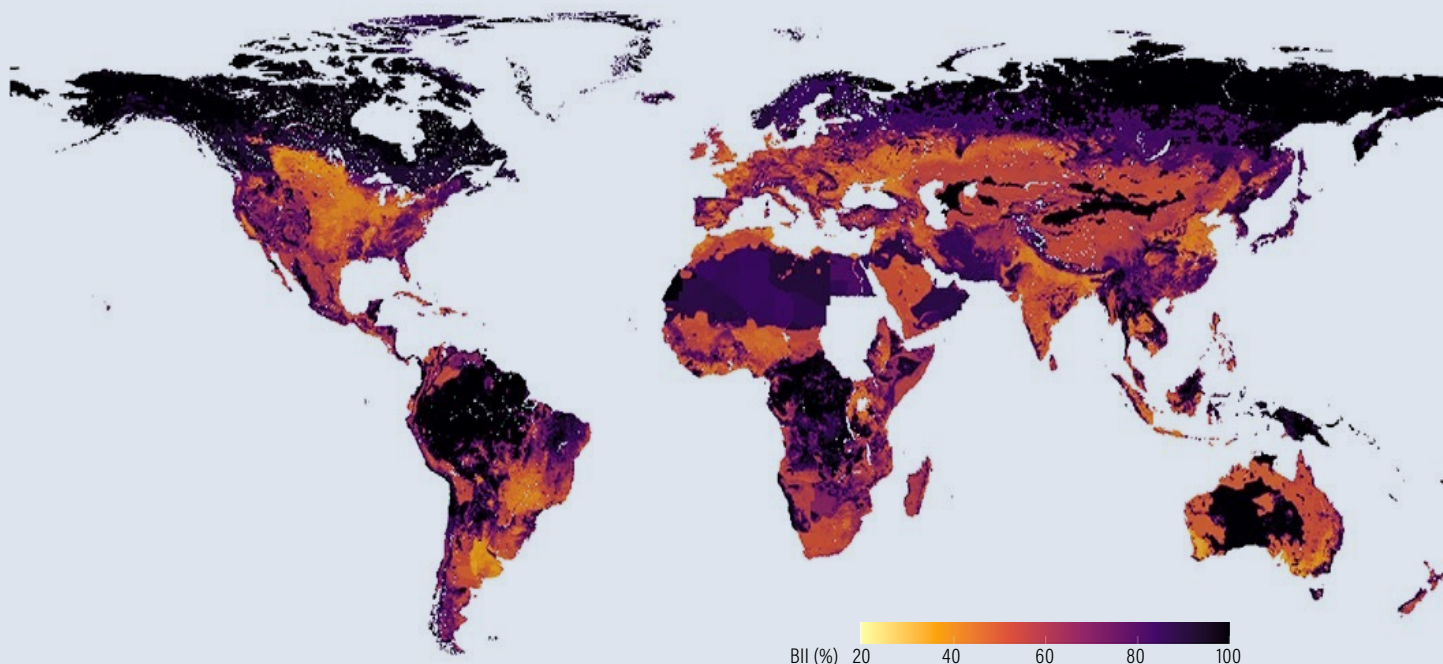
The BII quantifies the proportion of original biodiversity remaining in an ecosystem. It is based on the concept that ecosystems with higher biodiversity are generally more resilient and capable of providing essential services.

The index is calculated using species abundance data and distribution patterns, comparing the current state of biodiversity to a reference state. The BII can be expressed as a percentage, where a higher value indicates greater intactness and lower human impact.

The BII serves as an indicator of ecosystem health and functionality, helping to inform conservation priorities and measure the effectiveness of biodiversity management efforts.

It can be used at various scales, from local to global, allowing for assessments of biodiversity intactness, areas in need of conservation action and where companies may be at risk of ecosystem services disruptions.

### Global map of the biodiversity intactness index (BII)



## Protected Areas and Monitoring Tools

In addition to nature and biodiversity indicators, for conservation purposes, several conventions were designated to protect biodiversity and manage natural resources. Understanding these areas and any operations they have in or near them can help corporates and financial institutions monitor their geographical footprints and assess their impacts on biodiversity. The following tools can support financial institutions' assessment of protected areas. Please refer to **Appendix 8** for details on resources..

### The IBAT tool to monitor asset's geographical exposure

The designations of International Union for Conservation of Nature (IUCN) management areas, regionally, nationally or internally protected areas, and Key Biodiversity Areas, described below, provide valuable frameworks for understanding and protecting biodiversity. Corporates and financial institutions can leverage this information to monitor their geographical footprints, assess risks, and develop strategies that align with biodiversity conservation goals. They all are available in the Integrated Biodiversity Assessment Tool (IBAT, available here), a platform developed by a consortium of NGOs that provides access to a variety of biodiversity data sources in order to inform organisations' decision-making.

#### a. IUCN Management Categories

The IUCN categorises protected areas into different management categories (from I to VI) based on their conservation objectives and the level of human impact. These categories help guide the management and governance of protected areas to ensure the conservation of biodiversity.

#### b. Regional, national or international designations

National designation of protected areas is a crucial strategy for biodiversity conservation, providing legal frameworks to safeguard habitats and species from degradation and loss. Notable examples include the ASEAN Heritage Parks, which celebrate and protect natural sites of exceptional biodiversity across Southeast Asia, promoting regional cooperation in conservation efforts. In Europe, Natura 2000 represents a significant network of protected areas established under the EU's Birds and Habitats Directives, aiming to conserve various habitats and species of European importance. Other significant designations include National Parks and Wildlife Refuges in the United States, which protect vast areas of natural beauty and critical habitats for wildlife.

In Hong Kong, approximately 40% of land is designated as Country Parks and Special Areas, while around 8,517 hectares of marine waters are protected as Marine Parks and Marine Reserve. The city's conservation network also includes an internationally

important wetland recognised under the Ramsar Convention and the Hong Kong UNESCO Global Geopark.

In Australia, the National Reserve System serves as a network of protected areas that helps conserve the country's unique biodiversity. Additionally, World Heritage Sites, designated by UNESCO, recognise areas of cultural and natural significance, emphasising the importance of both conservation and sustainable use. Together, these frameworks reinforce the global commitment to biodiversity conservation by recognising the intrinsic value of natural ecosystems and the need for cooperative governance to ensure their resilience and sustainability for future generations.

#### c. Key Biodiversity Areas (KBAs)

KBAs are sites of global significance for the conservation of biodiversity, identified based on their importance for the persistence of biodiversity and threatened species. They encompass areas that contribute significantly to the global network of biodiversity. Data collection, satellite imagery and synthetic biodiversity footprints can support the measurement against KPIs to help measure nature in sustainable finance.

## Data Collection

Such geographical analyses require the collection of asset coordinates (latitude and longitude, shape and surface) in order to examine the distance of an asset to such designated areas.

On the asset financing side, it can be possible for financial institutions to collect data internally. On the corporate finance side, it is rather harder to collect coordinates from entire entities. Data providers have worked on collecting and distributing such data and now provide comprehensive geographical datasets.

## Satellite Imagery

Satellite imagery is playing an increasing role in providing preliminary assessments of the state of biodiversity. Either to assess deforestation risk or the evolution of land use change over time at asset level, it can provide insights on corporates policies and nature-related action plans.

Increasing or decreasing above-ground biomass and vegetation over time signal whether a company/asset is contributing to nature restoration or degradation on its remit.

Please see **Appendix 8** for a review of spatial analytics and conservation intelligence platforms.

## Synthetic biodiversity footprints

Synthetic biodiversity footprints are an estimate of the impacts of a company's activities on ecosystems. They are based on a company's financial and physical flows and, when available, environmental reporting.<sup>42</sup> Often expressed in MSA.km<sup>2</sup> or pdf.km<sup>2</sup>, a synthetic biodiversity footprint provides information on the level of biodiversity degradation induced by an economic activity (ex: a 1,000 MSA.km<sup>2</sup> footprint is equivalent to the artificialisation of 1,000 square km of pristine ecosystem).

They are based on the conjugation of two methodologies: creating a quantified link between a pressure exerted on ecosystems (example: air pollution) and its impact in terms of biodiversity integrity loss; and providing a quantified link between the production of a commodity in a geography and the average negative externalities it induces. Both combined allow to estimate in absolute terms the biodiversity loss induced by a production process.

They typically combine two essential tools to approximate physical flows and their pressures on the environment:

- **Exiobase** is a tool developed by several research institutes at the initiative of the European Union and its research programme.

It is an economic database that analyses the interactions between the economy and the environment. It provides detailed information on the flows of materials, energy and emissions associated with production and consumption in different economic sectors.

Exiobase is used to assess the environmental footprint of human activities, and to analyse the environmental consequences of economic policies and consumption patterns. This allows, for example, to discern the environmental pressures associated with a high-meat diet and a vegetarian diet.

- **GLOBIO** was developed by the United Nations Environment Programme (UNEP) in partnership with the Netherlands Environmental Agency (PBL).

The GLOBIO model evaluates all the environmental impacts associated with a product, service or process over its entire life cycle. These impacts are assessed from a set of quantitative relationships between pressures and impacts associated with

a product or service. These coefficients are established by multidisciplinary expert panels that use empirical data, field studies and models to estimate the magnitude of impacts on biodiversity.

The combination of both databases allows for an approximation of the biodiversity degradation induced by a corporate production process accounting for its negative externalities.

## Sectoral KPIs

KPIs tied to sustainability-linked financings enable issuers to commit to nature-related targets. Common KPIs include protecting/restoring habitats, reducing impacts, and improving practices. KPIs can powerfully drive issuer actions, as seen in financings supporting reforestation or wetland restoration, but targets must be science-based and impacts well-measured to ensure credibility.

On the sidelines, corporates have started to adopt common practices to address nature loss among various sectors:

- In the food and beverage industry, KPIs related to the integration of regenerative agriculture practices are flourishing.
- In the mining and metals sector, the rehabilitation rate is being monitored and engaged upon in short- and medium-term targets, with some companies in the sector periodically rehabilitating more land than they degrade.

Although the definitions, scopes and methodologies behind such indicators may vary among corporates, they pave the way for future harmonisation.

## Application and Enhancement

A combination of granular field metrics, scalable pressure-based indicators, synthetic tools, and KPIs can help comprehensively measure nature in sustainable finance. Applying TGBS guidance on ecosystem integrity assessment<sup>43</sup> enhances these approaches by providing a standardised framework for verifying biodiversity outcomes. Further work is needed to refine metrics and build capacity for consistent application across the finance sector, particularly in aligning with TNFD and related disclosures.

## Materiality

Materiality is critical to an organisation's ability to understand and effectively manage its nature-related impacts, dependencies, risks, and opportunities. Double materiality assessment considers both financial materiality (impact of biodiversity issues on the organisation) and impact materiality (impact of the organisation's activities on biodiversity and ecosystem services). By identifying which nature-related factors are financially and strategically material, organisations

can prioritise the ecosystems, resources, and biodiversity dependencies that underpin their operations and value chains, while also recognising the potential risks from regulatory shifts, reputational pressures, or physical degradation of natural capital. Organisations can integrate these considerations into governance, strategy, and risk management processes, helping them safeguard long-term resilience, identify and capture opportunities in emerging sustainable markets and nature-positive business models.

## Regional Implementation: Hong Kong's Biodiversity Data Infrastructure

Hong Kong's biodiversity data infrastructure exemplifies successful integration of global frameworks with local conservation priorities. The region has developed a comprehensive digital ecosystem that demonstrates how international biodiversity standards can be effectively localised while maintaining global interoperability.

### Hong Kong Biodiversity Information Hub (HKBIH)

The HKBIH serves as Hong Kong's primary biodiversity data portal, maintained by the Agriculture, Fisheries and Conservation Department (AFCD). This platform provides comprehensive access to:

- **Species Records Database:** Over 3,000 documented species across terrestrial and marine ecosystems
- **Habitat Mapping:** Detailed GIS layers covering Hong Kong's 24 country parks, 22 special areas, and marine protected areas
- **Conservation Status Assessments:** Local red list evaluations aligned with IUCN criteria

- **Monitoring Data:** Long-term ecological monitoring results from key sites across Hong Kong's 1,104 km<sup>2</sup> territory

### BIH.gov.hk Portal Integration

The government's biodiversity portal (BIH.gov.hk) integrates multiple data streams to support evidence-based conservation policy:

- **Policy Framework Integration:** Alignment with Hong Kong's Biodiversity Strategy and Action Plan (BSAP) 2016-2021 and subsequent updates
- **Stakeholder Engagement Tools:** Public access to biodiversity data for research, education, and citizen science initiatives
- **Corporate Reporting Support:** ESG-compliant biodiversity impact assessments for development projects
- **International Reporting:** Data contributions to CBD national reports and GBF indicator submissions

36. TNFD Global. (n.d.). Guidance on the identification and assessment of nature-related issues: The LEAP approach. <https://tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/>

37. <http://www.pbc.gov.cn/en/3688110/3688172/4157443/index.html>

38. <https://www.mas.gov.sg/sustainable-finance/singapore-asia-taxonomy>

39. [https://www.meti.go.jp/english/policy/energy\\_environment/global\\_warming/green\\_taxonomy.html](https://www.meti.go.jp/english/policy/energy_environment/global_warming/green_taxonomy.html)

40. <https://www.bnm.gov.my/documents/20124/938039/ASEAN+Taxonomy.pdf>

41. <https://asean.org/wp-content/uploads/2024/12/ASEAN-Taxonomy-Finalised-Version-3-4.pdf>

42. SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>2</sub> emissions, water consumption, ecotoxicity, etc.

43. [https://cdn.ymaws.com/www.ser.org/resource/resmgr/docs/25.07.2024\\_TGBS\\_-\\_The\\_Global.pdf](https://cdn.ymaws.com/www.ser.org/resource/resmgr/docs/25.07.2024_TGBS_-_The_Global.pdf)

# Conclusions

## Recommendations to accelerate the integration of nature related risks into business strategy

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Mobilising sustainable finance to halt nature and biodiversity loss is a nascent, yet rapidly evolving area that is highly complex, nuanced and location specific. Achieving alignment with global standards, principles and frameworks is essential to enhance comparability, interoperability and consistency of disclosures; mitigating risks such as greenwashing, and laying the foundation for building trust and credibility in nature-related finance. Capacity building for Financial Institutions and Corporates, on metrics, measurement and biodiversity indicators are crucial to effectively channel resources towards impactful actions that address the root cause of biodiversity loss.

### Recommendations for financial institutions

#### 1. Align with Global Standards & Frameworks

- Adopt and integrate TNFD recommendations for nature-related disclosures.
- Build industry-wide capacity and knowledge of TNFD LEAP framework and encourage its use to assess the risks, opportunities and financial impact of nature and biodiversity on business operations.
- Commit to the Finance for Biodiversity Pledge.

#### 2. Integrate Biodiversity into Financial Decision-Making and Risk Management

Suggested best practices and tools to monitor sensitive areas and biodiversity risks:

- Screen potential projects for assets in sensitive areas and other impacts on nature. Use tools such as IBAT to map asset locations against sensitive locations, such as Key Biodiversity Areas (KBAs).
- Use materiality matrices such as ENCORE to assess sectoral dependencies/pressures, portfolio dependency on ecosystem services and match with biodiversity degradation levels, Prioritising high-risk exposures (e.g., sectors dependent on degraded ecosystems).

- Develop biodiversity footprints (e.g., MSA.km<sup>2</sup>) to quantify portfolio impacts and prioritise high-risk sectors.
- Monitor pressure-related KPIs and adopt sector-specific proxies. Use Geospatial, eDNA Technologies, eDNA sampling, and satellite monitoring for cost-effective biodiversity monitoring.
- Leverage certifications (IUCN Green List, OECM Standards, Global Biodiversity Standard) to ensure credibility and measurable outcomes.

#### 3. Engage Clients on Risk Mitigation & Opportunities

- Incentivise corporates to reduce negative nature and biodiversity impacts (e.g., deforestation, pollution) and finance nature-positive projects through use-of-proceeds instruments such as Green Bonds, Blue Bonds, Sustainability-linked loans (SLLs) and bonds (SLBs). KPI's can be linked to activities and investments that promote regenerative practices (e.g., certified agriculture, and investments in water-efficient technologies).
- Partner with philanthropy, NGO, multilateral development banks, private sector and conservation organisations to develop blended finance facilities that support landscape-scale restoration (e.g., reforestation, watershed rehabilitation), aligned with global frameworks such as the Kunming-Montreal GBF. Create pilot scalable solutions (such as the \$50M reforestation fund in Southern China with WWF) as proof of concept.

- #### 4. Build and expand upon existing nature-focused investment products to diversify traditional investment portfolios and lower overall risk. Nature-focused funds can yield competitive risk-adjusted returns, in addition to enabling investments into growing markets (carbon credits, biodiversity credits) and access to new revenue streams. Launch biodiversity-themed bond funds (e.g., Goldman Sachs' Biodiversity Bond Fund), equity fund selection based on biodiversity-positive products/services (e.g. BNP Paribas Ecosystem Restoration), and screen using biodiversity footprints (e.g., Iceberg Data Lab's Corporate Biodiversity Footprint).

## Recommendations for corporations

### 1. Integrate Biodiversity into Corporate Strategy

- Develop formal biodiversity policies and site-level guidelines for development and management.
- Set science-based targets for nature, including “no net loss” of biodiversity and water positivity commitments.
- Tie nature-related KPIs and goals to executive compensation and capital allocation.

### 2. Align with Global Frameworks & Disclosures

- Adopt and report against TNFD recommendations for nature-related financial disclosures.
- Align biodiversity strategies and large-scale restoration projects with the GBF.

### 3. Implement Nature-Positive Operations

- Prioritise native species planting and create ecological corridors to enhance urban habitats.
- Invest in Nature-Based Solutions (e.g., green spaces) for climate resilience and community well-being.
- Achieve deforestation-free supply chains for key commodities through traceability and engagement.

### 4. Adopt Advanced Monitoring & Verification

- Use eDNA sampling for cost-effective biodiversity monitoring and verification.
- Implement satellite monitoring for deforestation and land-use change tracking in supply chains.
- Leverage data for early pest detection and to optimise resource management.

## Case studies

# How Financial Institutions are Utilising Sustainable Finance to Drive Positive Environmental and Economic Change

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The following case studies demonstrate that sustainable finance for nature and biodiversity is increasingly being shaped and accelerated by private sector innovation and investment. By piloting and mainstreaming financial instruments tied to conservation outcomes, the market is gradually shifting from philanthropy-driven funding to scalable, return-driven approaches that align business incentives with long-term ecological stewardship.

## 1. Mangrove Conservation Carbon-Collateralised Loans in China

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Mangroves are major global coastal ecosystems and are among the world's most effective carbon sinks, storing an estimated 6.5 billion tons of carbon globally.<sup>44</sup> Mangrove conservation has become a key ecological component of China's national "dual-carbon" strategy, with the Guangdong-Hong Kong-Macao Greater Bay Area and Hainan Province leading in conservation and mangrove-related blue finance innovations due to their natural distribution of mangrove ecosystems.

Industrial Bank Co., Ltd.<sup>45</sup> is a state-owned commercial bank headquartered in Fuzhou, China, and a constituent of the Shanghai Stock Exchange since its IPO in 2007. As one of the first joint-stock commercial banks approved by China's State Council and the People's Bank of China, Industrial Bank offers a wide range of financial services, including corporate and retail banking, investment banking, asset management, and research. With CNY 10.51 trillion (USD ~1.45 trillion) in total assets as of year-end 2024, Industrial Bank is one of China's largest commercial banking groups. Since the launch of China's national carbon emissions trading system in 2021, Industrial Bank has led a variety of blue finance initiatives, including blue bonds and carbon sink products in marine conservation and aquaculture.

At the 2024 China Marine Economy Expo, Industrial Bank's Shenzhen Branch signed a partnership with Shenzhen Blue Carbon Jiahua Technology Co.,<sup>46</sup> a local developer of carbon conversion, carbon sequestration technologies and provider of ecological management, conservation, and technological services. The agreement landed Shenzhen's first Mangrove Conservation Carbon-Collateralised Loan, a blue finance "carbon for loan" program that uses verified carbon credits from mangrove conservation as loan collateral, issued to Shenzhen Blue Carbon Jiahua Technology.<sup>47</sup> Loan specifics were designed to meet the needs of the relevant borrower enterprise, acting

as an innovative financial product that not only offers liquidity, but also advances Shenzhen's marine economy and blue finance development.

The loan was constructed with Shenzhen's first mangrove blue carbon credit auction in 2023 as its basis. Those credits were defined under Shenzhen's *Mangrove Conservation Project Carbon Sink Methodology (2023)*, which outlines protocols in measuring and certifying carbon sink in mangrove conservation projects; it provides guidelines for project definitions, baseline assessments, monitoring, and carbon credit issuances.<sup>48</sup> The credits, certifying 3,875 tons of carbon sink, were verified by a third-party organisation and officially registered and authorised for trading by the Shenzhen Municipal Planning and Natural Resources Bureau, trading for CNY 485/ton. Since 2023, Shenzhen has also explored other mangrove carbon sink-based financial products, such as a mangrove carbon sink index insurance and a CNY 10 million mangrove charitable trust both launched by Ping An Insurance Group.<sup>49</sup>

Shenzhen's mangrove conservation carbon-collateralised loan offers critical insights for ecosystem-based sustainable finance. First, it showcases that carbon credits from conservation can serve as viable collateral, de-risking loans for green projects. Second, the partnership between a state-owned bank and a private carbon-tech firm highlights the importance of cross-sector collaboration in designing fit-for-purpose financial products. Finally, the model's reliance on Shenzhen's mangrove carbon sink methodology underscores the need for clear regulatory frameworks to ensure transparency and trust in blue carbon markets. As China seeks to expand its marine finance ecosystem, this case demonstrates how financial institutions can utilise ecological assets to simultaneously promote climate resilience and economic growth.

## 2. ADM Capital's Asia Climate-Smart Landscape Fund (ACLF) in Hong Kong

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In the midst of Asia's climate and biodiversity crises, a new financial model is taking root—one where capital doesn't just avoid harm but actively works to heal ecosystems. ADM Capital, a Hong Kong-based investment firm with deep roots in emerging markets, is pioneering this shift through its Asia Climate & Nature Fund (ACLF). Launched in December 2023, this US\$100 million private credit fund represents a bold experiment in aligning finance with planetary health, proving that loans can be structured to regenerate landscapes, reduce emissions and support communities while delivering financial returns.

ACLF seeks out small and medium-sized enterprises—the kind of operations that hold the key to transformative change, such as wood products manufacturer in Indonesia helping its forest concession suppliers transition to certified product, or a producer of agricultural products that is introducing regenerative farming practices to its smallholder supply chain. These are the borrowers ACLF supports with tailored debt solutions, whether through working or growth capital loans.

What makes ACLF unique is how it weaves impact into every deal. Borrowers aren't just assessed on financial metrics but on their ability to deliver measurable benefits for nature. The fund's technical assistance partnerships with donor institutions allow it to also provide that support to borrowers for farmer training, certifications or traceability technology, for example, and take calculated risks where traditional lenders won't.

As Asia faces mounting pressure from climate change and biodiversity loss, approaches like ACLF's demonstrate how finance can be recalibrated to address these dual challenges. Its approach—grounded in real-world projects rather than theoretical models—offers a blueprint for how private capital can flow toward a future where economic growth and ecosystem health aren't at odds but inextricably linked.<sup>50</sup>

## 3. Sustainability-Linked Finance: Banking & Consumer Goods in Japan

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Sumitomo Mitsui Banking Corporation (SMBC) is a Japanese multinational bank with roots going back to 1876. It is one of the largest banks in the world, known for its extensive global network and diverse range of financial services. In March 2023, Sumitomo Mitsui Banking Corporation (SMBC) and KAO Corporation entered into a four-year sustainability-linked loan (SLL) agreement. This ground-breaking partnership exemplifies the growing trend of aligning financial incentives with environmental and social performance. The loan's interest rate is contingent upon KAO's achieving specific sustainability performance targets (SPT). These targets, aligned with KAO's broader sustainability strategy, primarily focus on environmental impact. A crucial element of the agreement involves KAO's performance on the CDP climate change, forests, and water security scores, whereby achieving an "A" score in at least two of the three categories entitles KAO to a preferential loan rate.

In 2023, KAO received a triple-A score from CDP for its sustainability performance across three categories. To further amplify its sustainability initiatives, KAO has invested significantly in pulp technology. This technology, which promotes forest conservation and efficient pulp utilisation, has led to a 97% volume of FSC-certified products, according to its disclosure through CDP. In 2022, KAO supported 390 farms in achieving RSPO certification and purchased all associated certification credits, based on CDP disclosure. This mechanism directly benefits farmers by providing a stable income through premium pricing.

By linking financial incentives to environmental performance, such agreements encourage real economy to prioritise sustainability in their operations and value chain.<sup>52,53,54</sup>

#### 4. The Natural Capital Initiative in Indonesia

The Natural Capital Initiative (NCI) introduces an innovative financial mechanism that leverages the value of nature to address the escalating climate and nature emergency.

##### **Making Nature Investable**

Our natural environment risks depletion with the status quo. The global economy needs to be reshaped by encouraging the private sector to participate willingly and sustainably in our planet's restoration. Investing in nature means recognising that nature does not have to be recorded as an expense in the accounting books or regarded as an act of goodwill. On the contrary, NCI proposes transforming natural capital into a financial asset with three steps: enable nature uplift by creating high-performance ecosystems; quantify natural capital through a simple and holistic metric; and present and package results in an effective and attractive manner.

Instead of offsetting, NCI promotes in-setting, treating nature as an investment. Investors can acquire nature uplift in the form of digital equity, with a value corresponding to the total financial effort required to achieve the uplift. KPIs from the nature uplift can improve SDG/ESG performances and unlock more green finance potential.

Nature has the ability to generate attractive tangible revenue under the initiative. Furthermore, applying blockchain technology to digitalise nature as an asset improves its appeal, as market demands for carbon credits, biodiversity credits and other nature-related solutions are expected to rise as TNFD matures. These benefits present natural capital as a robust investment option. Our planet needs immediate restoration, and this can be achieved by transforming how businesses value and interact with nature.

##### **Pilot Natural Capital Project: Bintan Island, Indonesia**

AECOM, commissioned by Napital Group, established a 100-ha pilot project on Bintan Island, Indonesia. This project aims to restore forestland using cutting-edge methodologies and digital tools to communicate ecological progress through key natural capital data. The site was originally covered in tropical rainforest, now largely lost due to land use changes. An implementation strategy for the pilot site will be developed involving both active and passive habitat management to achieve the target result.

A holistic approach is essential to assess true nature recovery, encompassing multiple ecosystem services beyond carbon or biodiversity. NCI employs natural capital accounting with five performance metrics representing core ecosystem services: soil, life, water, air, and climate regulation, forming the Natural Capital Index.<sup>51</sup>

Natural capital uplift refers to improvements in these five aspects as the forest is restored. Monitoring throughout the restoration ensures alignment with projections over a 30-year period. Baselines were developed using remote sensing data and scoping surveys, with methods like the Singapore Biodiversity Accounting Metric, camera traps, eDNA, and bioacoustics.

The gathered data will be displayed in a natural capital digital twin, allowing stakeholders to track progress. This transparency facilitates adaptive management and supports commercialising natural capital projects through collaborations with financial institutions, the FinTech sector, and global corporations.

##### **Conclusion**

Natural capital projects offer multiple benefits, including ecosystem restoration, revenue generation from agroforestry, eco-tourism, and more. Biodiversity is increasingly important in private sector agendas, with reporting standards requiring nature-related risk disclosures. Nature and Businesses are set to leverage more with green/sustainable finance instruments such as green bonds, sustainability/nature-linked loans, and environmental impact funds. Natural capital as a financial asset holds potential for business performance, growth, and resilience. Market-based instruments like carbon and biodiversity credits assign economic value to ecological outcomes. The initiative aims to promote blockchain technology to record and transform nature uplift as digital asset. The Natural Capital Initiative exemplifies how transforming the valuation and interaction with nature can drive immediate restoration and sustainable business practices.

## 5. Vana's Asian Community Reforestation Enterprise (ACRE) in Cambodia

ACRE, the Asian Community Reforestation Enterprise, is a sustainable reforestation program that demonstrates how a bankable, nature-positive solution can be scaled to address forest degradation and improve community livelihoods. The program, developed by Vana (sponsored by DFA), a Hong Kong-based nature-based solutions developer, is a direct response to the Indochina region's significant forest loss and land degradation implications for rural livelihoods.

Its pilot in Myanmar, which was funded by family offices, is already at Year 3 of operations and was awarded grants by The Nature Conservancy and WWF. Given the civil war in the country, Vana has developed its Cambodia pipeline partnering with RECOFTC, a Southeast Asia community forest NGO, funded with a blended finance structure of equity and debt from private sector and multilateral institutions; it has already received pre-investment technical assistance funds from the Japan Forest Agency and the Southeast Asia Climate and Nature-based Solutions (SCeNe) Coalition, along with US\$1 million of equity from family offices. Restoring the full 50,000 ha of degraded community forest will take well over US\$100 million of investment.

The project strategically partners with Cambodia's community forests, which often lack the capital, technical expertise, and resources to effectively fulfil their community- and government-mandated restoration plans. ACRE provides the means to overcome these barriers to initiate and sustain large-scale reforestation efforts. At the core of its model is a 10-year assisted natural regeneration (ANR) approach.

ACRE addresses a key barrier to traditional reforestation by providing day-one salaries for communities engaged in the reforestation work while securing longer-term economic benefits from timber and carbon credit sales.

Vana's approach with ACRE, demonstrated in Myanmar and vetted and supported by organisations such as RECOFTC, IUCN, and The Nature Conservancy shows that private capital can serve as a scalable, profitable, and regenerative force for the planet.

## 6. Commodities in Southeast Asia

There are many notable case studies regarding reputational and other risks of financial activity in the agribusiness and forestry sectors, particularly in Southeast Asia. In many of these cases, biodiversity loss through deforestation or other forms of land use conversion has been a recurring legacy issue of concern given the degradation of high pre-development ecological baseline values.

Community dependencies on agriculture may sometimes lead to land grabs and disenfranchisement, increasing attention from human rights and environmental organisations and adding to the reputational risks for associated financial institutions.

In more recent years – arguably by necessity in response to a range of drivers – significant commitments and efforts have been made by forestry and agribusiness companies, often with the backing of financial institutions, to turn attention to identification and protection of high conservation values and/or ecological enhancement or restoration in parallel with business operations. This refocus has often been a case of resetting from a diminished ecological baseline, meaning that substantial associated financing is not labelled as 'sustainable' to avoid greenwashing allegations and other reputational

risk, and may therefore be overlooked in aggregate accounting for nature-friendly (or friendlier) financing. Such financing may be via bilateral or syndicated loans and is often linked to an environmental action plan to include sustainable soft commodity certification scheme outcomes. As mentioned, such linkage may or may not be reflected through formally disclosed sustainable finance KPIs and targets.

### 6.1. Palm Oil Sustainability: Agribusiness in Indonesia & Singapore

Singapore-based RGE Group, a resource-based manufacturer focused on the bioeconomy, has benefitted from several disclosed sustainability-linked financial products, and has committed to transition all its financing to sustainability-linked loans (SLLs). RGE's 2024 US\$1bn SLL included KPIs to increase engagement with Indonesian suppliers compliant with No Deforestation, No Peat, No Exploitation (NDPE) commitments and to support suppliers to conduct independent traceability verification – both prerequisites for eventual Roundtable on Sustainable Palm Oil (RSPO) certification.<sup>55</sup>

## 6.2. Forest Conservation & Restoration: Pulp & Paper in Indonesia

The transition to nature aligned operations has been underway in certain soft commodities businesses for many years, in some cases with the active participation of international finance through multistakeholder initiatives. In 2015 RGE Group's integrated pulp and paper manufacturing entity Asia Pacific Resources International Limited (APRIL) committed to its Sustainable Forest Management Policy (SFMP 2.0) to enhance commitments to forest conservation and protection. Through SFMP 2.0, APRIL has conserved and restored over 350,000 hectares of forest including about 150,000 hectares of peatland swamp forest as part of the Restorasi Ekosistem Riau (RER) program in Sumatera. These areas lie within the 1 million hectares of forestry concession originally allocated to APRIL by the Indonesian government and came with a US\$100 million pledge from APRIL to fund the first 10 years of the RER carve-out license period, supported via bank financing and the collaborative efforts of a range of stakeholders.<sup>56</sup>

## 6.3. Sustainable Agribusiness Transparency: Soft Commodities in Southeast Asia

Multistakeholder collaborations have been particularly impactful in supporting business and financial institutions to navigate risks and opportunities inherent in certain sectors. Specific to the agribusiness and forestry sectors is the SPOTT initiative developed by the Zoological Society of London (ZSL). Much of the geographical focus of the SPOTT initiative is on soft commodities out of Southeast Asia, starting with palm oil but expanded to timber and natural rubber. The success of SPOTT has been in engaging with growers, traders and financial institutions (banks and investors) with a common interest in using improved disclosure and transparency metrics as a proxy for improved management practices across multiple ecological, environmental and social aspects. The outcome is a business rating and ranking system aligned with and building upon the principles and criteria of sustainable soft commodity certification schemes.<sup>57</sup>

## 7. Biodiversity Financing in Europe

### 7.1. Mirova's Biodiversity Fund

Mirova, a subsidiary of Natixis Investment Managers, was selected by a consortium of 11 prominent French institutional investors—including Abeille Assurances (Aéma Group), BNP Paribas Cardif, BPCE Assurances, the Caisse des Dépôts, CNP Assurances, EDF Gestion, MAIF, MACIF (Aéma Group), Malakoff Humanis, Société Générale Assurances, and Crédit Agricole Assurances—to manage the "Fonds Objectif Biodiversité," a €100 million listed biodiversity fund. With an initial duration of five years, this listed fund will primarily target small and medium-sized European companies, aiming to support the transition to sustainable business models and invest in innovative solutions that enable reduction of pressures on biodiversity.

Central to the fund's strategy is the integration of environmental disclosure data from CDP, emphasising the pivotal role of data-driven insights in responsible investment. As a starting point Mirova has been using CDP's corporate datasets—spanning disclosures from over 23,000 companies on climate change, water security, biodiversity, deforestation, and plastic pollution—to support construction of a universe of companies that provide minimum transparency on biodiversity related dependencies, impacts, risks, and opportunities.

Mirova and CDP are now cooperating on building dedicated methodologies to assess corporates nature transition maturity based on sample of most relevant CDP. This would enable quantitative assessment of corporates on a maturity scale. The framework is aligned with TNFD requirements on governance strategy stakeholder engagement and performance and is coherent with the thematic collaborative engagement platform on deforestation, water stewardship and pollutions.

Another workstream relates to the improvement of the minimum standards of the fund which are meant to exclude corporates deploying activities that are detrimental to biodiversity without intention to remediate it. Accordingly, CDP and Mirova have identified indicators enabling screening out of detrimental activities in biodiversity sensitive areas and use of deforestation-linked commodities.

CDP helps the investment team to understand the breadth and depth of reported data provided, how to interpret and apply these data in line with standards, frameworks, and initiatives, and its assumptions and limitations. Both Mirova and CDP view biodiversity as a cross-cutting issue that requires a holistic approach—one that integrates

considerations across the drivers of biodiversity loss, including deforestation and other natural ecosystem conversion, water abstraction and pollution, plastic production and waste, and climate change.

In addition to CDP data, Mirova will utilise complementary tools such as sectoral materiality assessment frameworks, foot printing metrics supporting comprehensive assessment over the value chain and geospatial analysis to help quantify local direct impacts.

CDP will provide updates and further interpretation of provided data improving analysis of maturity of corporates' nature transition. This support participates in Mirova portfolio building activity complying with the two-pronged objective of seeking both financial performance and meaningful ecological outcomes.

To uphold scientific integrity and transparency, a dedicated scientific committee comprising biodiversity and sustainable finance experts oversees the fund. CDP is also represented in this committee, whose role is to provide guidance on the theory of change, methodological strategy, development of impact indicators, corporate engagement principles, which will help evaluate the biodiversity performance of the portfolio.

The 'Fonds Objectif Biodiversité' stands as a model for integrating comprehensive environmental data into sustainable finance. Through close collaboration with CDP and the scientific committee, Mirova demonstrates how the strategic use of environmental data can make investment strategy contribute to global biodiversity targets – reduction of corporates' footprint, mobilisation of funding, mitigation of pollutions offering a scalable blueprint for future schemes.

## 7.2. Water Stewardship Financing: Energy & Banking in Spain

In 2022, Spanish bank BBVA launched the water footprint loan in partnership with Iberdrola, a leading Spanish energy company. The total credit amounted to €2.5 billion and involved 24 financial institutions, with BBVA as the coordinator and agent bank. This innovative instrument aligns lending criteria with environmental performance, particularly focusing on water resource management.

Central to the loan structure are two key performance indicators (KPIs) that determine the interest rate applied: water consumption reduction and the CDP Water Security Score. Iberdrola has committed to reducing water consumption in power generation by 50% by

2030, a target measured by the volume of water withdrawn that is not returned to the environment. Additionally, the loan incorporates the CDP Water Security Score that evaluates a company's progress to respond to water-related risks, providing an independent and standardised metric for water disclosure.

The loan's interest margin is reviewed annually and adjusted based on Iberdrola's performance relative to specific KPIs. If the KPIs are met, the margin may decrease; if not met, it may increase. This approach is designed to incentivise improvements in environmental performance.

The water footprint loan stands out as a pioneering example of sustainable finance. Through the use of standardised data such as CDP, BBVA and Iberdrola demonstrate how finance can drive meaningful transition while delivering economic value.<sup>58,59,60</sup>

## 7.3. Sustainable Land-Use Finance: Asset Management in Italy

Etica Funds exemplifies how financial actors can embrace and advance the landscape approach. Since its founding in 2000, Etica has focused exclusively on sustainable and responsible investment, integrating ESG analysis into its core strategy to manage risk and influence corporate behaviour.

As a signatory of the Finance for Biodiversity Pledge, Etica has prioritised action on deforestation and land-use change by working closely with CDP particularly through the CDP Forests Portfolio Assessment tool to leverage the CDP forests dataset to identify priority companies for engagement, focusing primarily on corporate forest-related target setting performance. In 2024, work has been done to further understand and engage corporates on landscape approaches that have been shown to deliver a range of environmental and economic benefits at scale.

To strengthen its approach, Etica is allocating new resources to expand engagement with investee companies and enhance the scale and effectiveness of forest stewardship. Acknowledging data gaps, Etica also actively encourages non-disclosing companies to respond to CDP's Forest questionnaire, reinforcing the role of transparency and accountability in managing financed deforestation and land-use change.<sup>61</sup>

## 8. Deforestation Risk Management: Asset Management in Global Markets

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Manulife Investment Management is the global wealth and asset management segment of Manulife Financial Corporation. They oversee more than CAD\$ 657 billion in AUM across multiple asset classes that spans 18 geographies, including 10 markets and 120 years of on-the-ground experience in Asia.

Manulife Investment Management supports the ongoing work of CDP as the data platform provides investors with climate, water, forest and biodiversity data that enables comparison of issuers in these areas around the globe. They believe the importance of CDP reporting will likely grow as the reporting platform is incorporating new standards from the ISSB and the TNFD.

In particular, Manulife Investment Management used CDP's Forests Portfolio Assessment tool and resources across several streams of

work. CDP conducted an in-depth analysis of CDP data and identified engagement points. Findings and analysis provided by CDP were leveraged in conversations with companies to discuss deforestation exposure and risk management across their supply chains. These conversations covered specifics on certification schemes, grievance reporting, commodities volumes, revenue dependencies, and traceability.

In addition, Manulife Investment Management reviewed a subset of holdings through a forest risk assessment using CDP's data. The exercise provided a high-level analysis into potential portfolio exposure to deforestation risks and opportunities. This type of assessment will be increasingly important as they work to meet the needs of clients who may want to remove deforestation risks from their investment portfolios.<sup>62</sup>

## 9. Bringing Sustainability Taxonomies to Life with Tech-enhanced Climate and Biodiversity Data Globally

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IWC Asset Management+ (IWC AM+) is a boutique natural capital asset manager overseeing over US\$ 500 million of forestry assets in Europe, Oceania, and the United States. IWC AM+ is part of the IWC group, founded 35 years ago to provide customised investment solutions to institutional investors seeking to invest in forests, agriculture, and ecosystem restoration around the globe. Today, the IWC group is majority-owned by BNP Paribas Asset Management and has about US\$ 6 billion of natural capital assets under advice or direct management.

IWC AM+ strategies are customised around the growing number of sustainability taxonomies, now in place in the EU, Australia, New Zealand, Singapore, Korea, and Japan. Drawing from deep understanding of policy targets on climate and biodiversity based on the Paris Agreement and the Kunming-Montreal GBF, they focus on efficiently serving the growing compliance and disclosure needs of

investors. Beyond taxonomies and FSC certification, AM+ strategies undertake mini-scale restoration across forests, addressing degradation, habitat fragmentation, and loss of niche habitats via so-called Signature Actions. IWC AM+ is on the forefront of EU climate, biodiversity, and sustainability policy development, and offers SFDR article 9 strategies applying the EU Taxonomy in all major temperate forest regions of the world. IWC's conviction is that government-backed taxonomies and frameworks for sustainable finance, increasingly will define and streamline integrated sustainability across climate adaptation, climate mitigation, biodiversity, water, and social responsibility themes, and across financial sectors. To implement these in practice, and inform them with solid data, investors must have the specific technology-enhanced data collection and advanced forest and carbon modelling based on IPCC Guidelines, as delivered by IWC AM+.

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# How Corporations are Integrating Biodiversity

## 10. Integration of Biophilic Design to Promote Urban Biodiversity: Taikoo Square and Taikoo Garden in Hong Kong

Swire Properties, a major real estate developer listed in Hong Kong, has established the Sustainable Development 2030 Strategy to foster sustainable communities that thrive in harmony with nature. Central to this vision is the company's Biodiversity Policy, which guides efforts in minimising its environmental footprint while promoting urban biodiversity and sustainable resource use. The company has also introduced biodiversity guidelines for building development and management, which provide specific recommendations on topics such as conducting biodiversity assessments, design for good quality woodland patches for landscape, native plant species selection, micro-habitat consideration, sustainable use of natural resources and use of nature-based solutions. Best practices in the guidelines are tailored to the regions in which the company operates, empowering their project development and building management teams to integrate nature considerations in buildings.

A practical example of the adoption of Nature-Based Solutions (NbS) by Swire Properties is the redevelopment of Taikoo Place. In this project, the company transformed a previously developed urban site into a vibrant landscape, called Taikoo Square and Taikoo Garden, that enhances both biodiversity and community well-being. By investing in green spaces, supported by the company's green bonds, it aims to deliver substantial ecological and social benefits. These green areas not only foster biodiversity but also significantly boost the portfolio's climate resilience. The green spaces at Taikoo Place help mitigate flooding by absorbing rainwater during intense rainfall events, reducing the risk of urban flooding—a critical concern in densely populated areas. Additionally, these spaces improve the microclimate, creating more thermally comfortable areas for visitors and workers alike, contributing to a cooler environment and combating the urban heat island effect.

By integrating over 260 native and exotic plant species that drew inspiration from Hong Kong's "feng shui woodlands", biodiversity hotspots where villagers traditionally preserved native plant species and created rich habitats for wildlife, the company aspires to mimic natural ecosystems in their landscape areas at Taikoo Square. The landscape also features a higher-than-average ratio (over 20%) of

native species, compared to the city's other public parks. This makes these spaces more attractive to birds, butterflies, and other animals by providing suitable habitats and food sources.

The company's commitment to enhancing biodiversity is also evident in the design of Taikoo Square, where it has created green corridors that facilitate the movement of wildlife between urban areas and nearby natural habitats. This ecological connectivity is essential for maintaining biodiversity and ecosystem services. Regular biodiversity assessments have shown promising results with increased species numbers, as well as sightings of species of high conservation value, including the collared crow, listed as vulnerable by the IUCN, and rare migratory birds like the orange-headed thrush, which normally lives in closed-canopy forests and mature shrublands and is considered a species of local concern in Hong Kong. In addition, breeding behaviours of various bird and butterfly species, including the presence of occupied nests and fledged young, also highlighted the ecological value of the biophilic designed gardens.

This case study shows that integrating NbS into project design not only creates business value but also leads to healthier, more resilient communities. By investing in green spaces, the company promotes urban biodiversity while preparing urban environments for climate challenges, making them better places for both people and nature. Taikoo Square and Taikoo Garden at Taikoo Place won a Gold Award at The Hong Kong Institute of Landscape Architects Awards 2024, in recognition of the biophilic and nature-inclusive design of the landscape project to promote urban biodiversity and community wellbeing.

As one of the TNFD Taskforce Members providing strategic direction in the development of the TNFD framework, Swire Properties also issued, in April 2025, an integrated Climate- and Nature-related Financial Disclosures<sup>63</sup> report as per TNFD recommendations and ISSB IFRS S2, recognising the interconnectedness of climate change, nature and biodiversity and the need for a holistic approach to managing climate- and nature-related risks and opportunities and their potential financial impacts.

## 11. Urban Biodiversity Oasis: Retail in Spain

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Plaza Mayor Málaga Shopping Center features an innovative natural garden project known as the Senda Mediterraneum, developed over 15 years with the goal of creating a self-regulated ecosystem that serves as a refuge for native flora and fauna<sup>64</sup>. This sustainable garden incorporates native plant species, biodiversity-friendly gardening practices, and advanced water and pest management systems to minimise resource use and promote environmental balance. Beyond its role in enhancing biodiversity, the project also provides an educational and recreational green space for visitors, fostering a deeper connection with nature while supporting local wildlife and ecosystem health.

In recognition of its excellence in environmental management and sustainability, Plaza Mayor Málaga was awarded the Green Flag Award<sup>65</sup>, an internationally respected certification for high-quality green spaces managed by Keep Britain Tidy under UK government licence. Plaza Mayor is among only five sustainable gardens in Spain to receive this award and the first located within a shopping center. The Green Flag Award acknowledges excellence in biodiversity conservation, sustainable resource use, environmental education, and community engagement.

SGS collaborated with Plaza Mayor Málaga to implement advanced biodiversity monitoring techniques, specifically through the use of environmental DNA (eDNA) sampling. This innovative approach enabled the identification of 245 species, including birds, mammals, and arthropods such as pollinators<sup>66</sup>. Among the findings were 30 bird species, including both common urban species and less frequently observed ones, 12 mammal species, and 203 arthropod species, with a significant presence of pollinators and other beneficial insects. Key species detected included solitary bees (*Andrena flavipes* and *Andrena dorsata*) and the iridescent cuckoo wasp (*Pseudomalus auratus*), which were notably absent in unmanaged areas.

The use of eDNA technology in biodiversity monitoring at Plaza Mayor Málaga also revealed its potential to deliver economic benefits. By reducing the costs typically associated with traditional biodiversity survey methods, such as visual surveys and trapping, eDNA sampling provides a more efficient and cost-effective approach<sup>67</sup>. Additionally, the ability of eDNA to detect invasive or pest species at an early stage enables targeted interventions, which are less costly than addressing established infestations or undertaking extensive ecological restoration<sup>68</sup>. Moreover, accurate monitoring of pest and beneficial species populations allows for the optimisation of pest management strategies, reducing the reliance on chemical pesticides and further lowering operational costs.

## 12. Corporate Sustainability Leadership: Diversified Conglomerates in the UK and India

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Because of their leadership and performance-linked accountability to environmental issues, UK-based Unilever and India-based Mahindra Group are prime examples of how large, diversified corporates can use their size and influence to drive change. While Unilever's recent strategic shifts have sparked some debate, both companies are embedding positive change to their operations as well as influencing their supply chains, spilling over to other industries. This case study is not endorsing any one company but highlighting how such corporates are integrating environmental goals into core business strategies to drive measurable impact, long term viability and broad influence.

Unilever has long prioritised sustainability, with focus on four core areas: climate, nature, plastics, and livelihoods. Within nature, Unilever is investing in regenerative agriculture and working directly on the ground with farms to increase soil resilience, enhance biodiversity and build robust food systems. They are doing all this not for altruistic

reasons, but because these are strategic business decisions to build resilient and long-lasting supply chains.

Unilever is focused on stopping and preventing further deforestation and has made a commitment to a deforestation-free supply chain. They have focused on high-risk commodities: palm oil, soy, paper and board, tea and cocoa. By the end of 2024, 97% of their order volumes for these commodities were independently verified as deforestation-free. To make this ambition a reality, they are using satellite monitoring, supplier engagement, and traceability tools. Unilever ties sustainability to performance—environmental goals are tied to executive compensation and capital allocation. These actions underpin sustainability as the foundation to their business activities and growth. To track progress, both Unilever and Mahindra are beginning to use pressure metrics—such as land-use change, water withdrawal, and pollution intensity—as well as consolidation metrics

like the percentage of operations with biodiversity action plans or the share of capital expenditure aligned with nature-positive outcomes. These metrics help ensure that sustainability is not only aspirational but measurable and actionable.

India-based Mahindra Group is another prime example of how sustainability can be incorporated into a conglomerate that has disparate operations ranging from automotive and real estate to IT and agriculture. Making this all possible is that environmental goals are intrinsically aligned with business goals and ambition. Mahindra looks at insetting and preserving, rather than destroying and offsetting. Biodiversity is their core commitment where the pledge “no net loss” of biodiversity is woven into all its operations. They achieve this measurable impact by conducting ecological assessments, around its facilities, avoiding or mitigating harm as well as creating biodiversity corridors to support wildlife. Their biodiversity strategy is aligned with the GBF, including third-party ecosystem audits and integration of biodiversity action plans into new projects. This reflects a broader shift toward integrating ecosystem and landscape-level perspectives- an approach that allows companies like Mahindra to prioritise high-value ecological areas, avoid unintended environmental trade-offs, and enhance long-term resilience. By considering the interconnectedness of ecosystems, Mahindra’s efforts go beyond site-level compliance and contribute to restoring ecological function at a regional scale.

A flagship project for Mahindra is Project Hariyali. Under this initiative, they have planted over 18 million trees across India and made a significant contribution to carbon sequestration, landscape restoration, and climate resilience, as well as support local communities and advance restoration efforts of degraded landscapes. Mahindra is also focused on being water-positive, meaning they return more water to nature than they consume. In addition, they are also focused on carbon insetting with a focus on neutrality.

Most effective is how Mahindra ties environmental objectives to company performance. This alignment is reinforced through structured KPIs, internal audits, and public reporting, ensuring that sustainability is not just encouraged but operationalised across the organisation. Mahindra’s 2025 roadmap is also aligned with science-based targets and a commitment to carbon neutrality by 2040, with sustainability integrated across the value chain.

Both Unilever and Mahindra can influence other industries to follow suit. They represent leadership which has a spillover effect on their suppliers, partners, and even competitors. Their actions demonstrate that sustainability is not a peripheral concern, but a driver of innovation, resilience, and long-term value. One key insight that both companies are beginning to reflect in their strategies is that biodiversity is not evenly distributed like CO<sub>2</sub> emissions. While carbon can be offset globally, biodiversity must be protected locally-especially in high-value ecosystems. This means companies must adopt targeted approaches that account for ecological context, not just carbon metrics.

As sustainability and the global business landscapes evolve, the examples of Unilever and Mahindra demonstrate that sustainability can be part of successful business operations and is essential for business viability in the long run. It further demonstrates that companies can no longer have a free ride on nature and must be responsible stewards—and not for altruistic reasons, but for pragmatic reasons—it’s a strategic imperative.

These case studies highlight that, while challenges remain—such as long investment horizons and the technical complexity of restoration—private capital is increasingly pivotal in scaling up efforts to restore ecosystems worldwide. The success of these models rests on strong business cases, technical expertise, supportive policies, and robust stakeholder collaboration, paving the way for restoration to become a mainstream investment strategy with high relevance for climate and biodiversity goals.

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# Appendix

## 1. Malaysia's National Policy on Biological Diversity (2022-2023)



Malaysia is among the top 12 biodiversity-rich countries in terms of species richness and endemism.

The National Policy on Biological Diversity (NPBD) 2022-2030 outlines five main goals for Malaysia's National Biodiversity Strategy and Action Plans (NBSAPs), along with specific quantified and time-bound targets to be achieved by 2030:

Goal 1: Empowering Stakeholders	Increase awareness of biodiversity values and sustainable use among Malaysians
	Strengthen the roles of indigenous peoples, local communities, civil society, private sector, and academia in biodiversity conservation
Goal 2: Reducing Pressures on Biodiversity	Ensure terrestrial and marine spatial planning incorporates biodiversity conservation
	Mainstream biodiversity into development frameworks
	Strengthen forest governance and management for biodiversity
	Ensure sustainable management and harvesting of agrifood, agricommodities, and fisheries
Goal 3: Safeguarding Ecosystems and Species	Realise synergies between tourism and conservation
	Conserve at least 20% of terrestrial areas and inland waters, and 10% of coastal and marine areas through protected areas
	Sustainably manage threatened natural ecosystems and restore degraded ecosystems
	Secure important ecological corridors and enhance ecosystem resilience
	Implement management actions for the recovery of threatened species
Goal 4: Safe Utilisation of Biodiversity	Minimise poaching, illegal harvesting, and trade of flora and fauna
	Establish measures for controlling invasive alien species
	Enhance capacity to implement the Access and Benefit-Sharing (ABS) framework
Goal 5: Improving Capacity and Knowledge	Operationalise a comprehensive biosafety system for modern biotechnology
	Strengthen Malaysia's capacity to implement biodiversity policies and agreements
	Increase funds and financial incentives for biodiversity conservation from government and non-government sources.

These goals and targets aim to enhance biodiversity conservation and sustainable use in Malaysia, addressing both ecological and socio-economic dimensions.

Beyond the call for companies to participate in Malaysia's biodiversity conservation efforts, the document outlines specific actions to engage the private sector, such as embedding biodiversity into Environmental, Social and Governance (ESG) commitments and scaling up Corporate Social Responsibility (CSR) initiatives such as disclosure based on international standards.

## 2. Mandatory Compensation Models

Australia	England	France
<p>Biodiversity compensation in Australia operates through a structured framework aimed at offsetting biodiversity loss due to development and other activities which impact ecosystems. This is achieved via biodiversity credits, specifically ecosystem and species credits, which are part of the <b>Biodiversity Offsets Scheme</b>.</p> <p>At the national and regional levels, biodiversity credits are generated at stewardship sites through Biodiversity Stewardship Agreements. These credits quantify the biodiversity values that are preserved and can be traded to offset the detrimental impacts at other sites where biodiversity loss occurs. Biodiversity credits generated through stewardship agreements typically ensure perpetual <b>conservation</b>.</p> <p><b>Australian Biodiversity Units (ABUs):</b> ABUs are a standardised unit used to quantify biodiversity conservation efforts specifically under the EcoAustralia™ program. An ABU represents 1.5 m<sup>2</sup> of protected land that contributes to biodiversity outcomes for Australian flora and fauna. These units are derived from state-based Native Vegetation Credit Registers like Biodiversity Equivalence Units (BEU) in Victoria or Significant Environmental Benefits (SEB) in South Australia.</p>	<p>In England, Biodiversity net gain (BNG) is mandatory under the Town and Country Planning Act since February 2024. It requires developers to provide for at least 110% of the biodiversity value found on the site prior to its development. BNG can be delivered either fully or in part through on-site habitat, off-site habitat, or as a last resort, the purchase of statutory biodiversity credits.</p>	<p>In France, the Green Industry Law of 23 October 2023 established the sites naturels de compensation, de restauration et de renaturation (SNCRR), a unique framework in Europe designed to encourage and promote biodiversity restoration efforts. It builds on a regulatory requirement, the Net Zero Artificialisation Law, aiming to halt the net loss of natural and agricultural land due to urbanisation and development. Enacted in 2021, the law establishes a framework to achieve “no net artificialisation” by 2050, meaning that any new development that converts natural or agricultural land must be offset by the restoration or preservation of an equivalent area. This legislation is designed to protect biodiversity, combat climate change and promote sustainable land use, ensuring that urban expansion does not come at the expense of vital ecosystems and agricultural capacity.</p>

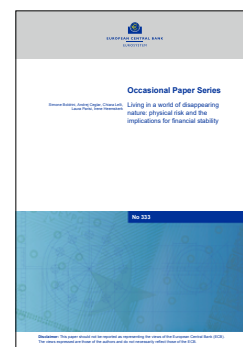
## 3. Biodiversity stress testing: the example of the European Central Bank (ECB)

In November 2023, the ECB published a first attempt at nature-related stress testing, providing a methodology to measure the sensitivity of financial institutions to biodiversity degradation through disruptions of ecosystem services.

The study outlined that more than 75% of all corporate loan exposures in the Euro area strongly depend on at least one ecosystem service, putting them at risk of ecosystem service disruptions.

With projected ecosystem degradation to 2050, the paper highlights an increase in the probability of default of these companies.


In May 2025 the ECB, alongside the Resilient Planet Finance Lab at the University of Oxford, published preliminary results on nature-related financial risks.<sup>69</sup> Focusing on a single ecosystem service (water provisioning), it demonstrates that surface water scarcity alone puts almost 15% of the Euro area’s economic output at risk.



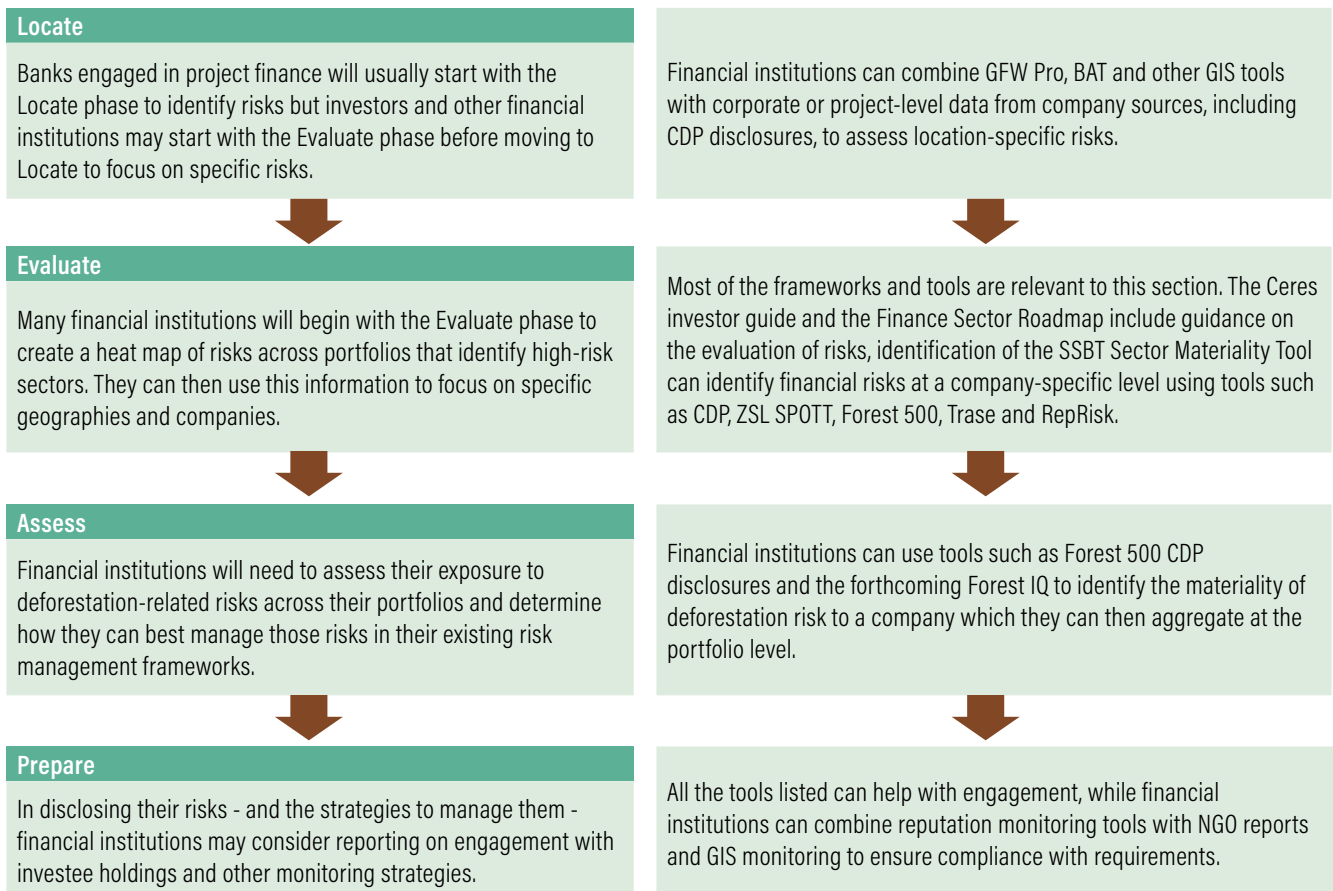
The bank also analysed Euro area banks’ loan portfolios and found that 34% of their total outstanding nominal amount (covering €1.3 trillion) is exposed to sectors with high water scarcity risks. More detailed results are anticipated to be published during the year.

#### 4. Examples of debt-for-nature swaps

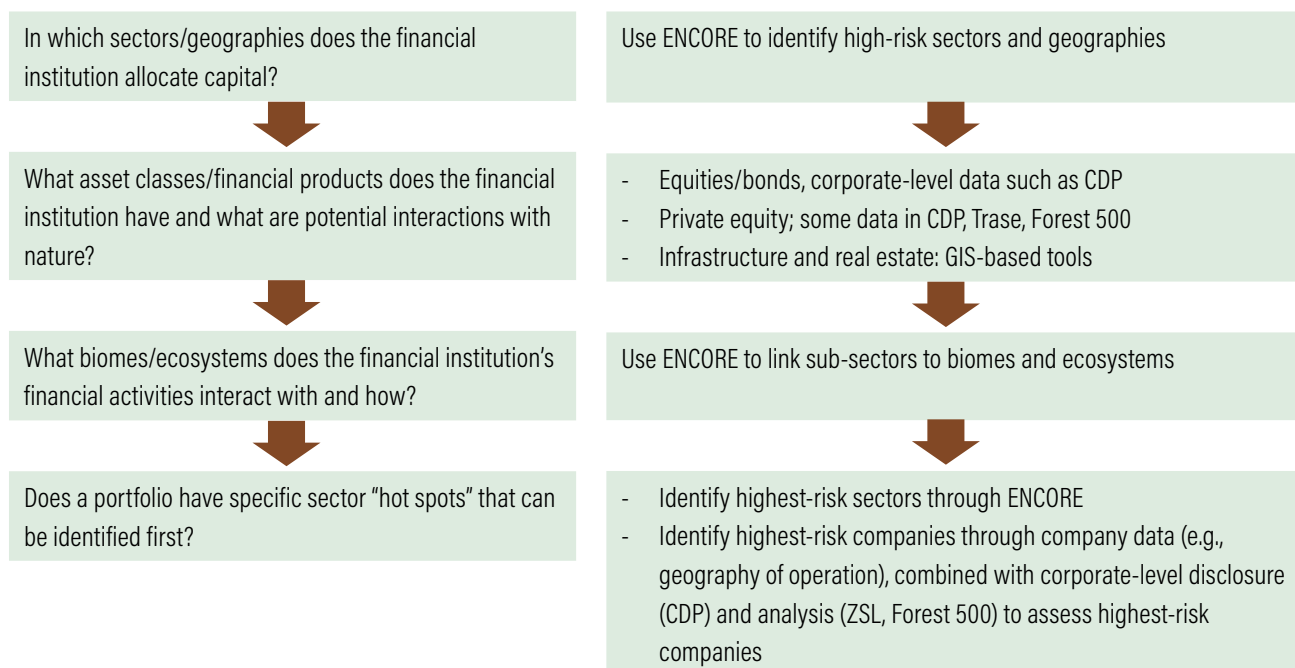
Source: Natixis CIB Green & Sustainable Hub

	 <b>Seychelles (2015)</b>	 <b>Belize (2021)</b>	 <b>Barbados (2022)</b>	 <b>Ecuador (2023)</b>	 <b>Gabon (2023)</b>
<b>Size</b>	\$21.6M of debt refinanced into \$15M of blue bond issued	\$553M of debt refinanced into \$364M of blue bond issued	\$150M of debt relief refinanced into \$150M of blue bonds issued	\$1,628M of debt relief/ \$656M loan	\$500M of debt refinanced into \$500M of blue bond issued
<b>Nature component</b>	Sustainable marine fishery support	Marine ecosystem protection, introduction of climate insurance policy	Marine ecosystem protection	Marine ecosystem protection	Marine ecosystem protection
<b>NGO involved</b>					
<b>Guarantee</b>					
<b>Structuration time</b>	4 years	1.5 years	N/A	N/A	N/A

#### 5. LEAP Application for Financial Institutions with Tool Recommendations



## 6. LEAP Core Entry Points for Financial Institutions<sup>70</sup>



## 7. Kunming-Montreal Global Biodiversity Framework Indicators Platform

The GBF Indicators Platform serves as the primary monitoring mechanism for the 23 global biodiversity targets established in 2022. This comprehensive system provides structured indicators aligned with critical conservation objectives, including protected area expansion, ecosystem integrity maintenance, invasive species management, and genetic diversity preservation. The platform's strategic importance lies in its capacity to synthesise disparate data sources into a unified reporting framework, enabling coherent progress assessment across international commitments.

The platform employs a four-tier indicator classification system designed to optimise tracking effectiveness and policy evaluation:

Indicator Type	Purpose	Example Applications
Headline	Track progress toward core GBF goals	Ecosystem integrity (A.1), Genetic diversity (A.4)
Binary	Yes/No policy implementation indicators	National biodiversity plans, spatial conservation strategies
Component	Detailed metrics supporting headline indicators	Restoration area coverage (Target 2.2), species recovery rates
Complementary	Optional deep-dive metrics for advanced analysis	Living Planet Index, Biodiversity Habitat Index

### Species Monitoring Data Sources Portal

This comprehensive catalogue encompasses over 200 global biodiversity monitoring initiatives, facilitating streamlined access to observation networks, citizen science datasets, and environmental DNA (eDNA) repositories. The portal's primary strength lies in harmonising fragmented data sources, enabling seamless integration into GBF indicator frameworks and supporting standardised global reporting requirements.

## 8. Spatial Analytics and Conservation Intelligence Platforms

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### Integrated Biodiversity Assessment Tool (IBAT)

IBAT integrates three foundational datasets: the World Database on Protected Areas (WDPA), Key Biodiversity Areas (KBA), and IUCN Red List Range Maps. This spatial intelligence platform enables comprehensive biodiversity risk assessment, supporting environmental, social, and governance (ESG) screening processes and strategic conservation planning initiatives.

### Protected Planet

Protected Planet provides access to critical conservation datasets including WDPA, Protected Area Management Effectiveness (PAME) assessments, and Green List certifications. The platform plays a vital role in monitoring global progress toward the “30x30” conservation target, which aims to protect 30% of terrestrial and marine areas by 2030.

### Human Footprint Index

This analytical tool generates composite human pressure scores at approximately 1 km<sup>2</sup> resolution across a 20-year temporal span. The index supports identification of ecologically intact areas and informs restoration prioritisation strategies by quantifying anthropogenic impacts on natural systems.

### UN Biodiversity Lab

The UN Biodiversity Lab operates as a cloud-based Geographic Information System (GIS) platform, enabling sophisticated spatial planning capabilities and biodiversity monitoring strategy development. This tool democratizes access to advanced spatial analytics for conservation practitioners and policy makers globally.

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69. The European economy is not drought-proof, ECB and Planet Finance Lab. <https://www.ecb.europa.eu/press/blog/date/2025/html/ecb.blog20250523~d39e3a7933.en.html>

70. <https://www.wbcsd.org/wp-content/uploads/2023/09/Deforestation-free-finance-a-guide-on-tools-and-frameworks-for-financial-institutions.pdf>