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Enhancing Financial Resilience: Identifying and Managing Nature-related Financial Risks

Institute of Finance and Sustainability

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About this Report:

This report and its findings are based on a combination of desktop research and in-depth interviews. Insights were drawn from interviews with seven institutions and subject matter experts, with findings systematically analysed and refined. The goal is to seek and provide actionable recommendations for identifying and managing nature-related financial risks, with a particular focus on enhancing decision-making frameworks for financial institutions and companies.

Summary

As global ecological degradation intensifies, nature-related risks such as biodiversity loss and resource scarcity have become systemic threats to long-term economic stability. Therefore, the disclosure framework developed by the Taskforce on Nature-related Financial Disclosures (TNFD) has garnered widespread attention globally since its launch. It provides a systematic approach for financial institutions and companies to identify, assess, and manage nature-related risks and opportunities. In September 2023, TNFD released its final recommendations, followed promptly in October by the accompanying LEAP approach, promoting the mainstreaming of nature into financial and risk decision-making.

This report demonstrates how financial institutions and businesses can integrate nature-related risks into their operational processes by analysing the four core phases of the LEAP approach - Locate, Evaluate, Assess, Prepare - supplemented by the initial practices of four financial institutions, including Oxbury Bank, and three companies, such as Mengniu Dairy Company Limited. Furthermore, the report identifies challenges and opportunities in implementing nature-related financial disclosures across five key dimensions: policies and standards, capacity building, tools and methodologies, products and mechanisms, and international cooperation. It also provides targeted recommendations for central banks and financial regulators, financial institutions, and companies, respectively, aiming to guide financial capital towards nature-positive activities and collectively build a more resilient and sustainable economic future.

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1. TNFD LEAP Approach and Tools Used for Identifying and Managing Nature-related Financial Risks

Within the global economic landscape, business depends on nature for resources and services to sustain operations. Financial institutions provide financing for businesses often without adequately pricing in the risks posed by the degradation of the nature on which these businesses depend. If ecosystems falter, the economic models built upon them could collapse, jeopardizing financial returns. This report addresses this global risk by examining how financial institutions in the UK and China use specific methodologies and tools to identify and manage nature-related risks, aiming to bridge the gap between awareness and action.

In September 2023, the Taskforce on Nature-related Financial Disclosures (TNFD) issued its final recommendations[1], building a comprehensive disclosure framework around the four pillars of Governance, Strategy, Risk and Impact Management, and Metrics and Targets, designed to promote the systematic integration of natural factors into financial decision-making and risk management by corporations and financial institutions. Central to the TNFD's disclosure framework is the principle of "double materiality", which requires organisations to disclose nature-related issues based on both financial and impact materiality:

- **Financial Materiality:** Based on the IFRS S1 of the International Sustainability Standards Board (ISSB), which focuses on the material impact of nature-related risks and opportunities on the organisation's financial position. According to the TNFD requirements, organisations should disclose material information about sustainability-related risks and opportunities that are expected to affect the organisation's outlook. Information is considered financially material if its omission or misstatement could cause capital market participants to make biased value judgments about the organisation[2].
- **Impact Materiality:** Emphasise the actual or potential impacts of the organisation on natural ecosystems and human society, and prioritise the disclosure of operations with significant negative effects on biodiversity degradation, natural resource depletion, and human rights protection. The TNFD proposes to adopt the Global Reporting Initiative (GRI) definitional criteria, which identify the topics that have the most significant economic, environmental and human rights impacts and are consistent with Target 15 of the Kunming-Montreal Global Biodiversity Framework (GBF).

To support the implementation of its final recommendations the TNFD released the LEAP approach in October 2023. This supplementary guidance, is designed to help organisations identify, assess, manage, and disclose nature-related dependencies, impacts, risks, and opportunities. The LEAP approach consists of four phases:

1. **Locate:** Locate the interface of the organisation with nature;
2. **Evaluate:** Evaluate the dependencies and impacts of the organisation on nature;
3. **Assess:** Assess the nature-related risks and opportunities of the organisation;
4. **Prepare:** Prepare to respond to, and report on, material nature-related issues, aligned with the TNFD's recommended disclosures.

[1] Taskforce on Nature-related Financial Disclosures, *Recommendations of the Taskforce on Nature-related Financial Disclosures*, 2023, https://tnfd.global/publication/recommendations-of-the-taskforce-on-nature-related-financial-disclosures/
[2] International Financial Reporting Standards Foundation, *IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information*, 2023, https://www.ifrs.org/issued-standards/ifrs-sustainability-standards-navigator/ifrs-s1-general-requirements/

* Before proceeding with these four phases, the organisation needs to complete a scoping exercise as a prerequisite. At this phase, the organisation should conduct a rapid, broad-based initial review of both internal and external data and reference materials to formulate a hypothesis regarding its possible dependencies, impacts, risks, and opportunities related to nature. Additionally, it should identify probable skill and data deficiencies and outline strategies to bridge these gaps to ensure the successful execution of the scoped assessment. This phase should generate a reference document covering assessment assumptions, timelines, staffing arrangements, data sources and budgets, etc., which lays the groundwork for the subsequent four phases of work. This report will focus on the four phases (Locate, Evaluate, Assess and Prepare). While the report is structured across 16 components (L1 to P4), the LEAP approach does not require strict sequential adherence. For each phase, it also highlights two tools out of the over two hundred featured on the TNFD website.

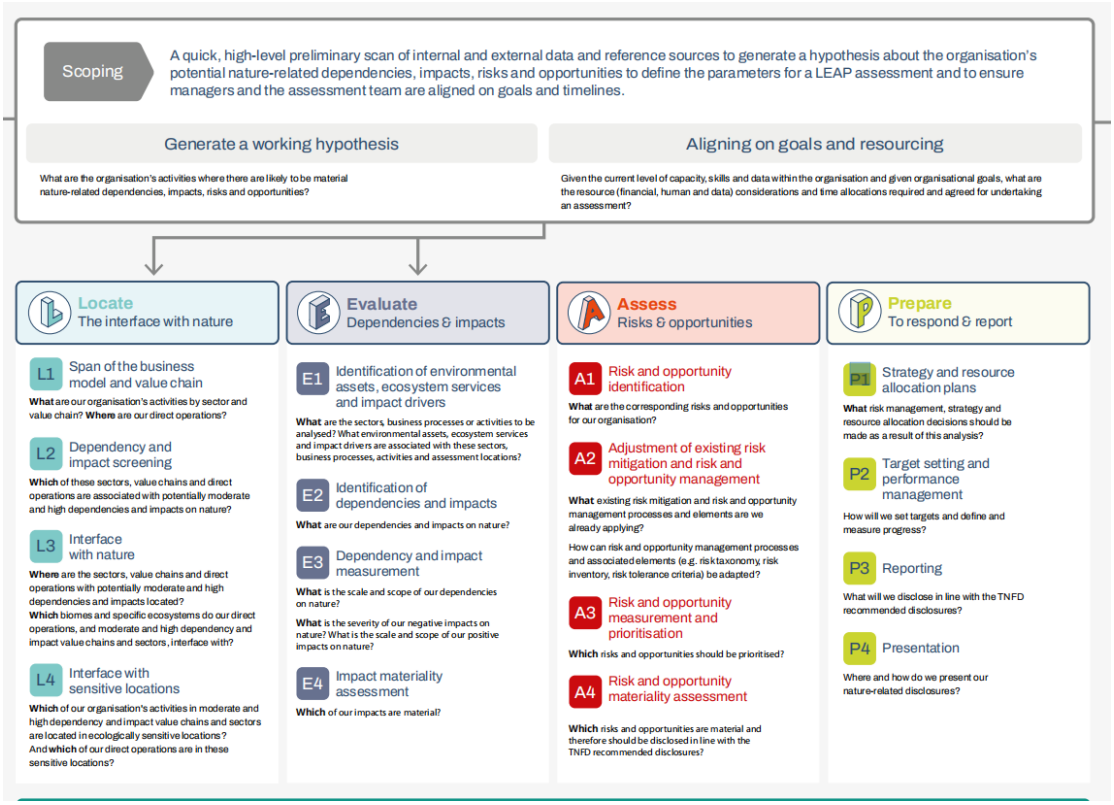

Figure 1: The TNFD LEAP Approach for Identification and Assessment of Nature-related Issues

Source: Recommendations of the Taskforce on Nature-related Financial Disclosures

1.1 Locate

The Locate phase of the TNFD LEAP approach has been designed to enable organisations to identify where their business activities interface with nature. This involves systematic screening and prioritisation to define the key focus areas for the Evaluate and the Assess phase. Because nature-related dependencies, impacts, risks and opportunities are highly location specific, geographic location is one of the core screening dimensions, combined with sector and value chain analysis to form a multi-dimensional prioritisation framework. Given the significant differences between companies and financial institutions in terms of their modes of operation, business scope, etc., the two are expressed separately in this report in the Locate phase.

For companies, this phase will focus on the three major filter dimensions of industry, value chain and

geographic location to systematically identify high priority nature interfaces. This process requires integrating internal asset-level data with external authoritative tools while also improving the visibility and traceability of geographic data through in-depth screening upstream and downstream of the value chain, and ultimately spotlights ecologically sensitive areas, laying down spatial benchmarks for subsequent assessments. Companies need to carry out the following four steps in the Locate phase:

1. Span of the business model and value chain (L1): The organisation should use internal asset-level data to define their sector, identify upstream and downstream value chain activities, and locate their direct operations (e.g., specific to GPS coordinates or polygonal);

2. Dependency and impact screening (L2): Companies need to compare the sectors, value chains and direct operations identified in L1 with reference sources such as ENCORE, SBTN's High Impact Commodity List, etc., to identify segments that may have moderate and high dependencies and/or impacts on nature. For example, the Spanish energy company Iberdrola combines the IUCN Red List of Endangered Species with local ecological studies to precisely assess the impact of wind farms on migratory bird paths;

3. **Interface with nature (L3):** After identifying potential dependencies and impacts in L2, companies need to further identify geographic locations with potential moderate and high dependency and impact activities;

4. **Interface with sensitive locations (L4):** Companies need to assess whether activities in their direct operations and in value chains and sectors of moderate and high dependency and impact are in ecologically sensitive locations, based on the geographic location identified in L3. This determination requires a clear definition of sensitive locations, including biodiversity hotspots, high water risk areas, or areas of rapidly degrading ecosystem integrity, etc. For example, Unilever uses the Trase tool to monitor its palm oil supply chain, aiming to exclude suppliers operating in illegally logged areas by identifying high-risk plantation areas in Indonesia.

Supporting questions from the Locate phase for Companies		Desired outputs from the Locate phase for Companies
L1: Span of the business model and value chain	Sector: In **which** sectors do our business model and value chain partners operate? Value chains: In **which** upstream and downstream value chains do we participate? Geography: **Where** are the geographic locations of our direct operations?	A list of potentially material activities in the business model and value chain (L2); and A list and/or map of assessment locations. This includes: • All sensitive locations: Locations where the organisation has activities and/or assets in its direct operations and value chains that meet the TNFD criteria for sensitive locations (L4); and • Other locations where the organisation has potentially material nature-related dependencies, impacts, risks and opportunities.
L2: Dependency and impact screening	**Which** of these sectors, value chains and direct operations are associated with potentially moderate and high dependencies and impacts on nature?	
L3: Interface with nature	**Where** are the sectors, value chains and direct operations with potentially moderate and high dependencies and impacts located? **Which** biomes and specific ecosystems do our direct operations, and moderate and high dependency and impact value chains and sectors, interface with?	
L4: Interface with sensitive locations	For our organisation's activities in moderate and high dependency and impact value chains and sectors, **which** of these are in ecologically sensitive locations? And which of our direct operations are in sensitive locations?	

Table 1 Supporting Questions and Desired Outputs from the Locate Phase for Companies

Source: adapted from the Taskforce on Nature-related Financial Disclosures (TNFD), and organised by Institute of Finance and Sustainability

Unlike companies, financial institutions focus on analysing the sector, value chain and geography of their portfolios during the Locate phase, which consists of the following four steps:

1. Span of the business model and value chain (L1): Financial institutions need to classify the sector, value chain and geographic distribution involved in their portfolios, identifying the sectors in which capital is invested as well as the geographic location of the relevant business activities (e.g., selecting the operation locations of major clients or investees in the portfolio);

2. Dependency and impact screening (L2): Financial institutions use tools such as ENCORE to conduct analyses to qualitatively identify sectors in their portfolios that have a moderate or high dependence on and impact on nature;

3. Interface with nature (L3): Based on L2, financial institutions need to further identify geographic locations with potentially moderate or high dependence and impact sectors (e.g., selecting and analysing the operating locations of major clients or investees in the corresponding portfolio);

4. Interface with sensitive locations (L4): Financial institutions need to assess whether the activities of major clients or investees in their portfolios are located in ecologically sensitive locations, such as biodiversity hotspots, high water risk areas or areas of rapidly degrading ecosystem integrity. For example, Storebrand tracks the supply chain of agricultural commodities through the Trase tool, identifying companies in the portfolio that are associated with deforestation risks and contributing to the implementation of measures to reduce natural risks.

Supporting questions from the Locate phase for Financial Institutions		Desired outputs from the Locate phase for Financial Institutions
L1: Span of the business model and value chain	Sector: In **which** sectors do our business model and value chain partners operate? Value chains: In **which** upstream and downstream value chains do we participate? Geography: **Where** are the geographic locations of our direct operations?	A heatmap of potentially material sectors (L2); Potentially material sectors, and analysis of the types of ecosystem or biome likely to be associated with these sectors and geographies (L3); and An analysis (most likely by portfolio) of its clients/ investees' interface with sensitive locations.
L2: Dependency and impact screening	**Which** of these sectors, value chains and direct operations are associated with potentially moderate and high dependencies and impacts on nature?	
L3: Interface with nature	**Where** are the sectors, value chains and direct operations with potentially moderate and high dependencies and impacts located? **Which** biomes and specific ecosystems do our direct operations, and moderate and high dependency and impact value chains and sectors, interface with?	
L4: Interface with sensitive locations	For our organisation's activities in moderate and high dependency and impact value chains and sectors, **which** of these are in ecologically sensitive locations? And which of our direct operations are in sensitive locations?	

Table 2 Supporting Questions and Desired Outputs from the Locate Phase for Financial Institutions

Source: adapted from the Taskforce on Nature-related Financial Disclosures (TNFD), and organised by Institute of Finance and Sustainability

1.1.1 Tools for the Locate Phase

In the locate phase, companies and financial institutions can locate the interfaces between their business activities and natural interactions using a variety of data, tools and methodologies, including internal data, external data sources, Geographic Information System (GIS) tools, ecosystem assessment frameworks, and heatmapping technique. While there are in total 212 tools developed for the LEAP approach[3], this report will closely examine the Integrated Biodiversity Assessment Tool IBAT and Biodiversity Impact Assessment BIA tool due to their distinct characteristics. IBAT provides fast, easy and integrated access to critical biodiversity information, having integrated access to many forms of authoritative data. BIA includes specific sector analysis and sector application through designing innovative approaches to identify protected areas and potential risks. Although improvements could still be made on assessment dimensions and dynamic monitoring capabilities, these two methods remain the most popular and are relatively comprehensive.

Tool 1 Integrated Biodiversity Assessment Tool (IBAT)[4]

IBAT is a globally used tool developed by the IBAT Alliance, which consists of organisations such as the International Union for Conservation of Nature (IUCN) and the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), and others. It aims to provide biodiversity data support to businesses and financial institutions, helping them identify, assess, and manage nature-related risks. The core function of IBAT includes the integration of global key biodiversity datasets (e.g., protected areas, endangered species distribution, ecosystem integrity, etc.) covering both terrestrial and marine areas.

In the Locate phase, IBAT is mainly used in L4, where companies and financial institutions can use IBAT's geospatial data to identify whether their business is located within ecologically sensitive areas (e.g., protected areas or endangered species habitats), and to identify the geographic distribution of potential risks.

Tool 2 Biodiversity Impact Assessment Tool (BIA)[5]

BIA is a biodiversity impact assessment tool jointly developed by the Shan Shui Conservation Centre and the Peking University Centre for Nature Conservation and Social Development. It integrates authoritative data resources from various sources, including the Nature Watch Biodiversity Database, the IUCN Species Distribution Database, the Key Biodiversity Areas (KBA) Database, the World Database on Protected Areas (WDPA), and the Green Grid Environmental Impact Assessment Database. BIA aims to identify potential impacts of construction projects on biodiversity through spatial overlay analysis, providing data support for planning decision-making, regulatory supervision, and public participation, thereby effectively reducing the risk of ecological damage. In practice, users can customise the buffer radius (e.g., 1km or 5km) to quickly identify protected species, protected areas, and potential ecologically sensitive areas within target regions.

Similar to IBAT, BIA is mainly used in L4, where companies and financial institutions can use BIA to quickly identify whether a factory site, a key node in the supply chain or a project site is located in an ecologically sensitive area.

[3] Taskforce on Nature-related Financial Disclosures, *TNFD Tools Catalogue*, 2023, https://tnfd.global/assessment-guidance/tools-catalogue/

[4] Integrated Biodiversity Assessment Tool (IBAT) Alliance, *IBAT for Business*, 2024, https://www.ibat-alliance.org/

[5] Taskforce on Nature-related Financial Disclosures, *Biodiversity Impact Assessment Tool (BIAT)*, 2024, https://tnfd.global/tools-platforms/biodiversity-impact-assessment-tool-biat/

1.2 Evaluate

Nature-related risks and opportunities for companies and financial institutions arise from their dependencies and impacts on nature. These dependencies stem from a reliance on ecosystem services to maintain business processes and cash flows – services that are themselves dependant on the health of natural resources. Therefore, in-depth analysis of nature-related dependencies and impacts is a primary and critical step in understanding the risks and opportunities faced by companies and financial institutions. The Evaluate phase aims to identify potential material risks and opportunities through a systematic analysis of the organisation's dependencies and impacts on nature. Aligned with the Locate phase, this report will express the work needed to be done by companies and financial institutions separately in the Evaluate phase.

In the Evaluate phase, companies need to analyse the pathways, scale and potential significance of natural dependencies and impacts based on the prioritisation scopes identified in the Locate phase (sectors, value chains, geographic locations, and sensitive areas) to provide data support for the subsequent assessment of risks and opportunities. The specific steps that need to be carried out by companies are as follows:

1. Identification of environmental assets, ecosystem services and impact drivers (E1): At E1, companies should produce a list of environmental assets, ecosystem services and impact drivers by business activities and/or assessment sites. Based on the list of sectors, value chains, geographic locations, and ecologically sensitive areas identified during the Locate phase, companies should identify environmental assets (e.g., forests, wetlands, rivers) and ecosystem services (e.g., water supply, soil retention, pollination) that are directly or indirectly linked to their business activities in conjunction with geolocation data (e.g., GPS coordinates, polygon ranges). At the same time, companies should list the main impact drivers (e.g., land-use change, greenhouse gas emissions, water pollution) according to the type of business activity (e.g., mining, agriculture, manufacturing).

2. Identification of dependencies and impacts (E2): At E2, companies should produce a list of dependencies and impacts by assessment site, including a qualitative description and initial prioritisation (high/moderate/low). Companies should identify the dependencies of their business activities on ecosystem services (e.g., food companies rely on clean water, climate stabilization) and evaluate how those activities impact nature (e.g., pollutant discharges lead to degradation of water quality, land development destroys habitat), based on the list outputs from E1 and the data on ecologically sensitive areas in the Locate phase. At the same time, companies should also assess cumulative effects by considering external factors (e.g., climate change, competition for resources from other companies), by mapping dependency pathways (e.g., "water scarcity → disruption of production → financial loss") and impact pathways (e.g., "discharge of wastewater → pollution of rivers → decline in fisheries → community conflicts");

3. Measurement of dependencies and impacts (E3): At E3, companies should produce a set of quantitative indicators of dependencies and impacts (e.g., water dependency intensity, carbon emission intensity) Companies should quantitatively measure dependencies and impacts (e.g., water consumption, carbon emissions, area of land degraded) based on the prioritisation in E2;

4. Determination of impact materiality (E4): At E4 stage, companies should produce a list of dependencies and impacts ranked in materiality. Based on the results of the E3 measurements and stakeholders' feedback, companies should refer to the Global Reporting Initiative (GRI) or the European Sustainability Reporting Standards (ESRS) to fulfil the requirements of those who need or want to disclose their impacts on nature and society.

Supporting questions from the Evaluate phase for Companies		Desired outputs from the Evaluate phase for Companies
E1: Identification of environmental assets, ecosystem services and impact drivers	**What** are the sectors, business processes or activities to be analysed? **What** environmental assets, ecosystem services and impact drivers are associated with these sectors, business processes, activities and assessment locations?	A list of relevant environmental assets, ecosystem services and impact drivers mapped to business activities and/or assessment locations (from E1), which can support reporting on the TNFD's recommended disclosures (Strategy D, and Risk and impact management A); A list of the organisation's dependencies and impacts on nature by assessment location, with a description of the dependency and impact pathway, including impact drivers, external factors, relevant ecosystem services and actual or potential changes in the state of nature (from E2). Its output can support reporting on the TNFD's recommended disclosures (Strategy A); An evaluation of material dependencies and impacts on nature, consistent with the impact materiality approach and reporting requirements of GRI and ESRS in the European Union; and A set of indicators and associated metrics developed by the organisation as part of this assessment (from E3 and E4). Its output can support reporting on the TNFD's recommended disclosures (Metrics and targets B, and Risk and impact management B).
E2: Identification of dependencies and impacts	**What** are our dependencies and impacts on nature?	
E3: Measurement of dependencies and impacts	**Dependency measurement** – What is the scale and scope of our dependencies on nature? **Impact measurement** – What is the severity of our negative impacts on nature? What is the scale and scope of our positive impacts on nature?	
E4: Determination of impact materiality	**Which** of the identified impacts are material?	

Table 3 Supporting Questions and Desired Outputs from the Evaluate Phase for Companies

Source: adapted from the Taskforce on Nature-related Financial Disclosures (TNFD), and organised by Institute of Finance and Sustainability

Unlike corporations, financial institutions focus on systematically analysing the natural dependencies and impacts of companies in their portfolios during the Evaluate phase, providing data support for subsequent risk assessment and disclosure, which consists of the following four steps:

1. Identification of environmental assets, ecosystem services and impact drivers (E1): Financial institutions should identify the environmental assets and ecosystem services related to the business activities of their portfolios in conjunction with their geographic location data (e.g., where the client operates), based on the list of sectors, value chains, geographic locations and ecologically sensitive areas exported during the

Locate phase;

2. Identification of dependencies and impacts (E2): In E2, financial institutions should produce a list of dependencies and impacts of companies in their portfolios by business activities and/or assessment locations, including a qualitative description and an initial prioritisation (high/moderate/low). Financial institutions should analyse their portfolios' dependencies and impacts on ecosystem services, based on the list produced in E1 and the ecologically sensitive areas data from the Locate phase, and assess the cumulative effects in the context of external factors, and construct dependence pathways and impact pathways;

3. Measurement of dependencies and impacts (E3): In E3, financial institutions should produce a set of quantitative indicators of the dependencies and impacts of the companies in their portfolios. Based on the prioritised list produced in E2, financial institutions should quantitatively measure and qualitatively assess the dependencies and impacts of the companies in their portfolios;

4. Determination of impact materiality (E4): In E4, financial institutions should rank dependencies and impacts in order of materiality. Financial institutions should draw on the Global Reporting Initiative (GRI) or the European Sustainability Reporting Standards (ESRS), aligned with companies' disclosures, based on measurements and stakeholder feedback produced in E3, in order to meet the requirements of those who need or want to disclose their impacts on nature and society.

Supporting questions from the Evaluate phase for Financial Institutions		Desired outputs from the Evaluate phase for Financial Institutions
E1: Identification of environmental assets, ecosystem services and impact drivers	**Which** companies/activities in our portfolios are in sectors, geographies and sensitive locations identified? **What** are the environmental assets, ecosystem services and impact drivers associated with these companies/activities?	A list of environmental assets, ecosystem services and impact drivers by portfolio sector, as identified in the heatmapping exercise in the Locate phase; A list of the portfolio companies/activities in these sectors mapped to their dependencies and impacts on nature; and An enhanced list of these companies/activities mapped to data on the scale of their dependencies and impacts, taking account of their management and mitigation efforts.
E2: Identification of dependencies and impacts	**What** are our dependencies and impacts on nature resulting from the dependencies and impacts of companies in our portfolios?	
E3: Measurement of dependencies and impacts	**Dependency measurement** – What is the scale and scope of our dependencies on nature as a result of the dependencies of our portfolio companies? **Impact measurement** – What is the severity of their negative impacts on nature? What is the scale and scope of their positive impacts on nature?	
E4: Determination of impact materiality	**Which** of the identified impacts are material?	

Table 4 Supporting Questions and Desired Outputs from the Evaluate Phase for Financial Institutions

Source: adapted from the Taskforce on Nature-related Financial Disclosures (TNFD), and organised by Institute of Finance and Sustainability

1.2.1 Tools for the Evaluate Phase

In the Evaluate phase, companies and financial institutions can use a range of evolving data, tools and methodologies to accurately assess the materiality of nature-related dependencies and impacts. These resources not only cover international authoritative theoretical frameworks and industry guidelines, such as

The Economics of Ecosystems and Biodiversity (TEEB) studies, the Natural Capital Protocol and its supplementary materials, but also tools such as Life Cycle Analysis (LCA), ENCORE, and Nature Risk Assessment methodologies proposed by the United Nations Environment Program (UNEP) and Standard & Poor's (S&P). In this report, ENCORE and Nature Risk Profile will be used as examples for specific analysis, providing practical references and guidance for the relevant practices of companies and financial institutions. Despite the need of continual enlargement of data, ENCORE stands out due to its relatively comprehensive coverage of various business activities, which includes 271 types of economic activities[6]. The Nature Risk Profile was selected because of its extensive data base: it contains 1.6 million corporate assets and over 130 metrics[7].

Tool 1 Exploring Natural Capital Opportunities (ENCORE)[8]

ENCORE is a free online tool maintained by Global Canopy, the United Nations Environment Programme Finance Initiative (UNEP FI), and the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). It helps organisations assess their business dependencies and impacts on natural capital, as well as explore nature-related risks. For financial institutions, ENCORE data can be used to identify nature-related risks exposed through their lending and investment activities in high-risk industries and sectors. As a sub-module of the tool, the biodiversity module of ENCORE can assist financial institutions in exploring how to align their activities in agriculture and mining with global nature goals.

In the TNFD LEAP approach, ENCORE can be applied in both the Locate and the Evaluate phases. In the Locate phase (L2), ENCORE offers financial institutions a qualitative approach to identify their portfolios that have a moderate or high dependencies and impacts on nature, in the Evaluate phase (E2), ENCORE helps companies to identify moderate or high dependencies and impacts of their business activities on ecosystem services.

Tool 2 Nature Risk Profile[9]

The Nature Risk Profile, jointly released by United Nations Environment Programme (UNEP) and S&P Global, introduces a risk assessment framework centred on the two core dimensions of dependencies and impacts. This framework aims to help companies and financial institutions assess their nature-related dependencies and impacts, thereby identifying, quantifying, and addressing related risks.

Dependence risk measures how much companies' operations rely on ecosystem services (e.g., water supply and disaster regulation) and the ability of ecosystems to continuously provide these services. It quantifies the importance of the dependency using three indicators: the materiality of the dependence, the relevance based on the location of the application, and the resilience of the ecosystems that provide the services. These indicators are combined with industry characteristics and geographic data to generate an overall risk score.

Impact risk measures the extent to which corporate activities undermine the integrity of ecosystems through "footprint" calculations, and assesses the significance of the risk in relation to the ecological irreplaceability of the affected areas (e.g., the distribution of endangered species, areas of critical biodiversity) and policy sensitivities (e.g., overlapping protected areas). The methodology uses a tiered analytical framework (Tier 1 based on sectoral and regional averages, Tier 2 based on asset-level geospatial data) and introduces the EII index to comprehensively assess the structural, compositional, and functional integrity of ecosystems, providing a

[6] ENCORE, *Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE)*, 2024, https://encorenature.org/en
[7] UN Environment Programme, *Nature Risk Profile: A Methodology for Profiling Nature-related Dependencies and Impacts,* 2022, https://www.unepfi.org/publications/nature-risk-profile/
[8] ENCORE, *Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE)*, 2024, https://encorenature.org/en
[9] UN Environment Programme, *Nature Risk Profile: A Methodology for Profiling Nature-related Dependencies and Impacts,* 2022, https://www.unepfi.org/publications/nature-risk-profile/

scientific benchmark for quantifying the degradation of natural capital.
Similar to ENCORE, the Nature Risk Profile can be applied in both the Locate (L2) and the Evaluate (E2) phases.

1.3 Assess

In the Assess phase, companies and financial institutions need to further identify, quantify and prioritise nature-related risks and opportunities based on the dependency and impact pathways, scale, and potential significance, which are previously identified in the Evaluate phase. This provides data support for integrating risks and opportunities into the existing risk management framework.

Nature-related risks refer to potential threats arising from the dependencies and impacts of companies, financial institutions, and the broader society on nature. Nature-related risks generally fall into three categories:

1. Physical risks: Risks to organisations arising from natural degradation, (e.g., ecosystem imbalance, loss of species diversity, and the loss of ecosystem services). These risks may be long-term (e.g., reduced crop yields due to a decline in pollinators) or immediate (e.g., natural disasters or forest fires).
2. Transition risks: Risks arising from a mismatch between economic actions and efforts to protect, restore, or reduce negative impacts on nature. These risks may be triggered by policy changes, legal precedents, technological innovations, or shifts in investor sentiment and consumer preferences (e.g., compliance costs due to environmentally unfriendly activities or a consumer backlash).
3. Systemic risks: Risks arising from the collapse of the entire system, rather than the failure of individual components. These risks are characterised by the interaction of multiple small tipping points leading to large-scale failures, where one loss triggers a series of other losses that prevent the system from returning to its previous equilibrium (e.g., an economic meltdown due to a biodiversity loss in the agricultural sector).

In the Assess phase, the specific steps for companies and financial institutions are as follows:

1. Risk and opportunity identification (A1): In the A1 phase, companies and financial institutions should list nature-related risks and opportunities by business activities and/or assessment locations. Based on the list of dependencies and impacts output from the Evaluate phase, companies and financial institutions should combine the geographic distribution of business activities, industry characteristics, and ecological sensitivity area data to identify nature-related risks (e.g., operational disruptions caused by ecosystem degradation, and increased compliance costs due to policy changes) and opportunities (e.g., reputation enhancement through ecosystem restoration and development of nature-based financial products). At the same time, companies should list the main risks and opportunities (e.g., physical risks, transition risks, systemic risks) based on the type of business activities (e.g., manufacturing or financial investment) and the impact driver analysis from the Evaluate phase;
2. Adjustment of existing risk mitigation and risk and opportunity management (A2): In A2, companies and financial institutions should propose enhancements to their existing risk management processes. Companies and financial institutions should assess their existing risk management processes and tools (e.g., risk categorisation, risk assessment methodologies) and identify what needs to be adapted to accommodate the nature-related risks and opportunities. For example, financial institutions need to ensure that their internal reporting systems are able to monitor nature-related risks and provide timely information to the board of

directors and senior management to support decision-making. At the same time, companies should adjust their risk assessment tools to incorporate nature-related risks and opportunities, based on the dependencies and impact data from the Evaluate phase;

3. **Risk and opportunity measurement and prioritisation (A3):** In A3, companies and financial institutions should produce a prioritised list of nature-related risks and opportunities, including quantitative assessments (e.g., risk exposure amounts) and qualitative descriptions (e.g., the impact scope of risk occurrence). Based on the risk management adjustments in A2, companies and financial institutions should quantify the scale of risks and opportunities, and assess the likelihood of their occurrence. In conjunction with the dependence and impact quantifiers from the Evaluate phase (e.g., water consumption, carbon emissions), companies should prioritise these risks and opportunities using risk assessment methodologies (such as Heatmapping, asset Tagging, and Scenario-based Risk Assessment). For financial institutions, scenario analysis can be used to assess the risk exposure of different industries or geographical regions within their investment portfolios;

4. **Risk and opportunity materiality assessment (A4):** In A4, companies and financial institutions should produce a list of prioritised sensitive and important locations. Companies and financial institutions are required to assess the materiality of nature-related risks and opportunities based on the quantification and prioritisation results from phase A3, thereby making the necessary disclosures based on the current and potential future impacts on their financial position and performance.

Supporting questions from the Assess phase		Desired outputs from the Assess phase
A1: Risk and opportunity identification	**What** are the corresponding risks and opportunities for our organisation?	A longlist of relevant nature-related risks and opportunities for the organisation. The output of this can support reporting on TNFD recommended disclosures (Metrics and targets A); A matrix of risks consistent with the enterprise risk management framework of the organisation (e.g. significance by sector, business line, location and value chain); A shortlist of material nature-related risks and opportunities. The output of this can support reporting on TNFD Recommended Disclosures (Strategy A); A list of priority locations. The output of this can support reporting on TNFD Recommended Disclosures (Strategy D); and An outline of the process followed to identify **existing risk and opportunity management processes and associated elements**, providing a set of recommendations for senior management to integrate nature-related risks and opportunities into these processes and elements. The output of this can support reporting on TNFD recommended disclosures (Strategy B, and Risk and impact management A, B, and C).
A2: Adjustment of existing risk mitigation and risk and opportunity management	**What** existing risk and opportunity management processes and associated elements (e.g. risk taxonomy, risk inventory, risk tolerance criteria) are we applying? **How** can existing risk and opportunity management processes and associated elements be improved?	
A3: Risk and opportunity measurement and prioritisation	**Which** risks and opportunities should be prioritised?	
A4: Risk and opportunity identification	**What** are the corresponding risks and opportunities for our organisation?	

Table 5 Supporting Questions and Desired Outputs from the Assess Phase

Source: adapted from the Taskforce on Nature-related Financial Disclosures (TNFD), and organised by Institute of Finance and Sustainability

1.3.1 Methods for the Assess Phase

In Annex 4: Risk Assessment Methods of the TNFD LEAP Methodology document, three risk assessment methods are introduced: Heatmapping, Asset Tagging, and Scenario-based Risk Assessment. The following section will provide a comparative analysis of the three methods in terms of their data granularity, analytical depth, and time perspective.

Method 1 Heatmapping

Heatmapping is a qualitative risk assessment tool primarily used to quickly identify and summarise the potential exposure of different industries or asset classes to nature-related risks and opportunities. Heatmapping uses colours or rankings (such as high, moderate, low) to display the performance of different industries or sub-sectors across various dependence and impact categories. Its advantages include relatively easy data access, the use of existing tools like ENCORE, and suitability for initial screening and cross-sector comparisons. However, its disadvantages include failing to account for value chain complexities, the lack of forward-looking analysis, and insufficient detailed analysis of specific assets or companies.

Method 2 Asset Tagging

In comparison to heatmapping, Asset Tagging is a more in-depth method that evaluates nature-related dependencies and impacts using specific asset-level data. Asset Tagging can be categorised at different levels, ranging from industry data to the geographic location of specific assets, progressively increasing data granularity. The advantages of this method include providing a more specific and refined risk analysis, identifying specific companies or assets at high risk, and is suitable for more in-depth decision-making. However, its drawback is the high cost of data acquisition, especially for private companies or cases requiring geographic location data, and limited data availability.

Method 3 Scenario-based Risk Assessment

Scenario-based Risk Assessment combines data from heatmapping and asset tagging to construct different scenarios (e.g., policy changes, market demand shifts, etc.), thereby evaluating the financial impacts of nature-related risks. The advantages of this method include its forward-looking and its ability to simulate potential financial losses or gains under various scenarios, which can help organisations in their strategic planning. However, the disadvantages include large data quantity requirement, modelling complexity, and the lack of readily available public scenario modelling, implying in-house development may be required.

Dimension	Heatmapping	Asset Tagging	Scenario Analysis
Data Granularity	Industry/Sub-industry level	Company/Asset level	Company/Industry level
Analysis Depth	Qualitative(high/moderate/low)	Qualitative or quantitative (e.g. hectares cut)	Quantitative (e.g., percentage loss of net present value)
Time Perspective	Current or short-term	Current or dynamic tracking	Forward-looking (e.g., 5-10 years scenario)
Advantages	Quick screening, comparable across sectors	Precise locating of high-risk assets, support of dynamic metrics	Quantifying financial impacts, modelling future risks
Disadvantages	Neglect of value chain, lack of asset details	Difficult and costly access to data	Complex models and high data requirements
Ability to generate financial impact	Estimating the potential financial impact	Estimating the potential financial impact	Simulation of financial impact data

Table 6 Comparison of Heatmapping, Asset Tagging and Scenario Analysis Methods

Source: Organised by Institute of Finance and Sustainability

1.4 Prepare

In the Prepare phase, companies and financial institutions need to build on the quantification and prioritisation of nature-related risks and opportunities identified during the Assess phase. Additionally, they need to determine their disclosure procedures to ensure the integration of nature-related issues into the overall business strategy and risk management framework, and ensure transparent disclosure to stakeholders. The specific steps companies and financial institutions need to undertake are as follows:

1. Strategy and resource allocation plans (P1): In the P1 phase, companies and financial institutions should align on a nature-related strategy, define governance responsibilities, and management roles, and draft an initial resource allocation plan. Based on the list of risks and opportunities output from the Assess phase, companies and financial institutions should organise cross-sectoral senior management teams to discuss the impact of nature-related issues on strategy, governance, and resource allocation. Specifically, companies and financial institutions need to assess the impact of nature-related issues on their existing strategies while considering potential future scenarios. They should then evaluate whether governance processes need to be adjusted to better oversee and integrate nature-related issues into overall risk management. Additionally, companies and financial institutions should analyse the impact of nature-related issues on short-term, medium-term, and long-term financial performance, and consider resource allocation decisions such as investment plans and funding sources;

2. Target setting and performance management (P2): In the P2 phase, companies and financial institutions should produce a list of targets with scientifically sound objectives and quantitative indicators. Based on the strategic consensus of the P1 phase, companies and financial institutions should set targets consistent with the GBF. To measure and reach those targets, they should establish corresponding performance management systems based on the results of the assessment of nature-related dependencies, impacts, risks and opportunities. At the same time, companies and financial institutions should select a set of response indicators from the Evaluate and

Assess phases of the LEAP approach to measure their progress in addressing nature-related issues. Indicators should be forward-looking or backward-looking and directly address governance, strategy, and the organisation's approach to assessing and managing nature-related issues. Additionally, companies and financial institutions need to continuously monitor changes in impact drivers, natural conditions, and ecosystem services, as well as the dynamics of potential risks and opportunities, to ensure the relevance and effectiveness of the indicators;

3. Reporting (P3): In the P3 phase, companies and financial institutions should develop a detailed list of disclosure content and ensure their transparency and consistency. Based on the results from the P1 and P2 phases, companies and financial institutions need to decide how to disclose nature-related issues, including the content and form of the disclosure. The disclosure should be based on the TNFD, covering governance, strategy, risk and opportunity management, indicators, and targets. Specifically, the oversight and management roles of the board of directors and management on nature-related issues need to be disclosed, describing the impact of nature-related issues on business models, strategies, and financial planning. They should also outline the processes for identifying, assessing, and managing nature-related issues. Additionally, the disclosure should include the indicators and targets used to assess and manage nature-related issues, as well as the progress made toward achieving those targets;

4. Presentation (P4): In the P4 phase, companies and financial institutions should finalise the presentation of the disclosure content and ensure that it complies with relevant standards and regulatory requirements. Based on the disclosure content list in P3, companies and financial institutions need to decide how to present nature-related disclosures, including the locations and forms of the disclosures. The disclosure should follow the International Sustainability Standards Board (ISSB) International Financial Reporting Standards S1 (General Requirements) to ensure transparency and consistency of the information. Businesses and financial institutions should choose the appropriate disclosure channels (e.g., annual reports, sustainability reports, or dedicated nature-related disclosure reports). Disclosures should be clear, comparable, and provide useful insights to stakeholders.

Supporting questions from the Prepare Phase	
P1: Strategy and resource allocation plans	**What** risk management, strategy and resource allocation decisions should be made after their assessment?
P2: Target setting and performance management	**How** will we set targets and define and measure progress?
P3: Reporting	**What** will we disclose in line with the TNFD recommended disclosures?
P4: Presentation	**Where** and **how** do we present our nature-related risk disclosures?

Desired outputs from the Prepare phase
Agreement of the board's oversight and management role in assessing and managing nature-related issues. This could include, for example, a description by the executive committee and board outlining the organisation's proposed nature-related risk management strategy, advice on ways to manage and mitigate nature-related risks, and to identify and realise nature-related opportunities for the organisation. The output of this can support reporting on TNFD recommended disclosures Governance A and B; The ability to describe the organisation's processes for engaging Indigenous Peoples, Local Communities and affected stakeholders with respect to the assessment of, and response to, nature-related issues and any agreed actions to improve these processes of engagement. The output of this can support reporting on TNFD recommended disclosures Governance C; Agreement of the overall risk and impact management processes relevant to nature-related issues. This could include, for example, a description of the organisation's nature-specific risk and impact management processes. The output of this can be used to support reporting on TNFD recommended disclosures Risk and impact management A, B and C; Agreement on the strategic implications of the organisation's nature-related assessment, taking into consideration of different scenarios, which could include, for example, a description of how the assessment has influenced the organisation's business decisions, strategy and financial planning. Its output can support reporting on TNFD recommended disclosures Strategy B and C; and The setting of targets in response to the nature-related assessment. This could include, for example, a selected number of science-based, ambitious and verifiable targets and goals for the organisation. The output of this can support reporting on TNFD recommended disclosures Metrics and targets C.

Table 7 Supporting Questions and Desired Outputs from the Prepare Phase

Source: adapted from the Taskforce on Nature-related Financial Disclosures (TNFD), and organised by Institute of Finance and Sustainability

1.4.1 Tools for the Prepare Phase

In the Prepare phase, organisations can refer to a range of authoritative guidelines and frameworks. These resources include the TNFD recommendations, the guidelines for Science-Based Targets (SBTs) for Nature, and the ISSB's IFRS-S1. The following section will provide an in-depth analysis of science-based Targets for Nature. The Science-Based Targets for Nature will be closely examined. The Science-Based Targets (SBTs) for Nature provides companies with actionable targets and a specific five-step guideline, hence distinguishing itself from other tools with its practicability.

Tool 1 Science-Based Targets (SBTs) for Nature[10]

[10] Taskforce on Nature-related Financial Disclosures, *Guidance for Companies on Science-based Targets for Nature (Version 1.0)*, 2023, https://tnfd.global/wp-

Science-Based Targets (SBTs) for Nature is a systematic framework designed to help companies set science-based targets related to nature, aiming to reduce negative impacts on the natural environment and promote sustainable development. This method was developed by the SBTN and is interoperable with the TNFD framework. The application of SBTN by companies to generate data and analyse results can facilitate the use of the LEAP methodology to assess nature-related issues; in turn, the application of the LEAP methodology can provide the data needed for SBTN.

SBTN consists of the following five steps:

1) **Assess:** Assess the business's impact on nature, including water resources, land use, biodiversity, etc., and identify key impact areas and locations;
2) **Interpret and Prioritise:** Based on the results of the assessment, identify and prioritise key areas and locations where targets need to be set;
3) **Measure, Set and Disclose:** Collect baseline data, set specific, measurable and time-bound goals, and disclose them externally;
4) **Act:** Develop and implement specific action plans to achieve the goals;
5) **Track:** Monitor, report and validate the progress of the goals, and periodically adjust the strategy to ensure that the goals are achieved.

content/uploads/2023/09/Guidance_for_companies_on_science_based_targets_for_nature_v1.pdf

2. Cases of Financial Institutions and Companies in Nature-related Risk Management

Chapter 1 has introduced the TNFD LEAP approach and related tools, constructing a framework for managing nature-related financial risks. This chapter selects cases of nature-related risk management and information disclosure from financial institutions and companies in China, the UK, and other European countries. They will provide references for other companies and financial institutions and promote implementation of nature-related risk management on a global scale.

2.1 Cases of Financial Institutions

Financial institutions play a critical role in the economic system, with their business decisions significantly impacting resource allocation and economic development. In the context of escalating global ecological changes, nature-related risks have become a major challenge that financial institutions can no longer overlook. As pioneers in applying the TNFD LEAP approach within the financial sector, the experiences of Oxbury Bank, Rabobank, Quinbrook and ICBC Huzhou Branch are highly instructive. This report analyses these cases to demonstrate how financial institutions effectively identify and manage nature-related risks.

Case 1 Oxbury Bank Plc – "Oxbury Bank Plc 2023 Natural Capital Report"[11]

Established in 2021, the UK's Oxbury Bank Plc (Oxbury), is dedicated exclusively to domestic agriculture. In 2023, Oxbury released its first natural capital report, conducting a comprehensive assessment of climate change and biodiversity issues in its business operations and loan portfolio using the LEAP approach.

In the Locate phase, Oxbury focused on its 20 largest term loan exposures in the agricultural loan portfolio (accounting for 26% of the total loan amount), whose businesses cover agricultural sub-sectors such as cereals and dairy products. Using the UK public databases, Oxbury analysed the natural capital conditions across the geographic locations associated with its term loan exposures. The results showed that among the 10,389 hectares of land, there were several sensitive areas (such as ancient woodlands and nitrate vulnerable zones).

In the Evaluate phase, ENCORE and the Natural Capital Protocol were used to analyse the dependencies and impacts of agricultural sub-sectors on nature. The results indicated high dependence on terrestrial, groundwater, and surface water ecosystems, and their production activities (such as pollutants and emissions) have significant impacts on ecosystem services. For example, livestock farming has a major impact on greenhouse gas emissions and is highly dependent on water resources; both grain and livestock production can cause soil and water pollution while also being highly dependent on the quality of soil and water resources.

In the Assess phase, Oxbury identified physical and transition risks, with targeted mitigation strategies aligned to 2023 operational data. Physical risks include acute risks driven by events (such as flooding, droughts, and heatwaves) and chronic risks (such as yield declines caused by high temperatures and the erosion of ecosystem services due to agricultural pollution), which could translate into credit risks and impact customers' ability to repay loans. Transition risks arise from policy changes (such as new environmental regulations and agricultural subsidy reforms) and new technological developments (such as low-carbon fertilisers and methane-reducing technologies), which require agricultural clients to adjust production methods to meet new environmental and market demands.

[11] Oxbury Bank, *Oxbury Natural Capital Report*, 2023, https://www.oxbury.com/media/hicmfzoj/oxbury-natural-capital-report-2023.pdf

Clear strategies were developed in the Prepare phase. For example, in its loan business, Oxbury prioritised supporting projects that adopt low-carbon technologies, such as low-carbon beef supply chains, to support the sustainable and nature-positive transition of agriculture.

Case 2 Rabobank – "Rabobank's Nature Vision and Approach"[12]

Rabobank, an international food and agri-business bank headquartered in the Netherlands, offers a wide range of financial products and services to retail and corporate customers in the Netherlands. As one of the early adopters of the TNFD, Rabobank did not identify and manage nature-related dependencies, impacts, risks and opportunities in accordance with the steps of the LEAP methodology in its "Rabobank's Nature Vision and Approach" report. However, it disclosed nature-related information in the report in line with the four pillars of TNFD, namely Governance, Strategy, Risk and impact management, as well as Indicators and objectives. Therefore, this case will be introduced according to these four pillars.

Rabobank has a multi-tiered governance structure, including a Supervisory Board that oversees sustainable development matters; a Managing Board tasked with setting sustainable development goals and the group's sustainable development strategy and roadmap; and a Risk Management Committee in charge of incorporating ESG risks into the risk management framework.

In terms of Strategy, Rabobank seeks to achieve full integration of nature into the bank's core business processes by 2030. Specifically, Rabobank has established clear targets in three key areas - land use, water and pollution, and aims to mitigate the negative impacts of these areas on biodiversity.

In terms of Risk and impact management, Rabobank uses tools to conduct nature-related dependency and impact analysis on most of its private loan portfolios (accounting for 63% of total assets). The results show that the impact on nature is mainly land use. Meanwhile, approximately 85% of the covered assets are "highly" or "very highly" dependent on one or more ecosystem services, such as water availability, soil quality, and climate regulation. Based on this, Rabobank analyses nature-related risks and mentions that physical risks triggered by extreme weather events and transition risks arising from the shift towards a nature-positive economy are its key concerns, but it does not disclose details in the report.

In terms of Metrics and targets, Rabobank has set Nature-related Effort Targets covering measurement, taking action, and awareness & disclosure. For example, by the end of 2025, nature education will be integrated into the regular training system, and nature-related meetings will be held regularly for senior management and the board of directors.

Case 3 Quinbrook Infrastructure Partners – "Natural Capital, Biodiversity and TNFD Report 2024"[13]

Quinbrook Infrastructure Partners (Quinbrook) is an investment management company focused on the energy

[12] Rabobank, *Valuing Nature: The Financial Sector's Role in Transitioning to a Nature-Positive Economy*, 2023, https://media.rabobank.com/m/382d29098ed124b3/original/Value-Nature.pdf
[13] Quinbrook Infrastructure Partners, *Natural Capital, Biodiversity and TNFD Report*, 2024, https://www.quinbrook.com/wp-content/uploads/2024/04/Natural-Capital-Biodiversity-and-TNFD-Report-2024.pdf

transition across low carbon and renewable energy supply, storage, grid stability, data centres, and industrial and supply chain decarbonisation. Quinbrook has invested in several nature-positive projects in the UK, USA, and Australia since 2017. An early adopter of TNFD, Quinbrook uses the LEAP approach in its TNFD report for initial identification and management of its own nature-related risks and opportunities.

In the Locate phase, Quinbrook used the tool World Terrestrial Ecosystems Explorer (WTEE) of the United States Geological Survey (USGS) to determine the top three ecosystems in its investment portfolio. Quinbrook used the Global Industry Classification Standard (GICS) to classify the companies and projects in its investment portfolio. Using tools such as IBAT and, based on three indicators - Key Biodiversity Areas, Protected Areas, and Rarity-Weighted Richness, 11 ecologically sensitive areas were identified.

In the Evaluate phase, Quinbrook uses tools such as ENCORE to assess the materiality of the impact and dependence on nature at the industry level of its investment portfolio, showing dependency on energy, water, materials and land. For example, Primergy Solar in the investment portfolio depends on sunlight for power generation to generate revenue. Quinbrook's impacts cover six aspects, including water use, terrestrial ecosystem use, and GHG emissions (there are still some assets that directly generate Scope 1 emissions).

In the Assess phase, the nature-related risks and opportunities within its investment portfolio are analysed. Physical risks (those triggered by water stress, heatwave, cold fronts, and other factors) and transition risks (triggered by policies, markets, technologies, and reputation) were identified. For example, legislative bodies formulate policies that have a positive impact on nature or mitigate the negative impacts on nature. Quinbrook identifies five areas of opportunity, including market opportunity, resource efficiency, capital flows and financing, reputation capital, and the protection, restoration, and regeneration of ecosystems. For instance, consumer demands, and government interventions have given rise to new markets for nature and biodiversity. In addition, Quinbrook has developed a risk management process to continuously identify, assess, and monitor these risks during the pre-investment, asset management, and divestment stages. Risks are prioritised based on the scale of impact and the likelihood of occurrence, and risk mitigation strategies are developed at the asset level.

In the Prepare phrase, Quinbrook states that from 2024 it will make disclosures in its product-specific reports in accordance with the TNFD indicators and targets, covering the core global and industry disclosure indicators of TNFD.

Case 4 Industrial and Commercial Bank of China Huzhou Branch – "Biodiversity Risk Management for Investment and Financing Projects of Industrial and Commercial Bank of China Huzhou Branch"[14]

As a pilot branch for green finance reform at the head-office level, the Industrial and Commercial Bank of China Huzhou Branch ("ICBC Huzhou Branch") is committed to promoting green development through green finance. The ICBC Huzhou Branch has integrated biodiversity risk management into the entire credit business cycle, constructing a risk management process covering the Pre-loan, In-loan, and Post-loan phases:

[14] Green Finance Committee of China Society for Finance and Banking, *Research on the Construction of China's Nature-related Financial Disclosure Framework*, 2023, http://www.greenfinance.org.cn/displaynews.php?id=4425

In the Pre-loan phase, the ICBC Huzhou Branch uses the ENCORE tool to evaluate the industries covered by its existing business and classifies them into low, medium, and high-risk levels. Finally, it identifies ten high-risk industries as key priorities for pre-loan reviews, particularly those that may significantly disrupt ecosystem services, trigger transition risks, or are highly dependent on ecosystem services and thus vulnerable to physical risks. Meanwhile, it assesses the feasibility of projects in combination with the map of key biodiversity areas in Huzhou. It uses the comprehensive biodiversity protection map of Huzhou to locate the project and determine whether it overlaps with an ecologically sensitive area. If it does, the bank assesses whether the project complies with the economic activities permitted in the biodiversity protection area and only considers supporting the project if it meets the requirements.

In the In-loan phase, the ICBC Huzhou Branch strengthens risk management and continuous assessment. Based on the pre-loan analysis results and biodiversity impact assessment information, it quantifies the risk trend in combination with the assessment methodology. For projects with potential biodiversity risks, it uses remote sensing satellite technology to monitor the impact of the project on the driving factors of biodiversity impact.

In the Post-loan phase, it implements and monitors mitigation measures to ensure that the implementers of projects with potential risks carry out the mitigation measures. It conducts long-term tracking or regular ecological monitoring according to the project situation and proposes technical support plans. It evaluates the actual impact of the project on the ecological environment based on the monitoring data, adjusts the risk level, takes management measures, and regularly discloses relevant information.

2.2 Cases of Companies

In the global economic system, companies, as key players in economic activities, are closely connected with the natural environment. From resource scarcity and climate change to biodiversity loss, changes in the natural environment not only threaten the long-term stable development of businesses, but also bring new market opportunities and transformation needs. Against this backdrop, companies like Iberdrola, Swire Properties and Mengniu have actively explored practices to address nature-related risks. This report will provide an in-depth analysis of these corporate practices, offering valuable references for businesses across industries in managing nature-related risks.

Case 5 Iberdrola Group – "World Business Council for Sustainable Development (WBCSD) TNFD Pilot Use Case"[15]

The Iberdrola Group (hereinafter referred to as the Iberdrola) is an international energy company headquartered in Spain, primarily engaged in the production, distribution, and sale of electricity and natural gas. As one of the early adopters of TNFD, Iberdrola has actively participated in nature-related risk management by implementing the LEAP approach.

In the Locate phase, Iberdrola compares the geographical location data of key assets with nature-related datasets (such as the IUCN Red List), and identifies power lines, substations, and transformer stations as priority locations for assessment.

In the Evaluate phase, Iberdrola assesses the dependencies on and impacts of its business activities on nature with the help of tools like ENCORE. The results show that Iberdrola's business activities mainly depend on abiotic supply resources, such as water, mineral and non-mineral resources. Meanwhile, business activities have impacts on nature during the stages of design, construction, operation and decommissioning. For example, air pollution caused by gases emitted into the atmosphere during the operation stage.

In the Assess phase, Iberdrola adopts different risk and opportunity assessment methods for different natural elements based on factors such as data availability. For example, it uses the heatmap method to assess the regulation of ecosystem services; and asset tagging or scenario analysis to assess water and others. After identifying the key risks, Iberdrola has introduced targeted mitigation strategies for different regions. For example, in Brazil, it has launched a "Degraded Areas recovery plan" in response to the risk of vegetation loss; in Spain, to reduce the impact on species, it has taken measures such as modifying the design of powerline poles and introducing innovative mitigation measures for wind farms in power grid and onshore renewable energy projects.

In the Prepare phase, Iberdrola has set two main targets: "Have a net positive impact on biodiversity by 2030" and "Commitment to no deforestation by 2025".

Case 6 Swire Properties – "Sustainability Report 2023"[16]

[15] WBCSD and Iberdrola, *LEAP Use Case*, 2024, https://tnfd.global/wp-content/uploads/2024/10/WBCSD_Iberdrola_LEAP-use-case.pdf

[16] Swire Properties, *Sustainability Report*, 2023, https://sd.swireproperties.com/2023/pdf/en/Swire-Properties_Sustainability-Report-2023_EN.pdf

Swire Properties is a Hong Kong-based global real estate development company engaged in the development of residential, commercial, hospitality and retail properties. In response to the need to incorporate nature-related considerations into financial decisions, Swire Properties became one of the first 320 companies to participate in the TNFD Early Adopter Program in 2023 and has adopted the LEAP approach as a comprehensive assessment framework.

In the Locate phase, Swire Properties defines the interfaces between its assets and nature. By leveraging international and local databases such as the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) and the Hong Kong Biodiversity Information Hub (HKBIH), it assesses the distance between its assets and important habitats. The results show that the connections between Swire Properties' assets and nature are highly diverse, spanning five different ecological zones and three terrestrial biomes, including multiple terrestrial and freshwater ecosystems. Meanwhile, Swire Properties has established a series of standards and indicators, covering aspects such as ecosystem integrity, the importance of biodiversity, and water resource scarcity, to evaluate the natural conditions related to its assets.

In the Evaluate phase, Swire Properties identified the business activities at priority locations (new and existing development projects in the property portfolios of Hong Kong, Mainland China, and the United States), covering property management, construction activities, and hotel management. It then used the ENCORE tool to define the importance of environmental assets and ecosystem services that it depends on or impacts. Among them, property management, construction activities, and hotel management all depend heavily on groundwater and surface water. These activities also contribute to greenhouse gas emissions and generate solid waste.

In the Assess phase, Swire Properties identifies the contributing factors of nature-related risks and opportunities and their resulting potential financial impacts from the dimensions of physical risks, policies, market, reputation, liability, and technology. For example, the collapse of ecosystems that supply fresh water could increase capital costs required to mitigate extreme weather events; the increasing demand from investors for nature-related investments may attract diversified financing channels.

In the Prepare phase, Swire Properties has established a series of nature-related policies and goals. For example, it aims to ensure that 25% of its product and service procurement comes from sustainable sources.

Case 7 China Mengniu Dairy Co., Ltd. – "2023 TNFD Report"[17]

China Mengniu Dairy Co., Ltd. (Mengniu) founded in 1999 and headquartered in Hohhot, is one of the leading dairy producers in China. As one of the few early adopters of TNFD in China, Mengniu has constructed a systematic nature-related risk management framework by applying LEAP methodology in its 2023 TNFD Report.

In the Locate phase, Mengniu analysed 55 factories and 64 ranches in China and internationally through the BIA Tool and IBAT. The focus was on whether the surrounding areas of the factory and ranch operation sites were close to endangered species, protected areas, etc., and the analysis was carried out using 10 km

[17] Mengniu Dairy, *Taskforce on Nature-related Financial Disclosures (TNFD) Scoping Report*, 2023, https://mengniuir.com/pdf/esg/tnfd_sc.pdf

and 50 km radii for analysis. The results showed that there were endangered species such as little egrets and yellow - breasted buntings within 10 km of the factories and ranches.

In the Evaluate phase, Mengniu utilised ENCORE and Natural Capital Protocol to assess the natural dependencies and impacts of business activities. Mengniu visualised the impacts and dependencies of various business segments through heat mapping. According to the analysis, the upstream ranch and raw material sectors have a strong dependence on and significant impacts on factors such as water resources and land quality.

In the Assess phase, Mengniu identifies nature-related risks from the dimensions of physical risks (both acute and chronic), transition risks (including policy, market, technology, reputation and liability), systemic risks, and nature-related opportunities from dimensions such as resource efficiency, reputation, and market, with corresponding response strategies formulated.

In the Prepare phase, Mengniu has set multiple quantifiable targets regarding nature-related issues such as climate change and water resource utilization, including “striving to achieve zero deforestation by 2030”. It will also regularly track the progress of these targets.

3. Challenges and Opportunities for Financial Institutions and Companies in Identifying and Managing Nature-related Financial Risks

3.1 Policies and Standards on Nature-related Risk Management and Information Disclosure

The coordinated development of international and national policy frameworks provides essential support for financial institutions and companies in identifying and managing nature-related risks. At the international policy level, in February 2025, the resumed COP16 meeting adopted four outputs, including the "Resource Mobilisation" decision, which stipulates "encouraging and supporting international enterprises, especially large multinational corporations and financial institutions, to regularly monitor, assess, and transparently disclose their biodiversity risks, dependencies, and impacts in line with Target 15 of the Kunming-Montreal Global Biodiversity Framework through appropriate and flexible means, including nature-related disclosure frameworks and reporting standards."[18] This offers clear and actionable policy guidance to help companies and financial institutions meet biodiversity disclosure expectations. In April 2024, the International Sustainability Standards Board (ISSB) launched a new research project on biodiversity, ecosystems and ecosystem services, which aligns with the above Target. Building on this momentum, the IFRS Foundation and TNFD strengthened their collaboration through a Memorandum of Understanding signed in April 2025.[19] In addition, ISSB's 2024-2026 work plan prioritises research into Biodiversity, Ecosystems and Ecosystem Services (BEES) with substantive discussions on potential disclosure standards slated for H2 2025.[20] Ongoing collaboration may increasingly harmonise ISSB and TNFD frameworks into interoperable standards, driving greater consistency in global nature-related disclosures.

At the national policy level, in February 2025, the UK released its National Biodiversity Strategy and Action Plan, providing funding support for initiatives such as the Nature Positive Economy and TNFD to facilitate nature-related risk management and implementation of financial institutions and companies. In addition, China has in recent years accelerated the improvement of its policies related to nature and biodiversity. In January 2024, the Ministry of Ecology and Environment released the China Biodiversity Conservation Strategy and Action Plan (2023-2030), which explicitly requires "vigorously developing green finance and strengthening nature-related environmental information disclosure." In April of the same year, the stock exchanges in Beijing, Shanghai, and Shenzhen issued the Guidelines for Sustainable Development Reporting by Listed Companies (hereinafter referred to as the Guidelines), which stipulate in Article 32 that entities with significant impacts on ecosystems and biodiversity must disclose relevant content within the reporting period. In November, the Ministry of Finance and eight other ministries issued the Basic Standards for Corporate Sustainability Disclosure (Trial) (hereinafter referred to as the Basic Standards), which includes basic concepts, principles, and methods for corporate sustainability information disclosure. Specific standards for biodiversity and ecosystems will be introduced in the future. This coordinated implementation of international and national policy frameworks not only drives financial institutions and companies to strengthen their nature-related risk management capabilities and information disclosure levels but also creates opportunities to align to nature positive practices.

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[18] United Nations, *Conference of the Parties to the Convention on Biological Diversity, Sixteenth Meeting,* 2025, https://www.cbd.int/doc/c/34c6/5cac/0c6ab2a0895053e08b9a6653/cop-16-l-34-rev2-zh.pdf

[19] CHINA ACCOUNTING STANDARDS COMMITTEE. *The IFRS Foundation and the Taskforce on Nature-related Financial Disclosures (TNFD) have formalized their collaboration*, 2025, https://www.casc.org.cn/2025/0430/270835.shtml#:~:text=

[20] IFRS. *Biodiversity, Ecosystems and Ecosystem Services*, 2025, https://www.ifrs.org/projects/work-plan/biodiversity-ecosystems-and-ecosystem-services/

Despite these policy advancements, significant implementation challenges and coordination barriers remain. On the one hand, while the China's Guidelines cover 21 key topics, including "ecosystems and biodiversity," they lack specific operational guidance for these topics, making it challenging for companies to identify relevant nature-related risks and implement targeted actions. On the other hand, existing policies do not provide differentiated disclosure requirements for different industries, resulting in disclosures that lack industry relevance and effectiveness in communicating actual risk exposure. Therefore, nature-related information disclosure policies still need further refinement.

Beyond these technical shortcomings, broader challenges to coordinated global implementation persist. Countries may prioritise different nature-related risks depending on domestic economic structures, resource dependencies, or political agendas, hindering the adoption of global standards.
In addition, even where policies exist, enforcement can be inconsistent, particularly at sub-national or local levels globally, undermining their effectiveness.

3.2 Implementation of Financial Institutions and Companies on Nature-related Risk Management

Current approaches to nature-related risk management reveal significant gaps in institutional readiness. Companies and financial institutions both lack well-established nature-related risk management systems and governance frameworks. Firstly, most companies and financial institutions have not yet developed systematic nature-related risk management strategies or incorporated ecosystem and biodiversity issues into their risk frameworks. Secondly, the responsibilities of boards of directors and their subcommittees in nature-related risk management systems have not been clearly defined, resulting in unclear accountability and weak oversight throughout the identification, assessment, and management of nature-related risks, which hinders the effective execution of risk management processes. Thirdly, companies and financial institutions lack specialised departments or personnel to systematically review business operations and value chains, which combined with insufficient collaboration among business units, makes it difficult to effectively integrate nature-related risk management into internal strategies.

Building on these structural challenges, disclosure practices remain superficial despite available frameworks. Firstly, there are few cases of companies and financial institutions fully applying the TNFD LEAP methodology. Many institutions only progress to the "Locate" phase (identifying ecologically sensitive areas in business operations and value chains) and the "Evaluate" phase (assessing nature-related dependencies and impacts). There is limited progress in the "Assess" phase (evaluating nature-related risks and opportunities), particularly in using scenario analysis to deeply assess nature-related financial risks. In comparison to companies, financial institutions have adopted the TNFD LEAP methodology less frequently, likely due to the higher complexity of applying LEAP across diverse investment portfolios. For example, financial institutions need to screen key client companies within complex investment portfolios to assess their nature-related risks, which requires extensive data collection and analysis and specialised knowledge and skills.

However, the investment landscape is gradually shifting as market participants increasingly recognise the materiality of nature-related risks. As evidenced by research from the FAIRR Initiative, investors can leverage tools such as the Protein Producer Index to identify and pinpoint biodiversity risks, while utilizing

climate risk methodologies to evaluate dependencies and impacts. Consequently, companies and financial institutions must urgently strengthen nature-related risk management practices to align operational resilience with emerging sustainability-driven market expectations.

3.3 Tools and Methodologies for Nature-related Risk Assessment

Although tools and methodologies such as ENCORE and the TNFD LEAP approach provide systematic support for companies and financial institutions in conducting nature-related risk assessments, practical implementation remains constrained. These limitations are exacerbated by the inherent spatial complexity of nature-related risks, which demand location-specific analysis which are not easily addressed by current frameworks. The limitations are reflected in the following two aspects:

At the tool level, existing nature-related risk assessment tools have shortcomings in industry classification standards, dynamic monitoring capabilities, and assessment dimensions. For example, the ENCORE tool, whose database is based on the United Nations' International Standard Industrial Classification of All Economic Activities (ISIC), provides cross-referencing tables between ISIC and some industry classification standards but does not cover all mainstream industry classification standards. This requires users to spend additional time and effort on classification conversions, limiting the tool's applicability across diverse user contexts. Similarly, IBAT, while covering global biodiversity data, cannot provide accurate ecological sensitivity analyses in remote areas due to delayed data updates, hindering risk management decisions. Additionally, although the Corporate Biodiversity Footprint (CBF) tool can assess the impact of business activities on terrestrial and freshwater ecosystems, it lacks the capability to evaluate impacts on marine ecosystems.

At the methodology level, the application of the TNFD LEAP approach in China relies on high-precision ecological data and professional technical expertise. Firstly, the TNFD LEAP methodology recommends that companies and financial institutions identify ecological sensitive areas in their business operations and investment portfolios during the "Locate" phase. However, in China, relevant ecological data is scattered across multiple public departments, such as environmental protection, forestry, and water resources, and there are issues with insufficient granularity (e.g., vague boundaries of some protected areas) and untimely data updates, making it difficult for companies and financial institutions to accurately define ecologically sensitive areas. Secondly, while the TNFD LEAP approach was developed from a global perspective, many small and medium-sized companies in China may operate primarily at the local level and lack international exposure, which limits their technical capacity.

However, to help address some of these barriers and enhance its accessibility for Chinese stakeholders, the TNFD has published a Chinese version of its "Recommendations" on its official website. This covers "Conceptual Foundations" and "Recommended Disclosure Content," providing a convenient reference for Chinese companies and financial institutions to conduct nature-related information disclosure. Additionally, TNFD recently launched two tools on its website—"Learning Lab" and "Trainer Portal"—offering a range of learning and teaching resources (including videos and webinars) from basic TNFD concepts to practical application guidance, supporting internal capacity building for companies and financial institutions and facilitating the practical application of the TNFD disclosure framework in China.

3.4 Products and Mechanisms on Nature-related Risk Management

Despite growing methodological advancements, current markets fail to adequately reward proactive entities that pioneer nature-related risk management and disclosure practices. Leading companies and financial institutions face a critical gap: a lack of standardised metrics that link improved nature-risk governance to financial benefits (e.g., preferential loan rates, reduced insurance premiums). Without explicit mechanisms connecting performance to capital allocation, such as biodiversity-linked loan covenants or nature-positive investment quotas, early movers struggle to justify upfront costs, which discourages broader adoption of nature-related risk practices.

Increasing investor focus on biodiversity-driven financial instruments is creating tangible incentives for financial institutions and their client enterprises to elevate ESG performance. As asset managers prioritise nature-related products, financial institutions that develop such offerings not only differentiate themselves but also empower their investees to gain market advantages through improved sustainability profiles. For example, in January 2025, Anji County in China launched the "Climate Ecological Product Value Impact (VEP) Climate Loan" and established a "Meteorology and Green Finance Development" collaborative mechanism, integrating meteorological data into financing processes and establishing risk assessment systems based on meteorological disaster risk levels. This facilitated financial institutions to quantify the ecological values, which encourages capital to flow towards nature-positive projects. This would in turn facilitate county-level economic transformations and provide valuable experience for financial institutions in managing and disclosing nature-related risks.

3.5 International Cooperation on Nature-related Issues

This year marks the 20th anniversary of China's "Two Mountains" theory (lucid waters and lush mountains are invaluable assets), reinforcing institutional efforts to monetise ecological value. Nature and biodiversity finance are emerging as a central mechanism for this transformation. Against this backdrop, and aligned with global goals such as the upcoming COP17, UK-China cooperation provides a critical platform to advance nature finance.

Since the establishment of the UK-China Green Finance Taskforce in 2017, the two sides have engaged in deep cooperation in areas such as environmental information disclosure. In March 2024 and March 2025 respectively, IFS and the British Embassy Beijing jointly hosted two workshops, which were themed "Nature-Related Information Disclosure" and "Identification and Management of Nature-Related Financial Risks". The meetings brought together experts and scholars from financial institutions and international organisations in both China and the UK, facilitating in-depth discussions on the management and disclosure of nature-related financial risks. The aim was to further strengthen UK-China collaboration on biodiversity finance and the nature-positive transition.

In early 2025, at the Eleventh UK-China Economic and Financial Dialogue, the two countries reached a series of agreements in the fields of biodiversity finance and nature-related information disclosure, including "to establish a Biodiversity Finance workgroup within the existing UK-China Green Finance Taskforce; both sides recognising the importance of effective risk management and investor information disclosure in achieving nature-positive outcomes and addressing climate change; both sides welcoming TNFD's work and encouraging leading international sustainability standard-setters to consider incorporating TNFD's risk

management and information disclosure framework." [21] Following this, the UK-China Nature & Biodiversity Finance Workstream was jointly launched in late June 2025 in London. As a direct outcome of the Dialogue, the Workstream aims to mainstream biodiversity and nature considerations across finance by: building financial sector capacity for TNFD-aligned risk assessment and disclosure; scaling financial instruments for nature conservation and nature-positive transitions; and facilitating policy-market dialogue to accelerate nature-inclusive finance. This adds momentum to the global standardisation of nature-related risk management and institutional capacity building.

However, effectively tackling nature-related risks and unlocking nature finance potential requires addressing challenges that extend beyond the financial sector itself. UK-China collaboration, leveraging the Workstream as a key platform, can significantly contribute to advancing solutions in the following critical systemic areas. First is establishing robust natural capital accounting and valuation to make nature's value visible in decision-making, which necessitates deep engagement from relevant ministries (e.g., statistics, environment). Second, scaling solutions requires developing innovative finance instruments, such as exploring biodiversity credits and nature-linked financial products. These create the standardised metrics and market pathways essential for financing nature. Third, accelerating nature-positive transformation in high-impact sectors is essential. Priorities include advancing sustainable agriculture and forestry practices through policy-technical partnerships, ensuring economic activities align with ecological resilience goals. Furthermore, the upcoming COP17 presents a pivotal platform for UK-China collaboration to demonstrate global leadership. This includes jointly contributing actionable recommendations on resource mobilization and showcasing successful challenge cases for biodiversity financing.

In addition, China and the UK have also achieved new progress in their TNFD-related collaboration. Bank of China became the first Chinese financial institution to officially join TNFD, and TNFD announced that the Institute of Finance and Sustainability would serve as its advisory body in mainland China. The cooperation between China and the UK in biodiversity finance and nature-related information disclosure not only provides opportunities for the development and refinement of international unified information disclosure standards but also establishes a platform for knowledge sharing and experience exchange for other countries. The Institute of Finance and Sustainability will maintain close communication with TNFD, organising and coordinating expert discussions to promote the adoption of the TNFD framework and LEAP approach by companies and financial institutions for managing nature-related risks, thereby creating valuable opportunities for Chinese institutions to build capacity in managing nature-related risks.

[21] Institute of Finance and Sustainability, 2025, https://mp.weixin.qq.com/s/77lZSUfvk9FRk1TGLS18cw

4. Recommendations For Identifying and Managing Nature-related Financial Risks

Based on the challenges and opportunities mentioned before, this report proposes the following recommendations for financial regulatory authorities, financial institutions, and companies to better identify, manage, and disclose nature-related financial risks.

4.1 Recommendations for Central Banks and Financial Regulatory Authorities

4.1.1 Strengthen Systemic Policy Frameworks for Nature-Related Risk Governance

Central banks and financial regulatory authorities should spearhead the integration of nature-related risks into systemic financial stability frameworks, including developing methodologies for nature-focused financial risk assessments and stress testing. This requires establishing macro-level policies to identify, monitor, and mitigate system-wide vulnerabilities stemming from biodiversity loss and ecosystem degradation.

4.1.2 Enhance Regulatory Requirements for Institutional Disclosure and Risk Management

Central banks and financial regulatory authorities must explicitly incorporate nature-related risks into existing sustainable finance regulations, addressing the current limited description on nature in disclosure frameworks, such as PBoC's Guidelines for financial institutions environmental information disclosure. Clear mandates should compel financial institutions to: (i) Require financial institutions to identify, assess, and manage nature-related risks across portfolios; (ii) Enforce standardised disclosure of material nature impacts/dependencies, ensuring metric alignment with climate reporting frameworks (e.g., TNFD-ISSB interoperability) to enhance policy coherence; (iii) Compel the integration of nature risks into internal governance and supervisory review processes.

4.1.3 Establish Cross-Ministerial Data Integration Mechanisms

The spatial datasets essential for nature-related risk assessment, such as ecological red lines, national territorial spatial planning, and three zones delineated by three lines for land use, remain fragmented across national, provincial, and municipal agencies. To realize their full value, a designated lead agency should spearhead the development of robust cross-ministerial data integration mechanisms. These efforts should build on existing national initiatives, such as the "One Map" system for territorial spatial planning, mandated by the Central Committee of the Communist Party of China and the State Council. This platform consolidates multi-source spatial data using standardized geographic coordinates, creating a unified national framework that supports real-time oversight and interdepartmental data sharing. Such integrated mechanisms enable financial institutions to assess asset-level exposure more effectively, for example, by flagging projects located within protected areas or identifying violations of ecological redlines. This facilitates the systematic identification, assessment, and management of nature-related risks across lending and investment portfolios.

4.2 Recommendations for Financial Institutions

4.2.1 Enhance Nature-related Risk Management and Disclosure Across Multiple Levels

Financial institutions should actively adopt the TNFD LEAP approach, using a two-tiered risk management approach to strengthen nature-related information disclosure. At the portfolio level, institutions should apply tools such as ENCORE or the Biodiversity Risk Filter to screen for geographical locations and the nature-

related impacts and dependencies of business operations and value chains. This requires a strong understanding of the concepts of "dependencies" and "impacts", and the use of scenario analysis to evaluate the potential nature-related risks across the portfolio.

At the project level, more detailed risk assessments should be conducted for high-risk projects to capture site-specific exposures. This two-tiered approach allows financial institutions to gain a more comprehensive understanding of the impact of nature-related risks and their implications for business operations, leading to more targeted and effective risk mitigation strategies.

Meanwhile, financial institutions should formally incorporate small-scale pilot programs within selected business units to test nature risk management processes. These pilots should include internal feedback mechanisms to capture lessons learned and build operational capacity for broader implementation.

Finally, financial institutions should formally integrate nature-related risk into their existing risk taxonomies. Rather than creating separate frameworks, nature risks should be embedded within standard risk management systems to ensure alignment and integration across the organization.

4.2.2 Improve and Adapt Nature-related Risk Management Tools and Methodologies

Financial institutions should develop localised nature-related risk assessment tools that reflect their specific business contexts and needs. While data limitations remain a challenge, financial institutions should make full use of available datasets rather than delaying action until the perfect data is available. At the same time, they should invest in building stronger databases and assessment models to improve the accuracy and reliability of future risk evaluations.

4.2.3 Invest in Internal Capacity and Expertise

Financial institutions should strengthen internal capacity by improving employee awareness and skills in managing nature-related risks. This can be achieved through two key approaches. First, institutions should regularly offer training courses on nature-related risks, inviting industry experts to lead sessions and helping staff understand types of nature-related risks, assessment methods, and response measures. Second, employees should be encouraged to engage in academic research and participate in industry forums or exchange programmes to develop their technical expertise and stay updated on best practices.

4.3 Recommendations for Companies

4.3.1 Improve Internal Management Systems for Nature-related Risks

Firstly, companies should accelerate the development of comprehensive nature-related risk management policies. These policies should integrate biodiversity and ecosystem services into existing risk appetite frameworks, offering clearer guidance for decision-making and risk oversight. Secondly, the responsibilities of boards of directors and their subcommittees should be clearly defined to ensure accountability in managing nature-related risks. This includes establishing effective oversight mechanisms across the identification, assessment, and management of nature-related risks, thereby supporting the effective execution of risk management processes. Thirdly, companies should establish dedicated departments or appoint specialists to identify geographical locations and nature-related dependencies, impacts, risks, and

opportunities across their operations and value chains. These functions should also coordinate internally to drive integrated biodiversity risk management and information consistent disclosure practices.

4.3.2 Conduct Nature-related Financial Disclosure Practices

Companies should align with the Guidelines, Basic Standards, and TNFD LEAP approach, among other nature-related information disclosure policies and guidelines. They are encouraged to use resources such as the TNFD website's "Learning Lab" and "Trainer Portal" for self-directed learning. They should thoroughly practice the "Locate-Evaluate-Assess-Prepare" process of nature-related information disclosure, using methods like scenario analysis to deepen the analysis of nature-related risks and opportunities.