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NATURE IS NEXT

INTEGRATING NATURE-RELATED RISKS INTO THE DUTCH FINANCIAL SECTOR

Research on nature-related risks, and recommendations on how Dutch financial institutions can learn, act and engage regarding nature-related risks in anticipation of the TNFD framework

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EXECUTIVE SUMMARY

Nature is declining faster than ever. Urgent action is needed to move toward an economy that is in harmony with nature. Several studies and reports have shown that the financial sector, including the Dutch financial sector, depends heavily on ecosystem services provided by nature. At the same time, financial institutions have an impact on nature through their financing and investing activities, such as deforestation and pollution. To ignore these impacts and dependencies on nature invites more than just damage to our natural environment: It threatens the very structure and stability of the global economy. The financial sector has a key role to play and can support a shift in global financial flows away from nature-negative outcomes and toward nature-positive ones.

Ripple effect causing risks for financial institutions

Nature loss is affecting all economic sectors, including the financial sector. Nature provides value to our economy and society through ecosystem services, such as clean water and food, but it also offers recreational, spiritual and inspirational value and supports climate regulation. Degradation of ecosystems can result in loss of its services, which in turn can create risks for economic actors. For example, depleted resource stocks, market changes, reputational harm, unsustainable fees, unusable land, severed supply chains and inoperable business models. The ripple effect then impacts the financial institutions that offer finance to their counterparties.

In short, these impacts and dependencies on nature can result in nature-related risks of three types: physical, transitional and systemic. They can lead to financial risks, such as credit, market, liquidity, operational and strategic risks. At the same time, moving toward an economy that is nature-positive can also result in significant business opportunities, for example through risk-mitigation strategies; offering new products and services, such as nature-based solutions; and making nature a key component of a purpose-led strategy. To avoid significant risks to our economy, and develop opportunities, financial institutions should recognise their impacts and dependencies, understand how these translate to financial risks and opportunities and make sure that nature is part of their strategic agenda.

The Taskforce on Nature-related Financial Disclosures (TNFD) is developing a framework for corporates and financial institutions to act on, manage and disclose the risks and opportunities associated with their own impacts and dependencies on nature. This can help financial institutions understand their interaction with nature – a complex network of interdependent functions and entities. The TNFD also provides guidance on how financial institutions can conduct nature risk assessments and what they should disclose.

Progress in the Dutch financial sector

WWF-NL and Deloitte Netherlands researched how the Dutch financial sector is integrating nature-related risks. Based on a survey, several interviews and a roundtable discussion with Dutch banks and asset managers, the progress in the Dutch financial sector was assessed and several use cases were identified.

The findings show that the Dutch financial sector is acknowledging and recognising the importance of its interaction with nature. Multiple initiatives, commitments and publications are already available in the Dutch context, suggesting that Dutch financial institutions could lead in acting upon the interaction of the financial sector with nature. Several key nature-related risks, relevant portfolios and sectors have been identified and first actions taken; examples include creating heatmaps to measure exposure to nature-related risks, integrating nature into organisational governance, making nature part of the strategy and defining qualitative targets. However, a full overview of material risks and adequate responses at the organisational or industry level is still lacking. Additional action is needed to be able to comprehensively assess, monitor and disclose these risks.

Recommendations to accelerate action

This report presents ten recommendations for financial institutions to accelerate progress in assessing, managing, and disclosing nature-related risks and opportunities across three different dimensions:

Learn: What can you do to achieve progress in your education and improve your understanding of nature-related financial risks?

- 1.** Explore the full scope of nature-related risks by considering all potential impacts and dependencies across the entire range of sectors and counterparties, treating each identified risk as potentially material.
- 2.** Build organisational awareness, knowledge and capabilities related to nature, to catalyse learning across all levels and functions of the financial institution.
- 3.** Seek alignment with emerging standards and frameworks, but ensure that this does not limit the learning journey by always maintaining a purpose-led approach.

Act: What actions can you already take with regard to governance, strategy, risk management, and metrics and targets?

- 4.** Conduct an inventory of all activities being performed, considering ongoing developments related to nature, climate and broader sustainability challenges.
- 5.** Establish ownership at the board level and shape governance regarding nature-related risks and opportunities.
- 6.** Choose a material issue and start a small-scale pilot programme to kick-start innovation, involving a cross-functional team with experts from across the financial institution.
- 7.** Develop and maintain a relevant toolkit that can support the actions, by periodically evaluating the tools and data sources in scope and exploring novel approaches.

Engage: How can you engage with your stakeholders to strengthen your learning and the actions you are taking?

- 8.** Collaborate with industry peers by exchanging ideas, co-developing new approaches and taking collective action to tackle shared challenges.
- 9.** Start and continue forceful conversations with your counterparties and their stakeholders to establish effective, active ownership and engagement that support counterparties in their journey to becoming nature-positive.
- 10.** Partner with NGOs, academics, governments and other external (local) experts to apply their knowledge, influence and experience to nature-related risks and opportunities.



1

1. INTRODUCTION

Nature loss has accelerated at an unprecedented rate in the past decade.¹ With half of the world's total GDP, approximately USD 44 trillion, being dependent on nature, its loss severely affects not just the natural world but also our economy.² In line with these figures, the World Economic Forum has classified climate action failure, extreme weather events and biodiversity loss as the top three global risks over the next decade.³ These risks all relate to nature loss. Rapid and scaled-up action is imperative to halt and reverse nature loss and to fight climate change.

Nature loss undoubtedly impacts all economic sectors and business, and the financial sector is being substantially affected as well. It is estimated that the Dutch financial sector has EUR 510 billion worth of investments worldwide that depend significantly on ecosystem services provided by nature.⁴ This can result in nature-related financial risks (hereafter: 'nature-related risks') for financial institutions and can affect financial stability.

Although the financial sector is clearly exposed to nature-related risks, it can also play a substantial role in protecting our planet, by redirecting capital flows toward activities that make a positive impact on nature, thereby also mitigating risks. Financial institutions need to recognise their impacts and dependencies on nature, understand how these translate to financial risks and make sure that nature is part of their strategic agenda.

Next to affecting our economy, nature loss has irreversible implications on society, from a cultural perspective and regarding the state of nature itself.⁵ Nature also offers cultural value in the relationship humanity has with nature and an intrinsic value for nature itself.

This report focuses on the value of nature to our economy and society through ecosystem services, which financially impact the financial sector. However, it is important to recognise that the value of nature is broader than its economic value; humanity has a duty to strive to live within the planetary boundaries.

WWF-NL and Deloitte Netherlands conducted research into how the Dutch financial sector is integrating nature-related financial risks and how prepared it is for the upcoming Taskforce on Nature-related Financial Disclosures (TNFD). This report summarises the findings of this research and provides recommendations. Chapter 2 introduces the concept of nature and nature-related financial risks and opportunities, based on literature research. It aims to provide guidance for financial institutions on the various concepts introduced in the vast number of other reports and frameworks. Chapter 3 introduces the TNFD framework for corporates and financial institutions to act on, manage and disclose nature-related risks and opportunities. Chapter 4 presents the findings of the research, which is based on a survey, several interviews and a roundtable discussion with Dutch banks and asset managers. It summarises how Dutch financial institutions are addressing nature-related risks and presents several use cases. Chapter 5 provides ten high-level recommendations for the Dutch financial sector to start learning about, acting on and engaging with nature-related risks.

1 [IPCC \(2022\) Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. In Press.](#)

2 [World Economic Forum \(2020a\) Nature Risk Rising: Why the Crisis Engulfing. Nature Matters for Business and the Economy. January 2020](#)

3 [World Economic Forum \(2022\) The Global Risks Report 2022: 17th edition. Insight Report.](#)

4 [De Nederlandsche Bank \(DNB\) \(2020\) Indebted to Nature: Exploring biodiversity risks for the Dutch financial sector](#)

5 [IPBES & IPCC \(2021\) Scientific outcome of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change](#)



2

2. NATURE-RELATED RISKS AND OPPORTUNITIES

This chapter introduces the key concepts for understanding how the financial sector interacts with nature. It is guided by the first beta version of the TNFD framework,⁶ released mid-March 2022, which includes definitions and core concepts to understand nature. This chapter is supplemented by additional insights from other initiatives where deemed necessary.

2.1 DEFINING NATURE

Fundamental to operationalise nature-related risks and opportunities is understanding the framing of nature and its related concepts. In the broadest sense of the word, *nature* encompasses the natural world, including living elements (e.g. plants, animals, people) and non-living elements (e.g. water, soil, air, minerals), with an emphasis on living organisms and their interactions among themselves and with their environment.⁷ The TNFD states that nature can be understood as a construct of four *realms*: Land, Oceans, Freshwater and Atmosphere, with which society, including people and organisations, interact.⁸

Closely related to the concept of nature is that of *ecosystems*, which are complexes of living plants, animals and micro-organisms, as well as their non-living environment, interacting as a functional unit.⁹ The non-living environment consists of non-living natural resources, such as air, water, soil and minerals, that make life possible. Ecosystems can be defined at various spatial scales, from something as large as an entire river delta to something as small as a piece of farmland. *Biomes* are collections of location-specific ecosystems having the same characteristics, which may include different types of forests (e.g. a tropical rainforest), grasslands (e.g. savannas), deserts, fresh- and saltwater bodies (e.g. coral reefs) and urban zones.¹⁰

Ecosystems naturally provide benefits that are used in economic and other human activity in the form of *ecosystem services*.¹¹ There are three types: provisioning services (e.g. food production), regulating services (e.g. water purification), and cultural services (e.g. natural tourism).¹² For example, a river ecosystem can function as a habitat for fish, provide fresh water, regulate local climate and offer recreational value. To provide services, ecosystems require a sufficient level of biodiversity and supply of supporting non-living natural resources. *Biodiversity* is best understood as the richness and variety among living organisms, at the level of genes, species, or entire ecosystems.¹³

Closely related to ecosystems and biodiversity is the term *natural capital*, which is used to define the stock of natural resources that give rise to flows of benefits to people and the economy in the form of ecosystem services.¹⁴ Here, natural resources can include living resources, such as plants and animals, and non-living resources, such as air, water, soil and minerals. Loss of natural resources and biodiversity, broadly defined as nature loss, can be highly detrimental to the provision of ecosystem services, on which our modern-day societies depend for food, water and energy.¹⁵ Human behaviour is one of the main drivers of nature loss.

6 [WTNFD \(2022a\) The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework. Beta v0.1 Release. A Prototype for Consultation with Market Participants. March 2022.](#)

7 [IPBES \(2022a\) Glossary of definition.](#)

8 TNFD (2022a)

9 [CBD \(1992\) Article 2. Use of Terms](#)

10 IPBES (2022a)

11 [System of Environmental-Economic Accounting – Ecosystem Accounting \(SEEA-EA\) \(n.d.\) Introduction to Ecosystem Accounting.](#)

12 [OECD \(2012\) Business, Biodiversity & Ecosystem Services.](#)

13 CBD (1992)

14 [Capitals Coalition \(2016\) Natural Capital Protocol.](#)

15 [Dempsey, J. \(2013\) Biodiversity loss as material risk: Tracking the changing meanings and materialities of biodiversity conservation. Geoforum, 45, 41-51](#)

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) recognises that humans can cause nature loss in the form of five main drivers:¹⁶

- **Changes in land and sea use:** Human activities leading to conversion of land and sea cover (e.g. deforestation, mining, urbanisation), mismanagement of ecosystems (e.g. intensification of agriculture or forestry), and changes in the spatial configuration of habitats (e.g. fragmentation of habitats resulting from infrastructure development)
- **Natural resource use and exploitation:** Human activities leading to the exploitation of natural resources (e.g. overfishing, unsustainable logging, hunting related to wildlife trade, mining)
- **Climate change:** Human activities that lead to greenhouse gas emissions (e.g. CO₂ emissions from fossil fuels, methane emissions from agriculture, emissions from the disruption of natural carbon sinks, such as forest, peatland, wetland); these activities are typically associated with global warming, but are also an important driver of nature loss (Information box 1 explains how climate change and nature loss are interconnected)
- **Pollution:** Human activities that lead to the pollution of soil, air and water (e.g. nitrogen oxide, lead, particulate matter, urban waste, plastic, agrochemicals, oil spills)
- **Invasive species:** Human activities that lead to the introduction of invasive animals and plants that may disrupt the regional ecosystems (e.g. introduction of destructive pests, mismanagement of pets and garden plants, release of untreated ballast water used to balance ships into the oceans)¹⁷

These five IPBES main drivers of nature loss are the result of various socio-economic, demographic, technological, cultural, and institutional factors influenced by human behaviour. They are the basis of many nature-related frameworks, including the Science-Based Targets for Nature (SBTN) Initial Guidance for Business, which the TNFD is actively incorporating into its own framework.¹⁸

Information box 1

THE INTERCONNECTEDNESS OF CLIMATE CHANGE AND NATURE LOSS

Climate change and nature loss are interconnected challenges that need to be addressed together.¹⁹ On a high level, this interconnectedness is prevalent in three ways:

- **Climate change and nature loss are mutually reinforcing:** The impacts of climate change, including rising mean temperatures, altered precipitation regimes and increased frequency of extreme weather events, are a main driver of nature loss. Reciprocally, nature loss can exacerbate climate change. For example, land-use change can reduce nature's ability to store carbon emissions from the atmosphere and lower regional resilience to climate-change impacts.
- **Nature conservation is key to climate change mitigation and adaptation:** Due to the mutually reinforcing relationship, nature is an important part of the solution to climate change. In terms of mitigation, natural carbon sequestration can be used to neutralise residual emissions by restoring ecosystems, such as forests, wetlands and peatlands. And in terms of adaptation, nature conservation and restoration can, in many ways, improve regional resilience to extreme heat, flood, droughts, wildfires and other climate-change impacts.

¹⁶ [IPBES \(2019\) The global assessment report on Biodiversity and Ecosystem Services. Summary for Policymakers](#)

¹⁷ [IPBES \(2022b\) Model of drivers of biodiversity and ecosystem change](#)

¹⁸ [Science-Based Targets for Nature \(SBTN\) \(2020\) Initial Guidance for Business](#)

¹⁹ [IPCC & IPBES \(2021\)](#)

- Climate action can be an (unintended) cause of nature loss:** Certain mitigation and adaptation solutions can be harmful to nature. For instance, the installation of renewable-energy facilities may require land-use change and interfere with local wildlife. Hydropower dams already have a long history of deteriorating river ecosystems, with only around one third of the world’s rivers remaining free flowing.²⁰ Moreover, there is an increasing concern about the biodiversity impacts of wind- and solar-power facilities, as these tend to take up substantial land and sea areas.²¹

The challenges of climate change and nature loss cannot be considered in isolation from each other and are both a consequence of society’s unsustainable use of natural resources (see Figure 1).²² The need for a more integrated approach to climate change and nature loss is increasingly recognised by governments around the world, for example during the 26th UN Climate change conference of the Parties (COP26).²³ The TNFD is also recognising this as a priority development, framing it as the ‘climate-nature nexus’.²⁴

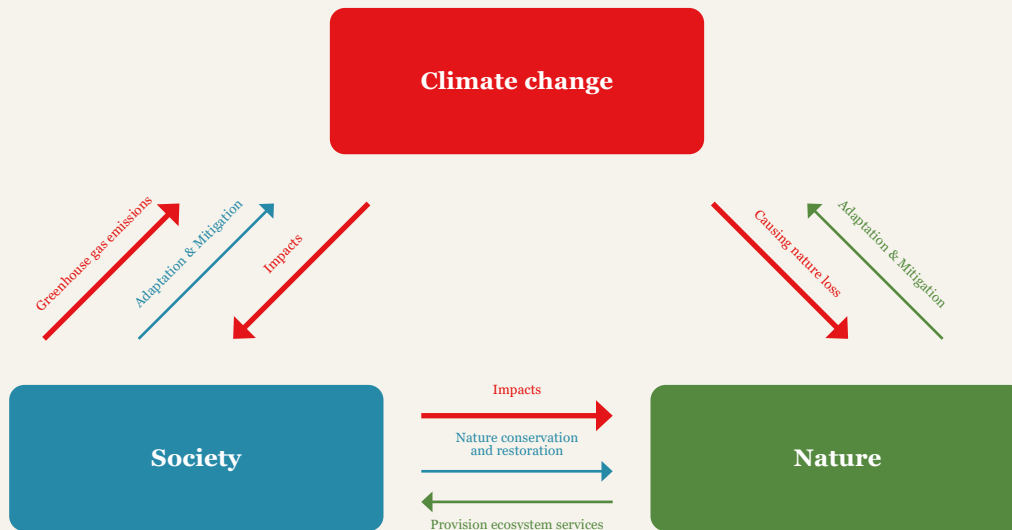


Figure 1: Visualisation of the interconnectedness of the climate change and nature loss, adapted from IPCC, 2022, Figure SPM.1, p. 36

²⁰ Thieme, M.L. et al. (2021) Navigating trade-offs between dams and river conservation. *Global Sustainability*, 4(17).

²¹ IUCN & The Biodiversity Consultancy (2020) *Mitigating biodiversity impacts associated with solar and wind energy development: Guidelines for project developers*.

²² IPCC (2022)

²³ COP26 (2021) *Glasgow Leaders' Declaration on Forests and Land Use*.

²⁴ TNFD (2022a)

2.2 NATURE-RELATED RISKS AND OPPORTUNITIES

Nature-related risks and opportunities are broadly defined as the risks and opportunities of an organisation that are associated with the interlinkages between its activities and the natural world. It is important for organisations, including financial institutions, to understand these interlinkages.²⁵

2.2.1 IMPACTS AND DEPENDENCIES

The interlinkages between an organisation's activities and the natural world are typically defined in terms of impacts and dependencies:²⁶

- **Impacts** are the contributions of an organisation or other actor to the state of nature, which may be negative or positive. Negative impacts can result from such issues as pollution of air, water and soil; the fragmentation of ecosystems; and the alteration of ecosystem regimes. On the contrary, positive impacts relate to such practices as regenerative farming, nature conservation and ecosystem restoration.
- **Dependencies** are aspects of nature's ecosystem services that an organisation or other actor relies on to function, including water flow and quality regulation; regulation of hazards, like fires and floods; pollination; and carbon sequestration.

Financial institutions are connected to the impacts and dependencies of their counterparties, which can be borrowers, advisory clients or investees.²⁷ A financial institution can contribute to their counterparties' impacts and be exposed to their dependencies. Evaluating the impacts and dependencies is part of an adequate risk assessment. For example, a financial institution provides a loan to an agricultural company producing livestock. This company has negative impacts on biodiversity, through its land use-change and water use, but at the same time is highly dependent on healthy ecosystems to provide grassland and drinking water. These facets influence the risk profile of the borrower.

The severity of the impacts and dependencies that a financial institution is exposed to depends on the counterparties to which it provides services. Important factors to consider include the sector a counterparty operates in, the activities a counterparty performs, the location of those activities (including both the upstream and downstream supply chains) and the biomes and/or ecosystems that are affected by these activities.

Priority sectors tend to have high impacts and/or dependencies, which can form a starting point for financial institutions seeking to address their material nature-related risks.^{28,29} The agriculture, energy, forestry, fishery, and food-and-beverage industries are examples that are heavily dependent on nature and ecosystem services for their continuity and existence.³⁰ The TNFD proposes two high-level approaches to start assessing nature-related risks: sector led, with the sector as starting point, and biome led, starting with the biome in which an organisation has its direct assets and operations.³¹

²⁵ TNFD (2022a)

²⁶ SBTN (2020)

²⁷ TNFD (2022a)

²⁸ [UNEP FI & NCFA \(2020\) Beyond 'Business as Usual': Biodiversity targets and finance](#)

²⁹ [World Economic Forum \(2020a\) Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy. January 2020](#)

³⁰ WEF (2020a)

³¹ TNFD (2022a)

2.2.2 NATURE-RELATED RISKS

An organisation’s impacts and dependencies on nature can give rise to nature-related risks, which may affect the financial performance of the organisation and subsequently the financial institutions providing services to it. Nature loss does not only financially affect individual financial institutions; it poses financial stability risks to the financial system as a whole. The TNFD distinguishes nature-related physical and transition risks:³²

- **Physical risks** arise from potential financial losses driven by a change in the functioning of ecosystems on which an organisation depends. This can include damage to assets, direct disruption of production processes, and indirect disruption of supply chains. With its detrimental effects on ecosystems, nature loss gives rise to physical risks. Physical risks can be event driven (referred to as ‘acute’), follow a long-term shift (referred to as ‘chronic’) or both. See Annex Table 1 for illustrative examples of physical risks.
- **Transition risks** arise from potential financial losses resulting from a misalignment between an organisation’s activities and the changing landscape in which it operates. This particularly concerns developments at the policy, legal, technology, market and reputation levels that are aimed at halting or reversing nature loss. These developments can penalise organisations with high impacts and/or dependencies on nature, as well as their commercial partners. See Annex Table 1 for illustrative examples of transition risks.

Physical and transition risks can each give rise to **systemic risks** when they lead to the disruption of entire systems, such as ecosystems, economic systems or financial systems. First, nature loss can lead to the collapse of entire ecosystems, for example when a critical ecosystem service stops functioning or when non-linear, potentially irreversible tipping points are reached, resulting in wholesale geographic or sectoral losses (Information box 2 provides a widely cited example of ecosystem collapse).

Second, nature-related risks may materialise in ways that affect one or more entire economic sectors, rather than a share of companies operating in these sectors. Having simultaneous large losses in several sectors creates risks at the portfolio level. Financial institutions cannot easily mitigate such risks through diversification of their portfolios.

Finally, there is the potential for nature loss to pose a risk to financial stability. This could occur when financial difficulties at one or more financial institutions, resulting from a failure to account for nature-related risks, spill over to the financial system as a whole.³³

Information box 2

ECOSYSTEM COLLAPSE: SEA OTTERS, SEA URCHINS, CLIMATE CHANGE AND KELP DEFORESTATION

A widely cited example of ecosystem collapse is that of the unprecedented decline in kelp forests, for example near the Aleutian Islands in Alaska, in the United States.³⁴ Sea otters are a key species in these coral-like ecosystems, as the natural predators of the sea urchins that graze on the kelp seaweed. However, the sea otters in the region were hunted to near-extinction during the fur trade of the 1700s and 1800s, ultimately becoming functionally extinct in the 1990s.

³² Adapted from the TNFD (2022a)

³³ [Leite-Filho, A.T., Soares-Filho, B.S., Davis, J.L. et al. \(2021\) Deforestation reduces rainfall and agricultural revenues in the Brazilian Amazon. Nat Commun 12, 2591](#)

³⁴ [Rasher, D. B., Steneck, R. S., Halfar, J., Kroeker, K. J., Ries, J. B., Tinker, M. T., ... & Estes, J. A. \(2020\). Keystone predators govern the pathway and pace of climate impacts in a subarctic marine ecosystem. Science, 369\(6509\), 1351-1354](#)

As a consequence, sea urchin numbers exploded, owing to the lack of a natural predator. At the same time, ocean warming and acidification caused by climate change made the kelp forests more vulnerable to grazing by sea urchins as their protective shells were softened. This allowed the sea urchins to mow down the kelp forests without restraint, leading to an unprecedented decline in kelp forests.

Experts are arguing that the ecosystem is reaching a tipping point and that urgent action is needed to manage the sea urchin population. The loss of kelp forests has had negative effects on regional wildlife, including fish populations essential to supporting the Aleutian fishing industry, generating over USD 2.5 billion of economic output.^{35,36} Given that kelp forests are an important natural carbon sink, their decline is also further exacerbating global climate change and – as a consequence – nature loss. This highlights how a change in an ecosystem can have cascading effects that lead to wholesale geographic, and even global, losses.

Nature-related physical, transition and systemic risks can have impacts at both the micro- and macro-economic levels, and are transmitted to traditional financial risks in the financial sector, including credit risk, market risk, liquidity risk, operational risk, litigation risk and strategic or business model risk.³⁷ According to the Network for Greening the Financial System (NGFS), the exposure of a counterparty to physical and/or transition risks can lead to financial risks via so-called transmission channels through business, households and the macro-economy.

For example, a changing customer demand that results from transition risks can lead to weaker profitability of an organisation, or a physical risk can impact assets or collateral of an organisation. This can lead to financial risks for the financial institution investing in those organisations. Because nature-related risks pose a material risk to the financial sector, central banks and financial regulators have started investigating the implications of nature-related risks on capital adequacy and solvency in the financial sector, as well as what type of regulatory actions might be needed to safeguard financial stability.^{38,39,40}

35 [Stewart, N. L., & Konar, B. \(2012\). Kelp forests versus urchin barrens: alternate stable states and their effect on sea otter prey quality in the Aleutian Islands. Journal of Marine Biology, 2012.](#)

36 [McDowell Group \(2020\) The economic value of Alaska's seafood industry.](#)

37 [Network for Greening the Financial System \(NGFS\) \(2021\) Biodiversity and financial stability: Building the case for action.](#)

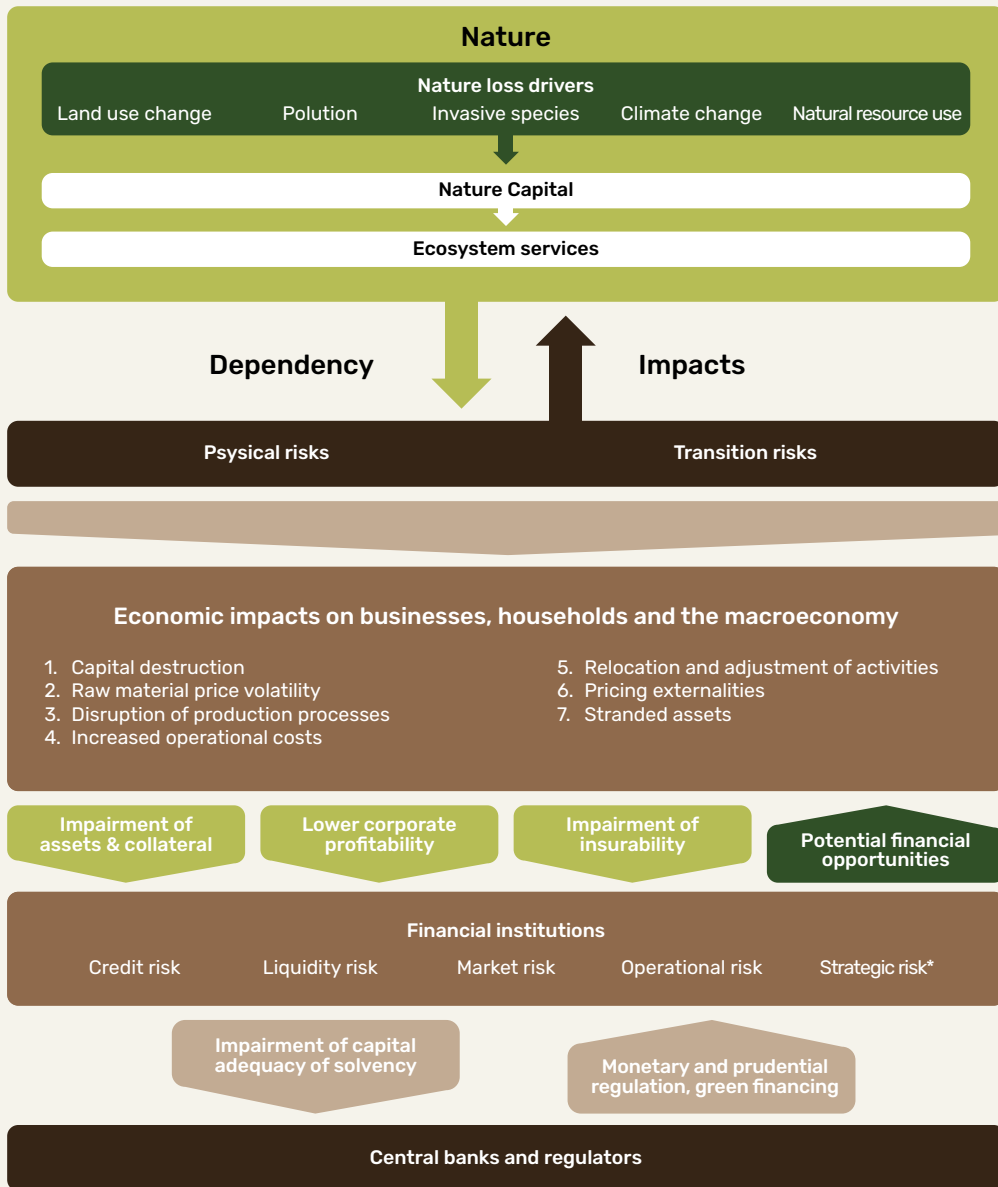
38 [WWF \(2021a\) Nature's next stewards: Why central bankers need to take action on biodiversity risks.](#)

39 [ECB \(2020\) Guide on Climate-Related and Environmental Risks. Supervisory Expectations Relating to Risk Management and Disclosure. European Central Bank, November 2020.](#)

40 [DNB \(2020\)](#)

Figure 2 summarises the transmission channels of nature-related risks to the financial sector, following the conceptual framework of the NGFS, supplemented with a depiction of nature loss that was introduced by the Cambridge Institute for Sustainability Leadership (CISL).^{41,42}

Figure 2: Visualisation of the transmission channels of nature-related risks, from nature loss to financial risks in the financial sector. Adapted from TNFD (2021) for the definition of physical and transition risks, NGFS (2021) for the economic transmission to the financial sector, and CISL (2021) for the conceptualisation of nature.



* Strategic or business model risk is added in alignment with ECB Guide on Climate-related and Environmental Risks

41 [CISL \(2021\) Handbook for Nature-related Financial Risks](#)

42 NGFS (2021)

2.2.3 NATURE-RELATED OPPORTUNITIES

In addition to nature-related risks, impacts and dependencies can lead to significant nature-related opportunities. Estimates show that a nature-positive economy can create business opportunities worth USD 10 trillion.⁴³ For an organisation, these are the positive commercial and nature outcomes for itself and nature that result from performing activities that benefit nature: halting or reversing nature loss, or contributing to the restoration of nature.⁴⁴

Integrating nature into risk management and financial analysis is generally proven to result in a better financial performance in the long term.⁴⁵ Financial institutions can seize nature-related opportunities by using their influence to stimulate the businesses, households and governments they consider as their counterparties to address their impacts and dependencies, possibly benefiting nature. This report recognises that the nature-related opportunities of financial institutions exist across three dimensions:

1. **Risk:** Opportunities arising from actions to mitigate nature-related risks of natural capital and ecosystem services loss. Nature-related risks can be mitigated through reducing the impact on nature, or reducing the dependency on ecosystem-services loss and thereby become more resilient as an organisation. An example is investing in enhancing soil quality provides financial benefits.
2. **Products and services:** Opportunities arising from finding new ways to serve current and new counterparties in existing and new markets. These might include green finance instruments (e.g. green bonds, sustainability-linked loans), project financing for nature conservation (see Information box 3), and solutions co-created with counterparties to reduce impacts on nature.^{46,47,48}
3. **Strategy:** Opportunities arising from actions that contribute to an organisation's strategy, for example by helping a firm align with its purpose, achieve its sustainability objectives, strengthen its ability to serve its counterparties, and improve its overall market positioning and competitive advantage, better aligning with stakeholder expectations.⁴⁹

Information box 3

FINANCING NATURE CONSERVATION: A CASE OF NATURE-BASED SOLUTIONS

Nature-based solutions are an example of the opportunities provided by markets, by creating less resource-intensive products and services. Specifically, these solutions are actions to protect, manage and restore ecosystems that address societal challenges, therefore simultaneously benefitting nature and human well-being.⁵⁰

The United Nations Environment Programme Finance Initiative (UNEP FI) reported that as much as USD 8.1 trillion in investments are needed by 2050 to meet the needs of nature in fighting the interlinked challenges of climate change, nature loss and land degradation.⁵¹ This amounts to an annual investment of USD 536 billion in nature-based solutions: three times the USD 133 billion invested in 2020.

44 TNFD (2022a)

45 Whelan, T., Atz, U. & Clark, C. (2021) ESG and financial performance: Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015 – 2020. NYU Center for Sustainable Business.

46 Global Canopy (2020) The Little Book of Green Investing in Nature

47 UNEP FI, WEF, ELD & Vivid Economics (2021) State of Nature Finance

48 Rabobank, FrieslandCampina & WWF (2022) Biodiversiteitsmonitor.

49 TNFD (2022a)

50 IUCN (2016) IUCN Global Standard for NbS

51 UNEP FI, WEF, ELD, Vivid Economics (2021)

Examples of relevant nature-based solutions include reforestation, mangrove restoration, peatland restoration and silvopasture. The need for scaling up finance for nature-based solutions opens up opportunities for financial institutions. Various organisations are involved in the development of guidance to support financial institutions in financing nature-based solutions, including the European Investment Bank's publication *Investing in Nature: Financing Conservation and Nature-based Solutions* and the WWF's initiative *Bankable Nature Solutions*.^{52,53}

52 [EIB \(2018\) Investing in Nature: Financing Conservation and Nature-based Solutions](#).

53 [WWF-NL \(2020\) Bankable Nature Solutions](#)



3

3. THE TASKFORCE ON NATURE-RELATED FINANCIAL DISCLOSURES

This chapter describes the core elements of the TNFD framework, guided by its first beta version. The TNFD is developing a framework intended for corporates and financial institutions to manage and disclose the risks and opportunities associated with their impacts and dependencies on nature.

The development of the framework started in mid-2021 and involves a taskforce of around 34 subject-matter experts from leading corporates, financial institutions and market service providers.⁵⁴ Drawing from the insights of a diverse pool of market actors and stakeholders, the framework will provide tangible and concrete guidance for its users. The TNFD is adopting an open innovation process. It will release several beta versions over 2022 and 2023, actively seeking feedback and urging organisations to perform pilot testing.

The first beta framework (vo.1) was released mid-March 2022 and has three core components:

1. **Fundamentals for understanding nature:** The TNFD framework provides an understanding of ‘nature’. By providing definitions and introducing core concepts, it is helping organisations understand how their impacts and dependencies on nature create both risks and opportunities.
2. **Disclosure recommendations:** The TNFD framework provides a set of draft disclosure recommendations, which are built on the four pillars of the Taskforce on Climate-related Financial Disclosures (TCFD):⁵⁵

Governance: Describing the board’s oversight and management’s role to assess and manage nature-related risks and opportunities

Strategy: Describing the impact of nature risks and opportunities on the organisation’s business, strategy and financial planning

Risk management: Describing how to identify, assess and manage impacts and dependencies and associated risks and opportunities

Metrics and targets: Describing the metrics and targets used to assess and manage nature-related risks and opportunities, including performance in reaching these targets

The beta framework summarises detailed disclosure requirements for each of these pillars, providing guidance for all sectors. Future beta versions will contain specific guidance for individual sectors.

3. **Risk management process (LEAP):** The beta framework includes voluntary guidance aiming to support organisations with assessments to understand and respond to nature-related risks and opportunities (see Annex Figure 7). This so-called LEAP process is built on four principles:

Locate the interface with nature

Evaluate the impacts and dependencies

Assess the risks and opportunities

Prepare to respond to, and report on, nature-related risks and opportunities

Each of these principles is further broken down into sub-questions that help organisations assess nature-related risks and opportunities.

53 [WWF-NL \(2020\) Bankable Nature Solutions](#)

54 [TNFD \(n.d.\) Taskforce on Nature-related Financial Disclosures](#)

55 TNFD (2022a)

The TNFD has developed a LEAP process specifically for financial institutions (see Annex Figure 7). The LEAP process should be applied to the financial institutions' financed activity, which requires an understanding of the connection between the institutions' counterparties and their link with nature. Depending on the type of financial institution, the product or asset class and the level of aggregation (individual entity or portfolio level), institutions might consider a location-based or a sector-based approach. Financial institutions could also request that their counterparties follow the LEAP process and provide information in line with the TNFD. The LEAP process can also be applied to the financial institutions' own operations and supply chain.

The TNFD aims to find alignment with other frameworks, as well as existing and future disclosure standards, such as the TCFD and the International Financial Reporting Standards (IFRS) Sustainability Board (ISSB). Several supervisory and governmental bodies implicitly already include nature in existing guidance and, therefore, also call for an integrated approach.

For example, the European Central Bank (ECB) has incorporated nature in its supervisory expectations for climate-related and environment risk management, referring to biodiversity loss, pollution and deforestation as material environmental risks to be considered by financial institutions.⁵⁶ Banks supervised by ECB should have already started addressing these nature-related risks in line with the supervisory expectations.

Similarly, as part of the new Sustainable Finance Package, the European Commission is drafting technical screening criteria for biodiversity, to be incorporated in the EU Taxonomy. The latter is a framework meant to provide insights into environmentally sustainable economic activities, such as the protection and restoration of nature and ecosystems. Part of the European Sustainable Finance Package is the shift toward a single mandatory sustainability reporting standard: the proposed Corporate Sustainability Reporting Directive (CSRD), which will also require organisations to report on biodiversity.⁵⁷ For climate change mitigation and adaptation, the CSRD is building on the TCFD recommendations. The TNFD could lay the groundwork for reporting on nature.

⁵⁶ [ECB \(2020\) Guide on Climate-Related and Environmental Risks. Supervisory Expectations Relating to Risk Management and Disclosure. European Central Bank, November 2020.](#)

⁵⁷ [European Commission \(2021a\) Communication from the Commissions to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. EU Taxonomy. Corporate Sustainability Reporting. Sustainability Preferences and Fiduciary Duties: Directing finance towards the European Green Deal. COM/2021/188 final.](#)



4



4. NATURE-RELATED RISKS AND THE DUTCH FINANCIAL SECTOR

This chapter describes the link between the Dutch financial sector and nature, and how Dutch financial institutions are currently addressing nature-related risks.

4.1 THE URGENCY FOR THE DUTCH FINANCIAL SECTOR TO ACT ON NATURE

Dutch financial institutions are under political and public pressure to limit their impact on climate change and nature loss. In 2020, Frank Elderson expressed his strong advocacy of going “beyond climate”.⁵⁸ He emphasised that the 2020 Dutch Central Bank (DNB) report provides evidence of Dutch financial institutions’ material exposure to the risks arising from nature loss.

The Dutch financial sector has estimated investments of EUR 510 billion worldwide that are highly dependent on ecosystem services provided by nature. When it comes to impacts, experimental modelling indicated that land-use change and greenhouse gas emissions generated by Dutch portfolios result in nature loss equivalent to 58,000 km² of pristine nature. That is an area representing over 1.7 times the land surface of the Netherlands.⁵⁹

Because many Dutch financial institutions finance activities that depend on ecosystem services, they may face physical risks. The DNB and the Netherlands Environmental Assessment Agency (PBL) showed that 36 per cent of the Dutch portfolios studied were exposed to such risks.⁶⁰ This suggests that the rapid decline of ecosystem services can have significant financial consequences on the Dutch financial sector and could affect institutions’ business continuity.

As described in Chapter 2 and illustrated with examples in Annex Table 1, financial institutions can be materially impacted by various transition risks, such as reputational risks. In 2020, Dutch financial institutions were exposed to reputational risks of EUR 97 billion by funding organisations involved in environmental controversies that severely harmed nature.⁶¹ Recent statistics revealed that a substantial amount of the Dutch financial sector’s financing activity is linked to deforestation. They revealed that, out of all European banks, Dutch banks made 40 per cent of the profits from loans to the most controversial counterparties causing deforestation.⁶² Additionally, plastic production companies are largely financed by Dutch banks, with the Netherlands being the eighth largest financier of the top 40 plastic suppliers.⁶³

These financial activities pose significant reputational risk, as financial institutions are facing increasing public pressure to stop investing in environmentally harmful companies. The Vereniging Milieudefensie (Dutch Environmental Defence organisation), for example, has started to actively target Dutch organisations, including banks and asset managers. It aims to push them to come up with plans to reduce their environmental impact in line with the Paris Agreement targets, or risk an imminent climate lawsuit.⁶⁴

Additionally, through their large biodiversity footprint, Dutch financial institutions increasingly face other transition risks, such as consumer preference and governmental policy shifts toward practices that protect and foster nature. The Netherlands is known for its excessive nitrogen emissions. The Dutch nitrogen crisis led to governmental measures (e.g. Programma Aanpak Stikstof in 2019) that increased the costs of nitrogen-emitting activities, to transition toward a low-nitrogen society. Between 2017 and 2020, three large Dutch banks provided a total of EUR 81 billion in loans to nitrogen-emitting organisations and are, therefore, exposed to significant transition risks.⁶⁵

⁵⁸ Elderson, F. (2022). Frank Elderson: Climate finance - towards carbon neutrality 2050.

⁵⁹ De Nederlandsche Bank (DNB) (2020) *Indebted to Nature: Exploring biodiversity risks for the Dutch financial sector*.

⁶⁰ DNB (2020)

⁶¹ DNB (2020)

⁶² Sustainable Finance Lab (2022). *A Nature-Positive Dutch Financial Sector*

⁶³ Portfolio Earth (2021) *Bankrolling Plastics: The Banks that Fund Plastic Packaging Pollution*.

⁶⁴ Milieudefensie (2022) *The Solution is Less Pollution: Milieudefensie/Friends of the Earth Netherlands demands climate plan from 30 major climate polluters*. News Milieudefensie.

⁶⁵ DNB (2020)

The Dutch financial sector undoubtedly needs to direct efforts at identifying and disclosing the various risks arising from nature. The DNB recommends that financial institutions attempt to understand the timescale and scope of these nature-related risks, and the extent to which they translate into financial risks and contribute to the bank's broader risk profile. Such methods as stress testing and scenario analyses can be useful in this aspect. The DNB suggests using climate-related initiatives, such as the TCFD, as inspiration for a framework centred on nature. It advises taking a sector-oriented approach to account for variations in exposure to nature-related risks, which is something the TNFD can facilitate.⁶⁶

Besides nature-related risks, financial institutions can benefit from nature-related opportunities as described in Chapter 2. The Dutch financial sector is uniquely placed to steer nature-positive actions in the financial system. The Netherlands is one of the largest global producers and traders in agriculture and food commodities, and its government has recently set aside EUR 25 billion⁶⁷ for the transition of the livestock industry to more sustainable farming practices. Dutch financial institutions can play an important role in this agricultural transition and influence global food systems. Moreover, this transition and the accompanying financial commitment of the Dutch government will create considerable opportunities for nature-positive investments.

4.2 STATUS OF THE DUTCH FINANCIAL SECTOR: RESULTS OF THE MARKET RESEARCH

As part of this report, market research was conducted to investigate the progress and current practices of Dutch financial institutions in managing their nature-related risks and opportunities. This was done through a survey of 22 questions and 4 sub-questions, alternating between multiple choice, drop-down and open-answer questions. The survey topics related to recognising impacts and dependencies on nature, actions taken to integrate nature-related risks and opportunities into risk management, challenges faced, tools and data used, and financial institutions' level of engagement with stakeholders.

The respondents represent over 70 per cent of total assets of the 12 largest Dutch banks⁶⁸ and over 75 per cent of total assets of the 10 largest Dutch asset managers.⁶⁹ In addition to the survey, financial institutions and other stakeholders were invited to participate in a virtual roundtable event, to share additional insights into their current practices in this field and learn from one another. Lastly, interviews were conducted with several Dutch banks and asset managers to deep-dive into specific practices and case studies.

Given the large number and variety of initiatives, commitments and publications on nature-related risks and opportunities in the Dutch financial sector, Dutch financial institutions could become global leaders in this field. This was part of the motivation to conduct this study. The survey results show that nearly all respondents (89 per cent) suggested that the Dutch financial sector could, and should, be a frontrunner in identifying and managing nature-related risks and opportunities.

⁶⁶ DNB (2020)

⁶⁷ [The Guardian, Net zero is not enough – we need to build a nature-positive future \(2021\)](#)

⁶⁸ [Banken.nl, Ranglijst grootste Nederlandse banken 2020 \(2021\)](#)

⁶⁹ [Statista \(2021\) Leading asset managers in the Netherlands in 2020, by total assets under management.](#)

The Dutch financial sector does not only recognise that it faces material nature-related risks. It is also increasingly expected – by policy-makers and societal actors – to take ownership of its investment and lending decisions in relation to nature. Respondents highlighted that the sector is highly ambitious and dedicated in this regard, and that they can use their position to turn their nature-related risks into opportunities. To illustrate this ambition, several respondents referred to the substantial effort of the DNB, which is reflected in recent reports,^{70,71} and to the various commitments of Dutch financial institutions through initiatives, partnerships and collaborations.

This section further elaborates on the current practices of Dutch financial institutions in managing their nature-related risks and opportunities. Three interconnected and iterative dimensions are covered:

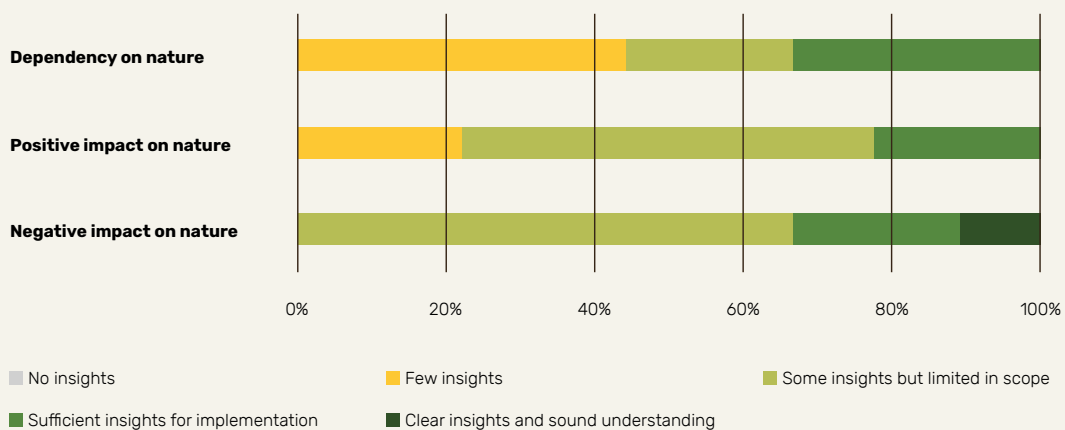
- **Learn:** What is the current understanding of nature-related risks in the Dutch financial sector and what do current learning processes look like?
- **Act:** What actions regarding nature-related risks have already been taken, pertaining to governance, strategy, risk management and metrics and targets?
- **Engage:** How are financial institutions engaging with stakeholders and peers to strengthen their learning and actions?

4.2.1 LEARN: CURRENT UNDERSTANDING OF NATURE-RELATED RISKS

The perceived importance of addressing nature loss is high among the respondents; all of them acknowledge that nature loss could financially impact their organisation. Figure 3 shows that although most organisations have initial insights regarding their negative impacts on nature, the positive impacts and dependencies are less understood. The majority of the financial institutions do not yet have a comprehensive view of their impacts and dependencies on nature and the resulting nature-related risks they are facing.

For that reason, the relevance and materiality of the risks tends to be underestimated. Until now, financial institutions have mostly concentrated their efforts on climate-related risks; nearly all of them intend to follow a similar approach to address their nature-related risks.

Figure 3: Respondents' level of insights regarding their impacts and dependencies on nature



70 DNB (2020)

71 DNB (2019) Good Practice. Integration of climate-related risk considerations into banks' risk management.

Understanding and recognising the full range of nature loss drivers, and their associated impacts and dependencies across different sectors, is a crucial first step to assess nature-related risks. Figure 4 reveals that from the five IPBES's nature loss drivers, 72 per cent of Dutch financial institutions currently largely focus on addressing climate change. Respondents consider land-use change and pollution to be highly material nature-related risks; they cited specific examples related to pollution, such as air pollution, nitrogen and toxins, and related to land-use change, such as deforestation and tree cover loss. Resource use and invasive species receive substantially less attention, and although these drivers can result in significant financial risks, over half of the respondents have not planned to act on them.

For example, invasive species are estimated to reach a mean annual cost of up to USD 162.7 billion.⁷² Regarding natural resource use, the overexploitation of fish has been shown to result in global fish stock depletion worth an annual economic loss of USD 83 billion.⁷³



Figure 4: Respondents' level of action in addressing the five IPBES drivers of nature loss

The respondents use different terms for nature-related risks, indicating the need for a better understanding and conceptualisation of the terminology. Nearly all respondents acknowledged the first two broad categories of nature-related risks identified by the TNFD: physical and transition risks. Other specific risks were mentioned, such as reputational, biodiversity-related and water-related risks, but systemic risks remain largely unaddressed.

Financial institutions have a substantial need for nature-specific knowledge, which is a significant challenge mentioned by respondents, along with data availability. To understand and address nature-related risks, knowledge of biodiversity and ecosystem services for specific sectors is required. For example, financial institutions should have an understanding of the functioning of biomes and ecosystems to evaluate how a counterparty interacts with them.

⁷² Diagne et al (2021) High and rising economic costs of biological invasions worldwide. *Nature* 592, 571–576.

⁷³ The World Bank (2017) *The Sunken Billions Revisited : Progress and Challenges in Global Marine Fisheries*.

Another challenge highlighted by respondents is the lack of universal guidance and the methodological complexity of evaluating impacts and dependencies. Most of them expect that the TNFD will serve as a practical guide and set a universal standard for disclosing and acting on nature-related risks and opportunities. However, it is essential for financial institutions to be proactive and take a purpose-led approach in this field by acting intrinsically to address nature loss, as opposed to taking measures to comply with external regulatory pressures. One asset manager respondent mentioned that biodiversity is at the core of its strategic purpose and has been addressing it through ownership activities for some years; such a purpose-led approach will help financial institutions start their journey and enable them to learn from the first actions taken.

USE CASE



ROBECO SUSTAINABLE INVESTING CENTRE OF EXPERTISE

Robeco, a Dutch asset manager, has been addressing biodiversity issues for a number of years. The institution's proactive uptake of the topic is a result of its strong research focus and its early roots in sustainable investing. Robeco has a large team dedicated to sustainability issues, called the Sustainable Investing Centre of Expertise. This centre currently consists of around 49 professionals with strong expertise and experience in sustainability. This centre has been developed through hiring sustainability experts, continuously educating and gaining experience. The team performs in-house research, strategy and policy development, engagements with issuers, data analysis and industry collaboration.

Key takeaways:

- Obtaining, maintaining and developing in-house experts is key for sustainable investing
- Continuous education is important for maintaining long-lasting expertise

4.2.2 ACT: ACTIONS TAKEN ACROSS THE FOUR TNFD PILLARS

The survey identified several use cases from the Dutch financial sector; some of them are highlighted in this section to illustrate how financial institutions can take action. Examples of actions include:

- heatmapping of impacts and dependencies to identify risk hotspots in portfolios
- formulating a biodiversity policy with inclusion or exclusion criteria to be met by counterparties
- active ownership and engagement of financial institutions with counterparties and other stakeholders to incentivise and guide them to act on their nature-related risks
- financial products addressing nature loss, for example by accounting for negative impacts.

Given the urgency and materiality of nature loss, it is key to take first steps as soon as possible. Starting small, such as with a pilot programme, could accelerate action.

Governance

Of the financial institutions participating in the survey, 78 per cent have started incorporating nature-related risks and opportunities into their governance framework. This action, and the assigned responsibility, takes multiple forms, such as: integration in existing risk departments, separate teams or committees, and/or assigned responsibility at the board level or in other functions of the organisation. Other governance-related measures include linking nature to climate and sustainability commitments, and implementing dedicated nature-related investment specialists, committees or taskforces. The TNFD recommends disclosing governance around nature-related risks and opportunities by describing the board’s oversight of nature-related risks and opportunities and management’s role in assessing and managing nature-related risks and opportunities.⁷⁴ Only 25 per cent of the respondents said they have integrated nature-related risks and opportunities under the board’s oversight, and 38 per cent under management-level responsibility. Subsequently, more emphasis could be placed on the integration of governance around nature-related risks and opportunities into institutions’ existing governance structures.

USE CASE



ROBECO BIODIVERSITY TASKFORCE

For integrating nature into its investment processes, Robeco set up a biodiversity taskforce in 2020. This taskforce consists of experts from its Sustainable Investing Centre of Expertise together with other domains in the institution including the different investment teams, data science, and product development departments.

The biodiversity taskforce’s purpose is to oversee, coordinate and drive Robeco’s approach to biodiversity into an overarching and leading strategy. The biodiversity taskforce meets on a regular basis, aiming to operationalise Robeco’s biodiversity approach and identify new opportunities. All taskforce members are periodically updated on internal and external developments, guaranteeing that its strategy is streamlined along all departments. The taskforce reports to Robeco’s Sustainability and Impact Strategy Committee, which is Robeco’s central body for making decisions about sustainability policies, composed of senior managers and Executive Committee members.

Key takeaways:

- Multiple domains of the organisation are contributing together
- The institution’s approach to biodiversity is translated into an overarching and leading strategy

Strategy

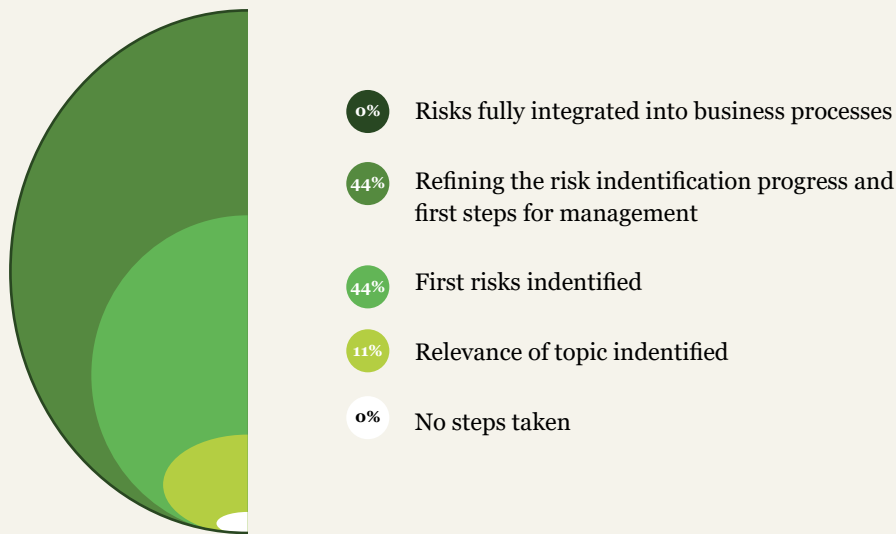
As discussed in the Learn section, the majority of respondents recognise nature-related risks. They have taken first steps to integrate nature-related risks, as well as opportunities, into their strategy. These actions were taken within the past two years and primarily focused on business strategy. Although some respondents have also integrated nature-related risks and opportunities into investment decisions, the level of risk integration for financial planning and project assessment is low. Furthermore, risks receive substantially more attention than opportunities in business and decision-making processes.

To further progress in their strategy and ensure alignment with the TNFD, financial institutions should concentrate on integrating both risks and opportunities into their business, strategy and financial planning, and consider these over the short, medium and long term. Different nature-related scenarios should also be considered in the organisation’s strategy.

Risk management

Financial institutions generally follow an iterative risk management cycle that consists of risk identification, risk assessment (assessing materiality), risk monitoring and risk mitigation.⁷⁵ Figure 5 indicates that 89 per cent of the respondents have taken at least initial measures to identify their nature-related risks. These measures took various forms, such as the use of heatmaps to identify potential nature-related risks on a counterparty or sector level; the output data can subsequently be used as input for the institution’s strategy and risk appetite.

Figure 5: Progress of Dutch financial institutions in recognising, measuring, and integrating nature-related risks



Nearly 80 per cent of financial institutions identified and provided examples of nature-related risks relevant to their portfolios, and were able to categorise these under physical and transition risks. Respondents considered most of the nature-related risks identified to have a medium materiality. One third of the respondents classified certain risks as highly material, such as deforestation, land-use change and degradation, pollution, agrochemicals and climate change. However, most respondents have not conducted a full risk identification process for nature-related risks.

66 per cent of the financial institutions have started mapping the impacts and dependencies or exposures to nature-related risks for some specific portfolios; only very few were able to state their level of exposure to these risks. For asset managers, the assessment of counterparties’ nature-related risks is often performed in collaboration with portfolio managers, using frameworks and tools, such as the Sustainability Accounting Standards Board (SASB) and ENCORE.

Other examples of actions taken on risk management are defining exclusion criteria, incorporating nature loss into internal ESG scores and active ownership and engagement with counterparties. No respondents have fully integrated all their nature-related risks into their business processes, as can be observed in Figure 5.

Concerning risk management, the TNFD recommends disclosing the process for identifying, assessing, and managing nature-related risks and opportunities and how these are integrated into the overall risk management framework. The majority of respondents have already identified their first nature-related risks, and some have started assessing and managing these risks. However, more progress is needed when it comes to integrating these risks into the overall risk management and strategy.

USE CASE



ING HEATMAPPING

ING, a Dutch bank, has developed a methodology to assess biodiversity impacts and dependencies in its lending portfolio, which feeds into a heatmap process to identify associated physical and transition risks. Per sector, the impacts, dependencies and associated risks are assessed based on input from external sources, such as ENCORE, and research by front-office and risk management teams.

In this heatmapping climate-related and environmental risks are considered, in line with the expectations from the ECB Guide⁷⁶ regarding these risks. The goal is to integrate the results of this heatmap exercise into financial risk management processes.

The heatmap is used to feed business strategy and risk appetite with climate-related and environmental risk considerations. Regarding business strategy, the heatmap is used and referenced in most strategy and risk-appetite papers, which are prepared for wholesale banking sectors and some products/portfolios. Regarding risk appetite, for both corporates and small and medium-sized enterprises, the overall transition and physical risk scores of each (sub)sector are used by a mechanism to limit growth of subsectors with a higher exposure to risks, while fostering growth in the low-risk subsectors.

Besides this, the heatmap is also used as a climate and environmental risk identification tool in the credit approval process for wholesale banking. This began with a pilot in the transport and logistics sector.

Another example of integrating nature-related risks into risk management is ING's Environmental and Social risk management framework. ING takes a sector-based materiality approach, by including additional nature-related due diligence requirements for sectors such as mining and agriculture. Finance for these sectors is conditional to certain criteria, helping ING's clients with their environmental and social performance and regulatory compliance.

Key takeaways:

- A risk assessment can begin with heatmapping environmental risks
- A first area of focus should be sectors and subsectors with material environmental risks



USE CASE

RABOBANK RISK MANAGEMENT

Rabobank, a Dutch bank, has a sustainability policy in place for the risk assessment, which is currently used for its financial services to corporate clients. Protecting biodiversity is included as a minimum criterion to meet Rabobank's acceptance standards. This includes, for instance, not financing deforestation and encouraging sustainable agriculture.

Rabobank assesses criteria by obtaining data about its client, either via public information or active client engagement. Additionally, Rabobank is aiming to obtain data from external data providers. The challenge therein is to reconcile and compare client data with external data, which can be resource intensive due to differences in data characteristics.

To better understand Rabobank's exposure to nature-related risks, the institution has initiated a research project with the support of WWF-NL. The portfolio of Rabobank is mapped using SBTN parameters. Rabobank aims to use the outcomes of the mapping assessment to deep-dive further into its most material exposures to nature-related risks. This assessment could point to an issue area related to a particular sector or region, for which possible mitigation interventions can be explored.

Key takeaways:

- Nature can be included as a minimum criterion in risk management processes
- Data obtained from different sources can be compared to improve risk assessments

Metrics and targets

The majority of respondents (78 per cent) indicated that their organisations set nature-related targets. However, few of these targets are quantitative. Instead, financial institutions have pledged to achieve high-level goals with their peers, or solely focus on a single nature-related issue across a small number of portfolios, such as a deforestation policy for palm-oil producers. Cited examples include the Finance for Biodiversity Pledge and roundtable initiatives. The limited use of quantitative targets can be explained by the lack of clear guidance on nature-related targets.

To disclose in line with the TNFD recommendations, financial institutions should establish metrics that enable them to measure their nature-related risks and opportunities in line with their strategy and management processes. Where relevant and possible, these metrics should include indicators on risks associated with particular impact drivers. Additionally, the targets used to manage nature-related risks and opportunities should be quantified and the performance in reaching these targets should be disclosed.

It is crucial for financial institutions to set clear and measurable metrics and targets to progress in their journey toward nature-positivity. These targets should include a base year and time frame, be absolute or relative and have clear indicators to measure progress toward the targets.

The Convention on Biological Diversity (CBD) envisions a society that lives in harmony with nature and is developing a framework of ambitious national targets to halt biodiversity loss by 2030 and achieve recovery by 2050.⁷⁷ To translate these national goals at an institutional level, the Science Based Targets for Nature initiative provides a framework for organisations to align their nature-related targets with.⁷⁸

4.2.3 ENGAGE: ENGAGEMENT WITH STAKEHOLDERS AND PEERS

When it comes to collaboration, all respondents are currently engaging with their industry peers on the topic of nature-related risks by taking part in various initiatives. These include the TNFD Forum, the Partnership for Biodiversity Accounting Financials (PBAF), the DNB Working Group on Biodiversity, and the EU Finance for Biodiversity initiative (see Annex C2). Along with Nature Action100 and other initiatives, these will help provide more clarity on pathways for assessing and reducing negative impacts and dependencies on nature.⁷⁹ Engagement among peers is particularly beneficial for financial institutions, as the majority of respondents are still deciding which approach and guidance material is best suited for them, and often are not making use of the available public guidance yet.

The survey also revealed that few financial institutions have started engaging with their counterparties on nature-related issues. This form of active engagement with counterparties is highly valuable for the financial sector to progress toward becoming nature-positive.

The public sector also plays a role in this engagement. In fact, 67 per cent of respondents are actively involved in dialogues with governmental or public organisations. This includes roundtables with ministries and civil-society actors, or other types of public-sector engagement.

⁷⁷ [CBD \(2021\) First draft of the Post-2020 Global Biodiversity Framework.](#)

⁷⁸ [SBTN \(2020\)](#)

⁷⁹ [Nel, D. \(2022\) Why the Dutch Finance Sector should play a leading role in Nature-Positive Finance.](#)



USE CASE

RABOBANK AGRI3 FUND

Rabobank collaborates with a global focus on Food & Agriculture – collaborates with partners to promote and implement a positive impact of agriculture on nature, mostly in Brazil, Indonesia and India, via the AGRI3 fund

Nature and biodiversity are traditionally addressed from an ESG policy perspective, but less so with a business development view in the regular client-engagement processes. The lack of a track record of nature-related business models leads to a longer development time before the commercial case becomes clear. Notwithstanding these constraints, the leadership of Rabobank started to recognise the financial risks resulting from not reversing the trends of land degradation, food insecurity and forest protection and launched a new financial mechanism.

The AGRI3 fund offers financial lending and risk-mitigation products to corporates and farmers via guarantees and subordinated loans in the agriculture sector, to promote and implement projects that increase forest protection, support sustainable agriculture and improve rural livelihoods. The farmers that are offered financing are dedicated to more sustainable farming, such as through efficient resource use, sustainable input and production, elimination of land-use change and regenerative practices. These practices will subsequently mitigate nature-related risks for the financial institutions.

Recognising the need for innovative business models to address new types of risks, that not (immediately) generate a sufficient financial return (but certainly environmental and social impact), has been a crucial driver to set up AGRI3 Fund and enable innovation, financially but also through tools such as satellite images and remote sensing.

[The Agri3 fund is an example of how financial institutions can increase investments in nature-positive solutions.](#)

Key takeaways:

- Establishing new financial products can provide opportunities to mitigate and manage nature-related risks so that it can become attractive to mainstream financial institutions. Engagement at the investee level can be supported by a collaborative initiative
- The recognition by leadership of the importance of integrating nature, while accepting that this does not (immediately) generate a sufficient financial return (but certainly environmental and social impact), is facilitating the development of new business models and products



USE CASE

MN SATELLITE-BASED ENGAGEMENT TOWARD ZERO DEFORESTATION

With several other investors MN – a Dutch fiduciary and asset manager – on behalf of pension funds PME (Pensioenfond van de Metalektro) and PMT (Pensioenfond Metaal & Techniek) joined the ‘Satellite-based engagement towards zero deforestation’ initiative launched by ACTIAM in 2019.⁸¹ ACTIAM has partnered with Satelligence, a geodata-analytics company that connects satellite imagery and artificial intelligence to detect and quantify changes in vegetation cover caused by plantation expansion or fires in forests, swamps and other natural areas. These changes are linked to specific areas, concessions, mills and traders. With this information investors can identify possible cases of deforestation occurring in the supply chains of specific investee companies, and assess the risk toward their investments.

This initiative is focusing on deforestation predominantly due to palm-oil expansion in South-East Asia, but also takes into account deforestation linked to soy, timber and beef production around the world. The investors are requesting companies to publicly disclose supplier lists for soft commodities, improving transparency with regard to deforestation risks. Based on the data, MN can decide to enter into dialogues with their portfolio companies, mitigating the effects of deforestation and putting in place robust processes to prevent future deforestation.

Initiatives like this are an opportunity for investors like MN to collaborate with industry peers in their engagement with investee companies, sharing knowledge and capabilities, while leveraging recent developments in geospatial analytics. By promoting responsible investment practices, MN and other investors are actively steering towards prevention of deforestation, and will also focus on companies’ efforts to remediate past incidents and work on reforestation.

Key takeaways:

- Engaging within (existing) initiatives can provide technical tools, such as geospatial analytics
- Engagement at the investee level can be supported by a collaborative initiative

4.2.4 TOOLS

A majority of the respondents (89 per cent) indicated that they are using tools to support their actions pertaining to nature-related risks and opportunities. The most cited tools were ENCORE, the Integrated Biodiversity Assessment Tool (IBAT) and Trase. Other publicly available tools being used are the WWF Water Risk Filter, ZSL SPOTT, Exiobase, the Carbon Disclosure Project (CDP), SASB and SBTN. In addition, several respondents stated that they are looking into biodiversity footprint tools. Information box 4, along with Annex C1, provides more insights into the ways tools are being used to help address nature-related risks and opportunities.⁸⁰

80 [ACTIAM \(2021\). Zero deforestation engagement.](#)

Information box 4

TOOLS AVAILABLE TO THE FINANCIAL SECTOR

As highlighted by numerous publications, a range of tools is already available to support financial institutions in assessing, managing, and disclosing their nature-related risks and opportunities.^{81,82,83,84} Many of these tools are still evolving and new tools are emerging at a rapid pace, which can make it challenging for financial institutions to determine which tools are best suited to support their needs and progress. Organisations are encouraged to test different tools and develop their toolkit as they go.⁸⁵

Key challenges in the use of tools currently include: identifying the appropriate metrics for target-setting, filling data gaps through direct measurement rather than using proxies, and achieving sufficient granularity to address the locality impacts and dependencies. Despite these challenges, the survey results indicated that the Dutch financial sector is already finding ways to make use of tools.

Four categories of tools could be identified that are helping Dutch financial institutions assess, manage and disclose nature-related risks and opportunities (see Annex C1 for further details and examples of tools):

- **Standards and frameworks** that can be used to understand concepts, determine the scope of information that should be considered, and prepare comprehensive disclosures
- **Assessment tools** to obtain high-level insights into impact and dependencies and the associated risks and opportunities, at the ecosystem, sector or company level
- **Footprint tools** as a type of assessment tool to quantify the biodiversity footprint of an organisation by measuring one or more impacts aggregated to a single metric
- **Databases** that can have wide-ranging applications related to obtaining measurable insights into impacts and dependencies and the associated risks and opportunities.

⁸¹ [Finance and Biodiversity Community \(2022\) Guide on biodiversity measurement approaches.](#)

⁸² [WWF \(2021b\) Assessing Portfolio Impacts: Tools to Measure Biodiversity and SDG Footprints of Financial Portfolios](#)

⁸³ [Netherlands Enterprise Agency \(2021\) Biodiversity Footprint for Financial Institutions: Exploring Biodiversity Assessment.](#)

⁸⁴ [EU Business @ Biodiversity Platform \(2021\) Assessment of biodiversity measurement approaches for businesses and financial institutions.](#)

⁸⁵ [TNFD \(2022b\) Discussion Paper on Nature-related Data and Analytics Availability.](#)



5

5. RECOMMENDATIONS

There is an increasingly imperative need for urgent action to address nature loss and move toward an economy that is in harmony with nature. Financial institutions have a key role to play. By acting on, managing and disclosing evolving nature-related risks, financial institutions can support a shift in global financial flows away from nature-negative outcomes and toward nature-positive ones.

There is growing awareness among Dutch financial institutions that nature poses material risks and opportunities, but a full overview of these risks, and adequate responses at the organisational or industry level, is still lacking. Dutch financial institutions are therefore recommended to begin disclosing in anticipation of the TNFD and act on mitigating their nature-related risks.

Based on the research findings about the status of the Dutch financial sector, this chapter introduces ten recommendations for financial institutions to accelerate progress in assessing, managing and disclosing nature-related risks and opportunities. Similar to the findings in Chapter 4, the recommendations are categorised across three dimensions: learn, act and engage (see Figure 6). Whereas Chapter 4 sought to uncover the status of the Dutch financial sector in each dimension, this chapter seeks to provide guidance on how to achieve improvements in each dimension.

The three dimensions in Figure 6 are mutually reinforcing, meaning that development in one dimension facilitates development in the other dimensions. For example, a financial institution achieving substantial progress in its learning journey will be able to take more comprehensive actions and establish more effective engagements. Learning, acting and engaging should, therefore, be viewed as an iterative process.

Throughout that process, financial institutions should aim to be transparent towards their stakeholders, including their counterparties, governments, regulators and NGOs. Even if a financial institution is still exploring, testing different approaches or developing its targets, transparency can help catalyse progress, as it enables stakeholders to provide feedback on the actions being taken.

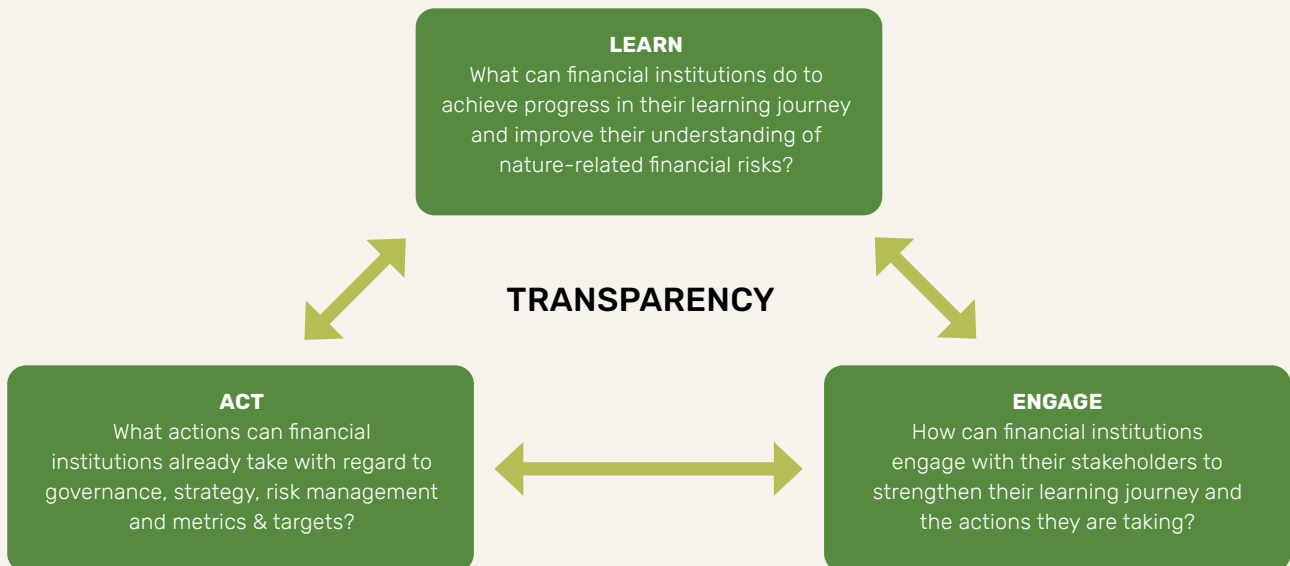


Figure 5: The iterative process of learning, acting and engagement across which the recommendations are categorised

5.1 LEARN

The first stage for financial institutions in addressing nature loss is learning about their relationship with nature. Chapter 4 highlighted how Dutch financial institutions have achieved progress in this dimension by embarking on the learning journey that involves the entire financial institution, counterparties and key stakeholders. Three recommendations are proposed to help financial institutions shape their learning journey.

Recommendation 1: Explore the full scope of nature-related risks

Explore the full scope of nature-related risks by considering all potential impacts and dependencies across the entire range of sectors and counterparties, treating each identified risk as potentially material

In relation to impacts, financial institutions should consider all potential sources of risk related to the key drivers of nature loss: land-use change, climate change, pollution, natural-resource use and overexploitation, and invasive species. The scope of risk identification should go beyond well-known drivers, such as deforestation, carbon emissions and nitrogen emissions, toward such topics as water use and pollution.

In relation to dependencies, financial institutions should prioritise learning about the dependencies that their counterparties have on nature and the extent to which these are at risk of becoming disrupted in the future. When identifying nature-related risks, they should consider both physical and transition risks – including potential systemic risks – across the full range of relevant sectors and counterparties. Each identified risk should be treated as potentially material, to determine the actual material risks to focus on.

Recommendation 2: Build awareness, knowledge and capabilities

Build organisational awareness, knowledge and capabilities related to nature, to catalyse learning across all levels and functions of the financial institution

Examples of ways to build awareness include promoting the topic of nature as a strategic priority, involving employees from across the financial institution and attracting support in the development of new nature-related projects. Knowledge and capabilities can be developed through internal learning and development, as well as by hiring experts from relevant fields that are not (yet) represented in the financial institution, such as biologists or environmental scientists.

Furthermore, data capabilities need to be developed to understand nature-related data requirements, to collect, transform and interpret nature-related data from counterparties and other data sources, including from external data providers. It is essential that financial institutions focus on building knowledge and capabilities related to ecosystems, biodiversity and specific sectors, as well as how these relate to each other.

Recommendation 3: Maintain a purpose-led approach

Seek alignment with emerging standards and frameworks, but ensure that this does not limit the learning journey by always maintaining a purpose-led approach

Financial institutions should seek to align with emerging standards and frameworks as these can provide valuable guidance. However, many are continuously under development and not yet widely accepted. Overreliance on them can put financial institutions in a waiting mode, which limits them in their learning journey. This can be avoided by maintaining a purpose-led approach, letting the institution's core beliefs about sustainability lead its efforts to address nature loss.

This calls for defining the institution's stance on nature loss and aligning its strategy with this, while looking beyond (short-term) financial returns and carefully considering the contribution it can make to society over the long term. A key component of a purpose-led approach could be committing to ambitious nature-related targets, such as to eliminate commodity-driven deforestation from investment portfolios by 2025.⁸⁶

5.2 ACT

Financial institutions must conduct a wide range of actions to address nature-related risks and opportunities. Chapter 4 identified actions with regard to the four pillars of the TNFD framework. Building on these insights, this section proposes four recommendations for financial institutions to take concrete actions that can help progress their efforts to address nature-related risks and opportunities. When implementing these recommendations, it is important that financial institutions consider how their actions align with their learning journey and engagement.

Recommendation 4: Conduct an inventory of all activities performed

Conduct an inventory of all activities being performed, considering ongoing developments related to nature, climate and broader sustainability challenges

Conducting an inventory of all activities performed across the four pillars can help determine what steps a financial institution has already taken and what is needed to assess, manage and disclose nature-related risks and opportunities. This can be done by mapping internal activities relating to nature and broader sustainability challenges, including existing products, projects, policies, capabilities and expertise, and considering how these activities can be leveraged. Involving all functions in this analysis, including governance, strategy, risk, reporting, compliance and front-office, is recommended.

Activities relating to climate change are especially relevant, as nature loss and climate change are highly interconnected. For example, financial institutions can use their existing processes of climate risk identification, stress testing and credit risk modelling.⁸⁷ However, as these topics are different, mitigating nature-related risks will likely require a unique approach. Nature and ecosystem health is defined by multiple local and non-linear dynamics. As a result, a comprehensive approach for addressing nature-related risks should include a consideration of these dynamics, as well as available collective actions, initiatives and governance systems.

Recommendation 5: Establish ownership and shape governance

Establish ownership at the board level and shape governance regarding nature-related risks and opportunities

Supportive governance is essential to address a systemic issue; a first step in that direction is to establish ownership at the level of the executive board. Once leadership understands and acknowledges the importance of addressing nature loss, it can be ensured that mitigation activities can receive adequate oversight, support and resources.

Consequently, financial institutions can begin shaping their governance down to the individual teams involved in executing their roadmap of activities designed to manage nature-related risks. In the process of shaping governance, it is also recommended to consider the knowledge and expertise already present across all levels and functions within the financial institution, and capitalise on this knowledge and expertise.

⁸⁶ UNFCCC (2021) Financial sector commitment letter on eliminating commodity-driven deforestation.

⁸⁷ Finance for Biodiversity Initiative (2022) Towards an Integrated Transition Framework. Managing Risks and Opportunities at the Nature-Climate Nexus.

Recommendation 6: Start a pilot programme

Choose a material issue and start a small-scale pilot programme to kick-start innovation, involving a cross-functional team with experts from across the financial institution

Even before a clear methodology is in place, there are many actions that financial institutions can take. Rather than waiting for a 'golden standard', it is recommended to take a learn-by-doing approach. This can be done by starting a small-scale pilot programme that seeks to address a single material issue, such as physical flood risk or transition regulatory risk, on a portfolio, sector or counterparty basis.

This pilot could focus on exploring the actions that can already be taken, such as heatmapping analysis, formulating a biodiversity policy and establishing counterparties' engagement. By involving several departments other than risk management, a pilot is also a powerful way of driving the broader financial institution's learning journey, and can set a precedent for taking more comprehensive actions in the future.

Recommendation 7: Develop and maintain a relevant toolkit

Develop and maintain a relevant toolkit that can support the actions, by periodically evaluating the tools and data sources in scope and exploring novel approaches

The landscape of tools and data is rapidly evolving. Financial institutions should periodically evaluate their toolkit to ensure they can support the actions being taken and meet the quality standard, which will evolve as they learn, act and engage. Novel and updated tools and data sources, particularly those that allow for location specificity, should be tested as they become available. This can help determine whether and how they could become part of the toolkit, and possibly replace tools already in use.

Tool and data evaluation should be done in a learn-by-doing manner, for example as part of a pilot programme described in Recommendation 6, with room to experiment. Further, it is recommended to explore novel modelling approaches, such as geospatial analytics using satellite images. This will ensure readiness to respond to new innovations.

5.3 ENGAGE

Chapter 4 describes how engagement with diverse stakeholders can play an important role in addressing nature-related risks and opportunities. Various types of engagement can underpin the learning journey and support financial institutions' actions. This section proposes three recommendations for financial institutions to effectively engage with stakeholders.

Recommendation 8: Collaborate with industry peers

Collaborate with industry peers by exchanging ideas, co-developing new approaches and taking collective action to tackle shared challenges

Collaborating with industry peers can be a powerful way to shape solutions to common challenges. In the first instance, financial institutions can focus on exchanging ideas. It is also possible to co-develop new approaches, such as a standard, methodology or engagement programme. Moreover, financial institutions can form a coalition that commits collective action by committing to a shared ambition.

Chapter 4 and Annex C1 identified several initiatives that financial institutions can take part in to collaborate with their peers. The Dutch financial sector provides a particularly promising context for such collaboration, considering that the majority of respondents suggested the sector could, and should, be a front-runner in addressing nature-related risks and opportunities.

Recommendation 9: Start and continue forceful conversations with your counterparties

Start and continue forceful conversations with your counterparties and their stakeholders to establish effective active ownership and engagement that support counterparties in their journey to becoming nature-positive

Many of the actions that financial institutions will need to take to address nature-related risks and opportunities will revolve around the impacts and dependencies of their counterparties. Therefore, institutions should start the conversation with their counterparties about their impacts and dependencies, jointly led by front-office and sustainability experts. Conversations should focus on establishing a shared understanding of the importance of addressing nature loss and the challenges that counterparties face in this.

Based on that conversation, financial institutions can establish effective active ownership and engagement programmes that support counterparties in mapping their nature-related impacts and dependencies, improving their impacts and safeguarding their dependencies. Financial institutions can also encourage their counterparties to act and report on nature-related risks, and request nature-related data from them. It can also be valuable to create a network with not only counterparties but also their key stakeholders, such as suppliers or local governments that may have substantial influence in the counterparties' sector of operation.

Recommendation 10: Partner with NGOs, academics, governments and other external experts

Partner with NGOs, academics, governments and other external (local) experts to apply their knowledge, influence and experience to nature-related risks and opportunities

NGOs, academics, governments and other external experts can provide valuable additional guidance to adhere to new approaches to address nature loss. This allows for innovative new approaches that align with the most recent developments and can credibly contribute to halting nature loss.

When partnering with external experts, it is recommended to consider location-specific experts. Governments or NGOs can contribute through their own influence and (more easily) connect with local stakeholders, such as how the Dutch government engages with the Brazil government.⁸⁸ In addition, local organisations can work with indigenous peoples who may hold valuable knowledge of, influence in and experience with the ecosystem services provided in a specific region.



A

ANNEX A: EXAMPLES OF NATURE-RELATED RISKS

Table 1: Illustrative examples of nature-related risks

Sector	Physical risks	Transition risks
Agriculture	<p>Reduced rainfall in the Amazon The agricultural sector in South America depends heavily on moisture and rainfall. With increased Amazon rainforest loss, rainfall becomes more likely to decrease and harder to predict. Both will affect agricultural yields, posing a financial risk to the agricultural sector.⁸⁹</p> <p>Loss of animal pollination More than three quarters of important food crops depend on animal pollination, representing a global market of up to USD 577 billion. The disappearance of pollination will cause dramatic losses in crop production and profitability. Financial institutions are exposed to pollination-dependent products worth about EUR 28 billion in total.⁹⁰</p>	<p>Financing deforestation By financing controversial soy, palm-oil and beef producers linked to deforestation, financial institutions are exposed to risks of reputational damage, litigation and possibly even withdrawal of deposits. Over the past five years, 40 per cent of the income generated from environmentally harmful loans in Europe (usually linked to deforestation) went to major Dutch banks.⁹¹</p> <p>Cattle farms in a nitrogen crisis Cattle farms in the Netherlands, particularly pig farms, have been heavily affected by stricter nitrogen reduction policies. Many of these farms had to be bought by the government, forcing banks to reconsider their market position and mitigate their credit risks.⁹²</p>
	<p>Fishery</p> <p>Cockle deaths in the Dutch Waddensea Heatwaves have been associated with a dramatic decline in the cockle population; 60–90 per cent of cockles older than one year did not survive the summer of 2018. This threatens the livelihoods of fishing communities and potentially leads to credit risks.⁹³</p> <p>Ignoring natural constrains The seafood industry depends on a healthy marine ecosystem. In Japan, while fish stocks dropped, supply and demand for seafood fell and the share prices of seafood companies increased. Investors bypassed natural capital constraints through de-leveraging, cost-cutting, vertical integration, acquisitions and foreign expansion. But the physical risk of depleting fish stocks remains.⁹⁴</p>	<p>Changes to fishing rights To sustain fish populations, governments have been known to restricting fishing rights. This can have tremendous economic impacts, such as seen when the 1992 Canadian cod moratorium led to the single largest job loss event in Canadian history.⁹⁵</p>
Real estate	<p>Flood risk from soil sealing Pavement (e.g. in paved gardens or car parks) is a leading cause of soil degradation in the EU. It can reduce cities’ adaptive capacity in terms of excessive stormwater runoff, and increase flood risks driven by climate change, putting mortgage portfolios at risk.⁹⁶</p>	<p>Market change in a nitrogen crisis Stricter nitrogen emissions control have slowed new housing and infrastructure projects. This is occurring during an already widespread housing shortage in the Netherlands, particularly near Natura 2000-protected nature reserves, putting financial institutions at strategic risk.⁹⁷</p>

89 Leite-Filho et al. (2021)

90 DNB (2020)

91 Sustainable Finance Lab (2022)

92 Estrada, A. & Voogt, F. (2020) Peperduur en inefficiënt. Groene Amsterdammer, 38.

93 Wageningen University & Research (2018) Extreme kokkelsterfte op droogvallende platen Nederlandse kustwateren

94 Planet Tracker (2021) Against the Tide.

95 WWF (2021a)

96 Helmholtz Centre for Environmental Research – UFZ (2019) Drivers and transboundary impacts of soil degradation.

97 Koenraadt, S. & Smit, H. (2020) Lagere bouwproductie door stikstof, maar overheid kan schade beperken

Sector	Physical risks	Transition risks
Energy	<p>Hydropower supply shortages</p> <p>Climate change, combined with the degradation of natural water storage, up to 31 per cent of future hydropower dams with increased drought risk. This can lead to blackouts, higher electricity prices and possibly even asset stranding, which could affect financial institutions invested in these dams.⁹⁸</p>	<p>Oil and gas disasters</p> <p>Financing oil and gas exploration, production and transportation carries reputation and liability risks, as these activities can cause severe ecosystem disruption, such as disastrous oil spills. A well-known example is the 2010 Deepwater Horizon spill of 4.9 million barrels of oil into the Gulf of Mexico.⁹⁹ By the end of 2010, BP had to pay around USD 65 billion in clean-up costs and legal fees.</p>
Industry	<p>Beer production</p> <p>Financial institutions invested in the beer industry could face substantial financial risk, because beer supply depends on barley yields. The increased frequency and severity of droughts – a result of climate change and non-resilient ecosystems – potentially causes average yield losses of up to 17 per cent. The decreased supply of barley globally would dramatically compromise beer production.¹⁰¹</p>	<p>Air pollution regulations</p> <p>Stricter air pollution regulations can change operational costs and the market position of manufacturers. For example, a Dutch steel manufacturer faced stricter regulations as the level of air pollution it emitted was found to be higher than declared. Complying with such stricter regulations can have substantial impacts on an organisation, whereas failing to take actions could cause reputational risks, including for lenders and investors.¹⁰²</p>

⁹⁸ Laporte-Bisquit, A. & Camargo, R. (2019) The power of Rivers at Risk: Mapping rising threats to hydropower dams using WWF's Water Risk Filter.

⁹⁹ Pallardy, R. (2021) Deepwater Horizon oil spill. Encyclopedia Britannica.

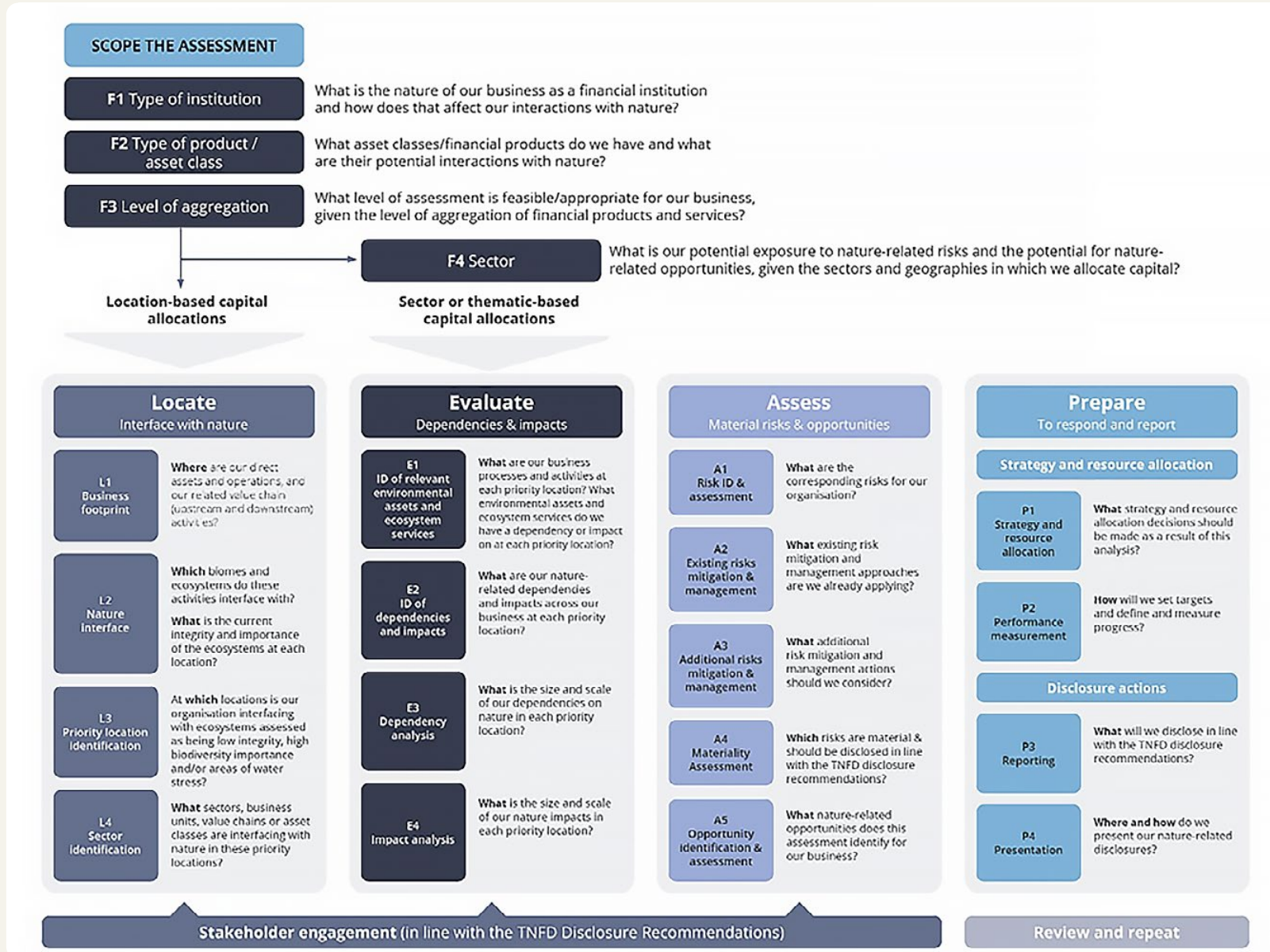
¹⁰⁰ Reuters, BP Deepwater Horizon costs balloon to \$65 billion (2018):

¹⁰¹ Xie et al (2018) Decreases in global beer supply due to extreme drought and heat. Nature Plants 4, 964–973.

¹⁰² Dutch News, Tata Steel emissions more polluting than thought, says new report (2022):

ANNEX B: TNFD LEAP PROCESS, INCLUDING ADDITIONAL COMPONENTS FOR FINANCIAL INSTITUTIONS

Figure 7: The LEAP approach for financial institutions (source: TNFD, 2022a)



ANNEX C: TOOLS AND INITIATIVES

This annex provides an overview of the rapidly evolving tool and initiative landscape, using the insights drawn from the research and from the TNFD beta version. As numerous publications on this topic exist, this is a starting point for financial institutions to explore in more depth, rather than an exhaustive list of tools and initiatives that are currently available.^{103,104,105,106}

C1 TOOLS

Standards and frameworks

Various standards and frameworks have emerged in recent years that provide guidance on how to assess, manage and disclose nature-related risks and opportunities. Most existing standards and frameworks are focused on the business context and do not yet incorporate the concept of financial risk as it known in the financial sector. Still, they provide an important starting point for financial institutions seeking to address nature loss. The TNFD is expected to combine elements of existing standards and frameworks into a comprehensive framework that is more tailored to the needs of the financial institutions.¹⁰⁷

Standards and frameworks typically have a descriptive or prescriptive focus:

- **Descriptive standards and frameworks:** Describe how to assess, measure and disclose impacts and dependencies. The Sustainability Accounting Standards Board (SASB) and the Climate Disclosure Standard Board (CDSB) Framework for Biodiversity Disclosures are notable examples that are focused on disclosure. In addition, the System of Environmental Economic Accounting (SEEA) is a notable example focused on measurement.
- **Prescriptive standards and frameworks:** Provide more actionable guidance on how to address impacts and dependencies, typically focusing less on the details of assessment, measurement and/or disclosure. Two notable examples include the SBTN Initial Guidance for Business (see Information box 5) and the Capitals Coalition’s Natural Capital Protocol. The latter has been supplemented with a guidance tailored to the financial sector.¹⁰⁸

Information box 5

SBTN INITIAL GUIDANCE FOR BUSINESS

The SBTN provides a framework for understanding the impacts and dependencies that a business has on nature, including five-step guidance to address these. The guidance explains how to conduct a materiality assessment, determine priorities, set targets, undertake action to achieve these and track progress. The SBTN emphasises the importance of Science-Based Targets that make use of the best available science and are measurable, actionable and time bound so as to ensure their effectiveness in halting nature loss.¹⁰⁹

Although the SBTN’s framework is still mostly focused on the business level, financial institutions are finding ways to incorporate it in their approach. As is highlighted in Chapter 4, Rabobank adopted elements of the SBTN to perform a heatmap analysis of the impacts and dependencies in its agricultural portfolio.

¹⁰³ Finance and Biodiversity Community (2022)

¹⁰⁴ WWF (2021b)

¹⁰⁵ Netherlands Enterprise Agency (2021)

¹⁰⁶ EU Business @ Biodiversity Platform (2021)

¹⁰⁷ [TNFD \(2021a\) TNFD: Proposed technical scope](#)

¹⁰⁸ [Natural Capital Coalition \(2018\) Connecting finance and natural capital: A supplement to the Natural Capital Protocol](#)

¹⁰⁹ Science Based Targets for Nature (2020)

Assessment tools

Assessment tools can support financial institutions with obtaining high-level insight into the impacts and dependencies connected to their counterparties, which aids in identifying material risks across different sectors, portfolios or asset classes. Some tools allow for assessing all potential impacts and dependencies across many sectors, such as the ENCORE developed by UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) (see Information box 6). Some tools focus on a subset of impacts and dependencies in selected sectors to address a specific risks, such as TRASE for deforestation-related risks. Finally, some tools can provide detailed company-level insights, such as ZSL SPOTT for deforestation-related risks in the palm-oil sector. New tools are rapidly emerging and existing tools are continuously updated to reflect recent developments. For example, WWF is developing a Biodiversity Risk Filter that builds on the Water Risk Filter.

Information box 6

ENCORE

ENCORE (*Exploring Natural Capital Opportunities, Risks and Exposure*) is an open-source tool developed by the Natural Capital Finance Alliance in partnership with UNEP-WCMC. It maps the impacts, drivers and ecosystem dependencies on various natural capital assets across a large number of industries. The tool enables the narrowing down of an assessment from 11 high-level sectors to 157 sub-industries and – in many cases – individual production processes. ENCORE also provides materiality ratings for impacts and dependencies in various industries, enabling financial institutions to identify the issues that should be the highest priority. This functionality makes ENCORE one of the most comprehensive assessment tools that is currently available.¹¹⁰

Footprint tools

Footprint tools are a type of assessment tool that quantifies the impacts associated with a portfolio. They calculate a biodiversity ‘footprint’ that measures one or more impacts aggregated to a single metric.¹¹¹ A biodiversity footprint can be made up of formulating quantitative targets, engagement strategies and inclusion criteria, as well as tracking progress on these.¹¹²

Some examples of footprint tools being explored in the Dutch financial sector are BFFI (Biodiversity Footprint for Financial Institutions), STAR (Species Threat Abatement and Recovery Metric) and CBF (Corporate Biodiversity Footprint). Each tool has its own strengths and weaknesses, relating to its stage of maturity, data requirements and scope of applications. Despite the fact that various footprint tools have been introduced, none of the survey respondents indicated they were using them as part of their efforts to address nature-related risks and opportunities.

Footprint tools aim to calculate as granular a footprint as possible, by including both upstream and downstream impacts. This typically includes a life cycle or value chain analysis linked to the company’s production locations and the relevant biodiversity impacts involved. To enable this type of assessment, footprint tools have demanding data requirements, including corporate disclosures, scientific data from open-source databases and proprietary modelling data.¹¹³ The scope of footprint tools varies but the environmental impacts of investments can be calculated at the level of portfolio, asset class, company or single project, depending on the tool.

¹¹⁰ ENCORE (2022) Sectors.

¹¹¹ WWF (2021b)

¹¹² Finance and Biodiversity Community (2022)

¹¹³ WWF (2021b)

Although it is encouraged to test new approaches, the use of modelled data and a single metric should be approached with caution. Biodiversity dynamics are multifaceted, non-linear¹¹⁴ and spatially variable¹¹⁵, and effects of interventions often extend beyond a single operation or intervention.¹¹⁶ The use of modelled data and a single metric by footprint tools does not enable the adequate reflection of these key aspects yet, and could, therefore, lead to inaccurate insights and counter-effective interventions.¹¹⁷ The EU Business @ Biodiversity Community found similarly that there is no single biodiversity measurement tool available yet that addresses all expected requirements, and that entities will need to use a combination of measurement approaches and metrics to track biodiversity-related progress.¹¹⁸

Databases

This report previously highlighted that the lack of nature-related data is perceived as one of the main challenges in the Dutch financial sector in addressing nature-related risks and opportunities. However, it has been critiqued that the challenge is not a lack of nature-related data per se, but rather the interpretation of the data.¹¹⁹ The TNFD attributed this to the fact that there is no uniform approach to data standardisation, leading to variety in data accessibility, quality, format, relevance, scale and transparency.¹²⁰ There are numerous databases available to support financial institutions in taking action on nature loss, but each database has a unique scope, structure and applications at the regional, sector or company level, which can make using them a challenge.

The TNFD emphasises that different databases can be useful across the various stages of the LEAP process, also providing a mapping of numerous databases and their usefulness across each stage.¹²¹ The data provided by databases can typically be categorised in three classes:¹²²

- **Asset location** data for specific sectors, ecosystem or supply chains
- **Observational data** related to these assets at different spatial scales and timeframes
- **Modelled data**, such as scenarios that are used in analytics, simulation and forecasting.

The collection of these data increasingly uses emerging technologies, such as artificial intelligence, remote sensing and geospatial technology. More information on the use of such technologies can be found in the *Geospatial ESG* report that WWF recently published in collaboration with the World Bank and Global Canopy.¹²³

¹¹⁴ [Huggett, A. \(2005\) The concept and utility of 'ecological thresholds' in biodiversity conservation. *Biological Conservation*, 124\(3\), 301-310.](#)

¹¹⁵ TNFD (2022b)

¹¹⁶ SBTN (2020)

¹¹⁷ [NGFS \(2021\); European Commission & Business @ Biodiversity \(2021\) Corporate Biodiversity Footprint applied to a portfolio of Agri-Food companies](#)

¹¹⁸ EU Business @ Biodiversity Platform (2021)

¹¹⁹ [Lester, A. \(2021\) Cautious optimism for TNFD despite challenges. *Environmental Finance*.](#)

¹²⁰ TNFD (2022b)

¹²¹ TNFD (2022b)

¹²² TNFD (2022b)

¹²³ [WWF, World Bank Group & Global Canopy \(2022\) Geospatial ESG.](#)

Based on the survey, the Dutch financial sector is currently using the following three types of database:

1. There are databases that can be used as stand-alone tools, sometimes taking on the functionality of assessment tools. For example, IBAT provides asset location data on protected biodiversity that can be used to determine whether a counterparty operates near a significant habitat (see Information box 7).¹²⁴ ENCORE can also be considered a database of this type, as it provides information on the materiality and underlying natural capital assets of impacts and dependencies in different sectors.¹²⁵
2. There are databases that support the use of other tools, including assessment, footprint and in-house developed tools. Notable examples include Exiobase for the supply of input-output data and Ecoinvent for the supply of life-cycle inventory data.
3. There is a range of external data providers of company-level data that can be used for counterparty analysis of nature-related risks. Examples include publicly available data from Carbon Disclosure Project and Forest 500, as well as proprietary ESG data offerings of commercial providers, such as MSCI, S&P, Sustainalytics and ISS.

Information box 7

IBAT

The International Biodiversity Assessment Tool (IBAT) is a comprehensive database of threatened species, protected areas and key biodiversity areas. The database combines geospatial asset location data from the IUCN Red List of Threatened Species, World Database on Protected Areas and World Database of Key Biodiversity Areas.

Although IBAT seeks to be a scientific database, it is also an essential database for the financial sector as it can be used to determine whether a counterparty's activities take place in – or near – a significant habitat. This can help determine the materiality of the potential impacts and dependencies that the counterparty has on its surrounding nature. Recognised by the TNFD, it can overlay a geospatial map of business activities with spatial data, helping relevant financial institutions determine the biodiversity footprint of their counterparties.¹²⁶


¹²⁴ [IBAT](#)

¹²⁵ [ENCORE \(2022\)](#)

¹²⁶ [IBAT](#)

C2 INITIATIVES

Table 2: Examples of existing initiative

	What?	Why?
	<p>The Partnership for Biodiversity Accounting Financials (PBAF) was founded by the Dutch financial sector and is aligned with various biodiversity-related initiatives, such as TNFD or the Finance for Biodiversity Pledge.¹²⁷ It developed the PBAF Standard, which enables impact and dependency assessment of investments in biodiversity, and provides guidance on nature-related risk management.</p>	<p>PBAF poses an opportunity to participate in the development of a holistic approach to biodiversity impact, involving further guidance, principles and definitions to enable reporting to investors. It is also a platform to share experiences with peers and learn about how negative impacts can be assessed and mitigated.¹²⁸</p>
	<p>The TNFD Forum is a global multi-disciplinary consultative network that is part of the TNFD alliance and supports the Taskforce. Apart from financial institutions, companies, public sector institutions, research organisations, inter-governmental organisations and societal associations are also represented in the forum.¹²⁹</p>	<p>Participants can contribute to shaping the TNFD and be part of the pilot studies. Members can give feedback and voice their concerns on the nature-related risk disclosure standards that are being developed. This will allow members to stay ahead of most recent developments and anticipate the TNFD publication.</p>
	<p>The EU Finance@Biodiversity Community was started by the European Commission to integrate biodiversity into the investment decisions of financial institutions. In 2020 the Finance for Biodiversity Pledge emerged as a bottom-up initiative by members of the community. With the pledge, signatories recognise the value of nature and commit to taking ambitious action on biodiversity.¹³⁰</p>	<p>Community members can engage in a dialogue among peers and organisations to share their experiences, promote best practices and raise awareness. The signatories aim to spread knowledge and increase collaboration among financial actors in the restoration of biodiversity. Both initiatives not only engage institutions in dialogue but also convey knowledge and provide guidance for biodiversity assessment, target setting and reporting.¹³¹</p>
	<p>The DNB Working Group on Biodiversity emerged from the Sustainable Finance Platform by DNB. It consists of Dutch financial institutions that recognise the value of nature and aim to increase investments in the restoration and conservation of biodiversity. Additionally, it receives input from academic and governmental bodies (the Erasmus Platform Sustainable Value Creation and the Dutch Ministry of Agriculture, Nature and Food Quality). A key focus is the conservation of forest ecosystems.¹³²</p>	<p>The working group shares good practices and builds knowledge related to biodiversity loss and deforestation, to find solutions to overcome obstacles of sustainable funding. It also advises on measuring impacts on biodiversity loss and creating new investment models.¹³³</p>
	<p>The Investors Policy Dialogue on Deforestation (IPDD) is an investor-led engagement initiative facilitating a public policy dialogue with local governments about stopping deforestation in vulnerable biomes. Focused on promoting sustainable land use and human rights recognition, the IPDD aims for long-term financial sustainability of investments associated with forest management.¹³⁴</p>	<p>The initiative offers a unique opportunity for investors to engage in a dialogue between industry associations and public agencies of different countries. Through a specific project in Brazil, investors can engage with Brazilian authorities and associations on the management of forests assets and the impacts of investments connected to deforestation.¹³⁵</p>

¹²⁷ [Partnership for Biodiversity Accounting Financials \(PBAF\) \(2022\) About PBAF.](#)

¹²⁸ PBAF (2022)

¹²⁹ [TNFD \(2022c\) The TNFD Forum.](#)

¹³⁰ [Finance for Biodiversity Pledge \(2022\) Finance for Biodiversity Pledge.](#)

¹³¹ [Finance for Biodiversity Pledge \(2022\)](#)

¹³² [De Nederlandsche Bank \(DNB\) \(2022\) Biodiversity Working Group.](#)

¹³³ ENCORE (2022)

¹³⁴ [Investors Policy Dialogue on Deforestation \(IPDD\) Initiative \(2022\) About.](#)

¹³⁵ IPDD (2022)

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