Assessing Nature-Related Issues in Sovereign Debt Investment

Additional Considerations Building on TNFD Guidance

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Introduction

Over the past several years, the financial services industry has made great strides to account for the symbiotic relationship between economic activities and nature, mirroring the political, corporate, and societal efforts to address environmental challenges and make progress towards the United Nations' Sustainable Development Goals (SDGs). One of the many ways in which this progress has manifested itself is through the launch of the Taskforce on Nature-related Financial Disclosures (TNFD) recommendations and additional guidance in September 2023, which was the culmination of a three-year process involving a diverse array of stakeholders from across the financial industry and civil society. This report builds on that critical milestone by introducing additional considerations for sovereign debt investors with a particular focus on the identification and assessment of nature-related issues, as opposed to nature-related disclosure recommendations for sovereign debt issuers.

The financial industry has exhibited significant enthusiasm for the TNFD, with some of the world's largest financial institutions featuring among the Taskforce's members. By rising to the challenge of assessing, managing and disclosing nature-related issues (dependencies, impacts, risks and opportunities), the financial sector recognises the unique role that it plays in the global economy and the outsized impact that it can have on nature via financial intermediation. Indeed, the TNFD's purpose in having organisations – including financial firms – assess, manage and disclose nature-related issues is to shift business activities away from those that lead to nature-negative outcomes, and towards those that create nature-positive outcomes.

While a financial firm's own direct dependencies and impacts on nature are important, its indirect relationships with the environment through its myriad financing activities are much larger, hence the financial industry's unique position relative to other sectors. Moreover, financial institutions have fiduciary responsibilities to key stakeholders, meaning that it is incumbent on financial firms to account for all sources of financially-material risks and opportunities affecting the assets that they manage. In this regard, financial risks and opportunities arising from nature-related dependencies and impacts should be treated no differently than other sources of financially-material risks and opportunities.

Among the plethora of widely used financial instruments, sovereign debt stands out as the bedrock upon which market participants depend for a reference interest rate. The importance of this asset class for the functioning of the global economy and capital markets cannot be overstated, as well as for being a conduit for capital to flow from advanced economies (AEs) to emerging and developing economies (EMDEs). With the annual SDG financing shortfall for EMDEs standing at some $4 trillion,[1] the stakes for boosting nature-positive capital flows to sovereign borrowers – both in EMDEs and AEs – could not be higher.

For these reasons, building on the TNFD's recommendations and additional guidance, NatureFinance has developed tailored guidance for financial institutions regarding the identification and assessment of nature-related dependencies, impacts, risks, and opportunities emanating from their sovereign debt exposures. While the suggested guidance in this report for disclosing nature-related issues for sovereign debt investments is aligned with the TNFD's all-sector guidance, it also seeks to provide complementary granularity of specific relevance to sovereign debt investors. The purpose of this report is to facilitate the disclosure by financial institutions of nature-related information that is both meaningful and feasible with respect to their sovereign debt holdings.

While recognising the pressing need for sustainability reporting on nature- and climate-related issues from sovereign issuers,[2] the scope of this guidance is limited to disclosures of sovereign debt exposures by financial institutions, with an emphasis on practical implementation of the LEAP[3] (Locate, Evaluate, Assess, Prepare) approach. However, sovereign borrowers can benefit from the guidance provided in this report and from the TNFD's guidance on identifying and assessing nature-related issues (the LEAP approach).[4] Moreover, all stakeholders in the sovereign debt landscape stand to gain from efforts by sovereign issuers to measure and publicly communicate their nature-related issues.

This report builds on the additional guidance developed by the TNFD for financial institutions in particular,[5] with considerations specific to sovereign debt. These specificities are largely informed by views from numerous relevant stakeholders, including the financial institutions that will be preparing these assessments and disclosures. NatureFinance gathered these perspectives through stakeholder engagement via calls and a questionnaire, the aggregate responses to which are included in this report.

Finally, the sovereign debt universe is one marked by a profusion of different categories of instruments. Sovereign debt can be bonded or non-bonded (e.g., loans), long- or short-term, categorized as official or private, and provided on non-concessional or concessional terms. Further sub-categories of sovereign debt exist, such as syndicated loans from commercial banks, trade finance, and bilateral and multilateral official lending. Debt can be issued at the level of sovereign or of sub-sovereign, which includes regional and municipal issuers. Sovereign debt exposures can be indirect, as in the cases of a sovereign's contingent liabilities or public guarantees that materialize only if certain conditions arise. While over the long term it will be important for sovereign debt investors to consider the nature-related implications of all types of sovereign debt exposures, in initial assessment it may be appropriate for financial institutions to focus their analysis on select categories of their sovereign debt holdings, as they get started applying the TNFD additional guidance and accompanying tools.

Box 1 | **A primer on the TNFD's disclosure recommendations and LEAP approach**

As organisations take stock of their relationship with nature, it is helpful to consider that the TNFD disclosure recommendations are applicable to organizations of all sizes and across all sectors. Applying the TNFD disclosure recommendations may not currently be feasible or applicable for certain entities, such as governments or small and medium enterprises (SMEs). However, all organisations can usefully implement the TNFD's additional guidance on identification and assessment of nature-related issues (the LEAP approach) to identify, assess and manage these nature-related issues and prepare data for other organisations along value chains that may have reporting requirements.

For those organisations to which the TNFD disclosures are applicable, as is the case for financial institutions with sovereign debt exposures, the four TNFD disclosure pillars are the structure according to which nature-related disclosures should be presented:

- **Governance:** Disclose the organisation's governance of nature-related dependencies, impacts, risks and opportunities.
- **Strategy:** Disclose the effects of nature-related dependencies, impacts, risks and opportunities on the organisation's business model, strategy and financial planning where such information is material.
- **Risk and Impact Management:** Describe the processes used by the organisation to identify, assess, prioritise and monitor nature-related dependencies, impacts, risks and opportunities.
- **Metrics and Targets:** Disclose the metrics and targets used to assess and manage material nature-related dependencies, impacts, risks and opportunities.

The LEAP approach provides guidance on how organisations can assemble the data and analysis to identify and assess their nature-related dependencies, impacts, risks, and opportunities, and prepare to respond and report on them. The approach comprises four phases, which may be conducted sequentially (but do not have to be):

- Locate the interface with nature, across geographies, sectors and value chains;
- Evaluate priority dependencies and impacts on nature;
- Assess material risks and opportunities to the organisation; and
- Prepare to respond to nature-related risks and opportunities, including reporting on material nature-related issues to the primary users of financial reports and other stakeholders, aligned with the TNFD's recommended disclosures.

The LEAP approach is not a requirement to adopt the TNFD recommended disclosures. It is provided by the TNFD as guidance to support the identification and assessment of nature-related issues and ultimately to support disclosure of those issues deemed material.

The TNFD has developed additional disclosure guidance for financial institutions, which may apply to specific sub-sectors, including banks, insurance companies, asset managers and owners, and development financial institutions. This approach to sub-sectors has been adopted to streamline the guidance and avoid overlaps with financial product disclosure regulatory regimes.[6]

Intersection of sovereign and nature risk

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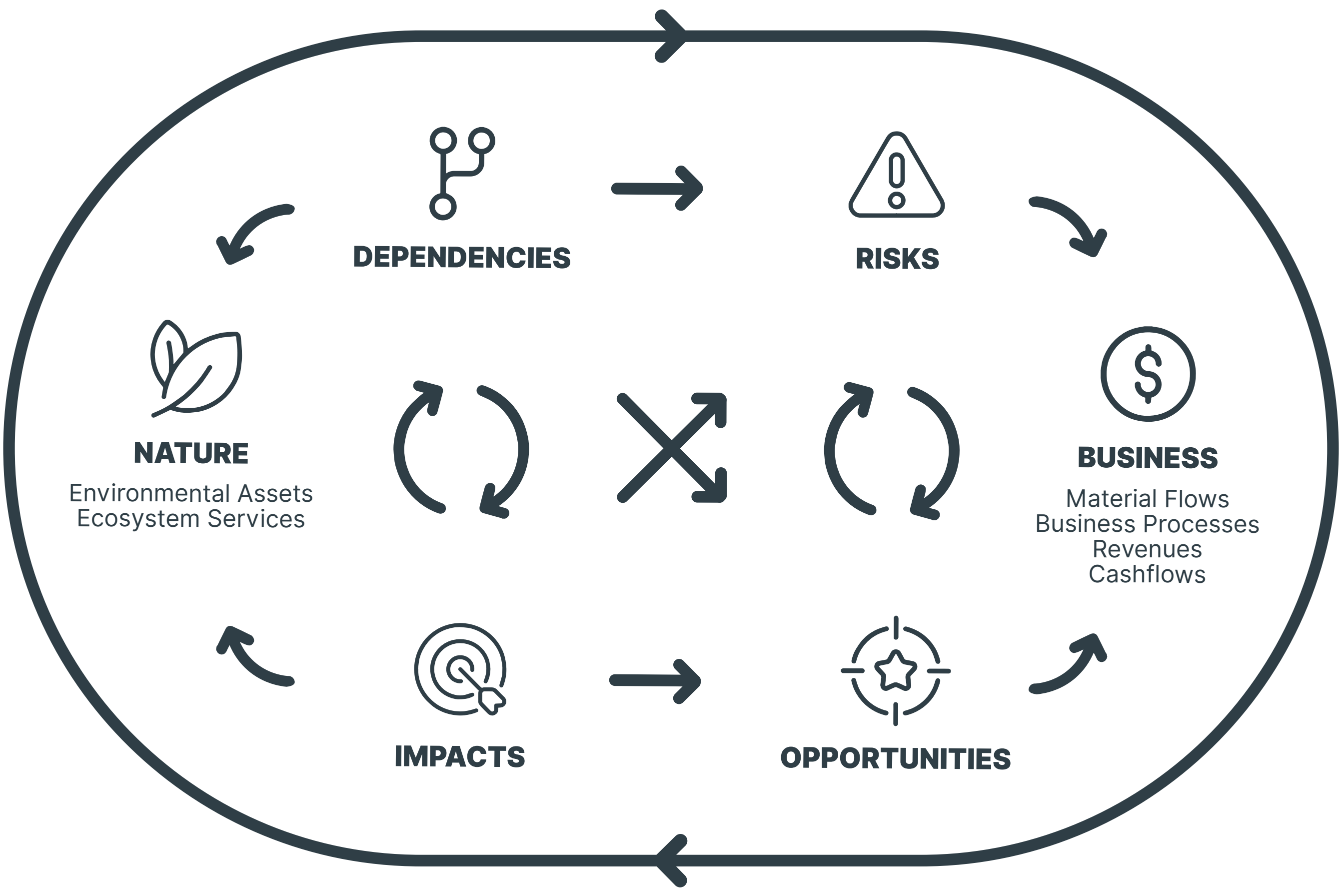
Intersection of sovereign and nature risk

Financial institutions seeking to integrate the nature-related issues of their sovereign debt holdings into their decision-making processes must first conceptualise the relationship between their business and nature. While the TNFD's detailed recommendations for all organisations and its additional guidance for financial institutions[7] are useful tools for these purposes, sovereign debt investors will also have to consider issues that are unique to sovereign debt. Sovereign borrowers differ from their corporate and household counterparts in many ways, including outsized social impact; revenue and expenditure profiles; the large number of locations where they have an interface with nature; and the absence of a legally-binding, international sovereign debt restructuring mechanism.

Nature-related issues

Sovereign debt issuers have dependencies and impacts on nature, which give rise to nature-related risks and opportunities that are financially material for government borrowers (Figure 1). The financial institutions that lend to sovereign borrowers in turn are also affected by these nature-related dependencies, impacts, risks, and opportunities since they can partly determine the pricing of sovereign debt instruments, the probability of repayment, and loss in case of default.

Figure 1
Core concepts for understanding nature and business



Dependencies are the ecosystem services and environmental assets that financial institutions and sovereign debt issuers rely on to carry out their activities. From a sovereign's perspective, a country's government and economy may be dependent on the ecosystem services of water flow; the regulation of water quality and of hazards, such as floods and fires; carbon sequestration; and the availability of an appropriate habitat for pollinators, among many others. Impacts represent changes to the state of nature, whether in terms of quality and/or quantity, that may affect nature's capacity to provide economic and social functions. Impacts can be direct or indirect, cumulative, and positive or negative. A sovereign borrower, such as a central government, will have impacts on the state of nature in its country and beyond through the public policies that affect social and economic activities.

Crucially, dependencies and impacts are not necessarily financially material, meaning that these relationships can exist without having a direct and observable financial effect on sovereign debt issuers and holders. In contrast, nature-related risks and opportunities specifically describe financial effects on sovereign debt issuers and holders arising from dependencies and impacts on nature. By extension, these also affect sovereign debt investors.

Nature-related risks are potential financially material threats to sovereign borrowers and creditors and are categorized as physical, transition, or systemic. Acute physical risks comprise specific, short-term events that change the state of nature, such as forest fires or oil spills, whereas chronic physical risks capture gradual changes to the state of nature, such as pollution from pesticide use. Nature-related transition risks stem from a misalignment with actions aimed at protecting nature and are prompted by changes in regulation and policy, legal precedent, technology or investor sentiment and consumer preferences. Nature-related systemic risks refer to risks arising from the breakdown of an entire system and include ecosystem stability risk and financial stability risk.

For sovereigns, nature-related risks constitute both contingent liabilities and macro-fiscal risks. The former can arise when the sovereign assumes financial obligations of other economic actors who suffer losses due to the crystallization of nature risks, for example when a systemic risk event causes bank failures that require government financial intervention. Nature-related macro-fiscal risks can generate larger-than-planned fiscal deficits that require additional funding during the budget cycle to cover the resulting shortfall, possibly on less favourable terms than under the original borrowing plan. On the revenue side, for example, the loss of biodiversity and critical ecosystem services can erode direct and indirect taxes on agricultural production, fisheries, and tourism. Spending pressures can arise from outlays to compensate economic actors whose livelihoods are adversely impacted by nature loss, to deploy investments into nature conservation, or to take remedial action to restore damaged ecosystems.

Nature-related risks can lead investors to reassess their sovereign risk exposures and reprice bonds to the point of locking vulnerable sovereigns out of international capital markets. This may be because the nature risks have crystallized, like when a critical ecosystem such as reefs rapidly degrades because of rising sea temperatures, or because bond investors have gained a greater appreciation for sovereigns' nature impacts and dependencies. Either way, sovereigns facing large debt redemptions in the near term generally require new borrowing to roll over maturing obligations. If this refinancing is not forthcoming or too costly, then sovereigns may be pushed into debt distress.

Nature-related opportunities are activities that create positive outcomes for sovereign borrowers and creditors through positive impacts or mitigation of negative impacts on nature. Opportunities may arise from avoiding, reducing, mitigating, or otherwise managing nature-related risks. Debt investors often deliberately limit exposure to sovereign issuers with vulnerable nature-related risk profiles. On the issuer side, sovereigns that actively work to halt or reverse the loss of nature might benefit from improved market access, increased capital inflows, and better financing terms. There are also broader economic opportunities from the sustainable use of natural resources and ecosystem protection, restoration, and regeneration in terms of enhancing nature's capacity for providing economic and social benefits.

Box 2 | **Case Study of Nature-related Risks and Opportunities – Belize**

Belize provides an illustrative case study of the dependencies that sovereigns can have on biodiversity and the implication of nature risks on public finance. Tourism accounts for around 40% of GDP, employment, and exports,[8] while tourism-related taxes (e.g., cruise ship passenger taxes, accommodation taxes, etc.) comprise a substantial portion of the fiscal revenue base.[9] The vast majority of tourism activity is concentrated around biodiversity hotspots such as the Barrier Reef Reserve System – a UNESCO World Heritage Site and mangrove reserve. These have been buffeted by hurricanes, rising sea temperatures, and overfishing. The combination with heavy dependence on nature tourism creates acute macro-fiscal risks for the sovereign, as four successive debt restructurings since 2000 have shown. Each restructuring event was driven by a combination of catastrophic hurricanes and downturns in tourism activity on top of persistent fiscal and external vulnerabilities.[10] Each episode was precipitated by large spikes in gross financing needs that could only be addressed through restructurings.

Belize also illustrates the unique opportunities created by natural capital in addressing the country's heavy debt burden. By the time the Covid-19 pandemic hit in 2020, Belize's debt-to-GDP ratio had climbed to 133%, a significant portion of which (30%) was in the form of a so-called "superbond" – an instrument created through the 2006-07 restructuring by consolidating various external commercial loans and bonds into a single US Dollar-denominated bond. Subsequent restructurings led to minor changes to the debt profile but did not meaningfully ease the debt burden or put the sovereign on a path toward debt sustainability. This was finally achieved in 2022, when the government extinguished the superbond via a debt-for-marine protection swap with The Nature Conservancy (TNC), in the event cutting public debt by 12 percentage points of GDP and generating significant savings in debt service over the long term.[11]

A "Blue Bond" issued by a TNC subsidiary and wrapped with a credit enhancement from the US Development Finance Corporation (DFC) provided low-cost funding for the buyback, while also channelling the equivalent of nearly USD 200 million into conservation funding over the next 20 years.[12] Moreover, these conservation flows are to be paid in local currency and circulated in the local economy, whereas absent the transaction Belize's authorities would have continued to service the relevant debt to external creditors in US dollars and be subject to the associated foreign exchange risks.[13] As part of the arrangement, the government also committed to place 30% of its ocean, including parts of the reef, under protection by 2026.

Sovereign- and portfolio-level analysis

As financial institutions measure the nature-related issues of their sovereign debt holdings, they will have to consider these issues at both the level of each sovereign issuer to which they are exposed and at the level of their own operations, business, and portfolio.

At the sovereign level, a sovereign borrower has nature-related dependencies and impacts that present financially material risks to and opportunities for its creditworthiness.

At the portfolio level, a financial institution with sovereign debt exposures will have to identify nature-related dependencies, impacts, risks, and opportunities across each of its sovereign credits in order to determine the aggregate materiality for its balance sheets. Financial institutions will thus partly rely on issuers to provide relevant information while conducting their own analysis of each credit, and then aggregate results at the portfolio level in a way that avoids double-counting. Central banks and supervisors have identified nature-related financial risks as a potential threat to financial stability, underscoring the importance of analysing nature-related issues at the level of financial institutions' balance sheets.[14]

Identifying and assessing nature-related issues

the LEAP approach

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Identifying and assessing nature-related issues
the LEAP approach

The TNFD notes that all components of the LEAP approach are important for implementing high-quality assessments of nature-related issues. LEAP provides practical guidance on identification and assessment of nature-related issues. It is relevant across all sectors, including the main categories of financial sector firms: banks, asset managers, asset owners, insurance companies, and development finance institutions.

The all-sector LEAP guidance draws from leading relevant materials, guidance, frameworks, reports, data, and tools. As part of its broad relevance to the activities of financial institutions, LEAP is fully applicable to sovereign debt investing, although differences between sovereign and corporate recipients of financial capital should be considered upon implementation.

The underlying sources and relevant tools of the TNFD's guidance are specified for each component in the LEAP approach alongside implementation guidance for financial institutions. This report seeks to complement the all-sector LEAP guidance by providing additional guidance to help sovereign debt investors optimize their use of the available suite of tools and application frameworks (see “Implementing LEAP at the nature-sovereign nexus” below). The TNFD has recommended several tools for applying LEAP, many of which are described below (see “Tools for LEAP Implementation”), and this report endeavours to augment this toolset by adding further resources that are useful for measuring the nature-related issues of sovereign debt exposures.

Scoping the Assessment

Organisations should create a shared internal understanding of their goals and objectives for a nature-related assessment to be able to prioritise their time and resources. Two high-level questions can guide them to help ensure alignment on goals and expected outcomes of a LEAP assessment:

Working hypothesis
What are the organisation's activities where there are likely to be material nature-related dependencies, impacts, risks and opportunities (DIRO)?
The spectrum of a financial institution's activities will shape its approach to using LEAP. Financial institutions that invest in sovereign debt can be highly diversified or more specialised. Their investment mandates may dictate to a significant degree where they invest their capital, whether according to geographic criteria (e.g., advanced versus developing and emerging economies) or rating classification (e.g., investment versus speculate grade). Depending on the geographic distribution of their sovereign debt portfolios, the material nature-related DIRO might differ considerably. Consequently, the sovereign debt investors need to understand aspects of a countries' sovereign risk profile that are likely to create material nature-related DIRO and their consideration in the public finance management.

Goals and resource alignment
Given the current level of capacity, skills and data within the organisation and given organisational goals, what are the resource (financial, human and data) considerations and time allocations required and agreed for undertaking an assessment?
Consideration of current level of capacity, skills and data within the organisation and given organisational goals within the financial institutions will also be a crucial element to determine the ambition and granularity of assessment. In practice, financial institutions may choose to start their assessment by focusing on one functional unit within their business, preferably starting with the one they consider most material for nature-related DIRO. Over time, financial institutions should assess all areas of their business, including those that manage sovereign debt investing. Specifically for the assessment of sovereign debt DIRO, financial institutions should consider potential discrepancies in the availability of country data and plan the assessment accordingly.

Output
The scoping exercise should produce terms of reference to determine the focus and timeline of the LEAP assessment in line with the financial institutions' resources and potentially material nature-related DIRO. In regard to their sovereign debt exposures, they could highlight their most material exposures and the country data availability.

Tools for LEAP implementation

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Tools for LEAP implementation

Below is a non-exhaustive list of tools that can be used by financial institutions to support the LEAP approach.[15] The TNFD references several of these resources explicitly in its Guidance on the identification and assessment of nature-related issues: The TNFD LEAP approach, while others feature on the Taskforce's Tools Catalogue[16] page.

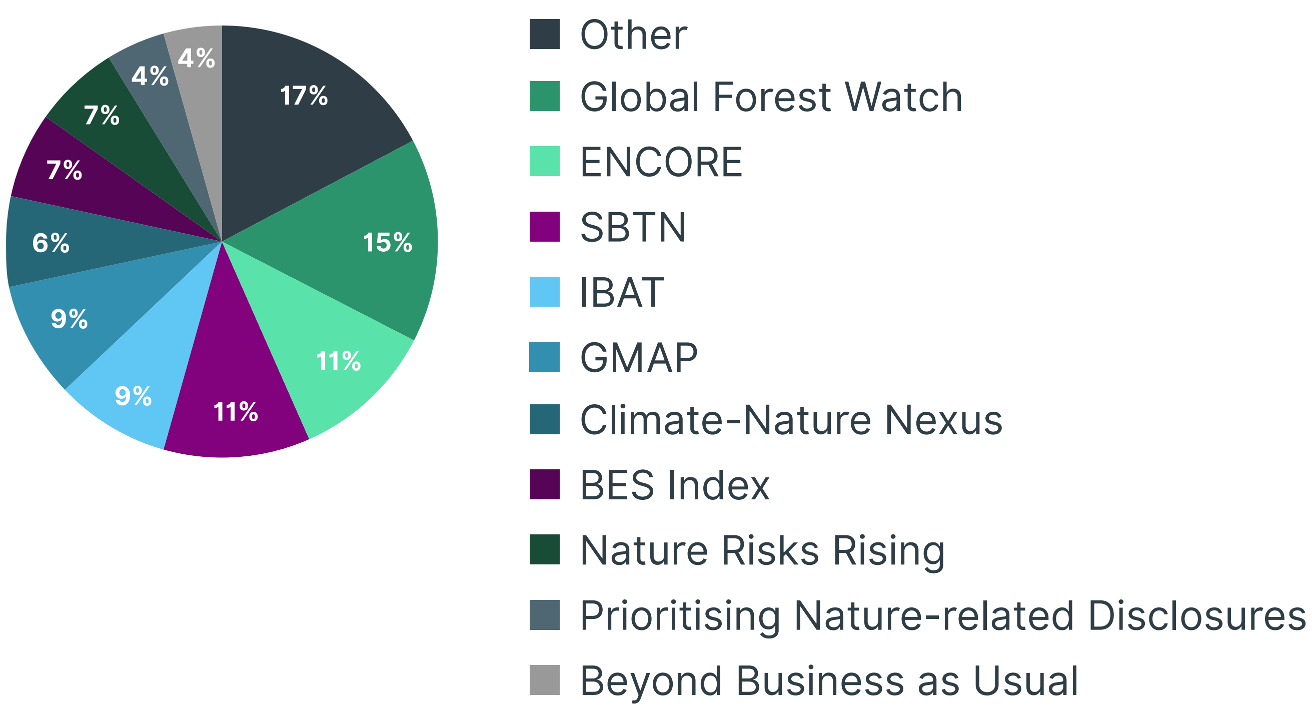
Other tools have been deemed useful for sovereign debt investing by financial institutions consulted for this report and feature below. Survey respondents found the Global Forest Watch, ENCORE, and Science-based Targets for Nature tools and application frameworks – among those listed by the TNFD in its Beta v0.4 recommendations[17] - to be most useful for financial institutions in preparing TNFD disclosures on sovereign debt exposures (Chart 1).

For other comprehensive catalogues of complementary tools and their use cases please refer to:

Finance for Biodiversity Guide on biodiversity measurement approaches[18]

NGFS-INSPIRE – Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability(pp. 29 – 31)[19]

Chart 1
Which tools and application frameworks are most useful?



Source: NatureFinance financial institutions survey

TNFD-recommended tools

The tools below are among those recommended explicitly by the TNFD in its LEAP implementation guidance for undertaking high-level scans of the nature-related issues pertaining to an organisation's business model and value chain.[20] These references provide data and customizable methodologies for measuring nature-related issues that financial institutions can apply to their sovereign debt exposures for the purposes of LEAP-FI and TNFD implementation. The TNFD lists numerous additional nature-related data tools aligned with the LEAP approach in its Tools Catalogue, some of which may be useful for sovereign debt investors.[21]

Allianz – Measuring and managing environmental exposure

A business sector analysis of natural capital risk. The Allianz report addresses natural capital risk and levels of mitigation at a sector level. It identifies the allocation of 12 sectors regarding their overall risk (related to impact and dependencies) and mitigation (awareness and preparedness of the sector) on seven nature-related risks: dependency on biodiversity; impact on biodiversity; impact through greenhouse gas emissions; impact through non-GHG emissions; impact a company has through its waste; dependency on water; and impact on water.[22]

Biodiversity Footprint Financial Institutions Tool

The Netherlands Enterprise Agency and a group of Dutch financial institutions produced the report Biodiversity Footprint for Financial Institutions Exploring Biodiversity Assessment which applied a BFFI tool to measure the impact of financial institutions on nature and biodiversity.[23]

ENCORE

Encore is a web-based tool that allows users to link sectors and sub-sectors to potentially relevant dependencies and impacts and provides an assessment of their potential material risks through consideration of impact drivers. Currently ENCORE doesn't currently explicitly refer to sovereign issuers. ENCORE allows users to identify the potential material risks of dependencies on 21 ecosystem services for the production processes of 157 sub-industries. It also identifies the environmental assets underpinning each ecosystem service and the potential drivers of environmental change that could influence them in a way that materially affects business performance. It contains maps of environmental assets, drivers of environmental change and impact drivers which could help organisations further understand location-specific risks. ENCORE is managed by the Natural Capital Finance Alliance (NCFA) – a collaboration between Global Canopy, UNEP Finance Initiative, and UNEP-WCMC. ENCORE analysis occurs at sector level and does not reflect full upstream and downstream value chains.[24]

Integrated Biodiversity Assessment Tool (IBAT)

IBAT is a mapping tool that provides businesses with a basic risk screening based on biodiversity and protected area data. The tool pulls together globally recognised biodiversity information drawn from a number of IUCN's Knowledge Products: IUCN Red List of Threatened Species, Key Biodiversity Areas (priority sites for conservation) and Protected Planet/The World Database on Protected Areas (covering nationally and internationally recognised sites, including IUCN management categories I-VI, Ramsar Wetlands of International Importance and World Heritage sites). The tool enables users to identify biodiversity risks and opportunities within or close to a project boundary.[25]

IBAT helps businesses incorporate biodiversity considerations into Project planning and management decisions, including:

- Screening and classifying potential investments.
- Siting an operation in a given region.
- Developing action plans to manage nature-related risks and impacts.
- Assessing risks associated with potential sourcing regions.
- Reporting on corporate biodiversity performance.

NGFS Nature-related Financial Risks: a Conceptual Framework to guide Action by Central Banks and Supervisors
In September 2023, the NGFS released a conceptual framework for nature-related financial risk to help guide policies and action by central banks supervisors. The framework marks a first step towards an integrated assessment of climate- and nature-related risks, on the basis that these systemic challenges cannot be addressed separately.[26]

Science-Based Targets for Nature (SBTN)
For the sector-level, SBTN provides a table that connects sectors and sub-sectors with impact drivers, based on ENCORE materiality ratings of companies' impacts on environmental issues for selected sectors. The table provides a preliminary assessment of the level of relevance (from 1 to 5, very low to very high) that a given impact driver might have on the value chain of the sector (upstream, direct operations and downstream).[27]

SBTN is currently developing an updated version of this table that will also include downstream impacts. SBTN has developed a Materiality Tool that enables businesses to explore in more detail the impact drivers that different sectors contribute to, with a focus on negative impacts on nature.

Swiss Re Institute BES Index – Biodiversity and Ecosystem Services
A business case for Re/insurance. The Swiss Re Institute BES Index assesses the state and capacity of 10 of the 17 IPBES (Intergovernmental Platform on Biodiversity and Ecosystem Services) nature contributions to people and ecosystem services on each square kilometre on land and coastal ecosystems through an analysis of peer reviewed scientific publications. The BES Index aggregates the km2 capacity values to country level to accommodate for macro use cases that need country level data (e.g., to compare entire countries with each other).[28]

It provides information to start building potential physical and partly transition BES risks-related exposure maps for single locations or portfolios – based on the ENCORE materiality dependency of an industrial activity by GICS or NACE code in conjunction with the state of the BES Index at the location. In addition, the BES Index provides a macro-view on the country specific GDP-dependency on BES, combining sector contributions to country GDP with sector dependency on BES and aggregated capacity of BES within a country.

UNEP – Prioritising Nature-related Disclosure
The UNEP report Prioritising Nature-related Disclosures aims to assist financial institutions with developing a sectoral focus to assess nature-related risks. It focuses on high-dependency and high-impact sectors as priorities for initial action, providing an overview of the main dependencies and impacts for 10 high-risk sectors (adapted from the Global Industry Classification Standard, GICS).[29]

UNEP, UNEP-FI and Global Canopy – Beyond "Business as Usual"
Biodiversity targets and finance. Managing biodiversity risks across business sectors. This report identifies a list of high priority sectors for impacts and dependencies on nature which can be used by financial institutions to inform the "Evaluate" stage of the LEAP process.[30]

WEF – Nature Risk Rising
The WEF and PwC report Nature Risk Rising examines the risks emerging from the dependency of businesses on nature. To estimate the extent to which the global economy depends on nature, an assessment was undertaken of the reliance on environmental assets of 163 economic sectors at an industry and regional level, based on the economic value creation of each industry.
The study examines the direct and supply chain risk to industries.[31]

This can provide a first basis for financial institutions to consider their dependencies on nature at a sector level across their investment portfolios and loan books.

Additional tools for sovereign debt exposures

The additional tools listed below do not feature in the TNFD's Guidance on the identification and assessment of nature-related issues: The TNFD LEAP approach, but have been included in this report given their usefulness for measuring the nature-related issues with respect to sovereign debt investing.

NatureFinance – The Climate-Nature Nexus
The NatureFinance[32] Report The Climate-Nature Nexus provides a list of sectors with the most significant direct impacts and dependencies on nature. These indicate priority areas for financial institutions when undertaking screening for nature-related risks and opportunities, and/or engagement with customers, clients or investees.[33]

Carbon Disclosure Project
CDP features analysis of water and forests that can help financial institutions assess risks and impacts, disclose data, and manage risks and impacts.

Environmental Performance Index
The EPI summarizes data reflecting sustainability performance of countries around the world. With forty indicators, the EPI provides rankings of 180 countries on ecosystem vitality and environmental health, which gauges each country's progress on environmental commitments and features practical guidance for improvements.[34]

ETH SEED Biodiversity Index
The Crowther Lab of ETH Zurich has developed a "biocomplexity index" (SEED) that uniquely provides a measure of the health of biodiversity relative to how it would be if subjected to only minimal human disturbance.

By combining remote-sensing and ground-sourced data, the assessment can show how biological complexity is changing in any site over time, and benchmarks it against other sites in the same ecoregion.

It is intended to:

- Create a standardised and comprehensible biodiversity index that measures the complexity of nature at a global scale;
- Shape standards and underpin the governance of nature markets and regulatory disclosures;
- Create a market-facing platform that catalyses capital to flow to equitable nature-based solutions.

EU – Biodiversity Information System for Europe
BISE serves as the European reference gateway for accessing data, information and knowledge regarding the status and progress towards EU biodiversity targets. This is derived from data collected through key nature-related policy instruments.[35]

Global Forest Watch (GFW)
Global Forest Watch is an online platform that provides data and tools for monitoring the world's forests in real-time.[36]

High-level roadmap: Aligning financial flows with the Kunming-Montreal GBF
The roadmap proposes recommendations for all actors within the financial landscape – financial ministries, financial supervisory entities, public development banks, private financial institutions, investors – on integrating the Kunming-Montreal Global Biodiversity Framework within their policies and decision-making processes. The roadmap was developed by the United Nations Environment Programme Finance Initiative (UNEP FI) in consultation with the co-organizers of the Finance and Biodiversity Day at COP15 of the Convention on Biological Diversity (CBD) in December 2022 in Montreal, including: the CBD Secretariat, the United Nations Development Programme (UNDP), the World Bank, NatureFinance, and Finance Montréal.[37]

Iceberg Data Lab
The Iceberg Data Lab features two application frameworks that could be of some use to sovereign debt investors seeking to measure their exposure to nature-related issues. Its Corporate Biodiversity Footprint measures the extent to which ecosystems affected by a company's business have been degraded from their pristine natural state. The score factors in a company's land use, nitrogen deposition, GHG emissions and release of toxic compounds. Iceberg's Net Environmental Contribution combines various environmental factors into a holistic environmental impact. The NEC metrics is transparent, with any stakeholder allowed to join the NEC initiative to contribute to the methodology's development in an open process.[38]

IFC – Global Map of Environmental and Social Risks in Agro-Commodity Production (GMAP)
The Global Map of Environmental & Social Risk in Agro-Commodity Production (GMAP) enables users to conduct rapid environmental and social due diligence associated with trade and short-term finance, through the Generation of country-commodity risk analysis reports.[39]

NatureFinance Alignment Tool (In development)
NatureFinance has built a quantitative tool that allows private and public financial institutions, and governments to assess the alignment of their underlying financial flows with nature. The tool allows private and public financial institutions, and governments to assess the alignment of their underlying financial flows with nature. It can assess financial flows in categories as diverse as corporate investments to public expenditures and provide an alignment score based on country and sector exposure.

Sustainable Development Report (SDR)
The SDR measures yearly progress on the UN's Sustainable Development Goals since these were adopted in 2015. The high-quality metrics and data provided in this report are crucial for achieving the SDGs, including those of relevance to nature-related issues facing sovereign debt investors and their client countries. The SDR provides highly useful cross-border indicators that can help financial institutions measure certain nature-related dependencies and impacts that are embodied in a country's imports and exports.[40]

WRI – Aqueduct
Aqueduct uses cutting-edge data to identify and evaluate water risks around the world.[41]

WWF Biodiversity Risk Filter and Water Risk Filter
The Biodiversity Risk Filter provides information on all industry sectors' direct impacts and dependencies on biodiversity. The Water Risk Filter maps of current and future water risks, scenarios maps, country profiles, and methodological documentation.[42]

Implementing LEAP at the nature-sovereign nexus

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Implementing LEAP at the nature-sovereign nexus

Implementing the LEAP approach for sovereign debt investing requires several overarching considerations. Financial institutions operating as a corporate entity can apply the LEAP approach for corporates as it pertains to their own operations and supply chain. However, these impacts will be limited compared to those of financed activities, including sovereign debt investing.

Financial institutions can encourage their sovereign debt issuing clients (recipients of financial investments), including debt management offices (DMOs), to use the LEAP approach for corporates and report information in line with the TNFD disclosure recommendations. It is within the remit of each financial institution with sovereign debt exposures to determine under which circumstances such requests may be appropriate, considering such factors as country- or sovereign-level data availability and the borrower's will and capacity to prepare information following the TNFD's recommended disclosures. As industry TNFD practices mature, financial institutions can assess whether TNFD-related information requests to sovereign borrowers are best made through bilateral communication or through multi-stakeholder groupings such as industry associations, civil society, or creditor committees. Data provided to financial institutions by clients can be used to complement other sources of data, such as proxy data available from public and/or private providers.

Financial institutions will need to apply the LEAP approach flexibly in the context of sovereign debt to accommodate variations in the nature and structure of the business, the type of asset classes/financial products and level of aggregation of financial products/services. For sovereign debt investments, financial institutions can adapt their implementation of LEAP to suit their type of exposure.[43] In cases where sovereign lending is linked to nature-related key performance indicators or the proceeds of sovereign debt instruments can be traced to specific activities, financial institutions are encouraged to be ambitious in explicitly assessing the granular implications of this financing in their TNFD reporting. Such cases could potentially include sustainability-linked debt, use-of-proceeds instruments, such as green bonds or loans, or export credit guarantees.

Tools and data already exist to help financial institutions get started with the assessment of their portfolios. These include matrices of high impact and high dependency sectors, such as the SBTN 2022 Sector Materiality Tool, and data and metrics on ecosystem integrity and importance. Examples and case studies are referenced in the TNFD additional guidance for financial institutions.[44]

Some asset classes and financial institutions may initially find it challenging to secure a comprehensive view of nature-related issues. Nature-related disclosures for sovereign lending specifically can benefit from the advantage of widely available country-level data. However, availability of TNFD-relevant data can vary by country, and as is the case with corporate issuers, investors will have to partly rely on sovereign issuers to provide useful information. The capacity and will of sovereign borrowers to disclose nature-related, material information also differs significantly across countries, indicating that, in turn, investors may find it more challenging to implement LEAP in instances where such information from the issuer is limited or absent.

Moreover, financial institutions may find it more difficult to conduct granular, comprehensive location-based assessments when implementing LEAP for their sovereign lending portfolios than for their corporate lending. This is because, in many cases, the number of relevant locations from which nature-related issues can manifest is likely to be significantly higher for sovereigns than for corporates.

Nonetheless, developments in data and analytics and greater transparency will support a more comprehensive understanding of nature-related risks and opportunities of sovereign debt investing over time. As with corporates, financial institutions can start with a narrow scope for their sovereign debt exposure assessment and build a more comprehensive assessment as they refine their approach and as methodologies improve. Financial firms with sovereign debt exposures should apply the LEAP approach flexibly to accommodate the broad implications of sovereign debt investing, data-related challenges, and the specificities of their own portfolios.

Financial institutions should consider the risk of misestimating nature-related DIRO of their sovereign debt exposures. One form of potential misestimation is double counting, in which case a nature-related issue is counted twice. Double counting can occur at different levels of analysis, such as when measuring issues that are both internal and external to a country/sovereign's borders. It is, of course, possible and even likely that a single dependency or impact can generate multiple financially-material risks and opportunities. Similarly, it is also possible to undercount a dependency or impact if, for example, issues are only measured within a country's borders and ignoring cross-border relationships. A further example of double counting would be to count twice the same DIRO in sovereign as well as corporate exposures.

Locate the interface with nature

The tools listed above (see "Tools for LEAP implementation") enable users to locate the organisation's interface with nature, which in turn affect sovereign debt issuers. Among other tools with a global approach,[45] the World Wildlife Fund's Biodiversity and Water Risk Filters appear to be the most practical for helping investors use spatial data to locate the interface of their sovereign debt exposures with nature.

Tools
Several tools provide useful features for sovereign debt investors seeking to locate the interface with nature.[46] Global Forest Watch (GFW) has interactive maps featuring spatial data on biodiversity, forest change, land cover, land use, and climate. Each of the GFW categories features sub-categories and several available indicators with integrated spatial coordinates, which can help sovereign investors identify the location of many salient interfaces that sovereign borrowers have with nature. While these indicators tend to be land-based, there is at least one that is water-based.[47]

The ENCORE tool enables users to visualise location-specific natural risks through its maps[48] of dependencies, impacts, and hotspots. ENCORE presents its spatial data on dependencies through the lens of various ecosystem services, with indicators linked to different types of relevant natural capital assets. Drivers of environmental change are also specified for each combination of ecosystem service and natural capital asset to more fully conceptualise each dependency. As for impacts, ENCORE lists several impact drivers, with spatial data provided for each underlying indicator.
In addition to dependencies and impacts, location-based data is also available for hotspots of natural capital stock depletion across various terrestrial and marine assets.[49]

Stakeholders can benefit from the Integrated Biodiversity Assessment Tool's (IBAT) mapping capabilities, which provide a basic risk screening based on biodiversity and protected area data.
IBAT hosts three key global biodiversity datasets, the IUCN Red List of Threatened Species, the World Database on Protected Areas, and the World Database of Key Biodiversity Areas, with these providing significant locational information available in country profile maps and elsewhere on the platform.[50]
Data derived from these sources include grid-based metrics on species threat abatement and restoration, and on rarity-weighted species richness. IBAT provides reports for single- or multiple-site locations.[51]

The IFC's Global Map of Supply Chain Risks in Agro-Commodity Production (GMAP) facilitates analysis of the location-based implications of a country's commodity-sector trade and supply chains for nature, including country-level location data and maps. Combinations of countries and commodities in GMAP are the basis of country-level reports for each country-commodity pairing, with scores for numerous indicators and qualitative information made available to users.[52] Of further use from a locational perspective, GMAP has a score comparative feature, which displays country-commodity combinations unique to users' supply chains.[53] As sovereign debt investors seek to locate the interfaces with nature of their sovereign borrowers, GMAP could prove useful in identifying cross-border natural dependencies and impacts of sovereign borrowers, particularly through commodity imports or exports.

The additional tools listed above can also be of use to TNFD preparers in the “locate” phase of the LEAP approach. The WWF’s Biodiversity and Water Risk Filters, the WRI’s Aqueduct, and the European Union’s Biodiversity Information System for Europe[54] each feature maps and/or country-level analysis that help determine the location of a sovereign issuer’s dependencies and impacts on nature, and by extension those of the sovereign debt investor.

The WWF’s Biodiversity Risk Filter (BRF) and Water Risk Filter (WRF) each have spatially explicit biodiversity[55] and water-specific[56] data and enable analysis of operational and key value chain sites. Maps of physical and reputational biodiversity risks are provided, for both terrestrial and marine areas, with numerous available risk indicators. Users can overlay the coordinates of relevant sites as a first step to measuring nature-related dependencies and impacts.

WRI’s Aqueduct has a Water Risk Atlas[57] that maps physical-quantity, physical-quality, regulatory, and reputational water risks across multiple locations and features temporal resolution, which enables viewing water risk indicators by month. Aqueduct’s other tools also take a spatial approach to water risks with respect to food,[58] flooding,[59] and at national and sub-national levels and include forward-looking locational data.

Desired outputs
Financial institutions with exposures to sovereign debt could assemble a list of the most material countries and ecosystems and/or biomes associated with them, as well as nature-related DIRO of the selected macroeconomic indicators.

Evaluate nature-related dependencies and impacts

Sovereign debt investors may find the tools listed above useful for the "Evaluate" phase of LEAP. This includes the resources under the "additional" category, such as those developed by the World Wildlife Fund, the World Resources Institute, the European Union, the Sustainable Development Report, and the Environmental Performance Index.

Tools

Global Forest Watch's dashboards and interactive maps are both available at the country level, which can potentially align well with the analysis of sovereign-level debt exposures. The country-level dashboards[60] include only data on land cover, forest change, land use, fires, and climate, with no apparent data in these country summaries on biodiversity, marine or freshwater ecosystems, or on cross-border issues.[61] GFW does, however, have more broadly-available information in its coverage of forest-related topics, including biodiversity, climate, commodities, water, and fires.[62]

ENCORE provides materiality ratings of ecosystem services and natural assets for economic activities categorized by the Global Industry Classification Standard. While ENCORE does not appear to aggregate these at the country or sovereign level, sovereign debt investors can evaluate the nature-related dependencies and impacts of key economic sectors and activities in a usefully granular way with this tool. The materiality ratings of dependencies and impacts are based on detailed criteria for the importance of:

- natural capital assets to ecosystem service provision;
- environmental drivers of change on natural capital assets; and[63]
- contextual criteria for the drivers of change in natural capital assets or ecosystem provision.

The IBAT tool enables users to identify biodiversity dependencies and impacts within or close to a project boundary. The country profiles contain information on species, protected areas, and key biodiversity areas that is useful for analysing the natural dependencies and impacts of sovereign borrowers, although cross-border topics appear to be absent from these summaries.[64] Financial institutions can use IBAT resources to create portfolios of project exposures to facilitate the management of multiple associate sites or assets and to generate multi-site reports for disclosure purposes.[65] IBAT also has a briefing note intended to facilitate screening for biodiversity risk in the financial sector, which emphasizes the special considerations that financial firms need to take into account regarding transactions involving higher-risk biodiversity locations.[66]

Users can turn to the IFC's GMAP to assess the cross-border dependencies and impacts on nature of a country's trade and supply chains for commodities such as wheat, cocoa, and rapeseed. Incorporating international trade into an analysis of nature-related dependencies and impacts is essential, and IBAT helps fill the void in cross-border information left mostly unaddressed by other tools. For lenders to sovereigns, GMAP's information on commodity supply chains partially bridges this gap. Yet non-commodity trade would also need to be covered for a fuller view of how natural dependencies and impacts are imported to and exported from a country, and in turn how this affects the sovereign borrower. Of note, GMAP criteria and indicators align with the IFC's 2012 Performance Standards on Environmental and Social Sustainability, including those on biodiversity conservation and sustainable management of living natural resources and on labour and working conditions.

The WWF's Biodiversity and Water Risk Filters, the WRI's Aqueduct, the EU's Biodiversity Information System for Europe,[67] and the Environmental Performance Index all appear to provide strong analytical usefulness for measuring nature-related dependencies and impacts at the country level for sovereign debt investors. The Biodiversity Risk Filter (BRF) and Water Risk Filter (WRF) feature materiality scores by economic sectors and across several biodiversity risk and water risk indicators. WRF has country profiles,[68] where the risk scores from each indicator are available at the country level, which facilitates analysis of a sovereign borrower's nature-related impacts and dependencies.

WRI's Aqueduct has Country Rankings[69] that enable users to understand and compare national and sub-national water risks. Of note for sovereign debt investors, the output provides national and sub-national scores across three water risk indicators on drought, riverine flooding, and baseline water stress and across the agricultural, industrial, and domestic sectors.

The Sustainable Development Report features excellent cross-border data on nature-related issues that are embodied in countries' imports and exports.[70] Examples of nature-related issues embodied in imports on a per capita basis include marine biodiversity threats, terrestrial and freshwater biodiversity threats, and scarce water consumption. Similarly, exports of hazardous pesticides and plastic waste are also measured on a per capita basis. The Environmental Performance Index is useful for sovereign debt investors by virtue of the focus on the country-level, even though it also provides limited location-related data.

Desired outputs

In relation to their sovereign debt exposures, the financial institutions could prepare a list of environmental assets, ecosystem services and impact drivers within the countries identified as material in the Locate phase of assessment, and an evaluation of corresponding governments' associated policies and strategies.

Box 3 | Measurement, Reporting, and Verification Providers

Measurement, Reporting, and Verification is a process that, in the first instance, measures the impact of a specific nature-positive solution that has been implemented over a period of time. The next step is to report the measured results to a third party that is accredited to verify whether these findings can be certified. The technology and processes in the nature and biodiversity MRV sector are improving rapidly,[71] particularly as nature credit markets appear poised to follow the rapid growth of carbon credit markets.

Indeed, the Global Environment Facility's (GEF) Expert Panel made significant contributions to advancing the development of biodiversity credits at the OneForest Summit in Libreville, Gabon, in March 2023. Key collaborative initiatives include the World Economic Forum's Working Group on Biodiversity Credit Markets and the Biodiversity Credit Alliance and underscore the momentum behind the emergence of these new instruments. In the same vein, the government of Australia has begun establishing the world's potentially first regulatory framework for a national nature credits market.

In parallel to these policy developments, accredited MRV providers are increasingly providing services with respect to nature-based solutions and biodiversity. Examples of such firms include Kanop,[72] MRV Collective,[73] and 4Impact.[74] Yet insufficient data on the potential results of nature-related investing is a significant obstacle to galvanizing private finance towards nature credit markets, including those that would have an impact on sovereign debt issuers. It is thus crucial for global stakeholders to successfully incentivize an increased availability of MRV technologies and providers in order to more firmly link private finance to nature-positive solutions.[75]

Assess nature-related risks and opportunities

Measuring nature-related materiality for sovereigns: creditors and borrowers
It may prove challenging for some financial institutions to quantify the financially-material risks and opportunities resulting from the dependencies and impacts of their sovereign borrowers' interface with nature. Sovereign investors often rely on receiving either limited or no data regarding nature-related issues from many debt management offices (DMOs), even though numerous countries have increased the quantity and quality of ESG data that they make available as part of their investor relations outreach.[76]

While the tools and frameworks mentioned above can aid sovereign creditors in measuring financially-material dependencies and impacts, as TNFD implementation matures, more in-depth analysis Çwill be necessary at both the level of the sovereign issuers and sovereign creditors. Such a rigorous analytical exercise will require the use of more thorough disclosed data from all stakeholders, the sophisticated tools and frameworks in existence ought to be complemented by more information disclosed by governments whenever possible. As such, firms should take a holistic approach in disclosing the nature-related risks and opportunities of their sovereign lending activities in instances where providing a numerical estimate may be unfeasible.

To the extent that quantifying the nature-related material risks and opportunities of a sovereign borrower is possible, sovereign debt investors will most likely have to map the dependencies and impacts evaluated with the tools above to economic indicators of relevance. The analytical challenge in doing so can likely be addressed, at least partially, by using past data on the financial effects of changes stemming from natural dependencies and impacts on economic activities and, in turn, on these economic indicators. Using backward-looking data to assess forward-looking risks and opportunities might be a sub-optimal approach but may be the most realistic one for a financial firm making its first attempts to disclose the nature-related materiality of its sovereign debt exposures.

It may be helpful for financial institutions to conceptualise materiality in terms of elasticities. By measuring the relationships between, on the one hand, percentage changes in quantity of some form of natural capital, and, on the other, percentage changes in relevant economic variables, investors can get a more tangible sense of how nature can financially affect sovereign borrowers and their creditworthiness. For instance, wildfires are known to negatively impact many businesses globally, including those in the agricultural and forestry sectors, which may lose some or all of their assets and have to cease some or all of their operations, resulting in higher costs, lower sales, and lower earnings. These financial losses can then likely have numerous second-order effects, which include diminished amounts of tax revenues that governments are then able to collect from these companies. Similarly, the lost output from affected sectors will weigh on GDP growth.

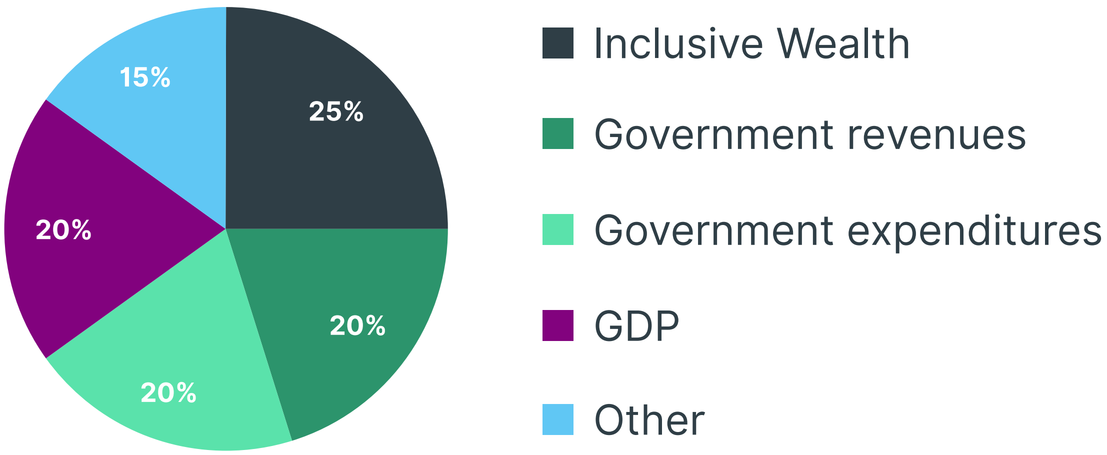
It is useful to take an even broader view of the economy, by considering natural and human capital in addition to the produced capital represented by GDP, in a measure known as inclusive wealth.[77] The overall economic losses to inclusive wealth are even larger than the hit suffered by GDP described in the scenario above, as there have already been, by definition, damages to natural capital and likely to human capital as well.

The cumulative result in this wildfire scenario is a ceteris paribus degradation of the borrower's sovereign risk profile due to nature-related factors. By translating nature-related dependencies and impacts into risks and opportunities in this way, financial institutions can thus make significant progress towards approximating the nature-related materiality of their sovereign debt exposures.

Economic indicators

There was no consensus among survey respondents about which economic indicators should be focused on when preparing TNFD disclosures with respect to sovereign debt exposures (Chart 2). Inclusive wealth[78] received the most endorsement as a useful metric for assessing nature-related material risks and opportunities faced by sovereign debt investors, followed closely by government revenues and expenditures, and gross domestic product. Some respondents pointed to the usefulness of referring to a sovereign borrower's natural capital accounts, where available, though such measures of natural capital correspond to one of the three main categories within the inclusive wealth framework. Yet multiple survey respondents and other financial institutions have noted the shortcomings of relying on inclusive wealth as an indicator, including that this concept is still poorly understood by many relevant stakeholders and that such data is released only at infrequent intervals.

Chart 2
Which economic indicators should sovereign debt investors focus on?



Source: NatureFinance financial institutions survey

Each of the other suggested economic metrics in the survey presents unique advantages and drawbacks. Regarding fiscal indicators, focusing on the role of nature in government revenues and/or government budget balances helps to directly integrate material repayment risks and opportunities for sovereign debt investors stemming from nature. Similarly, scrutinizing government expenditures can provide useful information on public policies affecting nature, including data that quantifies a sovereign issuer's spending priorities – helping investors observe how these evolve over time and to make cross-country comparisons.

Fiscal policies also have a symbiotic relationship with nature-related issues, meaning that fiscal indicators also reflect the impact that nature-related issues are having on the economy. For example, reduced crop yields resulting from any number of nature-related issues, such as drought, flooding, or insufficient pollination in the context of declining bee populations, lead to lower tax revenues from these economic activities in the agriculture sector.

As for GDP, some respondents noted that it remains a well-understood and widely-used indicator that should remain until the concepts of natural capital and inclusive wealth become more mainstream among sovereign investors and debt management offices.

Additional economic indicators may include those pertaining to the extractives industries and agriculture, considering the significant nature-related dependencies and impacts of these activities. Useful metrics regarding the material risks and opportunities of these sectors may include various types of price incentives, such as import tariffs, export subsidies, and fiscal subsidies tied to the production of a specific commodity or input. Still other financial institutions surveyed and spoken to alluded to the difficulty in quantifying the financial effects of natural risks, noting that these are best expressed by topic (e.g. water, forest area) rather than described by economic indicators.[79]

Given the significant variety of financial institutions' answers regarding the relevant economic indicators to assess the sovereigns' nature-related issues, it could be beneficial to explore this topic further and develop additional technical guidance for sovereign debt investors.

Prepare to respond and report

Having completed the first three phases of the LEAP approach, financial institutions with sovereign debt exposures will have to consider how to communicate their integrated assessment of material nature-related risks and opportunities to external stakeholders. This includes advice about the market disclosure of nature-related risks in accordance with the TNFD draft disclosure recommendations.
The TNFD provides the following guiding questions for all organizations as part of its broad LEAP framework:

Strategy and resource allocation
What risk management, strategy and resource allocation decisions should be made as a result of this analysis?

Performance management
How will we set targets and define and measure progress?

Reporting
What will we disclose in line with the TNFD disclosure recommendations?

Presentation
Where and how do we present our nature-related disclosures?

Conclusion

Assessing Nature-Related Issues in Sovereign Debt Investment

Additional Considerations Building on TNFD Guidance

NATURE FINANCE

Conclusion

One of the challenges of measuring nature-related dependencies and impacts is that these do not lend themselves as easily to straightforward accounting as greenhouse gas emissions do. For instance, the artificialization of soils resulting from the expansion of the built environment into previously-more pristine terrain has location-specific effects on the surrounding nature and biodiversity that can be difficult to meaningfully distil into a comparable, quantified score.

Nevertheless, the tools and methodologies available for financial institutions to measure the nature-related issues stemming from their sovereign debt exposures are evolving rapidly. No less than 23 tools of relevance for financial institutions are presented in this paper alone, which are supplemented by over 100 resources included in the TNFD's Tools Catalogue. Given this abundance of choice, each firm will likely use some, but not all, of these resources in preparing their nature-related financial disclosures. It is thus easier than ever before for investors to understand the underlying natural dependencies and impacts, and, in turn, the associated financially-material risks and opportunities.

Financial institutions with sovereign debt exposures should consider both actively engaging with TNFD[80] and following TNFD guidance as they prepare their nature-related disclosures. The LEAP approach is suggested guidance that can be used to support disclosures. By aligning themselves with TNFD guidance, financial firms will be in a stronger position to drive investments towards nature-positive solutions, including via sustainability-linked instruments. By doing so, financial institutions also stand to achieve significant progress in optimizing management of the material nature-related risks and opportunities on their balance sheets.

Finally, all stakeholders in the financial services sector would benefit from increased collaboration with the public sector and civil society in helping foster the emergence of a more robust MRV industry. Doing so would have the benefit in helping ensure the integrity of data on the outcomes of nature-related investments – whether in the form of sovereign debt or otherwise, and thus scale more private capital towards nature-positive solutions for sovereign borrowers and well beyond.

Annex: Reference Documents

Assessing Nature-Related Issues in Sovereign Debt Investment

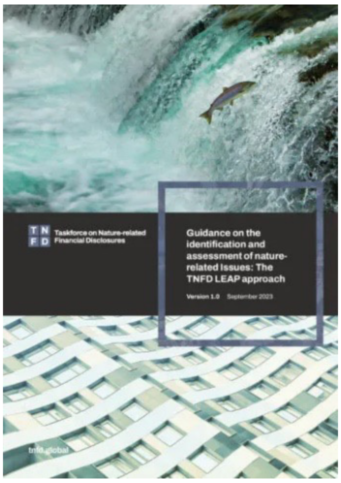
Additional Considerations Building on TNFD Guidance

NATURE FINANCE

Annex: Reference Documents

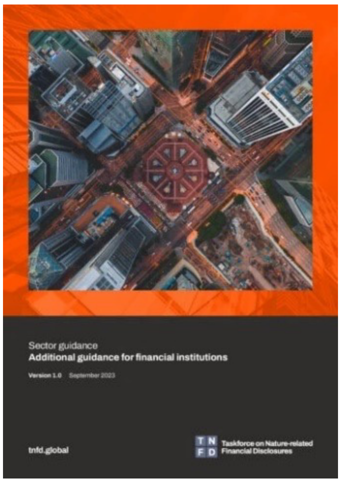
The final TNFD Recommendations including a set of general requirements for nature-related disclosures and a set of recommended disclosures structured around the four pillars of governance, strategy, risk and impact management, and metrics and targets.

ACCESS DOCUMENT →



Guidance on the integrated approach that TNFD has developed for the identification and assessment of nature-related issues, called the LEAP approach. It is designed for use by organisations of all sizes and across all sectors and geographies.

ACCESS DOCUMENT →



Additional guidance for financial institutions to apply the TNFD Recommendations. The guidance applies to banks, insurance companies, asset managers and owners, and development finance institutions.

ACCESS DOCUMENT →

Endnotes

[1] https://unctad.org/news/closing-investment-gap-global-goals-key-building-better-future

[2] https://documents1.worldbank.org/curated/en/099615001312229019/pdf/P170336065a94c04d0a6d00f3a2a6414cef.pdf

[3] The TNFD has published guidance on identification and assessment of nature-related issues, called the LEAP approach, which includes four phases: Locate, Evaluate, Assess and Prepare. https://tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/

[4] https://tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/

[5] https://tnfd.global/publication/additional-disclosure-guidance-for-financial-institutions/

[6] See: https://tnfd.global/wp-content/uploads/2023/08/Guidance_for_Financial_Institutions_v1.pdf?v=1695215983

[7] Ibid.

[8] https://www.imf.org/en/Publications/WP/Issues/2019/12/06/Tourism-In-Belize-Ensuring-Sustained-Growth-48844

[9] https://publications.iadb.org/en/tourism-in-belize-options-to-tax-and-regulate-the-home-sharing-sector

[10] https://www.imf.org/en/Publications/WP/Issues/2018/05/22/Belize-s-2016-17-Sovereign-Debt-Restructuring-Third-Time-Lucky-45842

[11] https://www.imf.org/en/Publications/CR/Issues/2022/05/10/Belize-2022-Article-IV-Consultation-Press-Release-and-Staff-Report-517761

[12] https://www.nature.org/content/dam/tnc/nature/en/documents/TNC-Belize-Debt-Conversion-Case-Study.pdf

[13] Ibid

[14] https://www.ngfs.net/sites/default/files/medias/documents/ngfs_conceptual-framework-on-nature-related-risks.pdf

[15] https://tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/ : p. 40

[16] https://tnfd.global/learning-tools/tools-catalogue/

[17] The survey was conducted prior to the release of the TNFD's finalised recommendations in September 2023.

[18] https://www.financeforbiodiversity.org/wp-content/uploads/Finance-for-Biodiversity_Guide-on-biodiversity-measurement-approaches.pdf

[19] https://www.ngfs.net/sites/default/files/medias/documents/central_banking_and_supervision_in_the_biosphere.pdf

[20] https://tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/ : p. 40

[21] https://tnfd.global/learning-tools/tools-catalogue/

[22] https://www.agcs.allianz.com/content/dam/onemarketing/agcs/agcs/reports/AGCS-Natural-Capital-Risk-Report.pdf ; country-level analysis appears to be absent.

[23] https://www.government.nl/documents/reports/2021/07/29/biodiversity-footprint-for-financial-institutions ; country-level analysis appears to be absent.

[24] https://encore.naturalcapital.finance/en ; country-level analysis appears to be absent

[25] https://www.ibat-alliance.org/ ; country-level analysis appears to be present.

[26] https://www.ngfs.net/sites/default/files/medias/documents/ngfs_conceptual-framework-on-nature-related-risks.pdf ; country-level analysis appears to be absent.

[27] https://sciencebasedtargetsnetwork.org/ ; country-level analysis may be absent.

[28] https://www.swissre.com/dam/jcr:a7fe3dca-c4d6-403b-961c-9fab1b2f0455/swiss-re-institute-expertise-publication-biodiversity-and-ecosystem-services.pdf ; country-level analysis appears to be present

[29] https://www.unepfi.org/publications/prioritising-nature-related-disclosures-considerations-for-high-risk-sectors/ ; country-level analysis appears to be absent.

[30] https://www.unepfi.org/publications/banking-publications/beyond-business-as-usual-biodiversity-targets-and-finance/ ; country-level analysis appears to be absent.

[31] https://www.weforum.org/reports/nature-risk-rising-why-the-crisis-engulfing-nature-matters-for-business-and-the-economy ; country-level analysis appears to be limited.

[32] Formerly known as Finance for Biodiversity.

[33] https://www.naturefinance.net/resources-tools/the-climate-nature-nexus-1/ ; country-level analysis may be absent.

[34] https://epi.yale.edu/welcome ; country-level analysis appears to be present.

[35] https://biodiversity.europa.eu/ ; country-level analysis appears to be present.

[36] https://www.globalforestwatch.org/ ; country-level analysis appears to be present.

[37] https://www.unepfi.org/publications/high-level-roadmap-aligning-financial-flows-with-the-kunming-montreal-global-biodiversity-framework/ ; country-level analysis appears to be absent.

[38] https://icebergdatalab.com/solutions.php ; country/sovereign -level analysis appears to be present (via coverage of "Govies").

[39] https://gmaptool.org/ ; country-level analysis appears to be present.

[40] https://www.sdgindex.org/ ; country-level analysis appears to be present.

[41] https://www.wri.org/aqueduct ; country-level analysis appears to be present.

[42] https://riskfilter.org/ ; country-level analysis appears to be present.

[43] Sovereign exposures can be bonded or non-bonded, short- or long-term, official or private, at a sub-sovereign level, or a contingency liability.

[44] https://tnfd.global/publication/additional-disclosure-guidance-for-financial-institutions/

[45] Regional approaches such as the EU's Biodiversity Information System for Europe have useful spatial data but do not have global coverage.

[46] See: https://tnfd.global/learning-tools/tools-catalogue/

[47] https://www.globalforestwatch.org/map/ ; see Key Biodiversity Areas under Biodiversity.

[48] https://encorenature.org/en/map?view=hotspots

[49] https://encorenature.org/en/map?view=hotspots

[50] https://www.ibat-alliance.org/the-data?locale=en

[51] https://www.ibat-alliance.org/sample-downloads?anchor_id=resource-header&locale=en&tab=reports

[52] https://gmaptool.org/reports

[53] https://gmaptool.org/score-comparision

[54] For EU countries only.

[55] https://riskfilter.org/biodiversity/explore/map

[56] https://riskfilter.org/water/explore/map

[57] https://www.wri.org/applications/aqueduct/water-risk-atlas

[58] https://www.wri.org/applications/aqueduct/food/#/

[59] https://www.wri.org/applications/aqueduct/floods/

[60] https://www.globalforestwatch.org/dashboards/global/

[61] Cross-border nature-related issues refer to dependencies and impacts of economic activities that are "exported" and/or "imported" across borders.

[62] https://www.globalforestwatch.org/topics

[63] https://encorenature.org/en/data-and-methodology/methodology

[64] https://www.ibat-alliance.org/country_profiles?locale=en

[65] https://www.ibat-alliance.org/resources?locale=en

[66] https://www.ibat-alliance.org/pdf/briefing-notes-financial-sector.pdf

[67] For EU countries only.

[68] https://riskfilter.org/water/explore/countryprofiles

[69] https://www.wri.org/applications/aqueduct/country-rankings

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Additional Considerations Building on TNFD Guidance

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