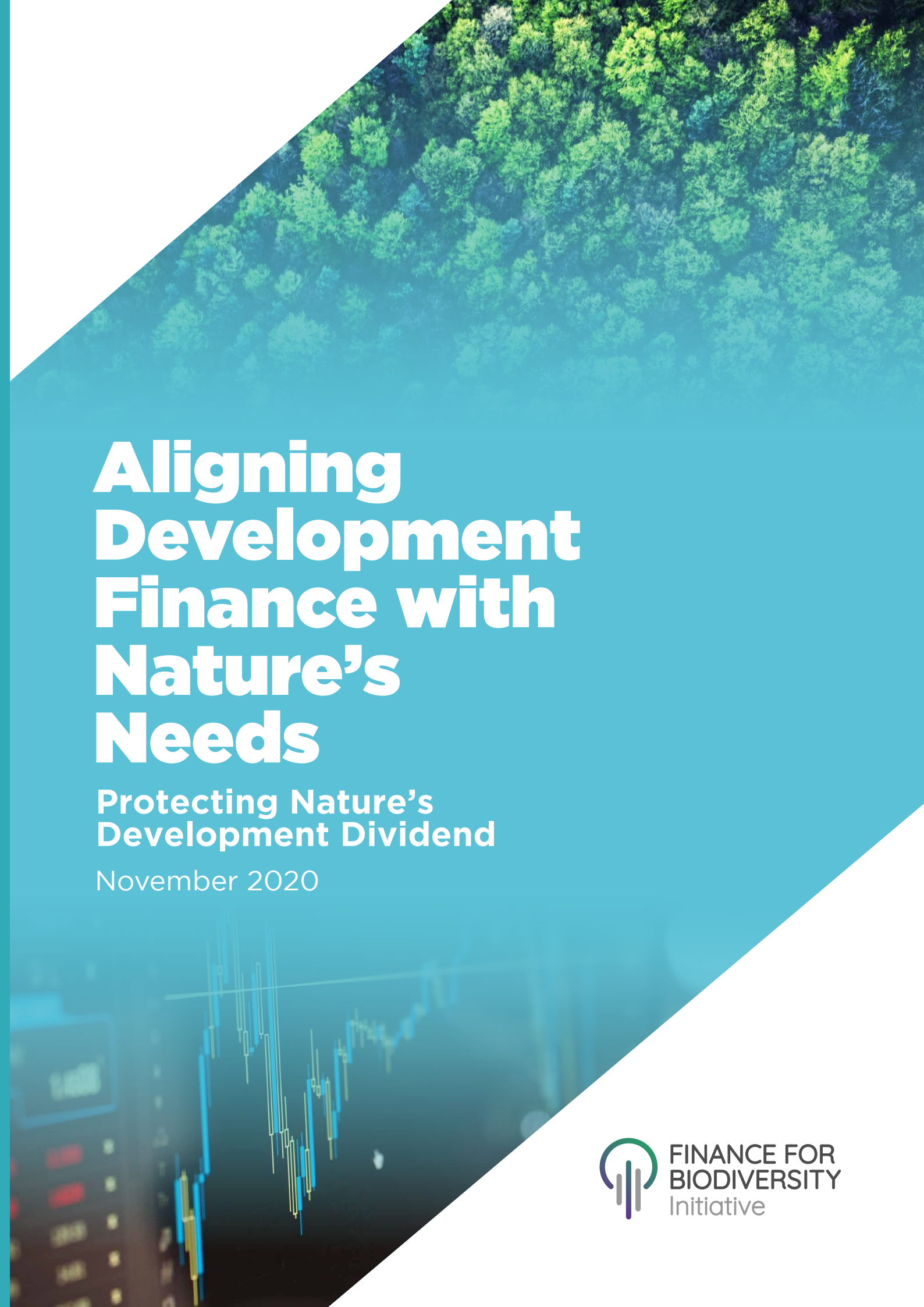

Aligning Development Finance with Nature's Needs

Protecting Nature's Development Dividend

November 2020

FINANCE FOR BIODIVERSITY Initiative

Aligning Development Finance with Nature's Needs

Protecting Nature's Development Dividend

About this report

"Aligning Development Finance with Nature's Needs: Protecting Nature's Development Dividend" uses readily available data to estimate the dependency of development finance institutions' (DFIs') collective balance sheet on vulnerable nature ("dependency risk"), alongside the potential damage to nature from their lending activities ("nature at risk"). We estimate aggregate balance sheet risk of over 450 DFIs by taking a representative sample of five multilateral development banks (MDBs). For these five MDBs, we estimate "dependency risk" and "nature at risk" using publicly available information on their lending activities. The results are then scaled upwards to reach the total value of assets held by DFIs globally. It shows that any financial institution can and should make a credible, first-pass, biodiversity-related stress-test of their balance sheet.

Comments are welcomed. Please direct these to:
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FINANCE FOR BIODIVERSITY Initiative

About FINANCE FOR BIODIVERSITY Initiative

Finance for Biodiversity (F4B) aims to increase the materiality of biodiversity in financial decision-making, and so better align global finance with nature conservation and restoration. F4B is advancing five workstreams that create and amplify the feedback signals that increase the value of biodiversity in private and public financing decisions:

- **Market efficiency and innovation**
- **Biodiversity -related liability**
- **Bridging biodiversity policy and financial rules and behaviour**
- **Citizen engagement and public campaigns**
- **Responses to the COVID crisis**

For more information, visit www.f4b-initiative.net

F4B is funded by the MAVA Foundation, which has a mission to conserve biodiversity for the benefit of people and nature.

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With thanks to our partners on this report:

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Executive summary

The purpose of development finance institutions (DFIs) is to facilitate sustainable development. Globally, there are more than 450 DFIs, which collectively invest about US$ 2 trillion annually, and have an aggregate balance sheet of US$ 11.2 trillion. Almost all are accountable to one or several governments, and ultimately their citizens. Given their substantial financial firepower and influence, DFIs have a responsibility to progress towards sustainable development goals through their own lending, and through leading by example, to achieve wider financial system change.

Nature has intrinsic value, and also provides vital benefits for people, including sustaining the quality of our air, the quantity and quality of our fresh water and soils, regulating the climate, providing pollination and pest control, and reducing the impact of natural hazards. These ecosystem services are the foundation for human life and are deteriorating rapidly. DFIs need to protect nature in order to fulfil their core purpose of sustainable development.

DFIs that finance activities that depend on nature, or that damage nature, are not fulfilling their purpose and are exposing themselves to nature-related risks. Where DFI activities depend on nature which is already vulnerable, they are exposed to "dependency risk". Where DFIs endanger nature, they create a cost to society by placing "nature at risk", and make themselves vulnerable to new environmental rules as well as to litigation and reputation harm.

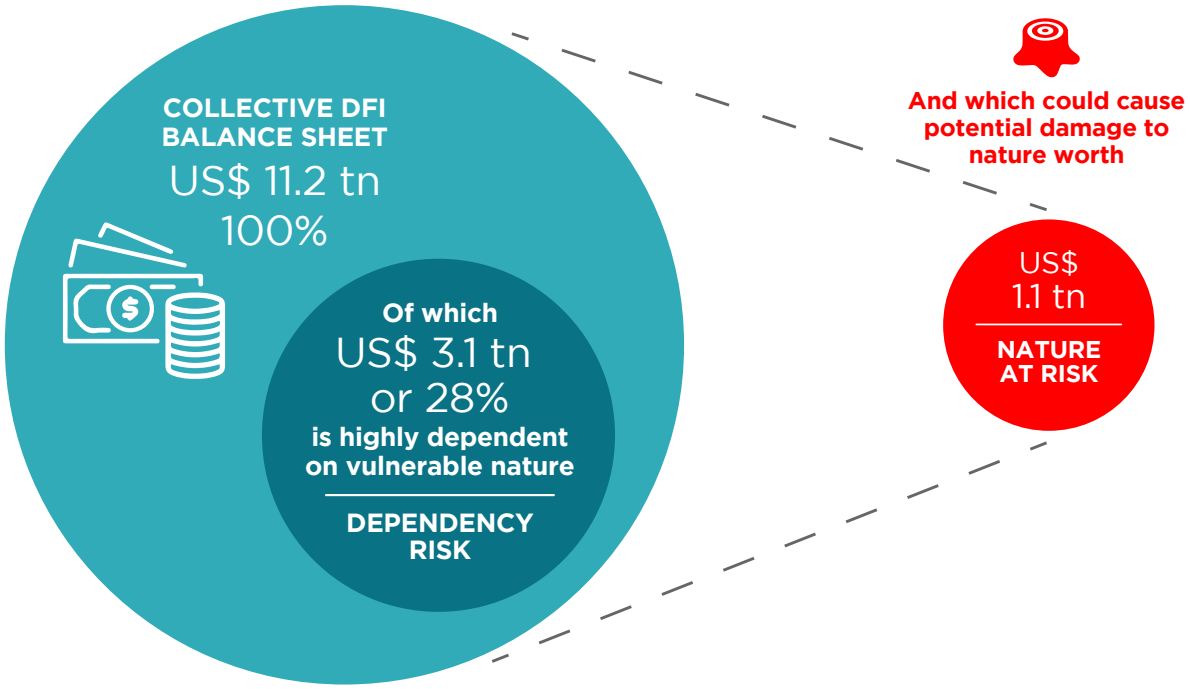
Finance for Biodiversity (F4B) estimates the "dependency risk" of all DFIs worldwide today at US$3.1 trillion (28% of their balance sheet), see Figure 1 below.

We estimate the "nature at risk" due to DFI lending activities at US$1.1 trillion annually

These very high biodiversity-related risk estimates are important leading indicators of financial risk. Our findings partly reflect how DFI lending is disproportionately high in resource-intensive countries with high levels of biodiversity and relatively weak regulation, where negative impacts are most likely, and nature is most vulnerable. We expect significant, unmanaged, associated material risk to DFI balance sheets. In parallel, unintended risks posed to vulnerable nature could undermine development.

The magnitude of our estimates shows that they warrant close consideration by DFIs. Within these aggregated results, some DFIs will have greater impact and exposure, and some less. DFIs today at best require only certain environmental safeguards – a checklist of harms that they should avoid. DFIs must urgently reduce their dependence on, and mitigate any risks to, vulnerable nature, and increase their investments in nature-based solutions. DFIs must first understand these key risks, impacts and opportunities, and therefore we urge them to measure and report these systematically.

Figure 1 | Collective DFI balance sheet, dependency risk, and nature at risk



Source: Basic Roots, Vivid Economics
Note: Dependency risk is defined as the aggregate value of assets that are held in sectors considered highly dependent on nature and in countries considered highly vulnerable to the deterioration of nature. Nature at risk is defined as the expected value of the damage to nature from lending activities without effective measures to mitigate harm to nature.

Impact and risk governance, including public reporting, is one of several core pillars of change needed to transform the financial sector's relationship with nature. In F4B's recent publication, "Aligning Global Finance with Nature's Needs: A Framework for Systemic Change", we identify six key areas for change, each underpinned by ambitious and actionable recommendations. DFIs now need to play a vital part in this. When the financial sector systematically reports nature-related impacts and risks, it will, once stakeholders become accustomed to the idea, receive support from owners, investors and investees to behave sustainably. DFIs could lead in this area, showing private financial institutions that existing data and methods already allow such reporting.

We urge every DFI to, within the next year, publish a whole balance sheet stress test of nature-related financial risks and impacts. F4B is advancing the methodology and data to do this, in part through supporting the emerging Taskforce for Nature-related Financial Disclosures. F4B is ready to engage with and support DFIs. Now is the time for DFIs to step up and take a leading, progressive role.

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1. Introduction

Development Finance Institutions (DFIs) have a substantial capital base and considerable influence over global finance. Globally, there are over 450 DFIs, with an aggregate US$ 11.2 trillion balance sheet, which is the total value of their lending to companies today. They invest about US$ 2 trillion annually, at the national, regional and global level.[1] About US$150 billion of this is Overseas Development Assistance (ODA), and OECD data shows that US$ 4-9 billion of this ODA, or less than 0.5% of their total annual spending, supports activities that directly lead to biodiversity conservation and restoration.[2]

DFIs are public banks, accountable to governments, and their purpose is to facilitate sustainable development. They include national DFIs, accountable to their national government as their single shareholder, and multilateral development banks (MDBs), accountable to the multiple governments that capitalise their funds.

DFIs also have a particular responsibility to drive change in financial markets for the public good. Given that DFIs are directly tied to governments, and have substantial financial firepower, they wield great influence and convening power. They have a responsibility to lead change in private finance towards sustainable outcomes, driving wider value for citizens.

The example of climate action demonstrates the potential for change. Asset owners and managers have put pressure on banks, which in turn have put pressure on their debtors, to reduce their climate impact. Earlier this year, Boston-based State Street joined a shareholder proposal asking JPMorgan to report how it plans to reduce greenhouse gas (GHG) emissions associated with its lending business in alignment with the Paris Accord. As banks have drawn fire from asset managers, the banks have in turn begun to put pressure on oil and gas companies to accelerate their renewable energy strategies. We now see the same effect with biodiversity. Earlier this summer, asset managers representing over US$ 3 trillion wrote to the Brazilian government urging it to uphold the Soy Deforestation Pact to help safeguard their investments against deforestation risk.[3] In October, the world's biggest asset manager, BlackRock, joined a shareholder revolt, demanding that the world's biggest consumer goods corporation, Procter & Gamble, specifically measure and report its impact on forests.

Nature is inherently valuable, makes vital contributions to people, and is central to sustainable development. Humanity depends on biodiversity and ecosystem services which sustain the quality of the air, fresh water and soils, distribute fresh water, regulate the climate, provide pollination and pest control, and reduce the impact of natural hazards. These services are the foundation of sustainable development. But biodiversity is declining at an unprecedented rate, and the pressures driving this decline are intensifying.[4] The World Economic Forum (WEF) estimates that US$ 44 trillion, over half of global GDP, is moderately or highly dependent on nature and its services. The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) has highlighted how nature-based strategies to prevent future pandemics such as COVID-19 are likely to cost US$ 20-30 billion – two orders of magnitude less than the damages pandemics produce.[5] DFIs have a core responsibility to fulfil their mandate of sustainable development, to protect nature today, and to prevent damage to nature in the future.

With the private sector looking for leadership, now is the time for the DFI community to step up and lead systemic change. Under the Finance for Biodiversity Pledge, 26 financial institutions, including household names such as AXA and HSBC and representing over € 3 trillion, committed to assess the impact of their financing operations on biodiversity, to set targets, and to report progress publicly. More than 30 financial institutions support and are contributing to setting up the emerging Taskforce for Nature-related Financial Disclosures, expected to launch in 2021. Yet private financial institutions will have to build systems to manage nature-related risks and will rely on infrastructure that has yet to be built. The DFI community can lead, contributing systems and infrastructure which private institutions could adopt, creating the foundations on which the private sector can later build.

The objective of this report is to demonstrate that DFIs can and should perform a stress test of the nature-related risks and impacts on their balance sheets today. This report employs an approach exclusively and deliberately using readily available data. We prioritise applicability over granularity, distinguishing our methodology from others offered in the space such as the Biodiversity Footprint for Financial Institutions (BFFI). Our work demonstrates the feasibility of the stress test.

The remainder of this report is structured as follows:

- Section 2 presents the main findings of the analysis;
- Section 3 details the methodology used;
- Section 4 concludes and offers recommendations to the DFI community.

2. Findings

Scope of analysis

We examine two distinct ways in which DFIs' balance sheets are linked to nature:

DEPENDENCY RISK

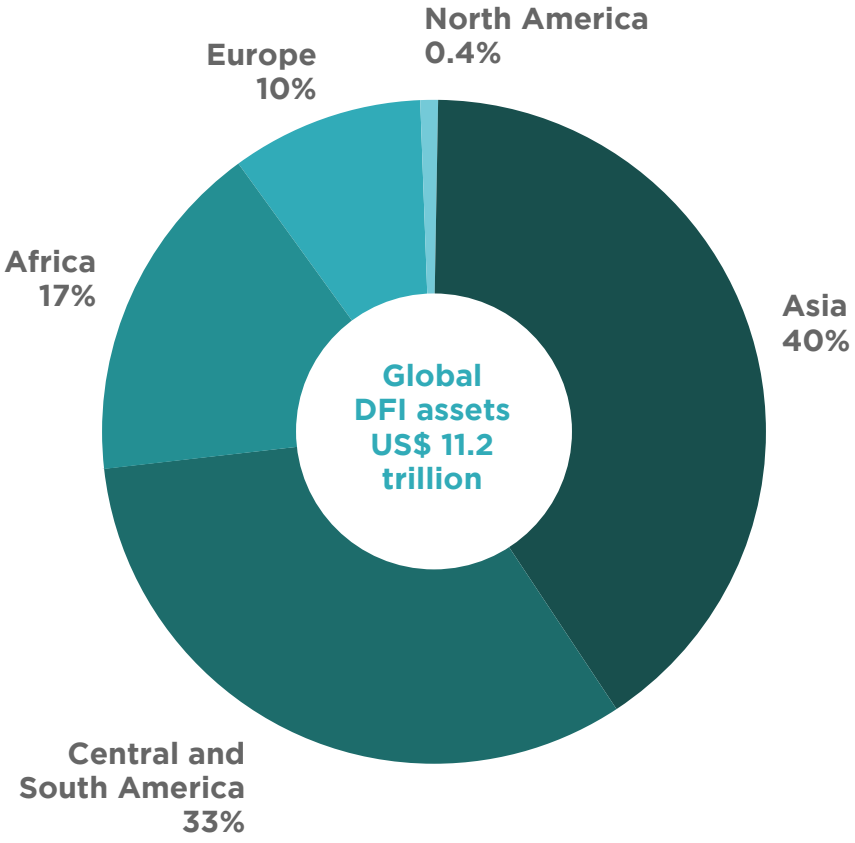
We estimate the share of the global DFI asset base that is highly dependent on nature in vulnerable countries.[6] We term this "dependency risk". Almost all businesses are in some way dependent on nature and ecosystem services. For example, fishers rely on healthy stocks of fish; apple growers rely on wild pollinating bees; and the pharmaceutical industry relies on natural substances for the development of new drugs. If these ecosystem services are lost, businesses will suffer.

NATURE RISK

We estimate the expected cost to society of the potential damage to nature that the activities the global DFI asset base finances could cause.[7] We term this "nature at risk". Some businesses damage nature, for example, by converting tropical rainforest into farmland to produce traded commodities such as palm oil, soya and beef. This damage to nature reduces the supply of essential ecosystem services to society. In our analysis, we do not include direct emissions of GHGs or air pollutants from business processes.[8]

Using only readily available data, we assess both the dependency risk and nature at risk associated with the global DFI balance sheet. By this, we mean all loans and investments owed to DFIs globally by the businesses and projects they lend to and invest in. This aggregate balance sheet is worth an estimated US$ 11.2 trillion.[9] Our approach analyses the dependency risk and nature at risk associated with the balance sheets of five MDBs, using publicly available data on their balance sheets. We assume each MDB is representative of the region, and we scale up results holding the proportion of assets held in each region constant (see Figure 2 below). This approach is approximate by design, and serves to demonstrate two things: (i) its feasibility with minimal resource and technical input; and (ii) the order of magnitude of the results. There are some promising initial attempts to champion nature and monitor nature impacts by DFIs, such as the IDFC's Finance for Nature Group (see Box 1)[10] which should be encouraged and expanded.

Figure 2 | Regional distribution of DFI assets



Source: Basic Roots, Vivid Economics
Note: The share of global assets held in each region is assumed equal to the share of assets held by the MDB in our sample set active in that region.

Box 1. Green shoots from the International Development Finance Club (IDFC)

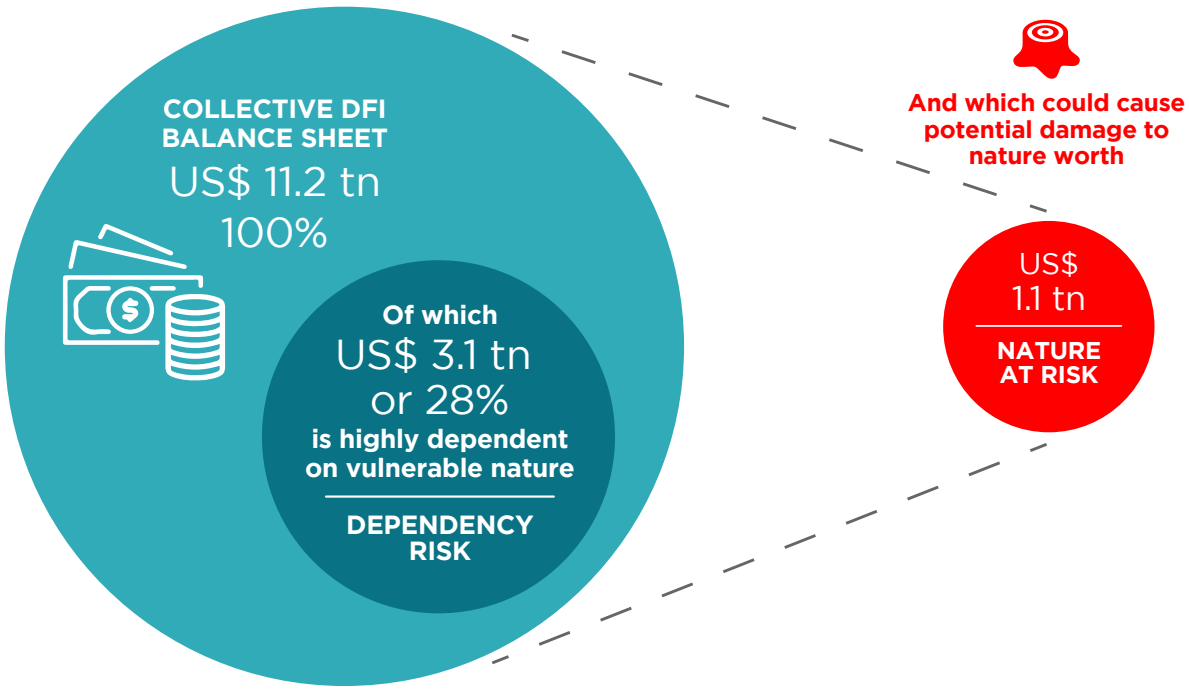
The International Development Finance Club (IDFC) has created a "Finance for Nature" (FfN) group to promote investment in favour of biodiversity. FfN group members share experiences and encourage best practice such as safeguards, exclusion lists, and biodiversity-positive finance. Exclusions work by banning financing of certain activities, such as destruction of critical habitats. Safeguards ensure that investments more widely are of high quality – for example, by requiring strong analysis of biodiversity impacts. Biodiversity-positive finance supports activities that directly lead to biodiversity conservation and restoration. The FfN group is also working to create reporting methodologies and hopes to establish a tracking method for biodiversity financial commitments and a biodiversity investment impact methodology for member organisations by 2021.

Global Results

We estimate global dependency risk at roughly US$ 3.1 trillion – that is, US$ 3.1 trillion or 28% of global DFI assets are highly dependent on vulnerable nature.

The Dutch National Bank (DNB) earlier this year published the results of a first-of-its-kind stress test of the Dutch financial system against nature-related risks.[11] By comparison, DNB found that 36% of assets held by the Dutch financial system were highly or very highly dependent on one or more ecosystem services.[12] It recommended that financial institutions commit to equivalent assessments on their own assets.

Figure 3 | Collective DFI balance sheet, dependency risk, and nature at risk



Source: Basic Roots, Vivid Economics
Note: Dependency risk is defined as the aggregate value of assets that are held in sectors considered highly dependent on nature and in countries considered highly vulnerable to the deterioration of nature. Nature at risk is defined as the expected value of the damage to nature from lending activities without effective measures to mitigate harm to nature.

The global figure can be partly attributable to the fact that DFI portfolios are highly dependent on vulnerable nature. DFIs often lend to sectors that directly rely on natural resources, such as agriculture, infrastructure and utilities. Moreover, their portfolios may be disproportionately weighted to natural resource-intensive developing countries, with potentially abundant biodiversity, and relatively weak or ineffective environmental regulation.

Failing to measure dependence on vulnerable nature could mean that DFIs miss important early signals of future financial risk and compromise their long-term fiduciary duties to investors and society. There is an increasing evidence base suggesting that high dependence on vulnerable assets could be linked to material financial risks in the medium term. [13 14 15 16 17] DFIs have a responsibility both to the government and citizens they serve to manage their assets responsibly.

We estimate global nature at risk at US$1.1 trillion per year – that is, global DFI assets are financing activities that could lead to damage to nature worth US$ 1.1 trillion to society each year.

To our knowledge, no other published analysis to date has placed a monetary value on a financial institution's potential impact on nature. Without strong measures to ensure the protection and restoration of biodiversity, alongside robust and frequent impact reporting, such large capital flows could lead to serious unintended harms. IFC and EBRD have taken significant measures to mitigate potential damage to nature through their lending operations by implementing their own nature-focused, project-level standards, and could serve as a model for other DFIs to do the same (see Box 2).[18]

Box 2. IFC and EBRD performance standards on biodiversity

Development finance institutions such as the World Bank Group International Finance Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD) make investment conditional on procedures which safeguard biodiversity. The IFC and EBRD formally recognise the importance of biodiversity and sustainable management of living natural resources in their respective Sustainability Framework and Environmental and Social Policy. Both specify a set of standards or requirements which require clients to identify, mitigate and manage social and environmental risks for projects receiving direct funding, including risks to biodiversity, ecosystem services and living natural resources.

Specifically, the IFC's Performance Standard 6 (PS6) and EBRD's Performance Requirement (PR6) provide detailed guidance to avoid or reduce adverse impacts on biodiversity and living natural resources. The former specifies three objectives: "to protect and conserve biodiversity; to maintain the benefits from ecosystem services; [and] to promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities". Towards these ends, PS6 requires clients to assess the direct, indirect and residual risks to biodiversity in the initial risk-screening process, and to avoid or minimise adverse impacts on biodiversity where risks have been identified. The EBRD's PR6 establishes similar objectives and risk-screening processes.[1] Both PS6 and PR6 limit project activity in natural and critical habitats, or where significant, adverse and irreversible impacts are identified, to circumstances where there is no other feasible alternative. In such cases, PS6 and PR6 mandate long-term monitoring and evaluation of biodiversity and zero net losses via biodiversity offsets.

Again, these extraordinarily high values are partly due to the presence of DFIs in countries with a high proportion of vulnerable nature. DFIs disproportionately lend in countries that have relatively high levels of biodiversity, highly resource-intensive economies, and weak environmental regulation. This means that there is a large amount of valuable nature, high levels of economic activity that could negatively impact that nature, and a lack of effective rules or incentives to prevent such harm.

These are aggregated results using high-level data across very different DFIs and contexts. There are, without doubt, DFIs doing much better than this, but by implication many doing far worse. While not a financial institution itself, AFD demonstrates how a development organisation can work practically towards improving its impact by simultaneously tightening screening around nature impacts in its approval processes, and setting financial targets for loans to activities that directly support and restore nature (see Box 3).[19]

Box 3. AFD biodiversity investments

The French Development Agency (AFD) has set a target to commit 30% of its climate finance for projects that favour biodiversity by 2025. Some 15% of AFD climate finance and 10% of its total financial commitments are in projects that support biodiversity. The 2025 target is underpinned by heightened scrutiny during screening to ensure that new projects do not create significant adverse effects on biodiversity.

AFD has demonstrated a commitment to the protection and restoration of biodiversity through a wide range of ongoing projects. It invested € 470m in global biodiversity in 2019, and continues to support numerous projects in biodiversity hotspots in North America, Asia and Africa through various financing tools.

Examples of past and ongoing projects include:

- € 60m loan to Mexico's National Commission of Protected Natural Areas (CONANP) to develop conservation policy and methods; create a territorial strategy; and support a pilot rural land management project in the state of Jalisco.
- € 30m concessional loan to the Indian State of Assam, which has been used to reforest 21,000 hectares of land; restore degraded wetlands and grasslands; revive the local economy in forest-dependent communities; and increase the population of threatened species such as the one-horned rhino.
- € 11m grant to support the implementation of the management and development plan of the Limpopo National Park Development Project, Mozambique, which has delivered benefits to biodiversity and local economic development.
- € 30m loan to restore the Qixian wetlands in Shanxi, China, and support the development of natural, historic and cultural resources in the Changyuan River National Park, which is home to numerous critically endangered species.

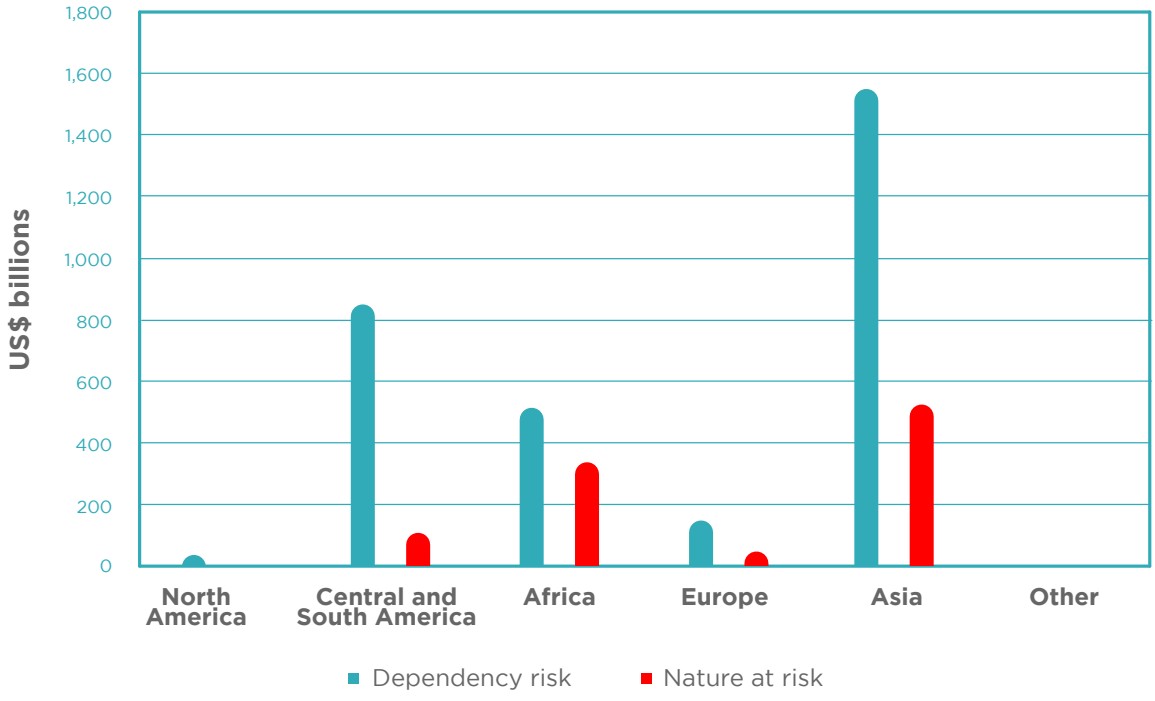
At a global scale, dependency and impacts are two sides of the same coin – one firm's damage to nature can lead to financial loss for another firm due to its dependence on that nature. In this sense, the scale of dependency risk seen across the DFI portfolio demonstrates the need for DFIs not only to mitigate their own potential damage to nature, but also to play a leadership role in helping other financial institutions to do the same. This in turn also shows why it is in every business and financial institution's interest to support others to reduce their impacts on nature and challenge those that do not. This powerful feedback loop is precisely why destruction of nature poses a system-wide risk to financial stability and why immediate action is needed to address the issue.

Sector and regional hot spots

Lending in Asia has the highest level of dependency risk, with US$ 1.56 trillion of assets highly dependent on vulnerable nature, or 50% of the global total. This is driven by two factors. First, we estimate that more DFI assets are held in Asia than any other region. Second, nature in Asia, alongside Africa, has a relatively higher level of vulnerability relative to other continents with less resource-intensive economies and stronger environmental regulation. Asia is followed by Central and South America and Africa, with roughly US$ 860 billion and US$ 530 billion respectively. High dependency in Africa is also driven by the high sectoral exposure to agriculture relative to DFI lending in other continents.

Lending in Asia also puts the largest amount of nature at risk by a wide margin: US$ 540 billion, or 51% of the global total. This is driven again by the larger share of assets held in Asia, but also by the higher intensity with which water is consumed relative to other continents. The next highest impacts are seen in Africa, with nature at risk estimated at US$ 350 billion. Deforestation, particularly in tropical ecoregions, accounts for roughly half of nature at risk in both Africa and Central and South America. In both regions, agriculture remains the most significant driver of deforestation.[20]

Figure 4 | Regional distribution of dependency risk and nature at risk

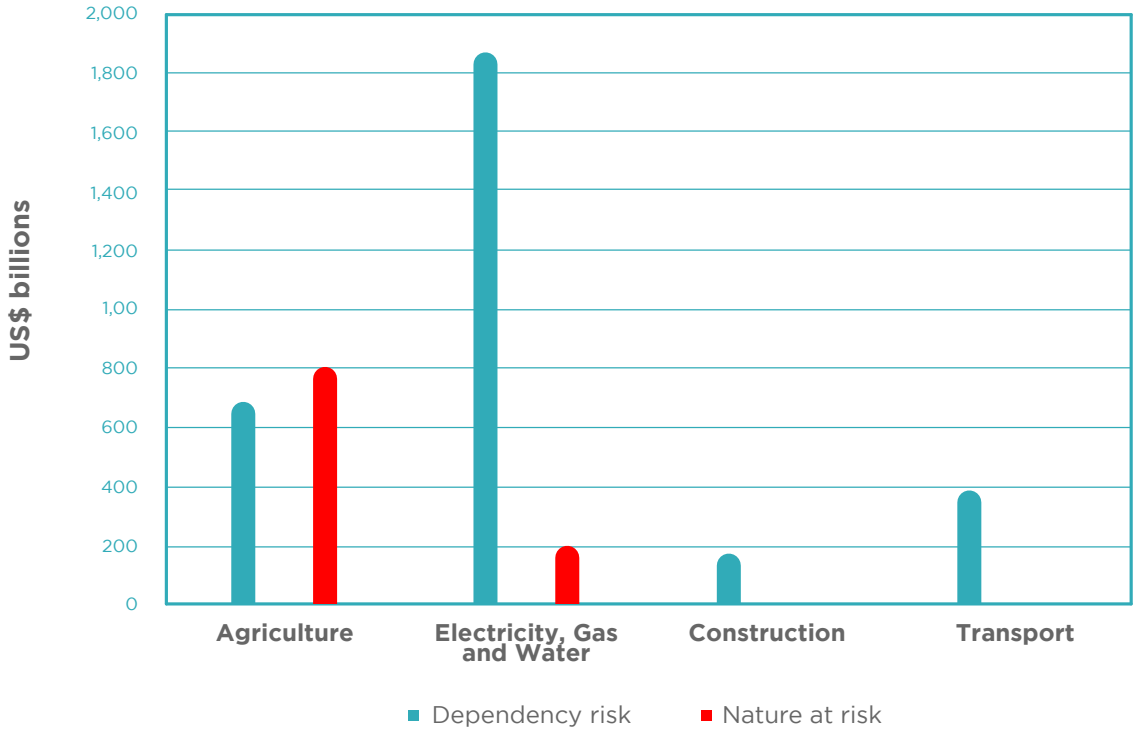


Source: Basic Roots, Vivid Economics
Note: Dependency risk is defined as the aggregate value of assets that are held in sectors considered highly dependent on nature and in countries considered highly vulnerable to the deterioration of nature. Nature at risk is defined as the expected value of the damage to nature from lending activities without effective measures to mitigate harm to nature.

The utilities sector – electricity, gas and water – faces the highest dependency risk across all regions, reaching a total of US$ 1.9 trillion. The agriculture, transport and construction sectors are also highly dependent on vulnerable nature, while most other sectors prove relatively resilient with little dependency.

The agricultural sector has by far the highest potential impacts on nature, accounting for US$ 810 billion, or 79% of the global nature at risk. This is due to a combination of the high intensity with which the agricultural sector consumes both land and water across all regions. The next most significant sector is electricity, gas and water, although this is considerably lower at US$ 207 billion.

Figure 5 | Sectoral distribution of dependency risk and nature at risk



Source: Basic Roots, Vivid Economics
Note: Dependency risk is defined as the aggregate value of assets that are held in sectors considered highly dependent on nature and in countries considered highly vulnerable to the deterioration of nature. Nature at risk is defined as the expected value of the damage to nature from lending activities without effective measures to mitigate harm to nature.

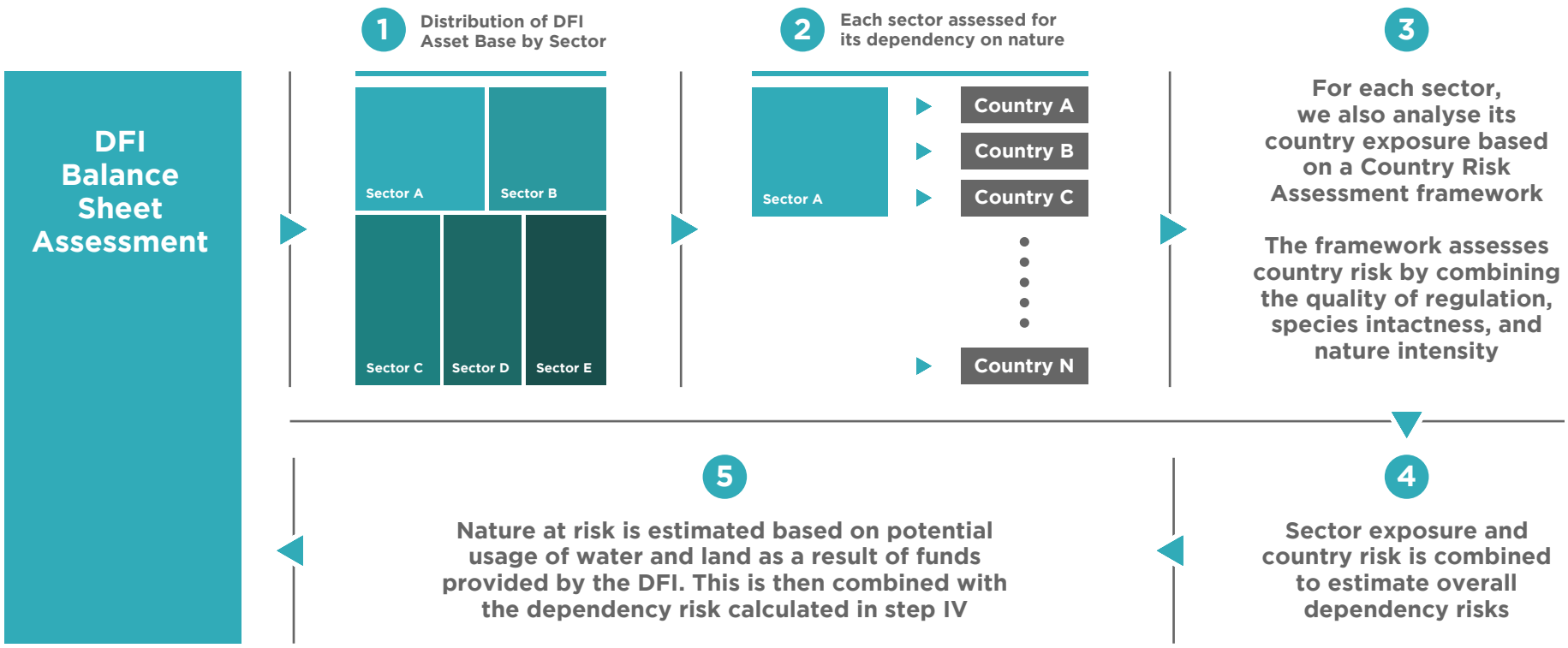
3. Methodology

Scaling up

We estimate aggregate balance sheet risk of all DFIs by taking a representative sample of five regional MDBs. These are the Asian Development Bank (ADB) for Asia; the African Development Bank (AfDB) for Africa; the European Bank for Reconstruction and Development (EBRD) for Europe; the North American Development Bank (NADB) for North America; and the Inter-American Development Bank (IDB) for Central and South America.

For these five DFIs, we measure two broad categories of risks – dependency and impact – explained further below. The results from this sample are then scaled up to reach the US$ 11.2 trillion of assets held by DFIs globally. We assume that the share of each MDB's assets in our sample is equal to the share of global assets held in the corresponding region. Summing across each region then provides aggregate results for the entire global set.

Figure 6 | DFI balance sheet assessment framework



Source: WEF, PwC, Basic Roots

Data on DFIs

The application of the DFI risk/impact framework requires information on sectoral and geographical exposure of the loan portfolios of DFIs. In the absence of data on sectoral distribution per country, we assume the aggregate sectoral distribution to remain the same for each of the borrowing countries. It should be highlighted that the analysis is constrained due to the lack of comprehensive, publicly available information on lending of DFIs. The sector classification of DFIs' loan outflow is not consistent across DFIs. We harmonised the reported sector classification of DFIs to match the 26-sector classification of EORA to use the environmental indicators from its national input-output tables.

EORA is a global supply chain database that consists of a multi-region input output (MRIO) table model that provides a time series of high-resolution IO tables with matching environmental and social satellite accounts for 190 countries.[21] Although the database offers global MRIO tables documenting the inter-sectoral transfers among 15,909 sectors across 190 countries, for the sake of our analysis, we have used a simplified version that uses a 26-sector harmonised classification, and focuses on national input-output tables. In addition, while EORA provides the data as a time series from 1990-2015, we have only used the latest information (i.e. 2015) for our analysis.

The data available from EORA allows the calculation of both direct (scope 1) and indirect (scope 3) intensities for each sector in each country. Scope 1 intensities define, for every dollar of output, the direct consumption by the sector of inputs such as land and water. Scope 3 intensities also include the indirect consumption of inputs by sectors further up the supply chains. For the purposes of our analysis, we have used Scope 1 intensities. The nature at risk when calculated using Scope 3 intensities will be considerably higher.

In evaluating loans for biodiversity risk/impact, we have excluded lending that has been explicitly categorised as "environment" by the DFIs. We also highlight that our analysis is primarily based on information that is readily available in annual and financial reports. We note that DFIs do have standard operating procedures for conducting environmental and social impact assessments before approving projects. In addition, in select cases, investments in a sector may be allocated to mitigation or offsets. However, given that this information was not explicitly available to us across DFIs in the dataset, our assessment has not been able to exclude such investments from the overall analysis. We have also excluded countries with relatively insignificant shares in the loan portfolio.

African Development Bank (AfDB)

The African Development Bank (AfDB), established in 1964, consists of three entities aimed at the economic development of the region: the African Development Bank, the African Development Fund, and the Nigeria Trust Fund. There are 81 member countries, of which 27 are not from the region. The beneficiary countries are entirely in Africa.

The country-wise split of the total loan book (US$ 47,275 million) for the three entities can be found in the 2019 financial report. We have excluded the portion of loans classified as private and multinational in the geographical breakdown. Countries with very small amounts of loans outstanding (in total accounting for 0.6% of total loans) have also been excluded, namely, Equatorial Guinea, Eswatini, Guinea-Bissau, Togo and Comoros. The sectoral breakdown of the full portfolio of the group has been taken from the annual report. For our study, we have assumed this breakdown to remain the same across borrower countries.

Asian Development Bank (ADB)

Established in 1966, ADB is a multilateral financial institution aimed at fostering sustainable growth and eradicating poverty in Asia and the Pacific. It is owned by 68 members, of which 49 are from the region.

The country-wise breakdown of the loan portfolio (US$ 114,389 million) is taken from the loan schedule in ADB's 2019 financial report. In the absence of a detailed sectoral breakup of the total loan portfolio, we have taken the five-year average (2015-19) of the sectoral commitments of ordinary capital resources that was provided in the 2019 annual report. There have not been significant changes in the composition of commitments, so we apply these average shares on the total outstanding loan portfolio. It is assumed that the sectoral shares remain constant across countries, in view of limited data.

For the purpose of our analysis, we have excluded countries with very small shares in loans outstanding – namely, Cook Islands, Micronesia, Kiribati, Marshall Islands, Timor-Leste, Tonga, Tuvalu, and a grouping called "regional". In total, these countries account for 0.5% of the outstanding loans.

Inter-American Development Bank (IDB)

Established in 1959, IDB aims at sustainable development of 48 member countries in Latin America and the Caribbean.

The total loans outstanding, as of December 31, 2019, to member countries amounted to US$ 96,273 million. The geographical breakdown of the total loan portfolio is taken from the 2019 financial report. For our analysis, we have excluded loans classified under the "regional" category which amount to less than 0.5% of the total loans outstanding.

In the absence of any detailed sectoral breakdown of the loan book in the annual or financial reports, we have calculated sectoral shares based on annual loans disbursement data for IDB in the OECD's Development Finance database. We have excluded loans classified as "environment" from our analysis that account for 3.5% of the portfolio.

European Bank for Reconstruction and Development (EBRD)

The European Bank for Reconstruction and Development (EBRD) is a bank that was established in 1991 to aid ex-Soviet and Eastern European countries transitioning into democracies by developing free-market economies. Today, the EBRD continues its work in 38 countries from the Southern and Eastern Mediterranean, to Central and Eastern Europe, to Central Asia, investing mainly in private banks and businesses, including both new ventures and existing companies. It is one of the leaders in climate finance.

To assess the biodiversity impact for EBRD, the portfolio distribution (EUR 27,021 million or US$ 31,885 million) across sectors and geography was taken from the 2019 annual report. Cross-sectional data for geography and sector was not available so it was assumed that the sectoral distribution of the portfolio will also hold for each of the borrower countries.

North American Development Bank (NADB)

NADB is a binational financial institution established by the governments of the United States and Mexico to provide financing to support the development and implementation of infrastructure projects, as well as to provide technical and other assistance for projects and actions that preserve, protect or enhance the environment in order to advance the well-being of the people of the United States and Mexico.

To assess biodiversity impact for NADB, the latest available information for total loans outstanding was taken from the 2018 annual report, unlike for other banks where more recent data was available. The sectoral distribution was also taken from the report and assumed to be the same for the United States and Mexico.

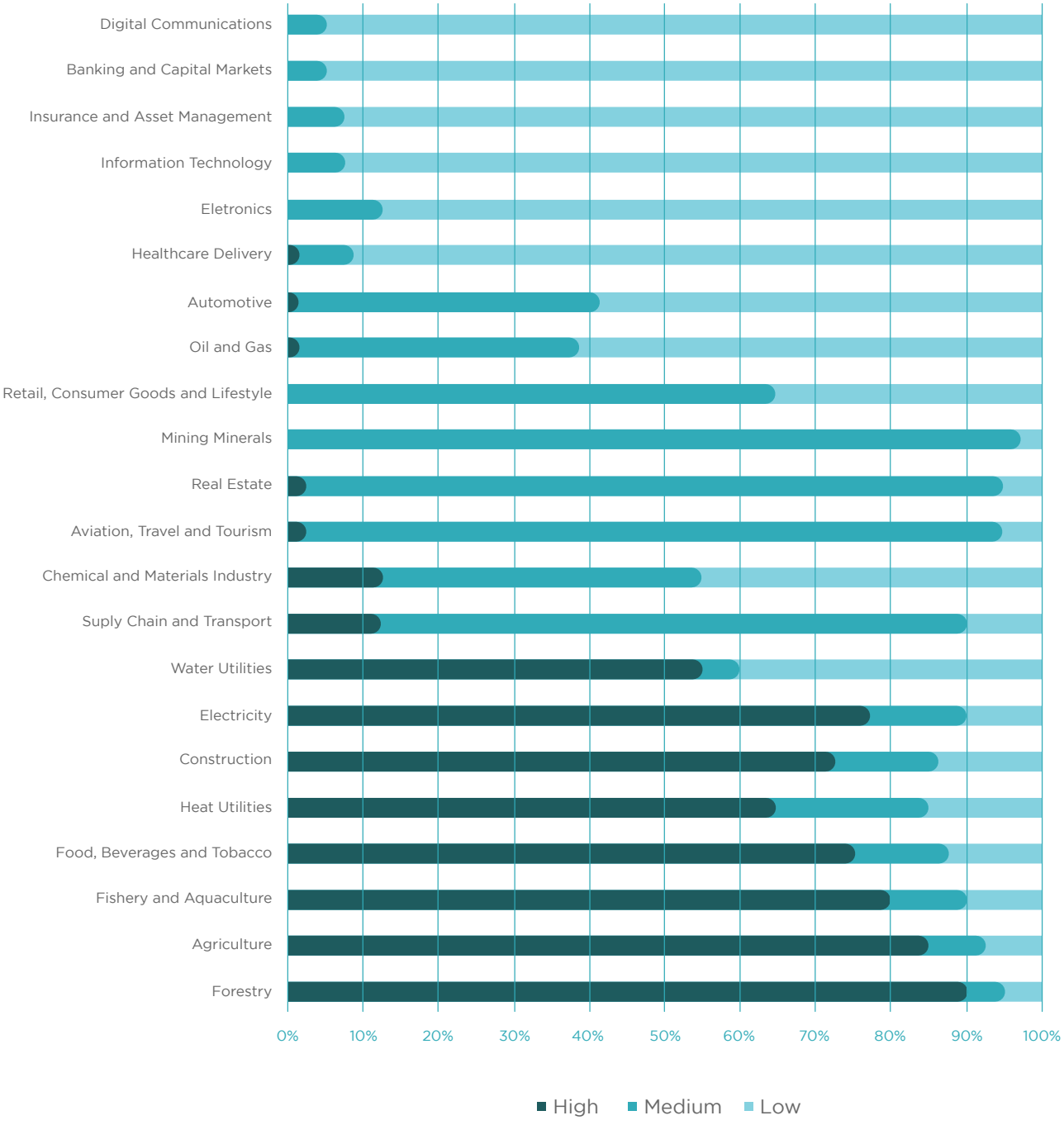
Dependency risk

We measure sectoral exposure, focusing on 26 sectors. We measure the dollar exposure (E) as aggregate lending to a given sector in a given country.

Based on work done by the World Economic Forum (WEF) and PwC as part of their January 2020 publication, "Nature Risk Rising",[22] we estimate a blended percentage of Gross Value Added (GVA) with high, medium and low nature dependency, by industry. This analysis considers both direct, as well as supply chain, dependencies. For sectors that are not covered by the above-mentioned report, we have estimated dependencies based on comparable industry averages for which data is available.

The WEF/PwC approach is based on an analysis of nature dependency of 163 sectors and their supply chains across a range of ecosystem services. The aggregate sectoral dependency is a function of three factors: a) the number of different individual dependencies identified; b) the mean strength of those dependencies (rated 1-5); and c) the maximum strength of any individual dependency. To determine nature dependency of a particular industry, the framework aggregated sectors into overarching industry groups. The industry GVA is calculated as the sum of GVA in all relevant sectors. The share of industry GVA in "high", "medium" or "low" dependency categories is then calculated based on the dependency scores of the sectors within that industry.

Figure 7 | Share of GVA of high, medium and low nature dependency, by industry



Source: WEF, PwC, Basic Roots

We then multiply this exposure by the percentage of GVA that has high nature-dependence in each sector (D). Sectors which have materially high nature dependency include agriculture, forestry, construction, energy, and natural resources. Each sector is further evaluated, based on the DFI's exposure across countries. Where sectoral distribution by country is available, we directly use that data. However, if the information is not available, we assume the same geographic distribution of sectoral exposure, as the overall balance sheet (this information is usually available). We then apply a "country biodiversity risk" (R), based on each individual country's quality of biodiversity regulation (stronger is low-risk); species intactness index (high species intactness is high-risk); and nature intensity (high intensity is high-risk).

Overall, we calculate a DFI's dependency risk as follows:

Dependency risk = E * D * R

As a summary, this means that dependency risk is a function of a DFI's exposure to sectors whose dependency on nature is high, and to countries that are vulnerable to biodiversity-related risks.

A note on country biodiversity risks

Our country biodiversity risk assessment takes into account three parameters:

• **Quality of Regulation:** We use the Environmental Performance Index (EPI), developed by Yale, to assess a country's ecosystem vitality. The EPI provides a data-driven summary of the state of sustainability around the world. Using 32 performance indicators across 11 issue categories, EPI ranks 180 countries on environmental health and ecosystem vitality. These indicators provide a gauge at a national scale of how close countries are to established environmental policy targets. For the sake of our analysis, we use a subseries of the composite EPI that assesses countries' actions toward retaining natural ecosystems and protecting the full range of biodiversity within their borders. Essentially, countries that have already put in place strong regulation or policy towards preserving biodiversity are viewed as lower risk.

• **Species Intactness:** Species Intactness measures the presence of biodiversity in a country. We use the National Biodiversity Index (NBI) calculated by the Convention on Biological Diversity (CBD) to rank countries. This index is based on estimates of country richness and endemism in four terrestrial vertebrate classes and vascular plants; vertebrates and plants are ranked equally. The index values range between 1.0 (maximum: Indonesia) and 0.0 (minimum: Greenland). The countries with high biodiversity are considered to be at higher risk (i.e. they are at a higher risk of getting affected by industrial activity). The NBI includes some adjustment allowing for country size. Moreover, the index also considers parameters such as natural history, presence of zoological and biological gardens, as well as number and size of protected areas. Countries that have a higher species intactness are viewed as higher risk.

• **Nature Intensity:** Nature intensity is calculated as nature use per unit of GDP, using estimates of land and water use per unit of GDP, each priced according to their estimated nature impact, per hectare and cubic metre respectively. To do this analysis, we use EORA's country footprint data. As outlined previously, EORA is a multiregional input–output (MRIO) database, which means that we are able to analyse a country's impact of resource use not just within its borders but also with other countries due to its trading activities.

Nature at risk

To assess nature at risk, we again focus on the allocation of a DFI's assets by country and one of the 26 sectors used in our framework. For each country and each sector that a DFI is exposed to, we undertake the following:

1

We take the US$ loan amount (L) and transfer that into a US$ annual output number by using an asset turnover (AT) ratio. The sector asset turnovers we use are an indicator of the efficiency with which investments/capital are used to generate output (O). We have used industry average asset turnover ratios from CSI Market and a range of other sources. To calculate average sectoral ratios, CSI Market measures reported financial information across businesses within a sector and then aggregates them to derive an industry estimate. While the dataset is primarily based on US businesses, we have assumed that average asset turnover ratios are less likely to vary within the same sector across geographies.

2

We then assess the impact of O in terms of Land and Water consumption by taking intensities from EORA for each parameter (IT). The "intensity" estimates how much land (expressed in hectares) and water (in m^3) is likely to be consumed to generate one dollar of output. We calculate these intensities by dividing the aggregate land and water consumption in each sector and country (available directly from EORA) by the total output for that sector in the given country (also available in EORA).

3 We then multiply this land and water consumption by a calculated value of ecosystem services offered by both land and water (V):

Land: From step 2 above, we have, for each DFI, the total agricultural land area that it is financing. We then use this to approximate the amount of deforestation that may occur in the country in question as a result of this lending. To do this, we first take the average tree cover loss in terms of hectares per year for each country (D). The average is based on data for a ten-year period that was sourced from Global Forest Watch.[23] We have used default definitions for deforestation when accessing this data, which is based on canopy cover levels of greater than or equal to 30%. We then take estimates of the share of tree cover loss attributable to agriculture (P) in each region from the literature.[24] Finally, we multiply by the share of agricultural land we estimate is financed by DFIs. This assumes that agriculture financed by DFIs and agriculture financed by other means contribute equally to deforestation.

The overall formula is as follows:

Potential deforestation from DFI funding = D x P x R

We recognise that our approach accounts only for potential deforestation and not wider land-use impacts. However, given limited availability of data, as well as in the interest of building a framework that can be applied directly to readily available information in annual reports, we believe our approach is reasonable for an initial assessment.

To value this deforestation, we look at two components: (i) the value of the carbon stored in the forest that is released at the point of conversion; and (ii) the value of the future flow of ecosystem services that the forest would have otherwise provided.

To value the first, we follow the latest IPCC guidelines. We take estimates of ecoregion - and continent-specific aboveground biomass from the 2019 revisions to the IPCC 2006 Guidelines Volume 4 on Agriculture, Forestry and Land Use.[25] We then apply the IPCC recommended ratios to below-ground biomass to calculate total biomass. For simplicity, we do not consider changes in soil carbon stock or dead organic matter. We convert to tonnes of CO2 emissions using the default carbon fraction of biomass and standard mass adjustment of 44/12. Finally, we apply the social cost of carbon recommended in the underlying methodology for Kering's Environmental Profit and Loss (P&L) Account, prepared by PwC, US$ 78 per tCO2.[26]

To value the second, we rely on work done by Groot et al. in 2012, in the meta analysis "Global estimates of the value of ecosystems and their services in monetary units".[28] The paper provides monetary values in terms of provisioning services, regulating services, habitat services and cultural services derived per hectare of temperate and tropical forests on an annual basis. For the purpose of our framework, we have taken the mean value among datapoints and excluded any services for which there was only a single estimate. We then calculate the net present value of the flow of these ecosystem services over time. We use a discount rate of 3.5% in line with UK Treasury Green Book guidelines for public sector analysis.[27] We consider a flow of benefits for ten years which assumes that the land converted will not return to forest for at least ten years.

Finally, we sum the two components to arrive at the net present value of one hectare of forest, specific to the continent, domain and ecoregion of the country.

Water: To estimate the impact of water use on biodiversity, we use two water footprints need to be considered: (i) green water footprint – water from precipitation stored in soil that is evaporated or incorporated by plants; and (ii) blue water footprint – water sourced from surface or groundwater incorporated into a product, including irrigated agriculture, industry and domestic water use.

We apply a variant of the country-level value for water that was incorporated in the Corporate Bond Water Credit Risk Tool (CBWCRT) developed by GIZ, NCD and VfU.[29] In the CBWCRT, shadow prices for water are used as a proxy for exposure to potentially increasing costs for water resulting from water stress. It applies a total economic value (TEV) framework accounting for the external benefits of water to society and the environment, in addition to private benefit gained by consumers.

While the CBWCRT framework estimates the value of water as a hybrid function of four dependent variables (agricultural values, domestic supply values, human health impacts, and environmental impacts), we have incorporated only the value related to environmental impact in our study. These values are based on the life-cycle impact factors estimated by Pfister et al. (2009).[30] The impact factors are measured as "area of ecosystem damage" in m^2 per m^3 of water consumed. This environmental value is more directly linked with the object of our study. However, it should be highlighted that this valuation is based on values that are considered conservative by the CBWCRT developers.

4 **The overall nature at risk is calculated as:**

$$O = L \times AT$$
$$\text{Nature at Risk} = O \times IT \times V$$

Comparison with other tools

Our focus was to build an approach that is scalable and standardised, while balancing granularity with ease of use. As a first step, we evaluated various existing approaches including:

A EP&L (Kering)

The EP&L approach (or Environmental P&L) developed by Kering, measures carbon emissions, water consumption, air and water pollution, land use, and waste production along the entire supply chain, thereby making the various environmental impacts of the Group's activities visible, quantifiable, and comparable. These impacts are then converted into monetary values to quantify the use of natural resources.

B Biodiversity Footprint of Financial Institutions (BFFI)

Developed by ASN Bank, PRé and CREM, the framework assesses the biodiversity footprint of the assets of ASN Bank by combining a qualitative analysis with data from Exiobase, and the ReCiPe methodology.

C ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure)

ENCORE was developed by the Natural Capital Finance Alliance in partnership with UNEP-WCMC. It helps users better understand and visualise the impact of environmental change on the economy. By focusing on the goods and services that nature provides to enable economic production, it guides users in understanding how businesses across all sectors of the economy depend on nature, and how these dependencies might represent a business risk if environmental degradation disrupts them.

Similarly, recent work by DNB (Indebted to Nature) and WEF (Nature Risk Rising) has focused on outlining biodiversity risks and why they should be measured.

In addition, given that efforts around understanding the financial impact of climate change on businesses are significantly more mature than nature-related risks, we studied a number of approaches to quantify GHG impacts, in particular those that have been applied to financial institutions to better understand frameworks being used. These include:

D Trucost

Trucost was one of the first tools to calculate the carbon footprint of an equity portfolio for Henderson Global Investors in 2006. The model is based, in part, on businesses' own carbon data. For those that do not produce inventories, emissions are estimated using statistical modelling (US environment extended input-output analysis).

E Cross Asset Footprint Model (CAFM)

The model combines a line-by-line calculation approach with the use of sectoral statistical averages to cover all listed nonfinancial companies, financial institutions, sovereign bonds, loans to SMEs and households, mortgages and green projects, for all Scope 3 emissions, including financed emissions. It has been trialled by AFD since 2012 and has been on the market since 2013 in the form of an online tool for analysing a portfolio or a bank's balance sheet.

F Methodologie ASN Bank

The Dutch bank recently developed a multi-asset method to calculate its emissions and monitor its carbon performance. This methodology is intended to be applied to the balance sheet as a whole.

How does our approach compare with the abovementioned frameworks?

When building an analysis framework, we focused on several key parameters which we believe need to be addressed when assessing the balance sheet impact of, and dependency on, biodiversity. These parameters include:

• **Quantitative assessment:** Several frameworks provide a qualitative assessment of impact or dependency on biodiversity. For example, an initial framework prepared by CREM classifies sectors qualitatively in term of their biodiversity risk. While such qualitative classification can serve as useful screening tools, we believe a quantitative approach will be required to robustly assess portfolio-level risk.

• **Monetary assessment:** In addition to building a quantitative framework, we believe it is imperative for a tool that assesses risks for a financial institution's balance sheet to do so by ascribing a monetary value. ASN Bank's work around calculating the biodiversity footprint for financial institutions is granular, quantitative and addresses several elements but does not translate that assessment to monetary value. For a broader audience, especially keeping in mind investors and financial decision-makers, it may be easier to understand parameters when expressed in monetary terms.

• **Measure both impact and dependencies:** To accurately assess biodiversity-related financial risk, a framework must assess both impacts and dependencies.

• **Public financial data:** A number of frameworks that have been developed require proprietary and granular financial data from the financial institution or the corporates that it lends to and invests in. The inability to easily apply the approach and the costs involved in working directly with individual corporates to collect specific financial data may limit interest in using methodologies and reduce the transparency of the approach.

The framework we have developed brings together the above-mentioned parameters to deliver a tool that can be used to quantitatively assess biodiversity impacts and dependencies in monetary terms. We have used publicly available financial data to build a tool that can be used across DFIs and private financial institutions of all size.

We outline below a comparison of our approach against existing frameworks. It is important to note that each of the frameworks outlined below may be more sophisticated than our approach for their specific applications. We have prioritised scalability and applicability over granularity.

Figure 8 | A comparison of our approach to other frameworks

Framework	Quantitative Assessment	Monetary Assessment	Measures Impact and Dependencies	Readily Available Data
Kering EP&L	✓	✓		
BFFI	✓		✓	
ENCORE	✓		✓	✓
DNB	✓		✓	
WEF	✓	Partial	✓	Partial
OUR APPROACH	✓	✓	✓	✓

Source: Basic Roots

Areas for improvement

Building on the discussion above, we outline below some thoughts on what an ideal tool could look like and where the data-gaps are that could limit the development of such a tool:

• **Company and Project Level Analysis:** Ultimately, a more accurate approach would require DFIs and other financial institutions to conduct a project-level analysis for biodiversity impacts and risks. This would mean not just analysing the projects and companies to which capital is provided, but conducting a deeper analysis of how and where the capital is deployed. The main challenge here is that such data is not always available, and the fungibility of capital could mean that it may be challenging to really ascribe exactly where a financial institution's funding is deployed. As a first step, DFIs should provide a more detailed allocation of their funding by project and company in a transparent and accessible format. In the longer term, this information can be converted to a geolocated project-specific allocation.

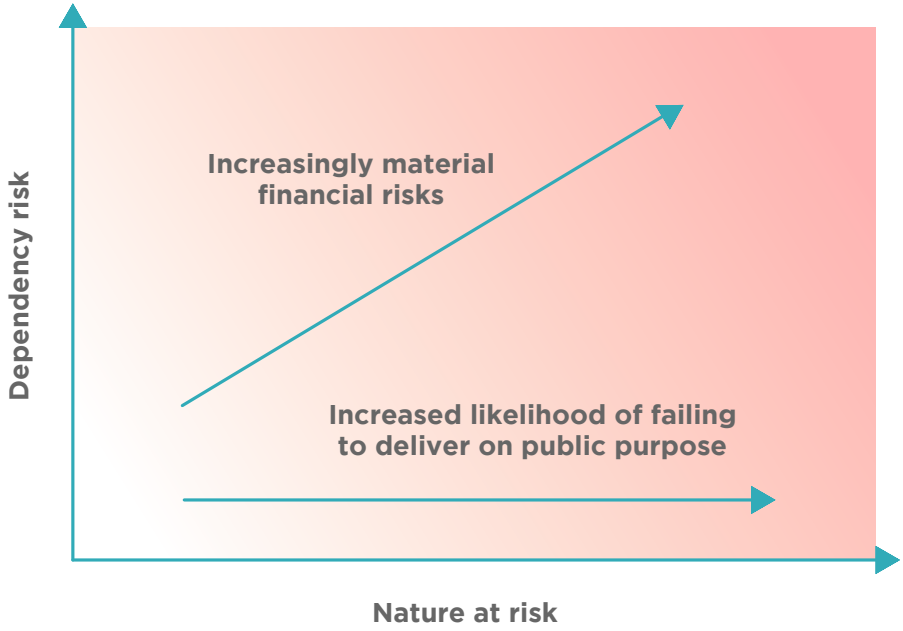
• **Refining Frameworks Used to Derive Monetary Values:** Our tool provides monetary values where possible for biodiversity dependencies and impacts. To do this, we have used estimates of dependency risk from the WEF and estimates of the value of ecosystem services from the academic and grey literature (see detailed methodology above). The most granular values available have been used; however, several elements of the framework remain at the regional or global level. With further investment, DFIs should look to refine these values and replace them with more granular and locally accurate estimates.

• **DFI Balance Sheet Distribution:** Finally, the approach will need DFIs to provide greater granularity on specifically which countries and sectors their investments are deployed in as, in some cases, assumptions were required to reach this distribution. Access to more granular financial data will help improve the accuracy of the results.

3. Conclusion and recommendations

Our estimates of the dependency risk and nature at risk associated with global DFI lending are material and call for closer consideration. It is concerning that DFIs today have no clear view on their nature dependencies and impacts, or how these translate into material financial risk. Most DFIs at best require only certain environmental safeguards in their lending activities – a checklist of environmental harms that their lending should avoid. But these are insufficient to inform DFIs, or the governments that they are accountable to, of the impact they have on nature. It is clear that the more dependent DFIs are on vulnerable nature, and the higher their potential damage to nature, the more likely they are to face material financial risks and the more likely it is that they may not be delivering their public purpose.

Figure 9 | Increasing materiality of nature-related risks



Source: Basic Roots, Vivid Economics

Nature is not adequately considered by the DFIs and other financial institutions and is suffering as a result. If a DFI fails to prioritise, measure and invest in nature, it will fail in its public purpose, because it will not deliver sustainable economic development. Nature-related risk should become an investment and operational priority.

These results suggest a systemic omission in DFIs' collective approach to the stewardship of nature. Today's global financial system is supplying capital for the destruction of the natural world. Incremental initiatives to improve nature-related financial risk and impact analysis and disclosure are welcome, but need coordination and leadership, and are only complements to making polluters pay and funding public goods with public money. There is much to be done in aligning global finance with nature's needs, as F4B has highlighted in its framework for systemic change (see Box 4),[31] including action needed from public financial institutions. Our estimates demonstrate that material impact DFIs may have on global biodiversity. DFIs have a huge opportunity to drive gains through their actions and through leadership towards a robust global risk and impact management system.

Box 4. Aligning Global Finance with Nature's Needs: A Framework for Systemic Change

What would it take to align finance with nature? F4B has published a framework made up of six core elements that would result in global financial flows being consistent with the protection and restoration of biodiversity:

1. Advance Citizens' Biodiversity Choices: financial institutions should take account of citizens' individual and collective biodiversity-related rights and preferences in their financing decisions.

2. Disclose Impacts on Biodiversity: financial institutions should publicly disclose actual and expected biodiversity impacts and associated risks.

3. Create Liability for Biodiversity: legal systems should make financial institutions liable for biodiversity impacts.

4. Align Public Finance with Biodiversity: governments and public agencies should transparently align all public finance to biodiversity-related policies, goals and commitments.

5. Align Private Finance with Public Policy: financial institutions should ensure that their activities are consistent with biodiversity-related public policies, goals and commitments.

6. Integrate Biodiversity into Financial Governance: institutions governing global finance should ensure that DFIs effectively steward biodiversity.

Nature impact and risk reporting is a critical first step for financial institutions globally to reduce their role in the destruction of the natural world. If the financial sector, including banks and asset managers, systematically measure and report such impacts and risks, they will understand better how to reduce these, and increase pressure on the companies they invest in to drive real change. DFIs can become world leaders in biodiversity impact and risk reporting by conducting such assessment themselves, and showing commercial banks that existing data and methods already allow such reporting. In this way, they can drive systemic change.

We recommend that all DFIs commit to, within the next year, publishing a balance sheet-wide stress test of nature-related financial risks, dependencies and impacts. F4B and leading financial institutions such as ASN Bank, AXA and Mirova are advancing both methodologies and data to do this. The approach offered in this report is based entirely on readily available data and requires minimal technical input. F4B is ready to engage with and support DFIs which make this commitment and act accordingly. DFIs must fulfil their role as the world's most progressive financial institutions, and lead the way for the rest of global finance. In stewarding nature, now is the time for them to visibly step up to this role.

[1] Research in support of the Finance in Common Summit estimates there are about 450 public development banks in the world in 2019, they held US$11.2 trillion assets in 2018, and have annual average investments of US$2.3 trillion.

[2] OECD (2020): A Comprehensive Overview of Global Biodiversity Finance

[3] https://www.ft.com/content/1dd92502-e95b-4c21-be1c-c18a598acf1a

[4] https://www.cbd.int/gbo/gbo5/publication/gbo-5-spm-en.pdf

[5] IPBES (2020): IPBES Workshop on Biodiversity and Pandemics

[6] This figure refers to the aggregate value of assets that are held in sectors considered by the authors to be "highly dependent" on nature and in countries considered by the authors to be "highly vulnerable" to the deterioration of nature. It does not reflect an assessment of the resultant financial risk to a DFI's balance sheet based on an analysis of default rates and non-performing loans. Further detail on the approach is given in the methodology.

[7] This figure refers to the aggregate expected value of damage to nature that could potentially arise from DFIs' current lending portfolio, without effective measures to mitigate harm to nature. It combines estimates of the scale of biophysical impacts with valuations of the ecosystem services that would be lost. It does not reflect an assessment of the resultant financial risk to a DFI's balance sheet if this damage were to occur. No adjustment is made for how this cost may translate to changes in the default rate of loans and investments. Further detail on the approach is given in the methodology.

[8] We do include the indirect loss of GHG sequestration services from deforestation (please see methodology for detail).

[9] Research in support of the Finance in Common Summit estimates there are about 450 public development banks in the world in 2019, they held US$ 11.2 trillion assets in 2018, and have annual average investments of US$ 2.3 trillion.

[10] https://www.idfc.org/life-of-land-below/

[11] DNB (2020): Indebted to Nature

[12] DNB (2020): Indebted to Nature

[13] Swiss Re Institute (2020): "Biodiversity and Ecosystems Index"

[14] Ninety One and WWF (2020): "Climate & Nature Sovereign Index"

[15] World Economic Forum (2020): "Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy"

[16] DNB (2020a): "Biodiversity Opportunities and Risks for the Financial Sector"

[17] Global Canopy and Vivid Economics (2020): "The Case for a Task Force on Nature-related Financial Disclosures"

[18] https://www.ifc.org/wps/wcm/connect/3baf2a6a-2bc5-4174-96c5-eec8085c455f/PS6_English_2012.pdf?MOD=AJPERES&CVID=jxNbLC0; EBRD. (2014). EBRD Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

[19] https://unfccc.int/sites/default/files/resource/Climate-Biodiversity%20Convergence_AFD.pdf; https://www.afd.fr/en/actualites/conserving-ecosystems-everyone-must-do-their-part

[20] Curtis et al (2018): Classifying drivers of global forest loss

[21] The Eora Global Supply Chain Database, https://worldmrio.com

[22] Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy, WEF/PwC (2019)

[23] Global Deforestation Rates & Statistics by Country, https://www.globalforestwatch.org

[24] Curtis et al (2018): Classifying drivers of global forest loss

[25] 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Volume 4: Agriculture, Forestry and Other Land Use

[26] PWC (2015): Valuing corporate environmental impacts PwC methodology document

[27] Global estimates of the value of ecosystems and their services in monetary units, Groot et al (2012)

[28] UK HMT (2018): THE GREEN BOOK CENTRAL GOVERNMENT GUIDANCE ON APPRAISAL AND EVALUATION

[29] Corporate Bond Water Credit Risk Analysis Tool, https://vfu.de/ressourcen/tools/waterrisk

[30] Assessing the Environmental Impacts of Freshwater Consumption in LCA, Pfister et al (2009)

[31] https://www.f4b-initiative.net/publications-1/aligning-global-finance-with-nature%E2%80%99s-needs%3A-a-framework-for-systemic-change-

[32] Over 30 financial institutions have agreed to take part and cooperate in the preliminary set-up activities of the emerging Taskforce for Nature-related Financial Disclosures.

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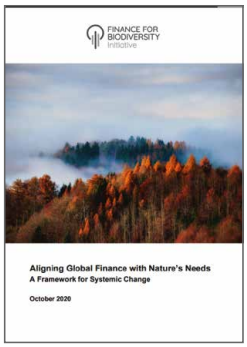

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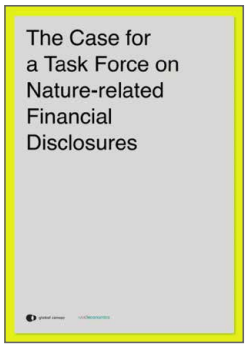

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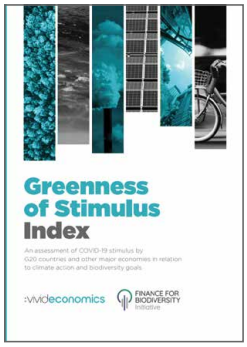

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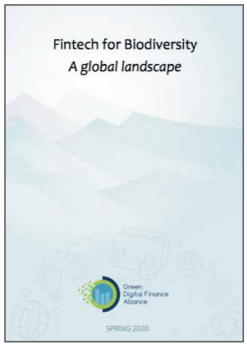

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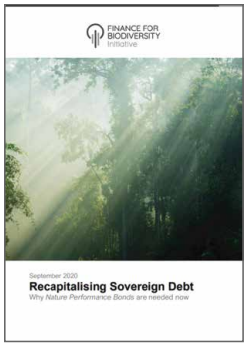

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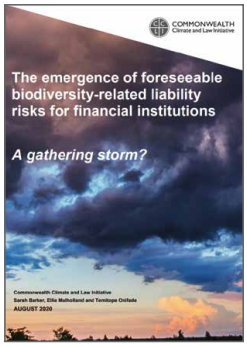

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