Accounting for Nature

An assessment of nature-related risk and prudential policy in the South African banking sector

Global Canopy

Acknowledgements

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About Global Canopy

Global Canopy is a data-driven not for profit that targets the market forces destroying nature by promoting transparency and accountability. Global Canopy provides innovative open-access data, metrics and insights to leading companies, financial institutions, governments and campaigning organisations worldwide, to help them make better decisions about nature, forests and people.

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Abbreviations and acronyms

AFD	Agence Francaise De Development
BASA	Banking Association of South Africa
BCBS	Basel Committee on Banking Supervision
BdF	Banque de France
BIOFIN	The Biodiversity Finance Initiative
CBD	Convention for Biological Diversity
CDP	Carbon Disclosure Project
CIPC	Companies and Intellectual Property Commission
CRISA	Code for Responsible Investing in South Africa
DFFE	Department of Forestry, Fisheries and the Environment
DNB	De Nederlandsche Bank
ECB	European Central Bank
EFRAG	European Financial Reporting Advisory Group
EIA	Environmental Impact Assessment
EMS	Environmental Management System
ENCORE	Exploring Natural Capital Opportunities, Risks and Exposure
ESG	Environmental, Social, and Governance
ESRS	European Sustainability Reporting Standard
EU	European Union
FSB	Financial Stability Board
FSCA	Financial Sector Conduct Authority
FSOC	Financial Stability Oversight Committee
FSP	Forecast Policy Scenario
FSR	Financial Sector Regulation
GBF	Kunming-Montreal Global Biodiversity Framework
GBS	Global Biodiversity Score
GDP	Gross Domestic Product
GHG	Greenhouse Gasses
GRI	Global Reporting Initiative
IBAT	Integrated Biodiversity Assessment Tool
IAIS	International Association of Insurance Supervision
ICAAP	Internal Capital Adequacy Assessment Process
IFRS	International Financial Reporting Standards
IIF	Institute of International Finance
IIRC	International Integrated Reporting Council
IMF	International Monetary Fund
IR	Integrated Reporting
ISSB	International Sustainability Standards Board
JNCC	Joint Nature Conservation Committee
JSE	Johannesburg Stock Exchange
KBA	Key Biodiversity Areas
LCA	Life Cycle Assessment
LEAP	Locate, Evaluate, Assess, Prepare
MSA	Mean Species Abundance
NBF	National Biodiversity Framework
NBSAP	National Biodiversity Strategy and Action Plan
NCA	National Credit Act
NCAS	Natural Capital Accounting Strategy
NCR	National Credit Regulator
NDP	National Development Plan
NEMA	National Environmental Management Act
NGFS	Network for Greening the Financial System
NGO	Non-Government Organisations
OEP	Office for Environmental Protection
PA	Prudential Authority
PACTT	Prudential Authority Climate Think Tank
PBAF	Partnership for Biodiversity Accounting Financials
PCAF	Partnership for Climate Accounting Financials
PRB	Principles for Responsible Banking
SARB	South African Reserve Bank
SASB	Sustainability Accounting Standards Board
SBTi	Science Based Targets initiative
SBTN	Science Based Targets Network
SDG	Sustainable Development Goals
SEC	Securities and Exchange Commission
SECO	State Secretariat for Economic Affairs
SFI	Sustainable Finance Initiative
TCFD	Taskforce on Climate-related Financial Disclosures
TNFD	Taskforce on Nature-related Financial Disclosures
UK	The United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNEP FI	United Nations Environmental Programme - Finance Initiative
UNEP-WCMC	UN Environment Programme World Conservation Monitoring Centre
WEF	World Economic Forum
WRF	Water Risk Filter

Executive summary

The global economy depends on nature. An analysis by the World Economic Forum found that over half of global GDP is dependent on critical ecosystem services that nature provides, ranging from pollination and flood protection through to the provision and regulation of water, climate, nutrients and soil health. It is now widely accepted that loss or disruption to these ecosystem services represents a systemic risk to many industries, including the financial sector. Despite the risk however, nature is poorly accounted for in financial risk management, including the extent to which nature loss will impact different industries and different geographies. This report contributes to a growing body of literature aimed at developing the frameworks and methodologies needed to assess nature-related financial risks across geographies and industries. Addressing these risks requires financial institutions and prudential policymakers to begin leveraging the tools and data already available to incorporate nature into their risk assessments and decision-making processes.

This report assesses the extent to which South African banks depend on nature through an analysis of four major agricultural portfolios. It explores current approaches taken by South Africa's five largest banks to assess, disclose and address nature-related risk, and evaluates the current prudential policy environment around nature-related risk in South Africa. So far, most studies have looked at nature dependencies at the GDP level (Hadji-Lazaro et al, 2023, Hadji-Lazaro et al, 2025) or at the level of the financial system as a whole (van Toor et al, 2020, Svartzman et al, 2021, Ranger et al, 2024). This bank-level analysis aims to show both how individual banks have different dependencies on nature, but also how these risks will have shared and cascading impacts across the entire sector, highlighting the need for both individual and collective action on nature-risk management. It concludes with a set of recommendations for banks, policymakers and other financial institutions regarding the steps they need to take to assess and address nature risk.

South Africa is a nature rich country with unique and outstandingly rich biomes, many of which are under threat from land clearance, water scarcity, climate change and pollution. This year, it will chair the G20 summit in Johannesburg with an agenda focused on "Solidarity, Equality and Sustainability". But an equitable and sustainable future requires a financial system that is aligned with nature. While policymakers and major financial institutions have taken steps to integrate nature-related risks into financial policy, they have potential to do much more and position South Africa as a leader in the field.

Part one assesses bank-level dependency on nature through an analysis of four of South Africa's five largest banks. The focus of this analysis is on the four banks' agricultural, forestry and fishing credit portfolios. These sectors are highly dependent on nature, represent approximately 2.4% of South Africa's GDP and play a critical role for the country's food security. In addition, as a primary sector, any disruption to South African agriculture is likely to have cascading impacts across value chains, with impacts to secondary and tertiary activities such as processing and manufacturing. The analysis uses ENCORE (Exploring Nature Capital Opportunities, Risks and Exposure) a data tool which can be used to screen a financial portfolio for nature-related impacts and dependencies at the sector level.

The ENCORE analysis reveals that South African banks have a high dependency on nature through their lending to agriculture, fishing and forestry. Across the banks' portfolios, all clients depend on at least one ecosystem service, with a majority exhibiting Very High dependency (according to ENCORE dependency categorisations) on multiple ecosystem services. Three out of four banks invest significantly in livestock activities, which depend heavily on water-based services. Most also have a large stake in crop-related activities, which depend on water flow regulation services and soil quality regulation services. One bank is especially dependent on erosion control, landslide mitigation services and rainfall pattern regulation, due to its particularly high exposure to monocrop forest plantation and logging, which is vulnerable to wildfires and landslides. Each bank would significantly benefit from the restoration of native vegetation given its key role in regulating water quantity and quality, soil quality and climate conditions.

Part two outlines international guidance and frameworks on assessing nature-related financial risk, alongside current progress on prudential policy in South Africa. The South African Central Bank (SARB) and other key bodies have laid the groundwork to integrate strong prudential policy on nature-related risk, but there is still a long way to go to bring nature policy up to speed with climate policy. There is also a need to better align domestic approaches to nature-related finance risk assessments with global standards.

Part three compares approaches currently being taken to address nature risk across South Africa's five largest banks – Absa, FirstRand, Nedbank, Investec and the Standard Bank of South Africa (SBSA). As global financial institutions, each has taken important steps on the path to addressing nature-related financial risk and South African banks may be considered leaders in the field. However, there is a lack of alignment and implementation of disclosure processes across the five banks, and each could do more to integrate nature-related risk into their portfolio management.

South African banks and prudential policymakers are making progress on assessing and addressing the nature-related risks in their portfolios. However, to protect its economy and financial system against the worst impacts of nature loss, South African regulators, supervisors and financial institutions will need to take further steps. We conclude with a list of key recommendations.

Introduction

Focus and context of this report

This report assesses the South African economy's dependence on nature by assessing nature-related risks faced by some of its largest banks. Although some studies have looked at the banking system's nature dependence in the aggregate (Svartzman et al. 2021, Boldrini et al. 2023, Ranger et al. 2024), this report provides a more granular approach by assessing the nature-related financial risk at the institution level. The aim is to provide a more nuanced understanding of individual banks' dependence on nature, but also to examine how domestic banks are responding to potential nature-related risks and opportunities, both individually and collectively. By focusing on individual South African banks, this study offers insights that could support the refinement of both micro- and macroeconomic thinking on nature risk, with the potential to guide and inform South Africa's prudential policy preparedness, with transferable lessons for other countries.

To date, only one study, carried out by the Agence Française de Développement (AFD), has examined in some detail South Africa's dependence on nature and possible implications for the South African economy (Hadji-Lazaro et al, 2023). Based on national economic output data, the report finds that half of South Africa's output is produced by economic activities highly dependent on at least two ecosystem services[1,2]. The analysis finds that more than 30% of South Africa's economic production is highly dependent on water provision and protection from flooding and storms, 20-30% is highly dependent on climate regulation and mass stabilisation, 8% is highly dependent on water quality, and 6.5% on the mediation of sensory impacts.

South Africa's net exports are the most exposed to physical shocks[3].

- 83.4% of net exports are generated by sectors highly dependent on at least one ecosystem service (ESS). This includes 80% of net exports dependent on at least three ESSs, and 70% dependent on at least four ESSs.

1. Ecosystem Services (ESS) are the connections between nature and business. Each of these services represents a benefit that nature provides to enable or facilitate economic activities – such as provisioning services (i.e, supply of food and fibres); regulating and maintenance services (i.e, filtration and pollination); and cultural services (i.e, cultural, spiritual and recreational benefits) (ENCORE, 2024).
2. Water provisioning ESS; climate regulation and mass stabilisation ESS.
3. Physical shocks refer to the projected impact on the economy of individual economic agents resulting from the realisation of a physical hazards such as heatwaves, floods, wildfires and storms (NGFS 2024b).

- The report shows that ecosystem degradation could severely impact South Africa's export capacity, weaken its balance of trade, and reduce its ability to generate foreign currencies, thereby limiting its ability to import goods and services. Many of these economic activities are financed by domestic banks through various debt instruments, exposing the South African financial system to major credit risk.

Other studies have also shown that nature loss and the degradation of ecosystem services can cause major financial shock, (Ranger et al, 2023, 2024), and have emphasised the potential importance of nature shocks across different types of financial risk, including credit risk, market risk, underwriting risk, liquidity and operational risk (Svartzman et al, 2021)[4].

As a proof of concept, this study uses bank-level credit information to compare the nature-related risk exposure of four of South Africa's largest banks (Section 2). It uses ENCORE to identify nature-related dependencies across the agriculture, forestry and fishing loan books of each bank. Compared to other sectors, agriculture is dependent on a broad range of ecosystem services, while also exerting some of the most significant impacts on nature (van Toor et al. 2020, Svartzman et al. 2021, Hadji-Lazaro et al. 2023). By focusing on the nature dependencies of agricultural loans, we highlight the variety of those dependencies, while reflecting on how nature shocks could impact banks both locally and systemically, thereby affecting the South African financial system as a whole. We consider how the participating banks are considering natural capital, and nature risks and opportunities in their respective risk management processes, and how they are currently disclosing on nature. The method used here provides an initial overview of nature-related risk and is an approach domestic banks can use and build on in their own nature-related financial risk assessments.

At 2.4% in 2022, agriculture's direct share of South African GDP is above the OECD average, but it is small compared to other African nations (Department of Agriculture, 2022a). Nevertheless, as in other OECD countries, agriculture plays an important role in domestic food security. Although South Africa produces less food than it consumes, its self-sufficiency ratio was close to 1 in 2022 (FAO 2016, Department of Agriculture 2022b). As a result, shocks to domestic agriculture could potentially have a significant impact on food inflation and consumption. The primary agricultural sector also contributes to secondary and tertiary economic and industrial activities such as processing, manufacturing, and biomass energy production. Consequently, disruption to agriculture would have cascading impacts on other sectors, including the financial sector.

4. Credit risk includes increases in defaults and collateral depreciation. Market risk includes the repricing of assets and fire sales. Underwriting risk covers insured losses and the insurance gap. Liquidity risk includes shortages of liquid assets and refinancing risk, and operational risk means various forms of disruption to financial institutions' processes.

We find that all four participating banks have significant dependency on multiple ecosystem services across various agricultural economic activities. Section 3 of this report presents a high-level contextualisation of relevant South African finance policy frameworks, as well as emerging global nature-related finance disclosure standards and directives, which are applicable to nature-related disclosures in the South African jurisdiction. Section 4 examines how domestic banks have been responding to ESG disclosure standards in general, as well as the adoption of mainstream nature-related reporting standards and frameworks, and the appetite for nature-related financial disclosure and supervisory guidance among domestic banks.

Section 5 provides recommendations for prudential policymakers – including recommendations for strengthening the policy environment, improving data to support decision making, capacity building for assessing nature-related financial risk and nature-related risk management.

Understanding nature-related financial risks, pathways and transmission channels

Nature-related financial risk refers to the economic threats an organisation faces due to its impacts and dependencies on nature (NGFS, 2021).

- Dependencies - All economic activities are dependent upon at least one ecosystem service (ESS) provided by nature, either directly or indirectly. 'Nature dependency', exposes companies and financial institutions to physical risk (if an ESS is lost or degraded), or transition risk (if accessto an ESS is disrupted through regulation).
- Impacts – At the same time, all economic activities have impacts on nature, through the resources they use and the waste they create. 'Impacts' expose organisations to reputational risk as well as litigation and/or compliance risk if their impacts are in breach of local laws.

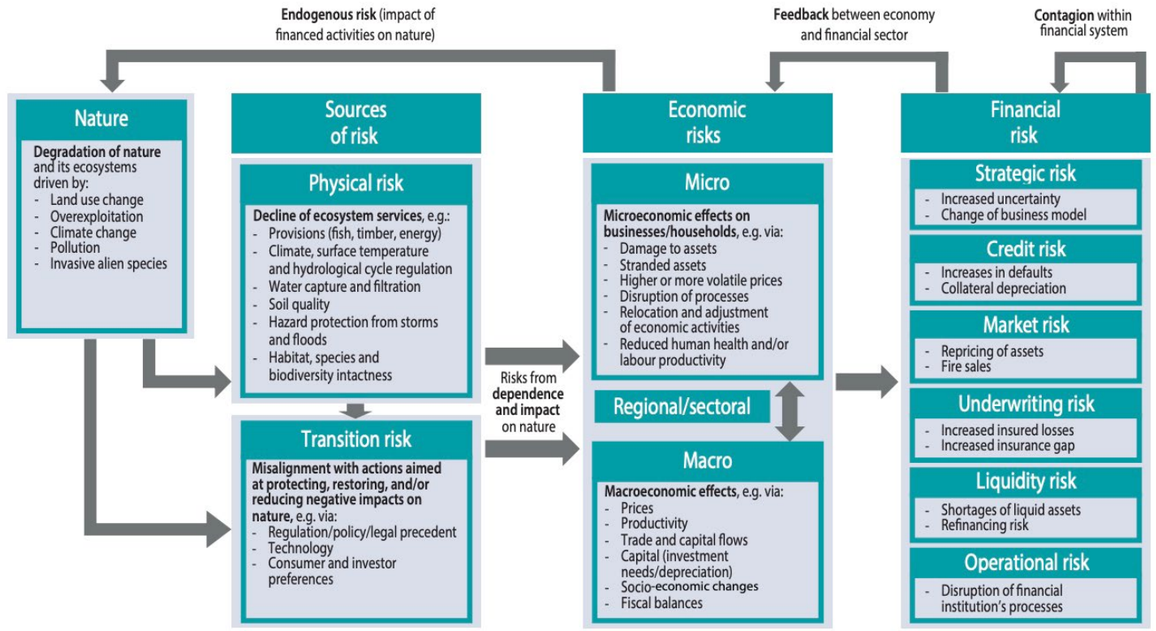
Physical risks stem from the direct or indirect loss of ecosystem services and degradation of nature that impact on economic activities and financial assets.

Transition risks arise from the misalignment of economic actors with policies, regulatory changes, and initiatives aimed at the conservation, protection, restoration and reduction of negative effects on nature (NGFS 2023a, TNFD 2023).

Nature-related risk and climate-related risk are inextricably linked. Climate change is a major driver of biodiversity and nature loss, while at the same time nature loss, particularly through conversion of land and deforestation, contributes to global warming. Healthy ecosystems on the other hand can strengthen resilience to growing climate risks. Nature-related financial risk and climate-related financial risks are both closely linked and likely to compound one another. These risks can transmit through multiple channels and translate into various forms of financial risks such as credit, market, liquidity, operational and litigation risks (NGFS 2022).

Nature-related physical and transition risks can have impacts at the microeconomic level, impacting specific sectors or geographies, or on the macroeconomic level, triggering broader market instability across multiple channels. These risks are a significant threat to financial institutions and the stability of the financial system. Figure 1 provides an overview of the transmission for physical and transition risks. (NGFS 2023a). Asset impairment can create contagion risk and significantly amplify the scale of financial risks (Ranger et al, 2023). Analyses of climate risks have shown that the largest risks are likely to emerge from the non-linear interaction of multiple risk drivers, leading to complex, cascading and compounding risks (NGFS, 2023b). The strong interplay between climate and nature means that both climate and nature risk must be considered in parallel.

Figure 1. Physical and transition risk transmission channels



Source: Svartzman et al. 2021.

Quantifying and predicting climate and nature-related risk is challenging with multiple uncertainties about how transmission channels interact and the role of complex feedback mechanisms. There is some, albeit limited, evidence quantifying specific channels of economic impacts, such as the risks to coastal properties of reduced flood protection associated with loss of mangroves and development on primary dune defence systems (e.g. Kwa-Zulu Natal Floods - see Ranger et al. 2023); as well as the historical and current drought and extreme temperature drivers of wildfires in California which has led to significant finance system risk exposure.

A bank-level assessment of nature-related financial risk in South Africa, based on agricultural portfolios

This section presents a bank-level analysis to examine nature-related risks in the South African domestic financial system. The analysis is carried out using ENCORE, a free tool, which can be a useful entry-point for financial institutions when assessing nature-related risk. The ENCORE knowledge base contains comprehensive information on the extent to which different types of economic activity impact and depend on nature, and can be used to screen for nature risks related to specific businesses or, as in this case, across an entire lending portfolio. In this analysis ENCORE is used to identify how selected portfolios depend on nature and the extent to which this presents material risk.

Agriculture, forestry and fishing were selected for analysis due to their high impact on the environment and their material dependency on ecosystem services. Land degradation linked to agriculture is the primary driver of nature loss. Land degradation is defined by IPBES (2019) as processes leading to the decline of biodiversity, ecosystem functions, or services. Croplands and grazing lands occupy over one-third of the Earth's surface (FAO, 2020), with 33% of croplands used for animal feed production (FAO, 2012). Pesticides and herbicides, while boosting agricultural productivity, accumulate in the environment, disrupting decomposition, nutrient cycles, and non-target species. Agricultural run-off and soil erosion reduce the diversity and complexity of freshwater and marine ecosystems (Chagnon et al, 2015; GCRMN, 2021). Overgrazing, tillage, and poor agricultural practices accelerate soil erosion and diminish soil biodiversity, which is crucial for food production, water quality, species conservation, carbon and nutrient cycling, and soil structure, all negatively impacting agricultural productivity (FAO et al, 2020; NGFS, 2022).

The analysis is based on agri-portfolio credit data shared by participating

banks. Four of South Africa's five largest domestic banks by market capitalisation participated in the analysis[5]. The participating banks have requested the data to be presented anonymously.

Methodology and approach

We combine two datasets in this analysis – Portfolio data provided by participating banks includes information on their exposure to a wide range of clients across different primary production sectors. The ENCORE knowledge base characterises the level of dependence of various production processes on critical ecosystem services. By linking the sectoral classification of clients in the portfolio data to their associated production processes, it is possible to assess each bank's exposure to nature-related risks. This approach enables the identification of dependencies on specific ecosystem services across the credit portfolios of participating institutions.

The ENCORE data

The analysis focuses on physical risks based on the ENCORE methodology. The 2018-2023 version of the ENCORE knowledge base describes the dependency of 92 types of production processes on 21 ecosystem services[6]. Ecosystem services are classified according to the Common International Classification of Ecosystem Services (see Table 1)[7]. 17 of the ecosystem services considered are regulation services; the remaining four are provisioning services[8]. Note that the ENCORE database does not include cultural ecosystem services, such as those related to recreational activities, nor other relationships linked to intangible forms of attachment to ecosystems or biodiversity.

5. The participating banks have requested the data to be presented anonymously. (One of the five largest banks declined to participate).
6. The analysis was conducted before ENCORE's SUSTAIN update to the knowledge base. https://encorenature.org/en/data-and-methodology/services
7. In the updated knowledge base ecosystem services were classified according to the UN System of Environmental-Economic Accounting Ecosystem Accounting (SEEA - EA): https://www.encorenature.org/en/data-and-methodology/services
8. At the time of conducting this analysis.

Table 1. Ecosystem services relevant to this analysis

Provisioning Services	Regulation and Maintenance Services
• Ground water • Surface water • Genetic materials • Fibres and other materials	• Mass stabilisation and erosion control • Pest control • Climate regulation • Disease control • Flood and storm protection • Filtration • Pollination • Dilution by atmosphere and ecosystems • Bio-remediation • Water flow maintenance • Maintain nursery habitats • Water quality • Soil quality • Buffering and attenuation of mass flows

Source: ENCORE Partners, 2023.

ENCORE dependency scores (or materiality ratings) illustrate the degree to which a given production process relies upon a specific ecosystem service, which are categorised as Very low (VL), Low (L), Medium (M), High (H), and Very High (VH). A high materiality score indicates that the ecosystem service is essential for the economic production process, and it cannot be substituted. For instance, the functioning of the production process; large-scale irrigated arable crops depend on the ecosystem service water flow maintenance with a High dependency score. If water flow maintenance ESS were disrupted, the production of large-scale irrigated crops would be severely impaired. The economic activity that uses this production process will be exposed to physical risks due to disruption to or loss of the ecosystem service. It should be noted that a particular production process may depend on several ecosystem services, and that an economic activity can use several production processes.

Linking banks' agri-portfolio data to ENCORE

To assess the exposure of the agricultural credit portfolio to physical nature-related risks, we assess the dependency of each counterpart in the bank's portfolio. Counterparts are clients of the banks that have been issued a specific financial instrument at a previous date which still appear as an asset in the bank's balance sheet (and as a liability on the client's balance sheet). If a client

(counterpart) defaults, the performance of the assets they owe to the bank could be affected. The more vulnerable the portfolio's assets are, the more vulnerable the bank is to financial underperformance (Figure 2).

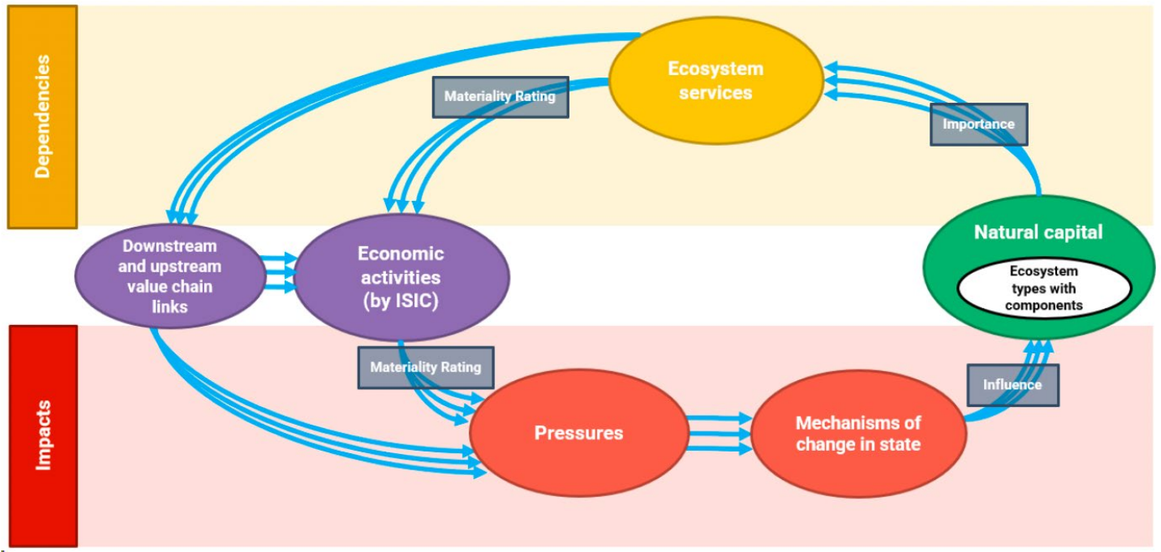
The clients covered in the portfolio are non-financial entities, operating in primary resource use sectors (mainly agriculture, forestry and fishing activities). We manually matched the most detailed sector categories included in each of the bank's portfolio databases to categories of production process used by ENCORE. This involved using benchmarks[9].

We assume that clients operating in a specific sector use corresponding production processes and are therefore dependent, to varying degrees, on the ecosystem services identified by ENCORE. Assets issued by a client are considered to be exposed to physical risks related to the specific ecosystem services on which it depends. Note that a client can depend on several ecosystem services, since it can use several production processes which may themselves depend on several ecosystem services. A client's maximum score for a particular ecosystem service corresponds to the highest score of the set of process-service relationships on which it depends. In other words, to assign a materiality rating to a client's dependency on an ecosystem service, we consider the whole set of their relevant process-service pairs, select the pair with the maximum dependency score and use this score.

This analysis only considered 'direct' dependencies and did not assess nature-related risk in the value chains of bank clients. Since the main sectors studied here are upstream in the value chain, they are less exposed to supply-chain risk. It should be noted however that primary agricultural production provides resource input into secondary and tertiary economic sectors such as processing and value-added products, through to retail. This downstream value-chain dependency was left out of the analysis.

9. The main correspondence table that exists between ENCORE production processes and economic sectors is based on the GICS classification of sectors (https://finance.ec.europa.eu/document/download/7e7aa605-37a3-4d87-95db-464a1ef39497_en?filename=192020-sustainable-finance-teg-benchmarks-handbook_en.pdf). This appeared to be too aggregated when applied to the specific agriculture sectors comprised in the banking portfolios. So, for reasons of thoroughness, we prefer to assign processes to sectors manually.

Figure 2. How economic activities expose financial institutions to nature-related dependencies and impacts



Source: ENCORE Partners 2024 (*using ISIC economic activities instead of production processes*).

Portfolio analysis results

Bank A

The assessment focuses solely on bank clients in the primary production sectors, therefore substantial exposure to nature-related risk is anticipated. All clients covered in Bank A's portfolio have at least a Very Low dependency on one ecosystem service, and almost all of the examined portfolio (99.9%) is exposed to clients with Very High dependency on at least one ecosystem service.

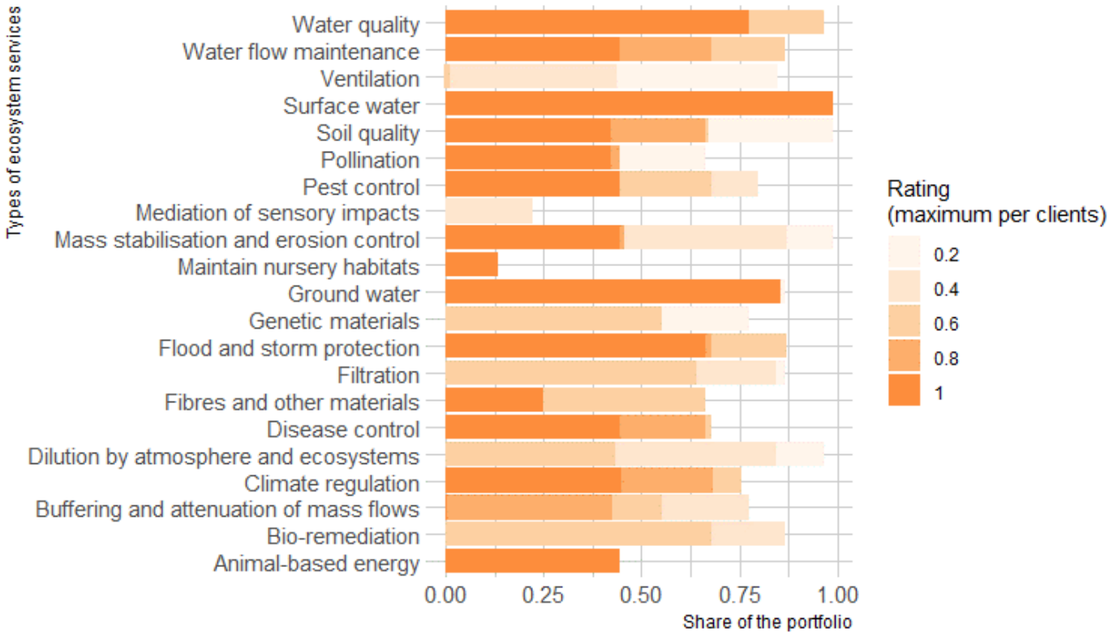
Some clients are Very Highly dependent on multiple ecosystem services. 66.5% of Bank A's portfolio (ZAR 2,561million) is exposed to clients with Very High dependency on at least six different ecosystem services, which is significant, but less than in other banks in this study. 45% of the portfolio consists of assets issued by clients with Very Low dependencies on ecosystem services[10]. This initial snapshot indicates a generally high exposure to physical nature-related financial risks across the portfolio.

10. The sum of exposure shares to different ratings can be higher than one because clients depend on several ecosystem services at different scores.

The portfolio's exposure to physical risk varies across different ecosystem services. Figure 3 indicates the extent to which Bank A's portfolio is exposed to each ecosystem service in the ENCORE knowledge base, and uses ENCORE's materiality ratings to show the extent of dependency.

- Almost the entire portfolio (98.9%) is exposed to clients with a Very High dependency on surface water.
- Pollination services are also crucial, with close to 50% of the portfolio having a Very High dependence on them.
- Flood and storm protection services are essential for 65%-80% of the portfolio with Medium to Very High materiality, emphasising the need for resilient infrastructure and effective natural barriers.

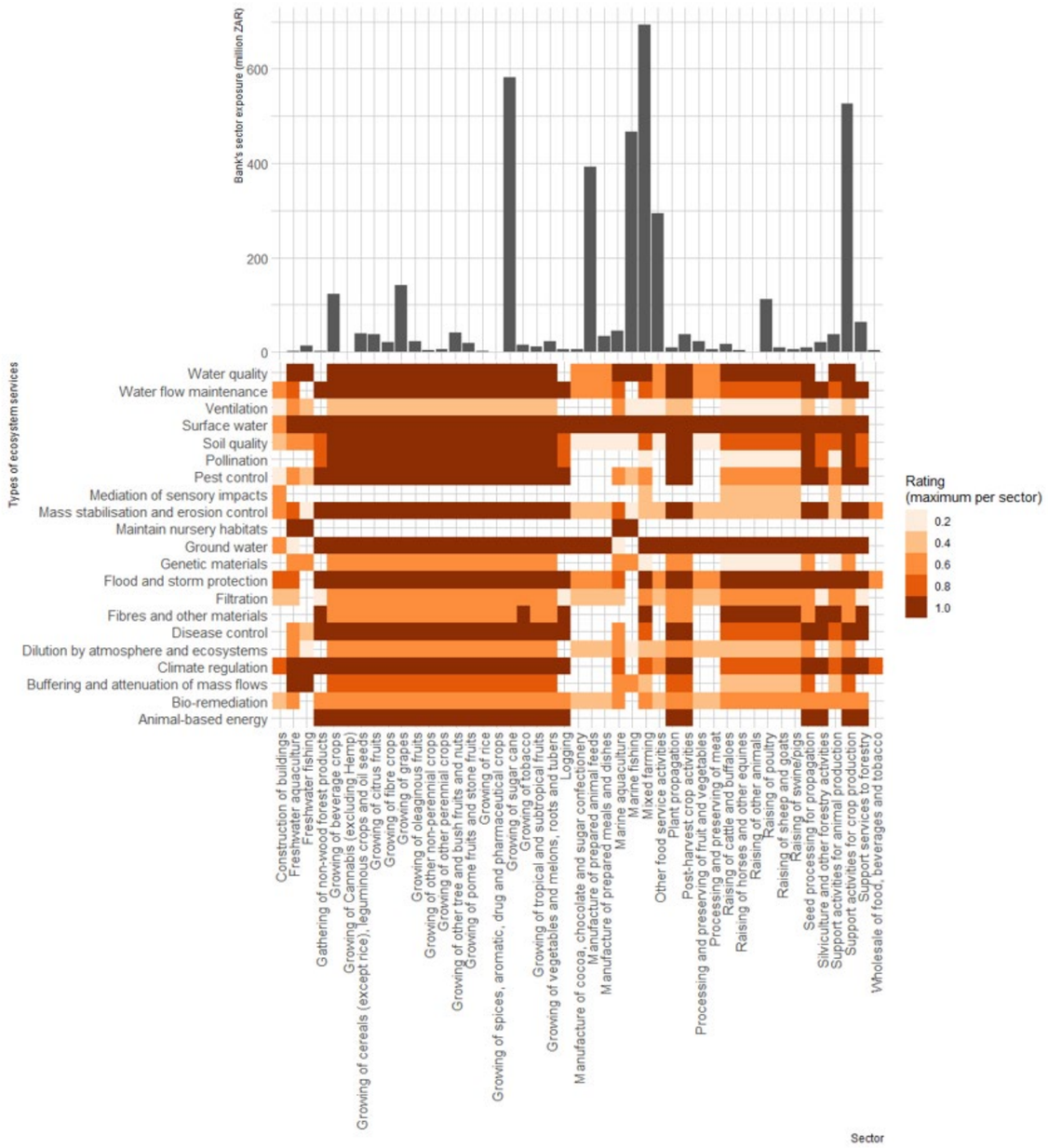
Figure 3. Percentage of Bank A's examined portfolio exposed to clients dependent on specific ecosystem services



Source: Bank A's primary sector portfolio and ENCORE Partners 2023.

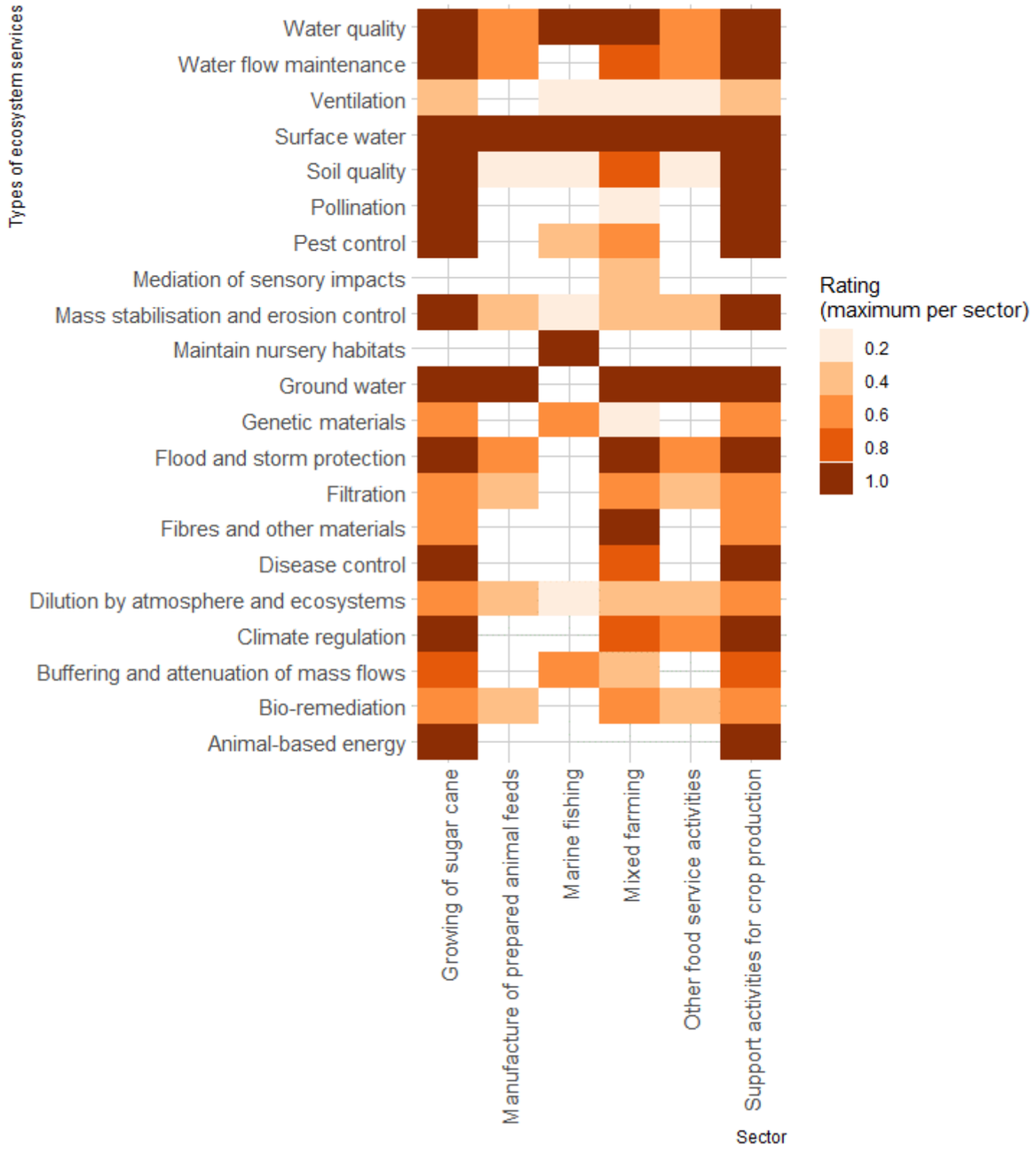
The heatmap in Figure 4 uses ENCORE to illustrate the extent to which different types of economic production in Bank A's portfolio are dependent on the 21 ecosystem services, with darker colours indicating greater dependency. The bar chart at the top of Figure 4 also shows Bank A's financial exposure to each sector in South African Rand (ZAR). The six sectors with the greatest financial exposure are Mixed farming (ZAR 694m of assets), Growing of sugar cane (ZAR 582m), Support activities for crop production (ZAR 527m), Marine fishing (ZAR 468m), Manufacture of prepared animal feeds (ZAR 393m) and Other food service activities (ZAR 293m). Together these represent 74.6% of Bank A's agricultural portfolio. Figure 5 is a consolidated view of the previous heatmap illustrating the ecosystem services dependencies of these six sectors.

Figure 4. Financial exposure by sector (on the top) and heatmaps of direct dependencies by sectors and ecosystem services (on the bottom)



Source: Bank A's primary sector portfolio and ENCORE Partners 2023.

Figure 5. Dependency scores of the 6 most exposed sectors in Bank A's portfolio



Source: Bank A's primary sector portfolio and ENCORE Partners 2023.

The six most exposed sectors can be consolidated into four key groups of agri-production, all of which have high ESS dependency.

- **Crop-related sectors** *(Growing of sugar cane and Support activities for crop production)*, represent 28% of the portfolio's financial exposure. These sectors depend on 19 ecosystem services, and have Very High dependency on 11 ecosystem services, including provisioning services such as water provision, and regulating services such as climate regulation or pollination.
- **The processing of food products** *(Manufacture of prepared animal feeds and Other food service activities)*, represents 17.3% of the portfolio. These sectors have a Very High dependency on water provisioning services including (ground water, surface water, water flow maintenance).
- **Livestock activities** *(Mixed farming)* represents 17.5% of the value of the portfolio. This sector is characterised by a broad and significant exposure to many types of ecosystem services such as water-related ecosystem services, as well as soil quality and disease control.
- **Fishing** *(Marine fishing in this case)*, represents 11.8% of portfolio exposure. The production processes used by this sector depend on the maintenance of nursery habitats and buffering and attenuation of mass flows (which allows the transport and storage of sediment by rivers, lakes and seas).

Bank A's agricultural portfolio is dependent on a range of ecosystem services, exposing Bank A to multiple physical risks if these services were to be disrupted.

Bank A's portfolio data includes information on the type of financial instruments involved in each of its client contracts, making it possible to conduct detailed analysis at an asset level. The Sankey diagrams illustrate how financing flows from different financial instruments (on the left) to service different production processes (in the middle), and the extent to which these processes are Highly or not Highly dependent on Pollination (Figure 6) and Soil Quality (Fig 7). While agricultural commercial mortgages granted by the bank are not Highly dependent on Pollination, they are Highly dependent on Soil Quality. In both cases, overnight loans have not been granted to activities Highly dependent on the ecosystem services.

Figure 6. Sankey diagram illustrating the extent to which different financial instruments are exposed to different production processes and the extent to which they depend on Pollination.

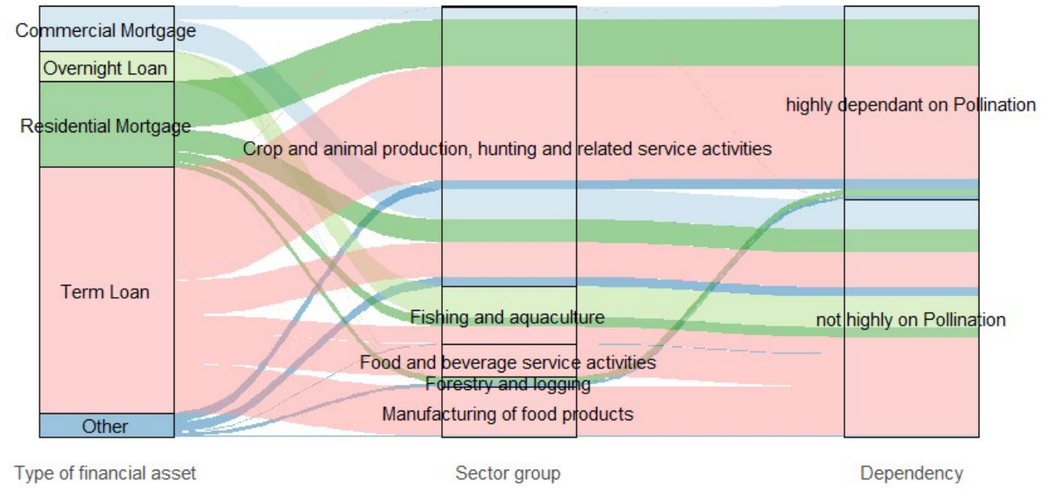
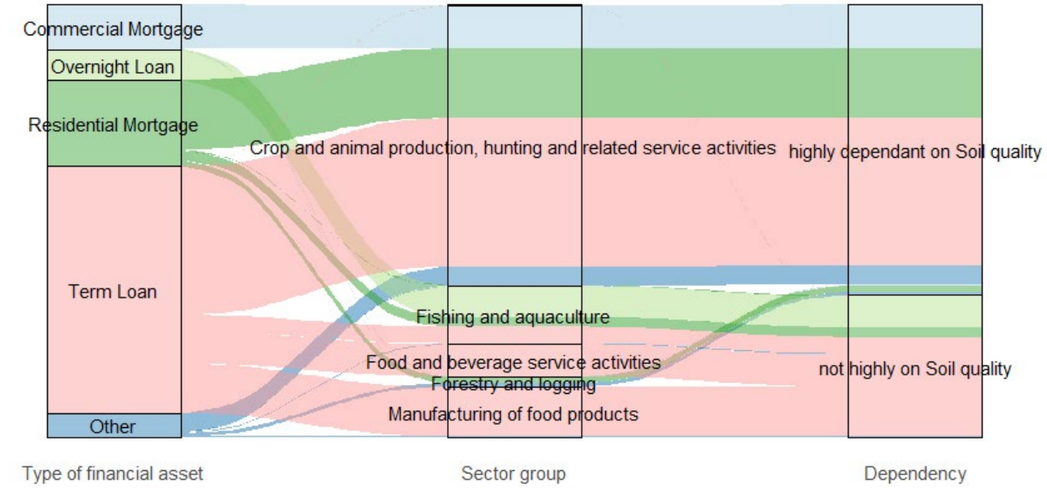


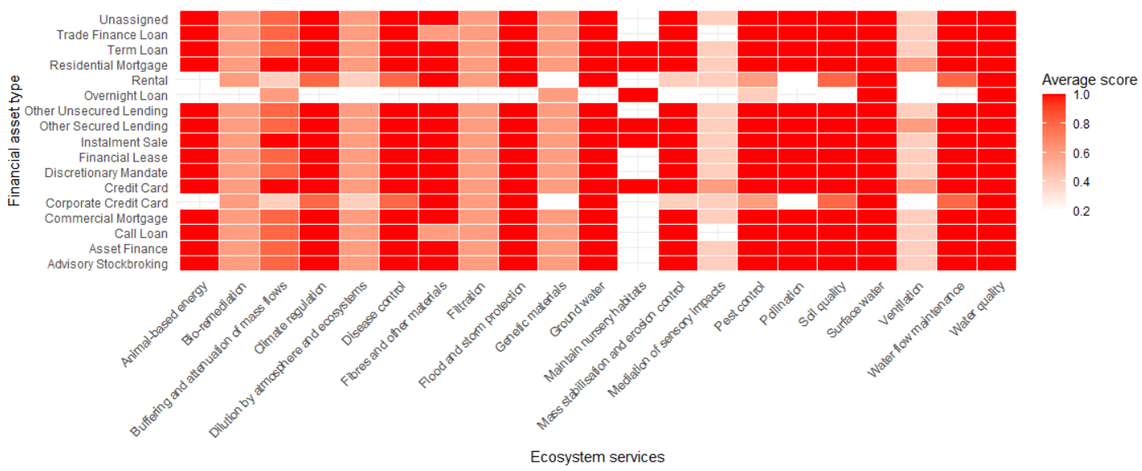
Figure 7. Sankey diagram illustrating the extent to which different financial instruments are exposed to different production processes and the extent to which they depend on Soil quality



Source: Bank A's primary sector portfolio and ENCORE Partners 2023.

The heatmap below (Figure 8) depicts the average dependency scores of different financial asset types on different ecosystem services. For example, agri-sector clients taking out corporate credit card advances are substantially dependent on fibres and other materials, flood and storm protection, ground water, surface water and water quality. Overnight loans are specifically dependent on maintained nursery habitats, surface water and water quality. Varying maturities and repayment conditions underlying these financial assets entail different financial risks. For instance, the short-term nature of overnight loans means that the bank's exposure to physical risks such as surface water and water quality may be more immediate and subject to rapid fluctuations. This shows the importance of tailoring risk management strategies to the specific characteristics and maturity profiles of different financial assets.

Figure 8. Average exposure of financial instruments to different ecosystem services



Source: Bank A's primary sector portfolio and ENCORE Partners 2023.

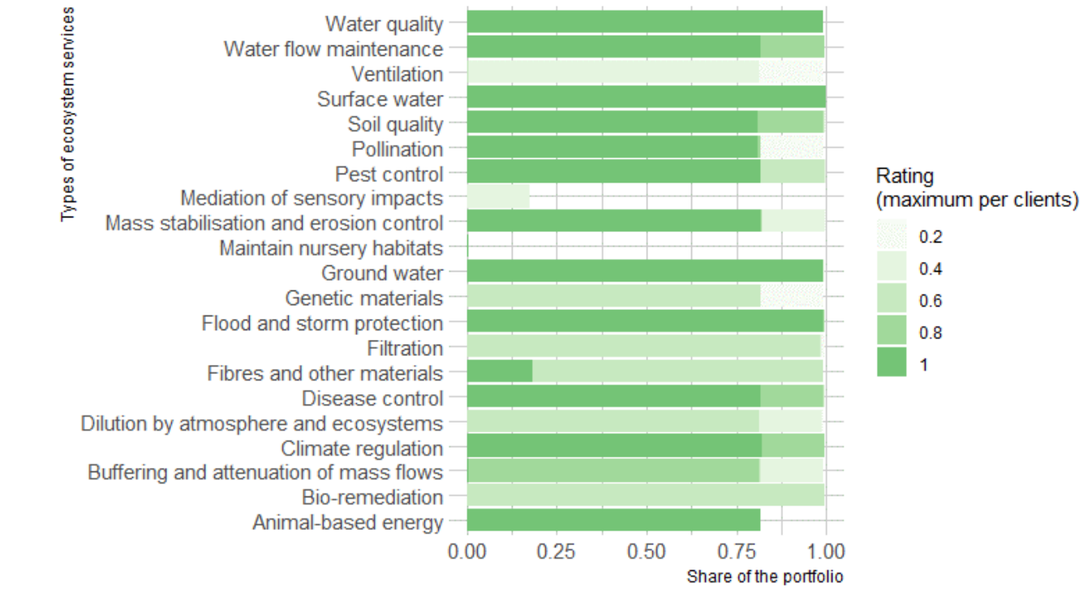
Bank B

Compared to other banks in the sample, Bank B's agri-portfolio is more exposed to livestock-related activities. This agri-production sector is highly reliant on ecosystem services, exposing this portfolio to multiple physical risks, including those linked to water provision and regulation services such as flood protection and pollination. The bank also has high exposure to the *Growing of Fruits, Nuts, Beverage, and Spice Crops* (ZAR 12,840m), which is also highly dependent on ecosystem services.

Figure 9 shows that 99% of Bank B's portfolio is exposed to clients with Very High dependency on at least six ecosystem services – highlighting a broad exposure to physical risks.

- Bank B's entire portfolio is exposed to a Very High dependency on surface water provisioning. This shows that all clients within the portfolio rely heavily on surface water sources for their operations, whether for irrigation, processing, or livestock watering. This dependency exposes the portfolio to significant risks related to water scarcity, drought conditions, and changes in water regulations or availability.
- 100% of the portfolio is likewise dependent on flood and storm protection services, indicating that all clients depend on natural barriers and ecosystem services that mitigate the effects of extreme weather events such as floods and storms. This dependency highlights the importance of maintaining and restoring ecosystems such as wetlands, mangroves, and forests that provide natural flood defences. Without these natural defences, clients are vulnerable to infrastructure damage, crop loss, and operational disruptions caused by severe weather events.
- 99% of the portfolio is dependent on water quality, underscoring the critical need for clean and safe water in agricultural and processing activities. Poor water quality can lead to decreased productivity, health problems in livestock, and contamination of agricultural products, which can have severe financial implications. This dependency necessitates stringent water management practices, pollution control measures, and regular monitoring to ensure water sources remain uncontaminated.
- Pollination services affect 78% of the portfolio (ZAR 40 727m), highlighting the reliance on pollinators such as bees, birds, and other insects for the production of fruit, vegetables, and other crops. The decline in pollinator populations due to habitat loss, pesticide use, and climate change poses a significant risk to agricultural productivity. This dependency underscores the necessity for practices that protect pollinator habitats, reduce pesticide use, and promote biodiversity.

Figure 9. Share of the portfolio exposed to clients dependent on specific ecosystem services



Source: Bank B's primary sector portfolio and ENCORE Partners 2023.

The four sector production processes to which the portfolio is most exposed are (Appendix Figure 1):

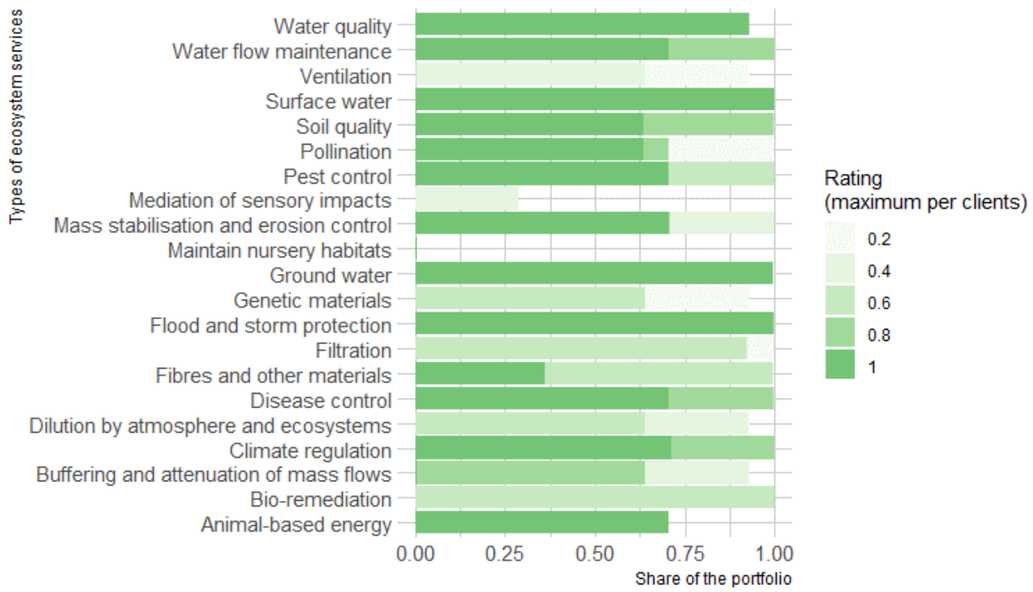
- ***Livestock activities (Mixed Farming)* (ZAR 22,631m)** is the production process to which the portfolio is most exposed. It is broadly and significantly dependent on 17 ecosystem services including water provisioning, soil quality, and disease control. The high financial exposure underscores the importance of these ecosystem services for sustaining mixed farming activities.
- ***Growing of Fruits, Nuts, Beverage and Spice Crops* (ZAR 12,840m)** is also highly reliant on ecosystem services such as pollination, water quality, and climate regulation. The dependency on these services is critical given the nature of crop production, which requires specific environmental conditions to thrive.
- ***Farming of Cattle, Sheep, Goats, Horses, Asses, Mules and Hinnies; Dairy Farming* (ZAR 5,957m)** is significantly dependent on water provisioning, soil quality, and disease control. The dependency reflects the needs for sustainable livestock management practices to ensure healthy and productive livestock.
- ***Growing of Cereals and Other Crops* (ZAR 4,820m)** is highly dependent on water flow maintenance, soil quality, and pest control. These services are vital for crop health and yield, which are directly influenced by environmental conditions.

Bank C

Bank C's entire portfolio is exposed to clients with a Very High dependency on more than six ecosystem services, revealing a broad and strong exposure to nature-related physical risks.

- It is most exposed to forestry and logging-related sectors (ZAR 2,232m). This makes it particularly exposed to specific physical risks such as those related to the provision of fibres and wood materials by ecosystems.
- Surface water provisioning emerges as a critical service (Figure 10), with 100% of the portfolio exposed to clients with a Very High dependency on this service.
- Flood and storm protection is also crucial, with 98% of the portfolio Very Highly dependent on these services.
- Soil quality and pollination services are essential for 60-75% of the portfolio, depending on the materiality rating.

Figure 10. Share of Bank C's agricultural portfolio exposed to clients dependent on specific ecosystem services



Source: Bank B's primary sector portfolio and ENCORE Partners 2023.

The three sectors with the highest exposure are (Appendix Figure 2):

- **Logging and related services (ZAR 1,723m),** which is highly dependent on ecosystem services such as soil quality, climate regulation, and water flow maintenance and provisioning. Monocrop plantations are particularly vulnerable to fire and soil degradation. The logging sector's reliance on these services is critical, and sustainable forestry practices are essential for maintaining soil health and ensuring the continuous availability of forest resources.
- **Agriculture service activities (ZAR 1,236m)**, shows significant dependencies on ecosystem services like regulation of water quantity pest control, pollination, and soil quality.
- **Growing of vegetables and horticulture (ZAR 1,072m)** is highly reliant on water provisioning, pollination, and climate regulation. The dependency on these services underscores the importance of favourable environmental conditions for vegetable and horticultural production, which require adequate water supply and effective pollination to ensure optimal growth.

This sectoral breakdown highlights Bank C's significant exposure to physical nature-related risks across its agri-portfolio. The high dependencies on key ecosystem services such as soil quality, water provisioning, and pollination emphasise the need for implementing sustainable practices and enhancing risk management frameworks. By understanding these dependencies, Bank C can better manage its exposure to potential disruptions in these ecosystem services, ensuring long term financial stability and resilience.

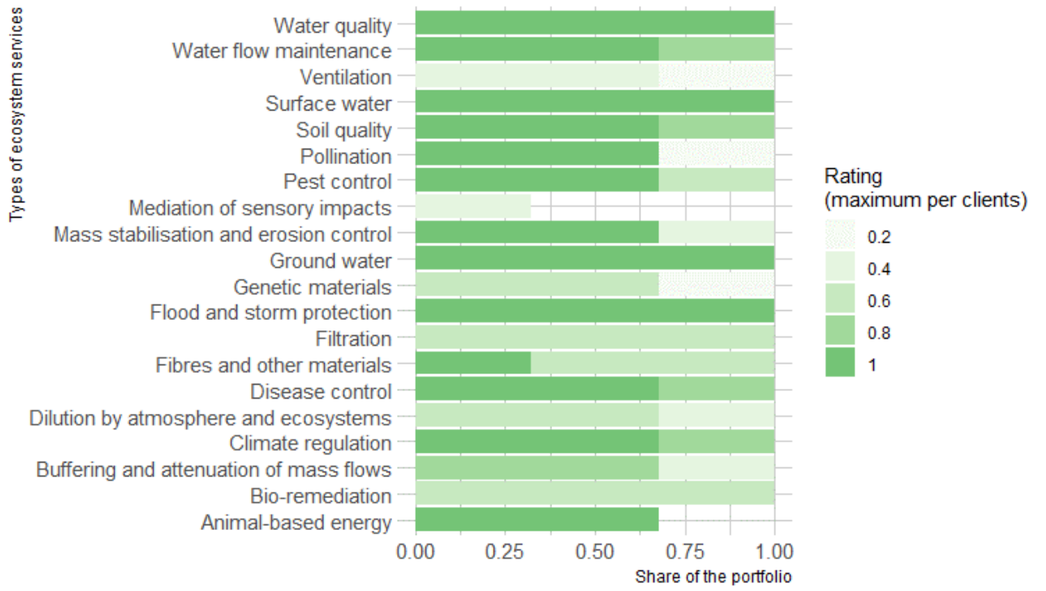
Bank D

Bank D's agri-portfolio is similar to Bank B with high exposure to livestock-related activities and the growing of fruit. This means it has high dependency on a wide range of provisioning and regulation ecosystem services. Like Bank B, it is also exposed to cereal crop-related sectors. Again, all clients in the portfolio exhibit a Very High dependency on at least six ecosystem services, which indicates a strong and broad exposure to physical nature-related risks.

Figure 11 illustrates the extent to which Bank D's portfolio is dependent on different ecosystem services.

- It is most exposed to forestry and logging-related sectors (ZAR 2,232m). This makes it particularly exposed to specific physical risks such as those related to the provision of fibres and wood materials by ecosystems.
- Surface water provisioning emerges as a critical service (Figure 10), with 100% of the portfolio exposed to clients with a Very High dependency on this service.
- Flood and storm protection is also crucial, with 98% of the portfolio Very Highly dependent on these services.

Figure 11. Share of the portfolio exposed to clients dependent on specific ecosystem services



Source: Bank D's primary sector portfolio and ENCORE Partners 2023.

The two sectors to which Bank D is most exposed (Appendix Figure 3):

- ***Growing of cereals (except rice), leguminous crops and oil seeds* (ZAR 7,792m)** is critically dependent on several ecosystem services including water provisioning, water flow maintenance, soil quality, and pest control. These services are essential for ensuring the health and productivity of cereal and leguminous crops. Effective water management, soil fertility, and pest management practices are vital for sustaining crop yields and maintaining the economic viability of these farming activities and thus the financial performance of the bank's agri-portfolio.

- ***Raising of cattle and buffaloes*** **(ZAR 6, 658m)** has significant dependencies on ecosystem services such as water provisioning and disease control. The reliance on these services highlights the importance of sustainable livestock management practices to ensure the health and productivity of cattle and buffaloes. Adequate regulation of water supply and effective disease management are critical for maintaining the wellbeing of livestock and supporting the portfolio's performance related to this sector.

This sectoral breakdown illustrates Bank D's substantial exposure to nature-related physical risks through its agricultural portfolio. The high dependencies on key ecosystem services such as water provisioning, soil quality, and pest control underscore the need for robust risk management strategies.

Key observations and results

The dependency analysis using ENCORE reveals significant exposure to physical nature-related risks across the agri-portfolios of all four banks. The analysis illustrates that all clients in the analysed portfolios depend on at least one ecosystem service, with a majority exhibiting a Very High dependency on multiple ecosystem services. For instance, Bank A's portfolio indicates that 66.5% of its agricultural loans (ZAR 2,561m) are tied to clients highly dependent on at least six different ecosystem services. Important ecosystem services include surface water provisioning, pollination, and flood and storm protection, underscoring the critical nature of these services for the agricultural sectors involved.

Different banks exhibit variations in their exposure profiles. Banks A, B and D all have substantial investments in livestock activities, which implies particularly high dependence on surface water and groundwater-related services. These banks also have significant investments in general crop-related activities, which, as well as depending on water flow regulation services, also depend on soil quality regulation services. Both Bank B and D specialise in financing fruit growing (ZAR 12,840m in Bank B's case) for which pollination services are particularly important. Bank C's portfolio, while similar, also includes high exposure to the forestry and logging sectors (ZAR 2,232m), introducing specific dependencies on erosion control, landslide mitigation and rainfall pattern regulating services, as the risk of wildfires, flooding and landslides is especially elevated in monocrop plantations.

While reliance on water-based services calls for more sustainable water use, it also calls for the restoration of native vegetation which is known to promote water retention, sediment retention and reduce drought (Butt et al, 2023, Alencar et al, 2015). Native vegetation restoration also has a positive effect on pollination, soil quality and climate-regulating services such as temperature regulation and cloud cover (Halinski et al, 2020; FAO, 2020; Spracklen and Garcia-Carreras, 2015).

The extended analysis carried out for Bank A shows that there is variation in dependency profiles across different types of financial instrument. Bank A's agricultural commercial mortgages for example, are not associated with companies that are highly dependent on pollination but highly dependent on soil quality, while its overnight loans are not very dependent on either. Such heterogeneity likely exists across all banks' financial portfolios, leaving some more vulnerable to nature shocks and nature degradation compared to others.

Cumulatively, the quantitative exposure of all participating banks' agriculture credit books could be material to the economy of South Africa on multiple levels. Although the direct contribution to GDP of the primary sector is only 2.5%, disruptions to this sector are likely to have cascading impacts across secondary and tertiary economic sectors which depend on agriculture, such as processing, manufacturing, distribution and retail. In addition, South Africa's food security is largely dependent on its agricultural sector. Banks also tend to be highly interconnected, increasing the likelihood that a relatively small shock to one bank could be amplified across the financial system (see Ranger et al. 2024).

Limitations and gaps

While the analysis above is a useful starting-point for identifying nature-related risk, it could also go further to address limitations in the methodology.

- The analysis only considers the physical risk exposure and dependency and does not consider transition risk, such as regulatory change, reputational risk or litigation risk.
- The current body of knowledge about financial risk assessments is nascent with little to no opportunity for comparison and benchmarking.
- The current analysis only considered agriculture, forestry and fishing credit exposure.
- The analysis provides evidence of the potential exposure of the portfolio to certain risks; it does not provide information on actual risks. Further research would be required to link portfolios to assess the materiality of nature-related risk at the asset level.

- Potential linkages between the agriculture sector and the national economy need to be further researched to better understand the cascading effects of shock to the agricultural sector to the wider economy.
- There is a lack of standardisation of industry sector and sub-sector classifications across the banks, which makes alignment with the ENCORE knowledge base difficult.

Recommendations for future research

Future research should address additional dimensions relating to banks' exposure to nature-related financial risk, including:

- An analysis of the geographical distribution of banking exposure based on the locations where the counterparts operate, such as at province or municipal level.
- Further analysis of the types of financial instruments involved (as illustrated in the case of the Bank A portfolio), along with their varying maturities, including long-term loans, short-term loans, and mortgages.
- An assessment of how nature-related physical risk is dispersed across different clients to understand the extent to which risk is concentrated in a few counterparts or loans.

Understanding these dimensions would provide a more comprehensive understanding of a bank's exposure, which would allow banks and policymakers to make more targeted interventions.

Further studies should also go beyond exposure analysis to assess the materiality of nature-related dependency risk at relevant locations. This would involve assessing the state of nature at specific locations, the likelihood and extent of decline and/or disruptions to ecosystem services, and the adaptive capacity of exposed clients and banks using, for instance, Value-at-Risk analysis, credit risk and scenario analysis.

Importantly, expanding the scope of the analysis to include secondary and tertiary sectors will be crucial to comprehensively assess the vulnerability of any banking portfolio to nature-related risks. These non-primary sectors are not only more significant in monetary terms but are also indirectly exposed to physical risks through value-chain cascading effects from the shocks endured by the primary sectors. Such a broader analysis would provide a more holistic and comprehensive view of the bank's or financial system's idiosyncratic vulnerability to nature-related risks.

Supporting nature-related disclosure and the regulatory policy landscape

South African banks' exposure to nature-related risks could be mitigated through disclosure, prudential supervision and regulation. This section provides an overview of South Africa's position within the international nature-related disclosure and regulatory policy landscape. A subsequent section will dive deeper into how South Africa's five largest banks are responding to those risks.

Financial institutions are regulated by their country's banking authority. This often follows the international recommendations of the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS) to determine the acceptable level of risk in the financial system. This is referred to as the prudential policy environment. There is also a broader disclosure and policy environment including organisations such as the International Sustainability Standards Board (ISSB), the Taskforce on Nature-related Financial Disclosures (TNFD), the European Union (EU) and national policy regulators. This group helps define sources of risk and puts pressure on financial institutions to disclose their risk exposure. This may be referred to as the 'regulatory enabling environment' as it demonstrates that regulation is valuable and possible (WWF and UNEP FI, 2024). The regulatory enabling environment plays a crucial role in the gradual integration of environmental risks as a recognised source of risk in prudential policy, including in South Africa.

The international prudential and broader policy environment

BASEL III

South Africa's banking authority has implemented several of the BCBS's recommendations on risk management. In January 2023, for instance, it implemented regulations aligned with the Basel III capital framework, a comprehensive set of international banking guidelines to strengthen the regulation, supervision, and risk management of banks to promote stability in the global financial system. Basel III's Pillar 1 focuses on minimum capital and liquidity requirements, Pillar 2 focuses on individual bank supervision, management and governance and Pillar 3 focuses on disclosure. The macroprudential component overlays all three pillars. While climate-related risks are not a formal, binding component of Basel III standards, the BCBS has provided significant guidance to encourage the integration of these risks into banking risk management and supervision frameworks. Internationally, many jurisdictions have included climate-related risk considerations and stress testing exercises as part of their Pillars 2 and 3 policies, the EU being a case in point.

Basel III does not explicitly mention that nature should be taken into account. However, around the world, many jurisdictions have started incorporating nature-related elements within regulations falling under Pillar 2 via supervisory review guidelines and Pillar 3 (see WWF and UNEP FI, 2024 for an international review of progress in this matter). Although progress is being made toward integrating nature-related financial disclosures under Pillar 3, Pillar 2 is arguably under-utilised in most jurisdictions. Leveraging the provisions of Pillar 2 does not require extensive data. Indeed, micro- and macroeconomic stress testing is precisely designed to consider the effects of different scenarios of uncertain probabilities (the counterweight is that it may not lead to stringent regulatory measures).

Integrating nature-related risks into Pillar 1 regulations on capital and liquidity requirements would require more information on the actual risks attached to nature-sensitive investments as well as methods for determining appropriate weighting for nature-related financial risk. Stringent data and methodological requirements should in theory precede any changes to Pillar 1. However, some have argued for Pillar 1 modifications even in the absence of such data due to enduring radical uncertainty and the necessity to take a precautionary approach (Chenet et al. 2022). The regulatory enabling environment is helping to refine methods and reduce uncertainty by promoting disclosure and research. As financial and non-financial firms conduct detailed assessments of their nature-related risks, transparency improves, and the availability of relevant data continues to grow.

Standard setters in corporate disclosure: TNFD and ISSB

Standard setters such as the TNFD and the ISSB promote awareness of environmental risk and provide guidance for companies and financial institutions to assess and disclose their nature- and climate-related financial risks. Their standards are commonly subject to voluntary adoption and may be regarded as part of a discovery and early application process in the policy-enabling environment. They shape perceptions of risk and produce findings that can then be integrated alongside other forms of financial risk, to guide prudential policy – albeit arguably sometimes too slowly and inefficiently (Chenet et al, 2022). These standards may also form the basis of disclosure and

due diligence regulations at the national level.

The ISSB was formed to develop global accounting and sustainability disclosure standards aimed at both companies and financial institutions.

- On the climate front, the ISSB issued two sustainability standards in June 2023: IFRS (International Reporting Standards) S1 – General Requirements for Disclosure of Sustainability-related Financial Information, and IFRS S2 – Climate-related Disclosures. More than 30 jurisdictions have announced plans to adopt or align with its standards. These jurisdictions represent more than half of the global economy by GDP.
- The ISSB is now actively considering the inclusion of nature-related risks and opportunities in its standards as part of its 2024-6 Work Plan. In particular, it is exploring how the TNFD's framework on nature-related risks and dependencies can be incorporated into future ISSB standards. The TNFD released its disclosure recommendations and additional guidance in September 2023. The TNFD is already aligned with the Taskforce on Climate-Related Financial Disclosures (TCFD) on the four disclosure pillars of governance, strategy, risk management, and metrics and targets.
- Only one South African financial institution and one company have formally adopted the recommendations and guidance of the TNFD.

Other reporting systems and standards, such as the Carbon Disclosure Project (CDP) and the Global Reporting Initiative (GRI), have also contributed to broader environmental disclosure efforts. The GRI has been widely adopted by South African reporting entities and addresses broader nature risk through the GRI 304 Biodiversity Standard (GRI, 2024)[11].

The ISSB has forged strategic relationships with other institutions to support the interoperability between its standards and others (IFC, 2024), this includes:

- CDP: the ISSB's climate standard is the foundational baseline for CDP's climate disclosure.
- GHG Protocol: the ISSB is actively engaged in updates to the GHG Protocol Corporate Standard.
- The GRI seeks to deliver full interoperability through jointly identifying and aligning common disclosures to deliver a seamless sustainability reporting system. Apart from alignment on analysis and mapping disclosure for Scope 1, 2 and 3 GHG emissions; they are collaborating to deliver full interoperability between GRI's 101 Biodiversity Standards and ISSB's project on Biodiversity, Ecosystems and Ecosystem Services – 'BEES' ("S3").

11. To be updated by GRI 101: Biodiversity 2024 reporting standard (effective implementation date of 1 January 2026)

- Transition Plan Taskforce (TPT): the IFRS Foundation will assume responsibility for TPT's disclosure-specific materials.

South African national policy initiatives

The South African government lags behind most developed economies and some emerging economies, such as Malaysia and Brazil, in integrating environmental disclosure standards and regulations. South Africa has not yet mandated the adoption of the ISSB's climate standards. The implementation of these standards requires amendments to existing legislation, specifically the Companies Act of 2008, which currently mandates financial reporting in accordance with the International Financial Reporting Standards (IFRS) but does not include sustainability disclosures.

Despite some international standard setters' advancements in promoting better knowledge and disclosure of nature-related risks, South African prudential supervisors and regulators have yet to incorporate disclosure frameworks as part of a national strategy. Nevertheless, they have recently made significant strides in improving climate-related and sustainability disclosures. The following section outlines key initiatives from the South African Reserve Bank's Prudential Authority (PA), the Financial Sector Conduct Authority (FSCA), the Department of Trade, Industry and Competition (DTIC), and the Companies and Intellectual Property Commission (CIPC).

The South African Reserve Bank and Prudential Authority

The South African Reserve Bank (SARB) is responsible for maintaining financial and price stability in South Africa. It considers relevant climate factors to be material to financial stability. Under the Financial Sector Regulation Act 9 of 2017 (FSR Act), the SARB is required to release a biannual review of the financial system's stability. In the Second Edition 2022 Financial Stability Review, the SARB incorporated climate change into the risk assessment. The review highlights the potential impact of climate change on the insurance sector, including rising claims and increased costs for insurance products (SARB, 2022b). The SARB Annual Report (2023/2024) highlights the bank's role in supporting the financial sector to adapt to and mitigate against climate risks by improving information flows within financial markets. This ensures that climate considerations inform investment decisions, maintaining financial and price stability amid rising climate risks (SARB, 2024).

The South African Reserve Bank's Prudential Authority (PA) is responsible for regulating banks (commercial, mutual and co-operative banks), insurers, co-operative financial institutions, financial conglomerates and certain market infrastructures. Additionally, as part of the PA's 2021-2024 Regulatory Strategy,

future supervisory initiatives will align with Basel III's Pillars 2 and 3 frameworks, integrating international standard-setting and developments across all risk types (SARB-PA, 2021).

The National Treasury's Financing a Sustainable Economy Technical Paper (2020, updated 2021) outlines recommendations for advancing sustainable finance. These include:

- Developing a Green Finance Taxonomy and governance framework.
- Co-developing technical guidance and standards on environmental and social (E&S) risk management, science-based methodologies, target-setting, and alignment with the TCFD.
- Creating a benchmark climate risk scenario for stress tests.
- Building sector capacity for effective climate risk governance, management, and disclosure.

Following the paper's recommendations, several working groups were formed under the Climate Risk Forum Steering Committee, chaired by the National Treasury (NT) and hosted by the Banking Association of South Africa (BASA). These groups include:

- A Taxonomy Working Group to develop the Green Finance Taxonomy and governance framework, promoting capital flows to green activities.
- A Financial Instruments Working Group to explore sustainable finance instruments for South Africa.
- A TCFD Working Group to establish minimum disclosure requirements.
- A Climate Working Group to benchmark climate risk scenarios for stress tests.
- A Capacity Working Group to enhance awareness and provide training materials.These efforts resulted in the creation of the South African Green Finance Taxonomy (GFT).

In May 2024 the SARB published four Guidance Notices on climate-related disclosures, risk management, and governance practices for banks and insurers following a public consultation process. These notices are part of the PA's broader strategy to integrate climate-related risks into its regulatory and supervisory framework. The Guidance Notices outline the minimum expectations for institutions' climate-related disclosures, governance, and risk management practices. While not legally enforceable, the notices aim to promote transparency, ensuring that local institutions align with international standards for climate-related disclosures, while also enhancing industry efforts to strengthen climate-related governance and risk practices. The PA will monitor the implementation of these notices, which are aligned with IFRS S2 and initially focus on climate-related risks. Other environmental risks and sustainability disclosures may be considered in the future.

South Africa's Financial Sector Conduct Authority

The Financial Sector Conduct Authority (FSCA) is South Africa's market conduct regulator for the financial sector. The FSCA's Sustainable Finance Consumer Risk Report and Roadmap 2024 (FSCA, 2024) addresses the broader domain of sustainable finance, emphasising the need for reporting and disclosures in line with the Principles on Financial Consumer Protection and the Green Finance Taxonomy (GFT). These frameworks promote sustainability and ESG disclosures, though they remain voluntary. Current regulatory guidance on non-financial information disclosures is also voluntary. However, entities listed on the Johannesburg Stock Exchange (JSE), must adhere to mandatory governance requirements related to sustainability outlined in the listing rules, which include adherence to South Africa's non-legislative but influential King IV (2016) Code of Corporate Governance on a "comply or explain" basis. While JSE listing rules are mandatory for exchange-listed entities, they are not mandatory from a finance regulatory perspective. The FSCA's Roadmap for sustainable finance includes disclosures, transparency, and alignment with the Green Finance Taxonomy.

The FSCA plans to release similar voluntary disclosure guidance for non-bank and non-insurance financial institutions, such as collective investment schemes, retirement funds, and listed companies. Addressing climate-related risk protection gaps, particularly in the insurance industry, is also a key focus for the FSCA. The authority is collaborating with the insurance industry to address contract certainty around climate-related exclusions, which exacerbate protection gaps. Furthermore, the FSCA is working with the National Treasury and the PA on policy responses concerning disaster risk financing.

The FSCA's Sustainable Finance Roadmap (FSCA, 2024) outlines its approach to corporate sustainability reporting and the initiatives it is considering. These include:

- Issuing voluntary corporate disclosure guidance for institutions that are not regulated by the PA. Where feasible, this guidance will be aligned with PA guidance and ISSB standards.
- Developing voluntary guidance for listed entities that aligns with ISSB standards.
- Assessing both regulator and industry readiness for the potential future adoption of ISSB-aligned standards on a mandatory basis. This assessment will include determining the scope of mandatory implementation, its timing, the entities affected, and the implementation timeline.

The FSCA emphasises that consultation and engagement with relevant

regulators, entities, and stakeholders will be integral to support the proposed activities.

The Department of Trade, Industry and Competition (DTIC) and the Companies and Intellectual Property Commission (CIPC)

The Companies and Intellectual Properties Commission (CIPC), which is relevant for financial institutions, has updated its Taxonomy to include all IFRS Taxonomy releases published. This update also incorporates the IFRS Sustainability Disclosure Taxonomy 2024, enabling early voluntary adopters of IFRS S1 and S2 to tag their sustainability-related financial disclosures according to the IFRS Sustainability Disclosure Standards.

The Department of Trade, Industry and Competition's (DTIC's) Research and Policy Unit is exploring the development of a policy to support mandatory sustainability reporting, while the CIPC seeks additional input to enhance and inform the DTIC's draft policy. Additionally, the 2024 CIPC XBRL Taxonomy, launched on 1 October 2024, has been updated to enable voluntary early adopters of ISSB IFRS S1 and IFRS S2 to tag their sustainability-related financial disclosures.

How domestic banks are responding to nature-related risks

This section examines how the five largest commercial banks in South Africa **(Absa, FirstRand, Nedbank, Investec and SBSA)** are responding to the ESG and nature-disclosure environment, and how they are further considering emerging nature-related risks in their practices. South African banks, like most global banks, are increasingly integrating sustainability and ESG considerations into their operations, policies, and reporting frameworks. This is driven largely by market pressure and increasing stakeholder interest in these topics. All the banks have continental African interests. They also interact economically with EU jurisdictions, where emerging sustainability disclosure requirements are becoming an important consideration for domestic finance institutions.

Corporate ESG disclosures

The South African finance sector demonstrates a high level of ESG reporting maturity. This is due to familiarity with other IFRS non-financial reporting frameworks such as Integrated Reporting (IR) and the King IV Code of Good Corporate Governance under the Value Reporting Foundation[12].

All the banks have established internal ESG policies and procedures across various line functions, including corporate and group sustainability, reporting and disclosure, specific business cluster ESG functions, and group strategic risk. However, these functions often lack coordination and have varying foci and mandates. Corporate and group sustainability functions align the group's ambitions and public commitments with global policy and standard requirements. Business cluster functions focus on operational and transactional ESG-related risks, considering sector portfolios and individual transactions to meet compliance ESG risk requirements[13]. Group risk functions address alignment with the financial system and organisational-wide risks, such as climate stress testing and high-level financial exposures. Corporate disclosure and reporting functions ensure the banks adhere to commitments to policies,

12. Now incorporated into the IFRS
13. such as environmental authorisations: EIAs and water use licenses. Often IFC Safeguard policies are followed for regional transactions.

standards and frameworks like GRI, King IV, and PRB for ESG reporting. This is communicated as part of their annual reports, although most banks publish a separate sustainability report. Some of the banks have started to focus on sector-specific ESG considerations for portfolios with significant impacts and dependencies on the environment such as agriculture and mining.

South African financial institutions are highly regulated by both global and domestic finance regulations, and most are signatories to global protocols and initiatives which require them to report on specific minimum requirements[14]. All are listed entities on the JSE and will be subject to current and future listing rule requirements. Competition among listed financial institutions means that all are disclosing on their material ESG exposure. IFRS finance reporting requirements take preference, and IFRS associated non-financial disclosure requirements such as the ISSB standards are being closely considered by the major South African financial institutions.

Johannesburg Stock Exchange (JSE) listing requirements

The JSE is a leader in governance and sustainability – it has introduced various initiatives, including aligning its listing requirements with the King Codes, the 2004 SRI Index (the first ESG index by an exchange), and involvement in global sustainability initiatives like the Sustainable Stock Exchanges initiative, the UN-backed PRI, and the GISD Alliance. It was one of the first emerging market exchanges to introduce segments for green, social, and sustainability bonds, and offers derivative contracts based on the FTSE/JSE Responsible Investment Index. Following ESG guidance from SSE (2015) and WFE (2018), 60 exchanges have since issued similar disclosure guidance.

The JSE also plays a key role in promoting sustainability and ESG reporting, especially with IR, which it helped establish in South Africa and globally. Adopting the King IV Code of Corporate Governance, the JSE has driven the adoption of ESG disclosures in corporate South Africa, emphasising that "markets are a powerful force for good" in achieving sustainable, socially equitable development. The exchange mandates sustainability-related governance requirements in its listing rules and requires companies to apply King IV on an 'apply and explain' basis. Additionally, its voluntary Sustainability and Climate Change Disclosure Guidance (June 2022) helps companies navigate global sustainability and climate disclosure frameworks, including GRI, TCFD, and the IIRC's International <IR> Framework.

14. Such as UNGC, UNEP FI's PRB and PRI, Equator Principles, IFC Safeguard Policies, PCAF, PBAF, amongst others.

More recently the JSE benchmarked the effectiveness and relevance of its own guidance against other key sustainability reporting initiatives. It considered the balance between the guidance provided and alignment with global best practice, specifically the ISSB IFRS S1 and S2 standards, against the background of possible regulatory developments.

All the banks in this study are listed on the JSE and have either adopted or are busy considering the JSE Sustainability and Climate Disclosure Listing Guidance (JSE 2022).

Domestic banks' response to climate risks

Domestic banks have recently placed increasing emphasis on understanding financed emissions, climate-related risks, and reporting. This focus has been driven by stakeholder pressure, particularly from financiers and guarantors, as well as emerging policy and regulatory demands. The global attention on financed emissions has pushed most banks to prioritise climate-related risks, with many banks relatively advanced in disclosing these risks. However, many are only beginning to address nature and biodiversity risks, with varying levels of adoption.

In addition to focusing on climate-related risks, banks actively participate in industry-wide initiatives, such as the BASA Sustainability Finance Committee, to tackle broader sustainability challenges and share best practices. Over the past few years, banks have invested significant effort into integrating climate-related aspects into their operations, policies, and reporting frameworks. This aligns with the global drive to reduce greenhouse gas emissions, supported by long-standing policy and standard developments.

All five banks interviewed for this study have released a climate change position statement outlining their intent and have disclosed climate-related aspects in their annual reports, with some publishing dedicated climate change reports. All are aligned with or disclose according to the TCFD framework, distinguishing between their own operational risks and their exposure to risks within their investment and lending portfolios. Following publication of the SARB's supervisory guidance on climate disclosures and stress testing, which remains voluntary, all banks have now adopted the guidance, with most already well advanced in conducting climate stress testing assessments.

How are commercial banks addressing nature?

A recent study found that at least 50% of bank activity in emerging markets is directly dependent on nature, (McKinsey, 2022). Despite the evidence that nature loss or disruption is a material risk to banks (see also section 2), nature-related or biodiversity risk is yet to be properly integrated into sustainability frameworks.

How nature features in domestic bank financial decision-making

All five banks studied are engaging with and considering nature-related risk for project-related finance. Nature is assessed in banks' social and environmental management systems (SEMS or ESRM) for credit applications at a transactional level. These review processes are conducted in South Africa within the context of national and provincial environmental legislation. These requirements translate into a set of questions which are included in the credit screening process and are evaluated by the banks' technical environmental and social specialists.

The banks often engage with additional global review criteria such as the UNGC Equator Principles and other recognised safeguards. Most have adopted the IFC safeguard policies as minimum criteria to ensure standardisation and comparability across jurisdictions. IFC PS6 (2012) specifically relates to Biodiversity Conservation and the Sustainable Management of Living Natural Resources.

As nature-related risks are only considered at a transactional level, they have not been considered within the wider enterprise risk management architecture. Most banks acknowledge that emerging nature-related risk is of material concern, and are starting, albeit very tentatively, to consider nature as a strategic risk. Due to the complexity of nature and the lack of guidance, uptake is slow. Yet some banks already have executive buy-in to consider nature following their respective climate assessments.

Applying the TNFD: A risk and opportunity management framework for nature

A UNEP FI pilot saw 42 global financial organisations trial the TNFD's Locate, Evaluate, Assess and Prepare (LEAP) approach between July 2022 to February 2023. The TNFD provides a framework for assessing and addressing nature-related risks and is closely aligned with the TCFD. Two of the South African banks studied here are already recognised signatories of the TCFD framework (Table 2), but none have formally started adopting the TNFD. FirstRand participated as a taskforce member during development of the TNFD framework. Specifically, it contributed to the working groups on metrics and targets, the agricultural sector and financial institutions. FirstRand and Nedbank have piloted the TNFD framework at a high level (limited to a readiness review of the TNFD Recommendations).

Adopting nature-related financial disclosures
Despite a lack of local guidance and limited integration of nature-related risks, most of the banks are supportive of mandatory nature-related disclosures (Table 3). However, many have indicated that transition risks are of greater concern than physical nature-related risks, suggesting that regulation and policy have the most important role to play in making banks act on nature-related risk. All have indicated an appetite for aligning corporate disclosures with the requirements coming out of the IFRS – in particular the ISSB S1 and S2 standards – due to their multinational distributions. It is anticipated that the ISSB Biodiversity, Ecosystem, and Ecosystem Services (BEES) project will materialise into an S3 standard for nature. Most of the banks have stressed that there are already significant challenges in addressing climate-related financial disclosures, and that addressing nature-related financial disclosures will require significant effort and cost due to the complexity of nature-related financial risk.

Table 2. Domestic banks' responses to nature-related risks and disclosures (voluntary and mandatory)

Bank	Previous and current work on nature and climate-related financial risks	Approach to climate and nature-related disclosures
Absa	• Environmental considerations at Absa are primarily focused on and include water stress and climate risk analysis. • Absa collaborated with the UNEP working group that piloted the TNFD, and is now developing a pilot in its agriculture portfolio to understand data requirements, risks, opportunities, and reporting, with regards to conducting nature-related risk assessment. • This initial research also includes developing a business case for nature and methods to effectively interpret client data. • Absa is increasing awareness of biodiversity among internal stakeholders, with a strategic focus on understanding biodiversity risks and opportunities. It is collaborating with external consultants to integrate climate risk and biodiversity, aiming to identify relevant data and understand impacts on sensitive biodiversity areas, with an initial focus on its agri-portfolio. • Absa has not engaged formally with international standards on nature-related risk, currently still dominated by addressing climate disclosures and stress testing.	• Absa anticipates that voluntary climate reporting will become mandatory and believes it should also be cautious about the potential for mandatory nature-related disclosures. • Climate disclosures face data challenges, requiring improved guidance. • Absa stresses the need for engagement with finance regulators to understand banks' actions and appetite for addressing nature risk. Guidance and assistance from regulators for addressing nature-related risks is required. • Biodiversity data assessments are more complex than climate assessments, often requiring location-specific and credible data sources – which in many instances are not available. Early discussions on nature are crucial, and Absa believes SARB should help guide banks in this area.

FirstRand

- FirstRand's approach to climate and nature-related risk management is set out in the FirstRand Environmental Sustainability Policy (FirstRand 2022).
- FirstRand is a pioneer among South African domestic banks in its approach to nature-related risk. It participated in one of the first ENCORE application case studies focused on nature-related impacts and dependencies across a portion of its agri-lending portfolio in 2018.
- FirstRand has consistently applied ENCORE to raise awareness of nature-related risks for client and internal risk assessment processes, including heatmapping high risk and high stress areas within portfolios.
- FirstRand participated in the TNFD forum and working groups to develop the TNFD framework. FirstRand actively contributed to the metrics and targets, agricultural sector and the FI working groups.
- FirstRand in partnership with FSD Africa has piloted the TNFD recommendations on nature-related risk disclosure.
- Currently nature is an integrated component within FirstRand's Environmental and Social Risk Assessment (ESRA) process. The process makes provision for climate and biodiversity screening (assessments) in addition to legislative requirements.
- The ESRA procedure includes restrictions on investment and funding activities, such as the exclusion of activities trading in endangered species, and various activities which have a negative interface with nature.
- FirstRand is a member of the Partnership for Biodiversity Accounting Financials (PBAF) and participates in various working groups.
- FirstRand's climate risk and disclosure journey has been prioritised, but nature is considered the next most important area of risk and opportunity management.
- FirstRand supports mandatory enforcement of nature-related financial risk disclosures but emphasises the need for a phased approach, as many financial institutions lack the capacity and resources for implementation (a lesson learned from climate disclosures). Without mandatory enforcement, organisations are unlikely to voluntarily disclose.
- Although FirstRand has actively participated in TNFD working groups, it has not adopted the framework due to the complexity of nature and the lack of metrics and targets. Similarly, supervisory guidance will be required to identify and establish the metrics required for disclosure.
- FirstRand is considering the adoption and alignment to the ISSB suite of non-financial reporting standards, which has been endorsed by the Chief Risk Officer. This is in anticipation that ISSB will become the standard of choice under the IFRS and future anticipation of mandatory disclosure requirements.

Investec

- Investec has an integrated Group Environmental Policy and Climate Change Statement (Investec 2021). The policy focuses on the organisation's transition to net-zero, as well as the bank's own environmental impact which is managed by an EMS. The policy lists investment and financing exclusions which includes activities that interface with areas of high conservation value, or high environmental risk, such as tar sands, the Arctic, and Amazon rain forest, among others.
- Investec is the first South African financial institution to have released an integrated climate and nature-related report (Investec 2024).
- The report is aligned with both the TCFD and the TNFD, and its four pillars – Governance, Strategy, Risk Management, and Metrics and Targets.
- Investec's Sustainability Team integrates biodiversity and climate considerations into its operations. Its June 2023 Biodiversity Statement and disclosure of TNFD recommendations highlight its commitment to transparent disclosure. While Investec has addressed governance, strategy, and risk management, metrics and targets for biodiversity are undecided, due to the complexity of nature-related indicators.
- Investec has developed high-level environmental screening criteria and plans to focus more on biodiversity, recognising its importance alongside climate change.
- Investec is regulated by both South African regulations as well as the UK. This requires the organisation to consider all developments under emerging EU requirements, particularly the CSRD.
- Investec has considered the recommendations from the PA (2023) – which include the two guidance notes on climate risk disclosures and climate-related risk practices for banks.
- Investec has further considered the recommendations for sustainability-related disclosures from IFRS S1 and S2 and has incorporated the double materiality requirements as guided by the CSRD (Climate and Nature Report 2024).
- Investec can be considered an early adopter as it is aligned with key emerging global standards and frameworks.
- Investec is considering disclosure of material information but is unsure what nature-related data is considered material in lieu of the current gap in targets and indicators. Disclosure metrics, especially for small loan book shares, are problematic due to the extensive effort required to assess them.

Nedbank	• Nedbank conducted an initial Rapid Natural Capital Risk Appraisal (RNCRA) using the ENCORE tool for a selected agricultural commodity in a specific location (nature interface), considering material impacts and dependencies (Nedbank 2020). • Nedbank conducted a climate-risk materiality assessment (CRMA) in 2023 largely based on TCFD requirements, and in alignment with the SARB climate-related disclosure requirements. • Nedbank piloted a TNFD Recommendations Gap Review with FSD Africa, which was funded by UNDP BIOFIN (2023). • Nedbank's Social and Environmental Management System (SEMS) process currently addresses nature/environment impact-related risks at a project credit application and transaction level. It does not consider nature-related dependency risks, but these are now considered as part of Nedbank's nature-related risk assessment. • Nedbank released a Nature Position Statement (2024) which was endorsed by the bank's Executive Management Committee, and the Nedbank Board. The Position Statement lays the foundation for all future nature-related risk management initiatives by the bank. • Following the Position Statement, Nedbank commenced with a Nature Risk Assessment, acknowledging that nature-related risks, impacts and dependencies are material to the bank. • The Nature-Related Assessment is a pioneering effort by Nedbank to understand and manage nature-related financial risks within its credit portfolio across all business clusters. The ENCORE tool was applied to prioritise sectors based on the materiality of impacts and dependencies and extent of financial exposure. • The Nature-Related Assessment employs the TNFD's LEAP approach ensuring a comprehensive and systematic analysis of nature-related risks.	• Nedbank indicates that the finance regulator (SARB) must align domestic guidance with global best practice on disclosure, to ensure there are no conflicting requirements between domestic and global guidance. • Nedbank's Nature Risk Assessment is aligned with the TNFD framework in anticipation of further IFRS-related nature disclosure guidance (BEES - which is being aligned to the TNFD). • Nedbank is considering adoption of the ISSB suite of non-financial reporting standards and requirements.

Standard Bank of South Africa (SBSA)	• Standard Bank of South Africa (SBSA) has an ESMS to screen adverse impacts on society and the environment related to its business activities. This includes both its direct organisational activities as well as activities related to its financing. • The ESMS, and other E&S risk policies, includes provision to exclude certain financing activities, including those with impacts on landscapes, biodiversity, ecosystems, critical habitats and endangered/IUCN Red-listed species; direct or indirect impacts on biodiversity and ecosystem services are identified and avoided or mitigated (according to a mitigation hierarchy). • SBSA has reported on its climate-related risks and opportunities. The group's approach to managing risks and responding to climate change opportunities is aligned with the recommendations of the TCFD. • SBSA has found that developing standardised ESG taxonomies and disclosure standards is challenging across the jurisdictions in which it operates. • SBSA has not yet considered nature-related risks due to the current emphasis and focus on climate.	• SBSA follows SARB guidance on climate-related disclosures and risk practices. • SBSA collaborates with the Institute of International Finance (IIF) on Basel climate disclosures, aligning closely with IIF recommendations. It is integrating climate risk management into existing frameworks, requiring upskilling on data and scenario testing. This aligns with regulators' expectations, indicating a need for standardised climate indicators and metrics. • With emerging frameworks like the TNFD, Standard Bank aims to establish a standardised framework to build on lessons learnt from its work on climate disclosures. • Nature-related disclosures and risks have not yet been considered outside the ESMS process.

South African commercial banks have been relatively quick to adopt sustainability-related reporting. The same may be said for corporate South Africa as a whole, which has led on the adoption and application of important sustainability-related disclosures, particularly the technical advancement of integrated reporting and the King Codes of good corporate governance. This includes initial reporting of GHG emissions within the Carbon Disclosure Project (CDP) assisting banks' TCFD disclosures, which all banks are reporting against.

While member banks are currently focused on meeting the SARB climate-related disclosures and stress tests guidance requirements, the banks we interviewed are also actively considering nature-related risks. This includes considerations around alignment and adoption of the ISSB standards on the assumption that they will, in time, be applied in the South African jurisdiction, as is the case in the EU. All banks have taken steps toward the adoption of the TNFD, with certain banks participating in the TNFD Taskforce, although none are yet listed as adopters. The BASA has been selected as the convening body for the TNFD locally, and will play a key role in strengthening the case for nature among South African banks.

Most banks indicated a preference for mandatory disclosure and guidance from the regulator, but with a phased approach in dialogue with the industry. Some banks are voluntarily embarking on nature-related risk and opportunity assessments. All banks interviewed indicated an increasing awareness around biodiversity loss affecting all components of the economy. Many banks have confirmed that in certain sectors, portfolio exposure to nature-related risks are starting to be considered material. Some banks' nature-risk assessments are aligned with the TNFD's LEAP framework, prioritising sectors with high impact and dependencies on nature.

Conclusion and recommendations

The South African banks studied here are all exposed to physical nature-related risks through their agri-portfolios. Financing across other industries almost certainly exposes them to further risk. Biodiversity loss, while not the first environmental risk considered by central banks and financial supervisors, presents significant and intricate risks, closely linked to climate change. Recent initiatives by the SARB have focused on sustainable finance and the economic impacts of climate change. However, initiatives to assess and address nature loss must go hand-in-hand with initiatives to address climate risks, as addressing climate risks can also benefit nature and vice versa. Nature plays a crucial role in climate adaptation and resilience, mitigating the impacts of extreme weather, yet the complex interconnections between biodiversity loss and climate change remain under-explored, particularly in financial stability scenario planning.

Our analysis offers an initial assessment of domestic bank credit exposure to nature-related risk. This proof of concept should be an early step for any financial institution or prudential policymakers to illustrate credit exposure at the sub-industry or production process level and link it to material ecosystem services. It serves as a foundation for quantifying credit risk linked to nature-related exposure and sets the stage for more detailed client-level exposure analysis.

Banks' individual exposure to nature-related risk has implications for South African prudential policy

The results shown in Section 2 suggest that some of South Africa's largest banks have agricultural loan portfolios that are Highly Dependent on a wide range of ecosystem services. Shocks to any one of these ecosystem services could impact each bank across multiple assets. These individual impacts can also have macroeconomic implications, such as inflating food prices, which could affect loan repayments at a local level (credit risk), or weakening asset prices (market risk) which could have knock-on effects on banks' access to funding and capital. As banks tend to be highly connected to each other, market risk could lead to financial systemic risk, impacting the financial system as a whole.

The primary aim of this approach is to compare exposure and dependencies across sub-industry or production processes within financed agriculture. Dependency risks to agriculture are particularly significant, with water-related risks dominant, and soil quality and pollination ecosystem services featuring as highly material to many agricultural production processes. These direct impacts could be amplified by cascading feedback across markets, and act as a risk multiplier alongside climate change, leading to significant impacts on people and economies.

The fact that some banks have different exposure profiles suggests that there are opportunities for banks to take individual and collaborative action. For instance, Banks A, B and D have substantial investments in general crop-related activities as well as livestock activities, making them particularly dependent on surface and groundwater-related services. Banks B and D both specialise in fruit growing which is heavily dependent on pollination. Bank C specialises in forestry and logging, a sector which is reliant on climate-regulating services which limit the risk of wildfires, flooding and landslides. Soil quality is paramount for all banks. While financial institutions can take individual steps to account for and mitigate against risk according to their specific exposure profiles, it is also in their interest to collaborate across shared problems and work with and alongside policymakers and regulators.

While reliance on water-based services calls for more sustainable water use, it also calls for the restoration of native vegetation which is known to promote water retention and reduce drought (Butt et al. 2023, Alencar et al. 2015). Native vegetation restoration also has a positive effect on pollination, soil quality and climate-regulating services such as temperature regulation and cloud cover (Halinski et al. 2020, FAO 2020, Spracklen and Garcia-Carreras 2015). Less intensive and regenerative agricultural practices would also be beneficial, and banks should engage across their portfolios so that these risks can be managed through their clients.

The case of Bank A also showed that there could be variation in dependence across different types of assets. Its commercial mortgages are not Highly Dependent on pollination but Highly Dependent on soil quality, while its overnight loans are not very dependent on either. Such heterogeneity likely exists across all banks and may present various characteristics. It may therefore be useful for banks to manage and target nature risks differently across specific asset types.

Domestic banks have started considering nature-related financial risks. Irrespective of whether policy mandates disclosure, they are responding to emerging global disclosure requirements. Many financial institutions have already commenced nature-related risk and opportunity journeys aligned to global disclosure standards and frameworks such as ISSB S1 and S2 standards,

and TNFD. While all banks are reporting against the TCFD for climate, some banks are already aligning climate and nature-related statements and disclosures. Despite progress, they could all do more to raise the bar on climate and nature-related disclosures, enabling more sophisticated understanding of how these risks interact, creating opportunities for collaboration across the sector, and supporting the work of regulators and policymakers.

Imperatives for South African policy

Climate change has been the main focus for South African sustainable financing initiatives; nature, however, has been largely absent. Within this context the SARB and FSCA can play a crucial role in maintaining financial stability and fostering sustainable economic and market growth. Adoption and integration of emerging nature-related standards and frameworks (under IFRS and TNFD) can provide the necessary tools for finance institutions to identify, assess, and manage nature risks, contributing to a more resilient economy. How the regulator responds is crucial in mitigating these risks in the financial system, by enhancing the transparency, comparability, and reliability of disclosures. Policy considerations suggest adopting a holistic approach, emphasising the importance of clear and consistent definitions, and enhanced disclosure standards. Within the finance sector regulatory environment both the FSCA and the PA share the role of strengthening the integrity and efficiency of financial markets as directed under the FSR Act.

Furthermore, regulators should align domestic nature-related finance risk assessments with global standards, such as ISSB, TNFD, and the NGFS Conceptual Framework, to meet emerging policy and standard requirements, and assist domestic banks in responding. This includes ensuring local policy and supervisory guidance aligns with international standards. Active participation is required from regulators in adopting ISSB and IFRS standards to ensure local compliance with emerging global requirements.

Key recommendations

Strengthening the policy environment

- **Creating a strong policy environment for nature-related finance risk management.** The SARB should establish a policy framework that integrates nature-related risks, particularly biodiversity-related risks, into financial supervision. This includes considering supervisory actions to manage these risks. To support this, existing financial regulatory frameworks, such as Basel III, should be reviewed to enhance supervisory expectations on governance, risk management, disclosures, and financial conduct related to biodiversity

risks. Specifically, Pillars 2 (Supervisory Review Process) and 3 of Basel III (Market Discipline & Transparency) offer a useful mechanism for engaging with domestic financial institutions, allowing for collaborative approaches to risk management. This collaboration can help avoid excessive regulatory intervention while fostering future-oriented risk assessments and innovative governance strategies between regulators and banks.

- **The regulator should engage closely with financial service institutions and real economy participants in the development of supervisory guidance for nature-related risks.**
    - The regulator should support banks, asset owners, and asset managers by detailing their plans to integrate nature into future regulations (voluntary or mandatory). This should take into consideration the cost of policy transition, and reasonable timeframes for staged implementation.
    - It should clearly communicate how regulators plan to approach nature over time, and the risks and opportunities relating to compliance and non-compliance among financial institutions. For instance, as regulators undertake risk-assessment exercises such as stress testing, they could regularly share the lessons learned with the private sector.

Capacity building

- **Provide nature-related capacity support to market participants.** To support domestic banks and market participants in addressing climate and nature finance risks, it is crucial to assist them in building capacity to understand and analyse these risks through training and participation in sector-specific initiatives, such as the Sustainable Finance Initiative (SFI). Existing institutional arrangements, like the SFI, should be leveraged to facilitate coordinated participation in addressing climate and nature-related risks. Central banks often play a key role in convening such efforts, as seen in the Green Finance Mainstreaming Working Group (GFMWG) in Botswana, chaired by the Bank of Botswana and co-chaired by the Ministry of Finance. The SFI, which includes finance regulators, NT, BASA, and domestic financial institutions, can be revived to create a work programme focused on nature-related finance risks, similar to the approach used in developing the Green Finance Taxonomy's climate focus.

Data to support decision-making

- **The regulator should provide a roadmap for nature-finance relevant data collection.** Data and accessibility to data is one of the most significant challenges in conducting authoritative nature-related financial risk assessments and analyses. More data will be needed on the sectoral and geographical distribution of economic activities, and particularly the spatially explicit financial exposure the location of clients' operations, current threats to local ecosystem services on which they depend, and the actions being taken to address the clients' impacts and dependencies on nature and its services. Data collection strategies should address climate and nature simultaneously.

- **The roadmap needs to provide further guidance on locally applicable data support systems, repositories and custodianship.** There are numerous data repositories and suppliers in the marketplace covering an extensive array of nature-related topics and metrics. At a national level SANBI and Stats SA also have authoritative natural capital accounting (NCA) data for various sets of national accounts, including ecosystem and water related accounts. These have not yet been applied in any nature-related finance analysis. Linking NCAs to financial metrics could provide further nuanced applications in the consideration of nature-related finance risks. The roadmap should provide clarity on who should be responsible for collecting data and where this data should be stored.

- **The regulator should provide clarity around metrics, targets and indicators required for nature-related disclosures and risk assessments.** The TNFD provides detailed guidance in this area.

- **The regulator should consider providing guidance on the standardisation of data.** Both the SARB and domestic banks hold sector, sub-industry, and client-level portfolio data, which provide a foundation for understanding nature-related finance risks. The alignment of data classification and nomenclature is problematic across the financial sector. Internally, banks also face challenges with consistent data classification. The regulator should propose a unified taxonomy, potentially as part of the Green Finance Taxonomy (GFT), to ensure comparability and consistency in financial nomenclature (e.g., industry codes like SIC vs. ISIC and ecosystem services linked to economic activities).

Nature-related risk management

- **The regulator should provide guidance on understanding the materiality of nature-related risks for individual banks and the financial system as whole.** This report serves as a starting-point for that understanding. Tools such as ENCORE have been used for initial sector-based assessment and heatmapping, but there is a pressing need for more spatially explicit client- and asset-level analysis. Only with this level of detail can the impact of nature-related risks on individual banks and their clients be accurately assessed (NGFS, 2023). To gather such detailed insights, advanced

technologies like remote sensing and geographic information systems (GIS) must be employed. If quantitative data is unavailable, the framework should clearly outline how to leverage qualitative and expert judgements. In the EU, both corporate disclosure regulation (CSRD) and prudential regulation (CSRD6) have formulated requirements related to the materiality assessment of ESG risks.

- **The regulator should foster a greater understanding of the financial connections that can lead to contagion.** This includes the analysis of nature risk transmission channels and feedback loops between domestic banks' nature-related risks and the macroeconomy.

- **The regulator should provide strategic guidance on how to approach nature-related scenarios.** Climate change and nature loss give rise to a range of future scenarios which can be challenging to integrate into risk management. Therefore, developing a thorough understanding of cascading financial impacts across different scenarios is essential. Scenario development is also important for visualising potential transmission channels. Without such scenarios, reliance on static analysis or localised case studies risks failing to capture the full financial or macro-financial risks arising from the interaction of varying hazards or diverse policies (NGFS, 2023b).

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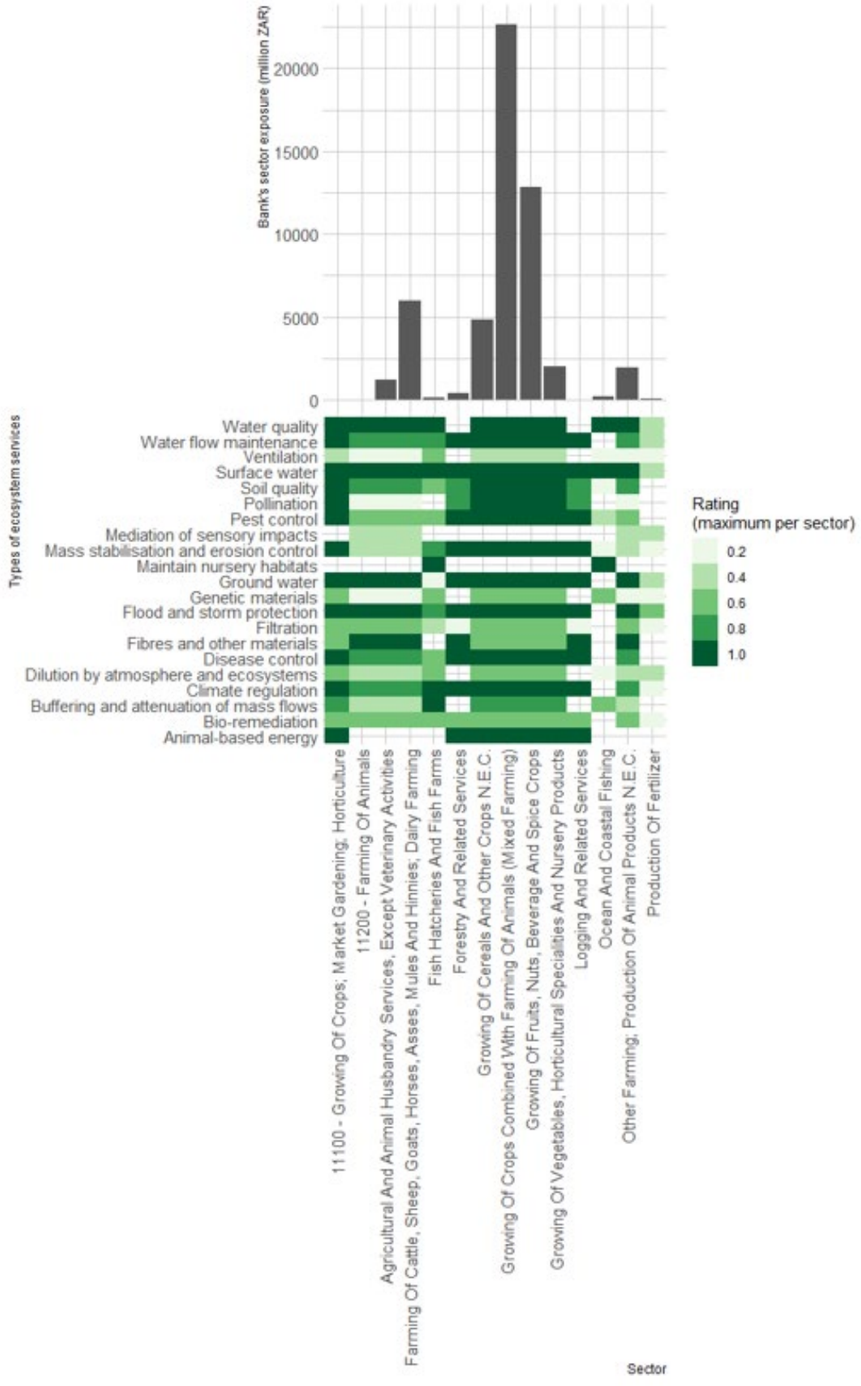
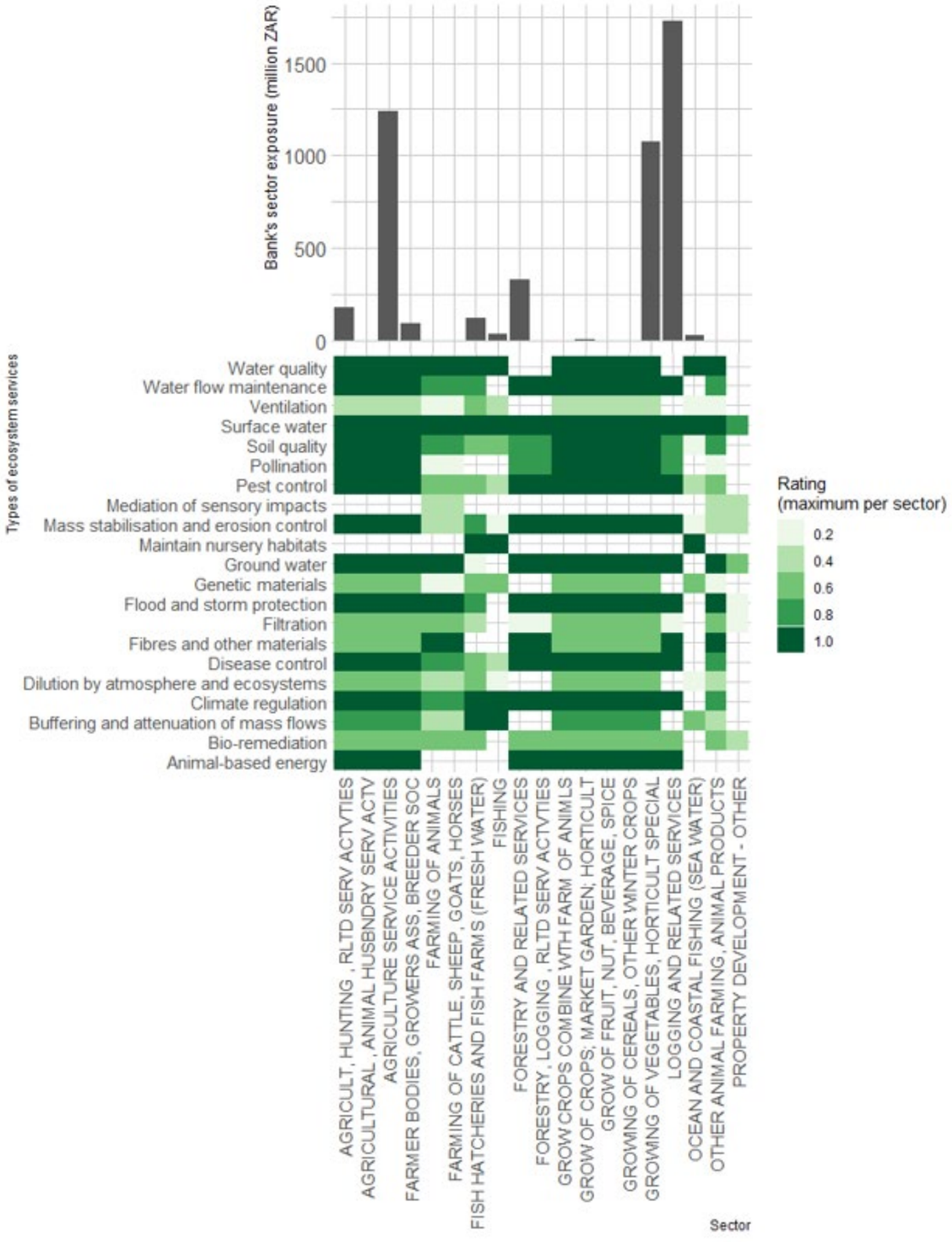
Appendix

Appendix Figure 1. Financial exposure by sector (on the top) and heatmaps of direct dependencies by sectors and ecosystem services (on the bottom)



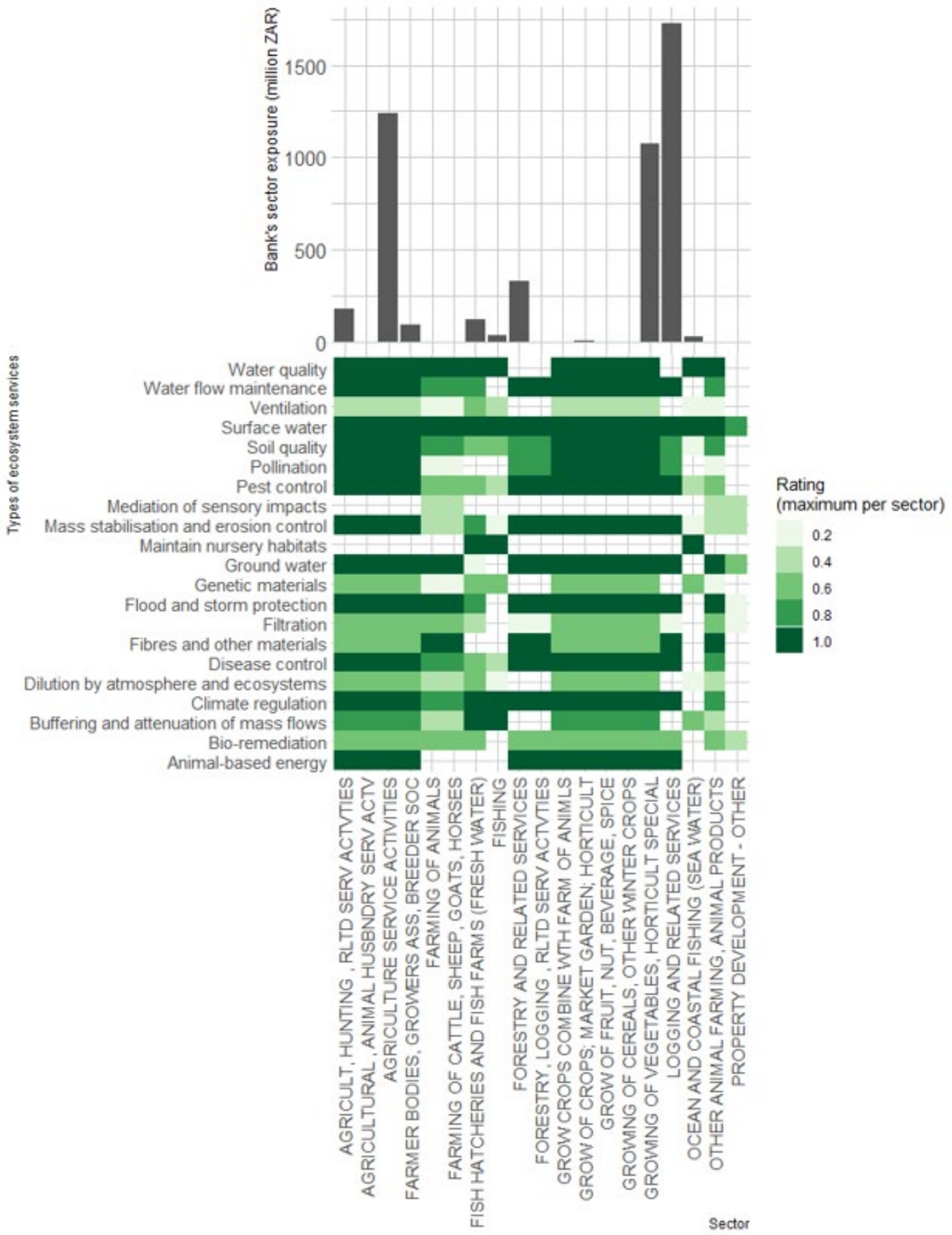
Source: Bank B's primary sector portfolio and ENCORE Partners 2023

Appendix Figure 2. Financial exposure by sector (on the top) and heatmaps of direct dependencies by sectors and ecosystem services (on the bottom)



Source: Bank C's primary sector portfolio and ENCORE Partners 2023

Appendix Figure 3. Financial exposure by sector (on the top) and heatmaps of direct dependencies by sectors and ecosystem services (on the bottom)



Source: Bank D's primary sector portfolio and ENCORE Partners 2023

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