Natural Capital Finance Alliance
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INTEGRATING NATURAL CAPITAL IN RISK ASSESSMENTS:

A step-by-step guide for banks

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EXECUTIVE SUMMARY

NATURAL CAPITAL AND THE FINANCE SECTOR

Natural capital is a way of thinking about nature as a stock that provides a flow of benefits to people and the economy. It consists of natural capital assets such as water, forests and clean air that enable economic activity by providing businesses with materials, inputs to production, protection from natural disasters and absorption of the pollution they emit. Any adverse change in a natural capital asset can have a negative effect on the businesses that depend on it; in much the same way as the impairment of a conventional asset might affect the cashflows of the business owning it. The portfolios of financial institutions are exposed to these natural capital risks that affect the businesses that they lend to, insure or invest in. By focusing on risks to businesses resulting from environmental degradation, rather than on the businesses' environmental impacts which have traditionally been the focus of environmental risk assessment, natural capital risk analysis allows financial institutions to see the risks that they are exposed to in a new light.

The Natural Capital Finance Alliance (NCFA) has developed a process that enables financial institutions to easily assess natural capital risks in their portfolio. This rapid natural capital risk assessment process focuses on identifying the ways in which businesses depend on the environment, how these dependencies are threatened by environmental change, and the resulting risks for financial institutions. This report provides a step-by-step guide for conducting a rapid natural capital risk assessment, with links to additional online resources. The guide was developed based on experience piloting the approach with banks across three countries: Colombia, Peru and South Africa.

By using this approach to understand their natural capital risk, banks will be better equipped to devise solutions that will protect their portfolios in an era of accelerating environmental change, as well as to identify potential opportunities around solutions provision and new products.

KEY FINDINGS

The experience piloting rapid natural capital risk assessments with banks confirmed that the approach can be valuable for any bank, regardless of its size, geography and existing risk management processes.

Rapid natural capital risk assessments allow banks to improve their foresight by uncovering risks that they were previously unaware of.

Whilst banks are at different stages in their understanding of environmental risk, their processes typically overlook how natural capital disruption can put their borrowers' operations at risk. The rapid assessment approach fills this gap; it identifies the ways in which businesses depend on the environment and the threats that these dependencies face. This reframing allows for the identification of previously unseen risks in banks' loan books.

For example, disruption of natural capital on which companies depend can force them to interrupt production and incur a shortfall in revenue. In instances of unforeseen, long-term or irreversible natural capital disruption, businesses' long-term financial performance can be significantly affected, jeopardizing the credit quality of banks' entire loanbooks.

Rapid natural capital risk assessments can expose systemic risks in bank portfolios which would not have been detected in individual transaction assessments.

Unlike other forms of risks assessed by banks, environmental risk tends to only be assessed at the transaction level. Using banks' entire portfolios as a starting point of analysis under the rapid assessment approach unearthed at least two forms of potentially systemic risk. These systemic risks cut across sectors and have a domino effect on the economy, highlighting the limitations of a siloed approach to risk assessment:

- **Regional concentration risk.** Natural capital risk is determined by the state of natural capital in a given geography. Concentration of risk can happen where multiple different borrower assets are exposed to heightened natural capital risk in the same region. For example, water scarcity in a region is likely to impact all businesses in the region at least to some degree, regardless of their sector.
- **Process concentration risk.** Natural capital disruption can create systemic risks in a portfolio, even when borrowers are spread across geographies. This is because some drivers of environmental change operate at the global level, creating risks for businesses across sectors and geographies. Climate change is an example of a global source of natural capital risk. Whilst it manifests in many different ways at the local level, climate trends and their impact on portfolios need to be understood as a whole by financial institutions if they are to prepare an appropriate risk management response.

The rapid assessment approach allows banks to monitor the evolution of natural capital risks and their potential impact on borrowers in the future.

The environment by its very nature is in constant change, and human interactions with nature are depleting natural capital at an accelerating rate. For this reason, the analysis of past environmental conditions is not always a reliable guide for future events. For example, some regions across the globe are expected to face drought for the first time in their history over the next decades, due to the effects of climate change.

The resulting need to monitor environmental trends continuously and to consult future-looking environmental scenarios where available can be addressed by using a rapid assessment approach. The NCFA has developed a web-based tool to help financial institutions identify material natural capital risks to any business sector and assess these risks at any time for any location, based on available environmental data.

The rapid assessment approach is highly versatile, making it a valuable tool for any bank.

The approach has been designed to be useful to any bank, regardless of its size, geography and existing risk processes. It is a flexible, principle-based approach that can be adjusted to the realities of a financial institution and of its portfolio. It has been developed to be conducted at the portfolio level but can also add value to client and transaction-level assessments. The results of the assessment can inform the bank's course of action at different points of its risk management cycle, for example by equipping client-facing teams in discussing appropriate natural capital risk management measures with borrowers or by supporting central risk teams in monitoring risks in a given region or portfolio segment.

The approach was also developed with an understanding of the current gaps in environmental and economic asset-level data. It therefore provides a series of simple, logical steps a bank can undertake with limited readily-available data in order to understand the highest areas of natural capital risks in its portfolio, on which deeper analysis can be conducted.

RECOMMENDATIONS

The work conducted has confirmed that whilst natural capital risk can be complex, there are a number of methods and resources available for banks to cut through this complexity and get an initial understanding of their natural capital risk exposure. Banks can use these resources to significantly enhance the integration of natural capital risk in their systems in the short to medium term.

1

Banks can leverage their existing risk processes to embed natural capital risk thinking.

Banks do not need to invest significant resources and efforts to integrate natural capital risk in their processes. Simple adjustments to existing processes can be enough to bring about a much more systematic and comprehensive understanding of natural capital risk.

The pilot studies conducted with participating banks demonstrated that they had numerous options for integrating natural capital in their processes, depending on their needs and preferences.

1. One option for integration is to embed natural capital risk within the institution's environmental and social risk management frameworks.
2. Another option for banks wishing to deepen their understanding of the connection between natural capital risk and financial risk is to integrate natural capital risk assessments within credit risk assessments. Some participating banks are piloting the integration of natural capital risk in their credit assessments and credit risk models.

There are also other options and combinations of options that banks may wish to explore.

2

Banks can derive significant value from qualitative natural capital assessments.

Pilot studies conducted with the participating banks confirmed that valuable insights can be drawn from high-level, qualitative assessments of natural capital risk. Qualitative assessments can point to regions that are at high risk of natural capital disruption and identify clients with whom discussions on natural capital risk management are needed. The findings from such assessments can also feed into banks' strategic sectoral outlooks or in the qualitative components of credit risk models.

Banks wishing to deepen their assessment of natural capital risks can also experiment with quantitative natural capital risk assessments for selected sectors and types of risk. Quantitative assessment methodologies for specific natural capital risks such as water and climate change are becoming available and can be a good starting point for banks wishing to trial the quantification of natural capital risks.

3

Banks can increase the accuracy of their natural capital risk assessments by enhancing their data collection and storage processes.

Many banks do not collect data relative to natural capital risk from borrowers, or do not collect them in a way that is easily accessible or usable by banks' central risk teams. This means that natural capital risk assessments often rely on incomplete data and estimates.

1. **Data collection.** Banks should review the environmental and operational information they request from borrowers and complement these requests where necessary to capture information relevant for conducting natural capital risk assessments. As a priority, they should seek to obtain precise location data for borrowers' operational assets. Location-specific analysis is critical for natural capital assessments as natural capital assets in one location can have very different characteristics to those in a neighbouring location. Where possible converting location information from borrowers to spatial formats will facilitate its integration with environmental datasets which typically come in this format.

   There can be considerable challenges in sourcing key information from borrowers. Where this proves to be unfeasible, banks may consider using relevant regulatory and market databases as proxies for borrower data.
2. **Data storage.** Even when relevant data from borrowers is compiled, it is often confined to specific departments within a financial institution. Collecting data relevant to natural capital risk assessments in a standardised format and using shared file storage tools is a worthwhile investment to enable dedicated risk teams to conduct centralised natural capital risk analysis.

4

Considering natural capital risks at the portfolio level is necessary to complement transaction-level assessments.

Banks typically conduct environmental risk assessments at the transaction level, running the risk of overlooking significant systemic risks that are only visible at the portfolio level. Whilst transaction-level assessments remain important, portfolio assessments are critical to identify regional and sectoral trends and link these more closely to a financial institution's credit risk.

Portfolio-level assessments can be conducted with varying degrees of complexity, but any financial institution can derive value from a simple, qualitative portfolio assessment using the step-by-step guide in this report.

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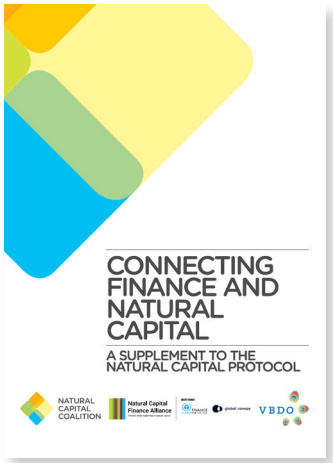
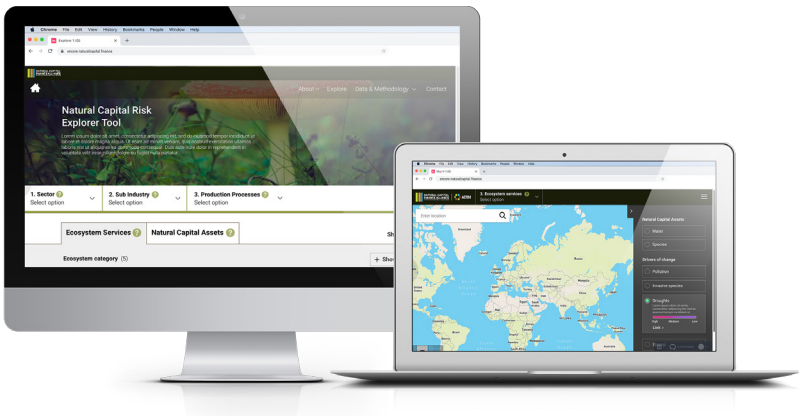
INTRODUCTION

The Natural Capital Finance Alliance (NCFA), a collaboration between UN Environment Finance Initiative and Global Canopy, was set up in 2012 by a group of pioneering financial institutions who saw the need for a better understanding of how finance both depends on and impacts nature, in order to manage risks and unlock opportunities. Initially formed around the four commitments of the Natural Capital Declaration, the NCFA's financial institutions and supporters work collaboratively to better understand the science linking nature to the economy, integrating this knowledge into their decision making, and sharing their experiences with the rest of the finance sector and stakeholders. The outputs of the NCFA contribute to developing a systematic and evidence-based approach to measuring, quantifying, valuing how environmental change affects companies and the financial institutions that fund or insure them.



Since its inception, the NCFA has developed tools and methodologies to incorporate natural capital risks and opportunities into financial analysis. These include a framework for addressing deforestation risk in commodity production and tools to incorporate water stress into traditional financial analysis for bonds and equities or that allow users to stress test their credit portfolio under a number of drought scenarios. The NCFA has also collaborated with the Natural Capital Coalition and the Dutch Association of Investors for Sustainable Development (VBDO) to develop 'Connecting Finance and Natural Capital, A Supplement to the Natural Capital Protocol'. The Supplement provides guidance for financial institutions to assess the natural capital impacts and dependencies of their banking, investment and insurance activities.

This project – Advancing Environmental Risk Management (AERM) – builds upon the NCFA's previous work to provide a comprehensive view of the ways in which degradation or destruction of natural capital constitutes a risk to financial institutions. In the previous phase of the project, the NCFA partnered with UN Environment World Conservation Monitoring Centre (UNEP WCMC) to review existing knowledge and extract the relevant information to enable financial institutions to better understand, assess and integrate natural capital risk into their operations. The output of this work is ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure), a web-based tool for financial institutions.



PwC, with support from Little Blue Research Ltd., was commissioned to implement the second phase of the AERM project, which aims to enable financial institutions to better understand, assess and integrate natural capital related risks into their existing risk management processes. The project was initiated and guided by NCFA members and piloted in five financial institutions: Banco de Bogotá, Banco de Crédito del Perú, Davivienda, Development Bank of Southern Africa, and FirstRand.

The NCFA would like to thank our main donor, the Swiss State Secretariat for Economic Affairs (SECO), as well as the MAVA Foundation, for the generous support that has made this project possible.

CONDUCTING A RAPID NATURAL RISK ASSESSMENT: A STEP-BY-STEP APPROACH

FRAMEWORK

A rapid natural capital risk assessment is a process for financial institutions to quickly identify the key areas of natural capital risk associated with the businesses to which they lend. The assessment identifies the ways in which businesses depend on the environment and the threats to these dependencies, and provides insight into how these threats can create previously unseen risks for financiers.

The approach, illustrated in Figure 1 below, follows an intuitive four-stage structure consistent with the Natural Capital Protocol. Each stage is important to the success of the assessment and feeds into the following stage. For each stage, the guide explains the steps to undertake and provides options for carrying them out. The guide also explains how to use ENCORE, a web-based tool developed by the NCFA, which enables users to visualize the exposure of economic sectors to natural capital risks according to their geographical location.

The guide is tailored to banks, having been developed based on experience piloting the approach with banks across three countries (Colombia, Peru and South Africa). Other types of financial institutions face their own challenges and have specific risk assessment needs, but much of the approach described here will still be relevant and can be adjusted where necessary.

	Steps	Outputs
1. FRAME **Establish why the bank should conduct the assessment**	1.1 Become familiar with natural capital concepts 1.2 Sell the business case within the bank	• A business case for undertaking the assessment • Buy-in from important stakeholders within the bank
2. SCOPE **Determine what will be included in the assessment**	2.1 Map coverage of natural capital risk in existing processes 2.2. Define assessment objective 2.3 Scope the assessment	• A clear objective for the assessment • A defined scope including a lens and level of analysis
3. ASSESS **Understand the bank's key sources of natural capital risk**	3.1 Identify likely causes of disruption 3.2 Assess disruption	• An understanding of the status and trends in natural capital relevant to the bank's portfolio
4. APPLY **Take stock of the assessment findings and identify follow-on actions**	4.1 Take action 4.2 Embed natural capital risk management	• Key messages for communication to stakeholders • Agreed actions for enhanced natural capital risk management

Figure 1: *Rapid natural capital risk assessment framework.*

1. FRAME

1.1 Become familiar with natural capital concepts

The first step in conducting a rapid natural capital risk assessment is to master key natural capital risk concepts. The assessment sponsor, who will lead the process within the bank, needs to understand these concepts in order to communicate them within the bank and ensure there is buy-in from key stakeholders for taking action on natural capital risk. We present the key concepts briefly below.

What is natural capital?

Natural capital is a way of thinking about nature as a stock that provides a flow of benefits to people and the economy. It consists of natural capital assets—such as water, forests, and clean air—that together provide humans the means for healthy lives and enable economic activity. The goods and services that natural capital provides, in the form of foods and fibres, water, risk protection and absorption of pollution, are called ecosystem services. Through inputs to production, risk reduction, impact mitigation, and by supporting life more generally, ecosystem services underpin all economic activity. Any adverse changes in natural capital therefore have a potential negative effect on the businesses that depend on it. Figure 2 shows the dependencies of the economy on natural capital and the impacts such as pollution and waste, which can impair the resilience of natural capital.

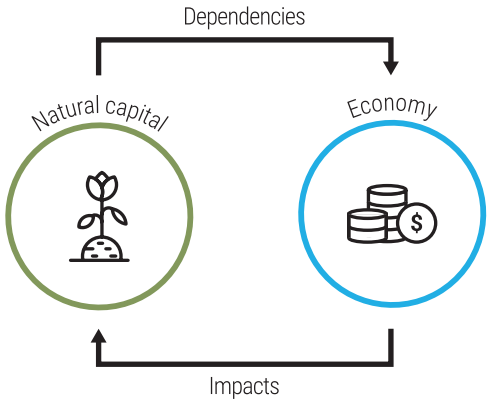


Figure 2: *Nature and the economy.*

What is natural capital risk?

Human interactions with nature, whether direct such as deforestation or pollution, or indirect such as climate change, are depleting natural capital at an accelerating rate. This affects nature's capacity to continue providing the ecosystems services on which the economy depends. These drivers of environmental change can, through the risk to continued provision of ecosystem services, trigger disruptions to economic production, as shown in Figure 3.

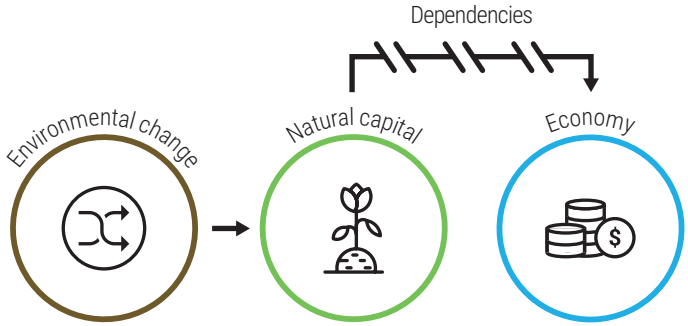


Figure 3: *Disruption risks arise when environmental change affects nature's ability to provide goods and services on which the economy depends.*

What is the link between natural capital risk and financial institutions?

Financial institutions are exposed to natural capital risks that affect the businesses that they lend to, insure or invest in. If a bank is lending to a farm that is unable to sustain production or facing increased costs due to water shortages, or whose crop is failing regularly due to changing climate conditions, then the farmer may not be able to service loan payments temporarily or may go out of business in the long term. A worked example of this link can be found in Figure 4

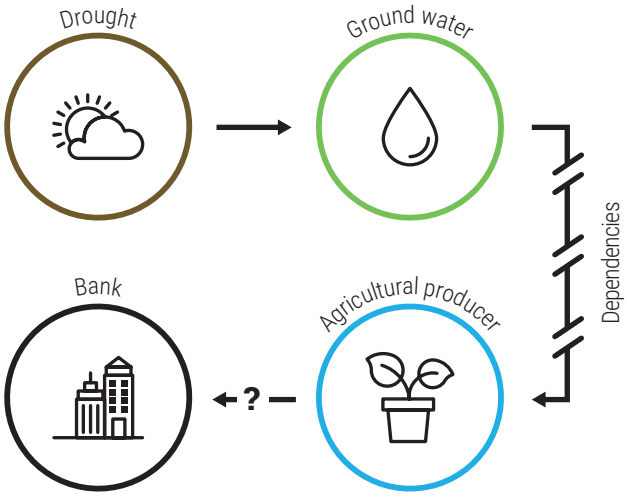


Figure 4: *Example of disruption risk potentially affecting a financial institution.*

1.2 Make the business case within the bank

It is important for the bank to understand the benefits it will derive from the assessment. The assessment sponsor can make the business case for conducting a natural capital assessment by understanding its strategic value and communicating it to key stakeholders.

Understand the strategic value of rapid natural capital risk assessments to financial institutions

The fundamental value of natural capital risk assessment is its potential to uncover material risks a bank might previously have been unaware of. Natural capital risk assessments can therefore be a valuable addition to the processes of any bank. They can be used by banks who have no prior experience assessing environmental risks; but will also complement traditional environmental risk assessment processes that many financial institutions already have in place. Banks whose credit risk assessment processes consider specific factors relating to natural capital will also benefit from the assessment's systematic, forward-looking approach. By adding this form of assessment to their processes, financial institutions will be able to detect risks that they were previously unaware of and better understand how natural capital risk is linked to the performance of their portfolios.

Financial institutions' existing environmental risk assessment processes are typically focused on the impacts of borrowers on the environment. By contrast, a rapid natural capital risk assessment explores how borrowers depend on natural capital to operate. Adding this lens to their assessment processes gives financial institutions a more rounded view of the risks they face through the businesses in their portfolio. The characteristics of natural capital dependency risks differ from risks posed by environmental impacts, so banks may require a differentiated risk management response, including drawing in teams not previously involved in environmental risk management. By understanding how natural capital disruption can affect borrowers' operations and therefore their financial performance, financial institutions can also link natural capital risk to their credit risk more clearly.

Rapid natural capital risk assessments also provide the benefit of a systematic approach for screening risks triggered by businesses' dependencies on natural capital. Whereas current environmental assessments tend to consider issues in isolation, the rapid assessment

approach offers a framework for prioritising natural capital considerations on which to conduct a deeper assessment, and highlights the relationships between natural capital issues.

Financial institutions can use the insights from these assessments to better manage their risk. The insights generated will equip them for discussions with borrowers and help them make informed lending and risk mitigation decisions. They may also inform longer-term, forward-looking decisions, such as strategic sectoral and regional portfolio allocation.

Another argument for conducting a rapid natural capital risk assessment, which may resonate strongly with some people within the bank, is grounded in the need to address evolving expectations from key stakeholders. Lack of action by banks may aggravate customers and shareholders even in instances where natural capital risk does not translate into material credit risk. These stakeholders now expect banks to have a positive role in society and are increasingly taking steps to sever ties with those that are not. Undertaking a natural capital risk assessment will help the bank fulfil its wider societal role to be part of a financial system seeking to make positive contributions to the environment, society and the economy. For instance, by assessing borrowers' dependencies on natural capital and helping them to manage these dependencies more sustainably, the bank can contribute to the achievement of Sustainable Development Goals related to environmental preservation and the sustainable management of water.

Identify key stakeholders and communicate the business case

In order for a natural capital rapid risk assessment to be effectively conducted by a financial institution, the assessment sponsor needs to identify any internal stakeholders who may be integral to its successful application and engage them on the value of conducting an assessment. Key stakeholders are people within the bank whose buy-in is essential both for conducting the assessment and for acting upon the findings.

As part of the engagement process, the assessment sponsor may wish to firstly ensure these stakeholders are familiar with the key natural capital concepts underpinning the process (see 1.1); in particular they may wish to consider emphasising the difference between natural capital impacts and dependencies, since this distinction is critical to understanding the process' strategic value. It is also suggested that the sponsor tailor the business case to the specific role and responsibilities of the stakeholder. Table 1 below provides some examples of key internal stakeholders that the sponsor may wish to engage, and suggested lenses through which to frame the business case for each of them.

Table 1: *Examples of key stakeholders within a bank and value of the rapid natural capital risk assessment for each stakeholder.*

KEY STAKEHOLDER	VALUE OF ASSESSMENT
BOARD OF DIRECTORS (BOTH EXECUTIVE AND NON-EXECUTIVE DIRECTORS)	As part of the non-executive directors' remit to safeguard the interests of the bank's shareholders, conducting an assessment may help to increase, or avoid a drop in share price through identifying risks and opportunities across a range of price-sensitive areas, such as financial performance, compliance and public relations. For executive directors, the assessment may help to improve both the financial resilience and performance of the bank through avoided credit and reputational risk, and provide a strategic advantage over peers.
CHIEF EXECUTIVE OFFICER	As global natural capital assets further decline, the risk they pose to banks' loan portfolios will increase correspondingly. Understanding natural capital risks may inform strategic decisions and grant the bank an 'early-mover' competitive advantage over peers who are less attuned to these risks.
CHIEF RISK OFFICER	By affecting borrowers' operations, natural capital risks present potentially material financial risks to the bank which it may be currently unaware of. Complementing current risk processes with natural capital risk assessments will help the bank have a more rounded view of the risks it faces.
HEAD OF ENVIRONMENTAL AND SOCIAL RISK MANAGEMENT	The assessment can help to span the gap between environmental and financial risk, creating a more integrated blueprint for risk assessment and boosting the department's strategic value to the financial institution.
HEAD OF PUBLIC POLICY	The assessment can be a powerful example of how the bank conducts business responsibly; that is, working with its borrowers to manage natural capital in a way that creates shared prosperity for current and future generations.
HEAD OF LEGAL/ COMPLIANCE	As the regulatory landscape shifts towards a more sustainability-minded agenda and as natural capital assets dwindle worldwide, banks may be required to disclose in the future how their borrowers are managing these resources. Early adoption of the assessment may lessen any eventual regulatory burden relating to this.
CHAIR OF SUSTAINABILITY COMMITTEE (OR EQUIVALENT)	The assessment can be a winning example of a sustainability-related tool of value to the wider bank; this can raise the profile of sustainability within the bank and increase internal appetite for integrating similar tools in the future.
HEAD OF STRATEGY	Banks' existing environmental risk assessment processes are typically focused on business impacts and carried out at transaction level. By contrast, the assessment will assess how the businesses in the bank's portfolios depend on natural capital to operate. This should result in more strategically actionable insights and a more systematic approach to screening environmental risk.
FRONT OFFICE BANKERS/RELATIONSHIP DIRECTORS	The insights from natural capital risk assessments can help client-facing teams cement their role as trusted advisers by identifying innovative and value-adding opportunities for their clients.

2. SCOPE

2.1 Map coverage of natural capital risk in existing processes

Mapping risk processes that are already in place within the organisation will provide context for the rapid assessment and ensure the assessment is focused on areas that could benefit from deepened natural capital risk management. It may also highlight that natural capital risk is already being considered in some instances, albeit often in isolated processes for specific natural capital risks and transaction types. This step is recommended but optional; there may be a benefit in keeping it at a high level so as not to delay the next steps of the assessment, and revisiting its findings in the 'Apply' stage.

Create an inventory of existing risk processes

Whilst documentation of processes is unique to each institution, the Operational Manual of the bank is usually a good starting point for understanding existing processes. In particular, key aspects that should be understood prior to starting the assessment include the bank's overall governance arrangements for risk management as well as processes for conducting credit and environmental risk identification and assessment. This will help the bank make a more informed choice of objective for the rapid assessment and have a more holistic point of view when taking action following the assessment.

It may also be useful to understand other steps of the risk management lifecycle and processes for other types of risks managed by the bank, as presented in the figure below. It should be noted that creating an exhaustive inventory of existing risk processes can be a complex and time-consuming undertaking. Therefore the mapping should be fit-for-purpose and may be accelerated, especially if the assessment sponsor is already familiar with processes in place or is constrained in the time or resources available to conduct the assessment.

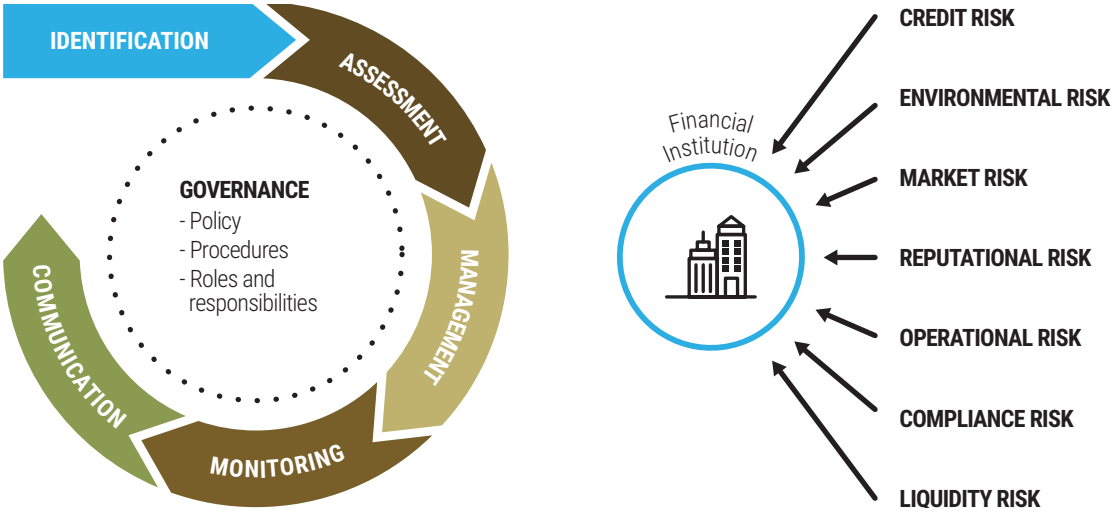


Figure 5: *Stages of the risk management lifecycle and types of risks faced by financial institutions.*

Discuss with process owners

The rapid assessment sponsor should also liaise with teams involved in developing the bank's risk assessment policies and models and with those responsible for applying the bank's risk management framework. This includes the central credit risk team and environmental and social risk team as well as front-office staff, and may also include portfolio risk management teams, enterprise risk management teams and emerging risks teams, depending on the bank's organisational structure. These discussions should help the assessment sponsor both in locating key policy documents and in understanding how roles and responsibilities are implemented in practice, as practices within an organisation may at times differ from documented procedures.

2.2 Define assessment objective

Having spoken to key stakeholders and having mapped how risk is currently managed within the bank, the assessment sponsor is now in a position to set an informed objective for the assessment.

Examples of the objectives for running a natural capital risk assessment include:

- identifying which natural capital risks are most material to the bank's investment/loan portfolio in country [X] now and in the future;
- understanding the current state of these risks and how these are likely to evolve;
- identifying information needed to make decisions and manage natural capital risk exposure.

If this is the first time the bank conducts a natural capital risk assessment, it is advised to select a narrow objective that can be expanded in subsequent assessments. The defined objective should also consider institutional needs and priorities of important stakeholders. This will ensure that there is buy-in within the organisation to conduct the assessment and interest to act upon its results.

2.3 Define the scope

There are two key aspects the bank should consider when defining the scope of its rapid assessment: the geographical boundaries of the assessment ('level of analysis') and the focus of the assessment ('lens of analysis'). Both aspects should be considered in parallel to ensure that the scope is consistent with the time and resources allocated for conducting the assessment.

Select a geographical level of analysis

The bank should first choose a geographical scope for its assessment. The geographical scope selected should match the bank's resources, timescale, priorities and appetite for granularity.

The bank can conduct the assessment on its entire portfolio, but we recommend starting with a few priority geographies when conducting a rapid assessment for the first time. If the bank has global or multinational operations, it can for example select its top countries by portfolio value or countries where environmental risks tend to be more pronounced. If the bank is national or regional, it can focus on one country, or even on a specific region where its portfolio's credit quality is lower.

Select a lens of analysis

The bank should then consider which lens it wishes to use to screen its portfolio for natural capital risk. Choosing this lens will give structure to the bank's assessment, as it will determine how the bank intends to analyse natural capital information. Here we present two possible lenses: sector and natural capital consideration. A bank can also consider other lenses, for example a focus on a single borrower or on a selection of operational assets it finances.

Firstly, the bank can take a sectoral lens to conduct its assessment. Taking a sectoral lens has the advantage of structuring the assessment and its findings in a way that the bank's internal stakeholders are familiar with. Banks may wish to focus the analysis on a subset of the sectors they are exposed to in order to make the assessment more manageable. A simple approach to filter sectors for analysis is to limit the analysis to the top 5 or 10 sectors by portfolio value. However, other factors to limit the number of sectors that can be considered (either individually or in combination) include the following:

a) Sectors at higher risk of default

b) Sectors with multiple material dependencies on natural capital, such as primary sectors, energy, utilities and mining

c) Sectors for which environmental risk management is particularly lacking within the bank's current processes

d) Sectors to which the bank is considering lending for the first time

ENCORE uses the Global Industry Classification Standard (GICS) for classifying economic sectors, which are then broken down into production processes. While this is a common classification, especially for investors, many other classifications exist. Financial institutions can either re-map their current classification into GICS or map the production processes to their current sector classification. In some instances the bank may prefer to align its priority sectors to the production process taxonomy used by ENCORE without first mapping to the GICS classification - this is possible and can be desirable if the sectors align more smoothly to the production process taxonomy.

For some sectors, especially downstream sectors such as retail, natural capital risk mainly comes in the form of supply chain disruption. For such sectors, the bank may wish to consider if the focus of their assessment is associated with any significant supply chain dependencies that have not already been scoped in the assessment. To do this, the bank should add to the scope of its assessment the key sectors which are upstream of the sectors it has already scoped. Other relevant sectors should also be included. For example, a bank which includes the automotive sector in its assessment may also wish to include tire manufacturing, because of the close relationship between the two sectors. These key supply chain sectors can be identified through discussions with the bank's sectoral specialists or with borrowers. The bank may also wish to consult economic input-output tables to establish the linkages between sectors in a given economy.

Another option for the bank is to focus its assessment on one or a few specific natural capital considerations. For example, a natural capital consideration can refer to the state of a natural capital asset such as water or to specific drivers of environmental change like pollution in the bank's region of interest. An assessment focused on specific natural capital considerations can highlight unseen risks for specific sectors or for the bank's entire portfolio. It can also help limit the scope of the assessment when the bank is new to natural capital risk and has limited time and resources.

Factors that can help determine which natural capital considerations the bank should focus on in its assessment include:

- advice from regulators such as central banks,
- initiatives like the Task Force on Climate-related Financial Disclosures (TCFD),
- recurrent themes in news articles such as habitat modification in the form of commodity-related deforestation in the Tropics,
- issues that several borrowers in the bank's portfolio have faced, and
- considerations that the bank is currently unfamiliar with or that are not currently captured in risk processes.

Step 3.1 provides further guidance for identifying relevant natural capital considerations to assess.

The figure below provides an example of the series of decisions a bank may take to define the scope of its rapid assessment.

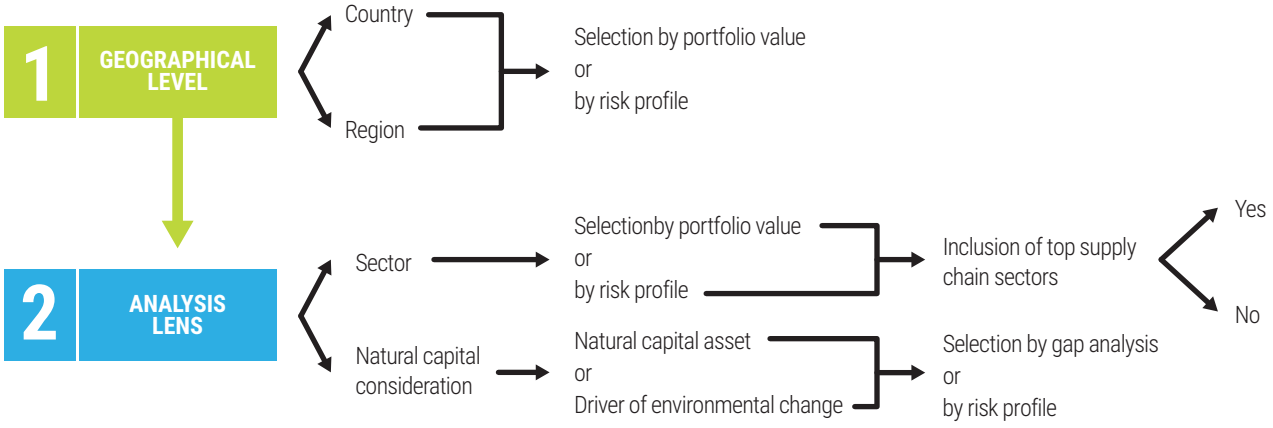


Figure 6. *Example of decision steps for defining the scope of the rapid assessment.*

3. ASSESS

3.1 Identify likely causes of disruption

For each sector or production process selected, ENCORE can be used to identify the natural capital assets that provide the ecosystem services on which they depend and the drivers of environmental change that influence them.

Identify material natural capital assets

Disruption risk is a function of the ability of natural capital assets to continue providing the services on which businesses depend. Therefore, the bank must understand the state of the key natural capital assets on which it depends to understand the risk faced by the key sectors it is exposed to.

The bank can easily identify the natural capital assets on which any sector (or production process) depends by selecting the sector in ENCORE's drop-down menu. It can then use the 'natural capital assets' page of the tool to explore the various assets that deliver the key ecosystem services on which the sector depends.

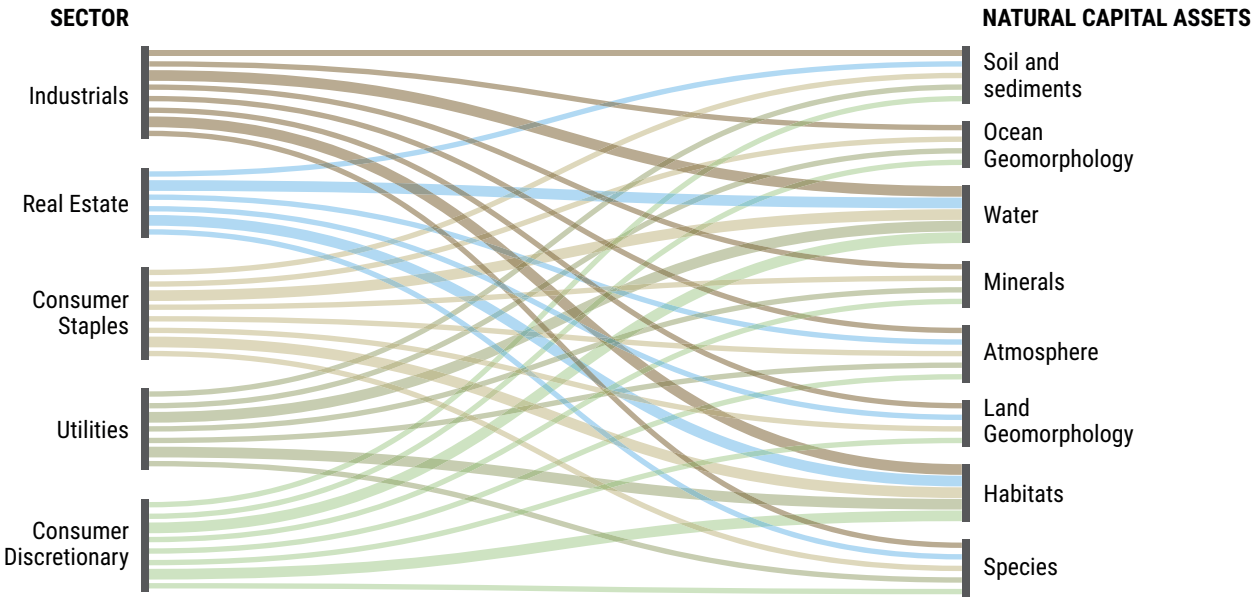


Figure 7. *Highly important natural capital assets for selected sectors.*

Each sector, through its dependence on multiple ecosystem services, typically relies on a number of natural capital assets. The bank may therefore wish to prioritise a subset of natural capital assets on which to conduct further analysis. One way of doing this is by focusing on natural capital assets that provide highly material ecosystem services to multiple sectors in the assessment's scope. An example of how to do this is presented in Figure 7. In this example, a bank has selected five sectors for analysis. The supply chain of these sectors has not been included for simplicity. The lines from each sector indicate a dependency on a natural capital asset, with the thicker lines representing a highly material dependency. In this example, all of the natural capital assets in the figure provide at least four of the five sectors with ecosystem services that they rely upon to operate. In particular, water and habitats provide all five sectors in scope with ecosystem services that are highly material to their operations. In this context, the bank may wish to focus its assessment on these two key natural capital assets.

Identify important drivers of environmental change affecting the portfolio

Drivers of environmental change are important because they influence various natural capital assets and therefore the provision of the many ecosystem services provided by these assets. Drivers of environmental change and their influence on natural capital assets and production processes can be found in the 'drivers of environmental change' page of ENCORE.

Sectors typically have multiple drivers of environmental change that influence them. The bank can therefore prioritise drivers of environmental change on which to conduct further assessment. Options for doing so include:

- focusing on drivers of environmental change that have a high influence on the production processes included in the assessment's scope - this information can be found in the ENCORE tool;
- conducting background research to understand drivers of environmental change that are likely to be problematic in the geographies in scope;
- habitat modification and weather conditions are drivers of environmental change that have a significant influence on many sectors of the economy and in many different geographies across the world. Limiting the analysis to these two drivers of environmental change will not lead to exhaustive findings as in some instances other drivers may be equally or more relevant to a bank's portfolio. Nevertheless, it can be a good starting point for those conducting a rapid natural capital risk assessment for the first time.

Whilst prioritisation may be needed to maintain a practical scope for the assessment, it is useful for the bank to take note of all the drivers of environmental change that are likely to influence its portfolio. This will allow the bank to improve its foresight and promptly recognise natural capital risks as they arise.

3.2 Assess disruption

Once the bank has selected the natural capital considerations on which it wishes to conduct deeper analysis, it can then use the information available on ENCORE to conduct an assessment of the potential risk of disruption to these natural capital considerations. As natural capital risk materializes in different ways at a granular geographical level, this will allow the bank to assess if the potential sources of natural capital risk identified above are likely to materialize for its sectors and geographies of focus.

Identify geographical areas at risk

The bank can use ENCORE to identify locations within its geographies of interest that are vulnerable to natural capital disruption or are likely to be in the future due to changes in the state of natural capital assets or in the severity of drivers of environmental change. ENCORE indicates, for each natural capital asset and driver of environmental change identified as a potential source of disruption, the data layers needed to understand the risk as well as a map where the data can be visualised in a spatial format. For example, the data needed to assess the state of weather conditions as a driver of environmental change is the change in the seasonality of temperature and precipitation, and changes in wind speed. In ENCORE, the bank can select each of these indicators individually and observe the state of the indicator in different geographies.

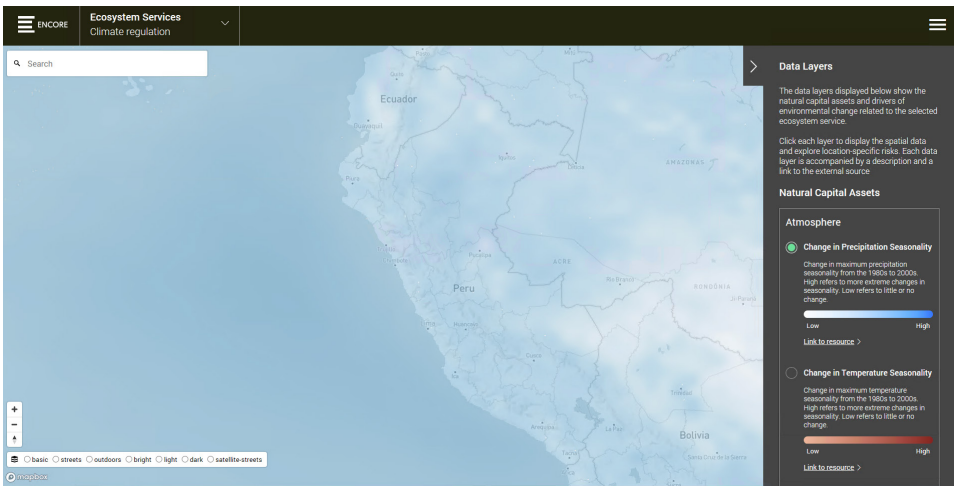


Figure 8: *Extract from ENCORE tool showing change in precipitation seasonality for Peru. Sources: Vega et al. 2017a. and Vega et al. 2017b*

Most indicators are designed such that natural capital disruption risk is the highest in geographical areas where the indicator is marked as 'high' according to the legend. That said, the bank should make sure that it understands what each indicator represents and consult the reference link under each indicator where necessary to confirm its understanding. ENCORE uses global level environmental datasets; the bank may therefore also wish to use other useful national-level datasets it is aware of to complement the assessment.

Overlay sectoral exposure in areas of risk

Users can focus on the geographical areas where the businesses in their portfolio have operations in order to understand if their portfolio is vulnerable to natural capital disruption risk. The more precise information the bank has on its borrowers' operations, the more accurate the assessment will be. For example, banks that have granular information about the location of their borrowers' operational assets can consult the maps available in ENCORE to visualise natural capital risk for these locations. An example of such an overlay is presented in Figure 9, where the location of mining operations in Peru has been overlaid onto a map of water stress in the country.

The bank can still derive insights from natural capital datasets even when it does not have granular information about its borrowers' operational assets. For example, the bank can pay particular attention to regions where its portfolio, or a sectoral segment of its portfolio, is significantly exposed. It can also seek to understand individual sectors' exposure to different sources of natural capital risk. If the bank does not know its geographical exposure by sector, it can use publicly available economic data or knowledge of the bank's sector specialists to understand different regions' contribution to economic activity per sector in a given country. It is also worth noting that some lending books have by their nature more detail on specific asset location than others. For example, home loans, project finance, infrastructure and agriculture portfolios might have location details of the assets being financed as these might also form part of the bank's security. Banks will need to systematically capture this data so it can be more easily used for natural capital risk assessments.

Each sector will be impacted differently by the state of natural capital assets and the trends for drivers of environmental change in a given location. The bank should use the information on sectoral dependencies within ENCORE complemented by its own knowledge of sectors to understand their vulnerability to natural capital disruption. The next section in this report provides examples of insights of sectoral exposure to natural capital disruption that can be derived by using ENCORE.

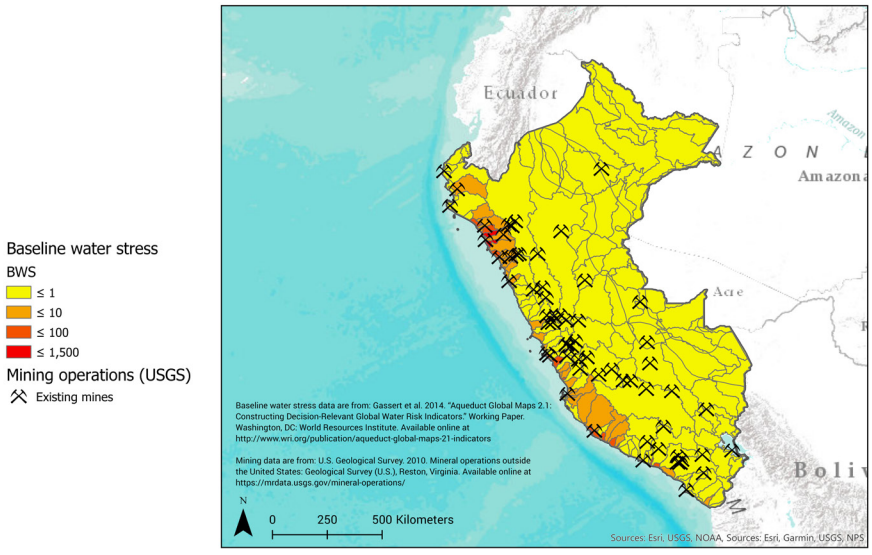


Figure 9. *Overlay of mining locations with water stress map of Peru. Baseline water stress measures the ratio of total annual water withdrawals to total available annual renewable supply, accounting for upstream consumptive use. Higher values indicate more competition among users. Sources: Gassert et al. 2014 and U.S. Geological Survey 2010*

Each sector will be impacted differently by the state of natural capital assets and the trends for drivers of environmental change in a given location. The bank should use the information on sectoral dependencies within ENCORE complemented by its own knowledge of sectors to understand their vulnerability to natural capital disruption. The next section in this report provides examples of insights of sectoral exposure to natural capital disruption that can be derived by using ENCORE.

4. APPLY

4.1 Take action

Once the assessment sponsor has conducted the assessment, the findings from the assessment will need to be collated in order to understand the implications for the bank's portfolio. Communicating the findings and suggested next steps to key stakeholders in a compelling way will be instrumental in pushing the bank to appropriately address its natural capital risk.

Synthesize and communicate results

In the first instance, the results will need to be synthesised in such a way that their key findings can be easily disseminated and understood by stakeholders. There are numerous ways to synthesize the results, including flagging sectors and geographies most at risk in the portfolio, or drivers of environmental change that may cause the biggest disruption to portfolios now and in the future. Consultation with key internal supporters of the process may be advisable, to ensure the results are pulled together and communicated in a manner aligned to their expectations and to the objective agreed for the assessment.

The key messages communicated to the assessment's stakeholders (identified in Step 1.2) should provide insight for the bank's strategy and management of risks and opportunities. Different messages may resonate better with each individual stakeholder, depending on their position in the organisation. Here are a few examples of framing that may be effective with senior stakeholders within the bank:

- communicating the magnitude of the risk e.g. the proportion of the bank's loan book that is exposed to regions where natural capital risk is high,
- providing clear recommendations for better risk management e.g. regions/sectors which should be monitored more closely in the future,
- drawing attention to the potential impact on loans at risk of default e.g. companies whose credit quality is already poor and at risk of deteriorating further due to their exposure to natural capital risk, and
- highlighting opportunities e.g. sectors that may benefit from changing environmental conditions in the future, or companies that are appropriately managing their natural capital risk.

Added to this, information on the assessment's methodology, data sources and any uncertainties should also be shared, to generate confidence in the assessment process but also to clearly communicate the assessment's limitations.

Identify next steps

Once the results have been widely shared, the financial institution may wish to consider how best to act upon them. The next steps will depend on the findings of the assessment and the objectives for conducting the assessment. Building upon the findings of the assessment can be done by:

- broadening the assessment: the bank can complement the analysis already undertaken by reviewing additional sectors, portfolio segments, natural capital considerations or geographies.
- deepening the assessment: the rapid assessment is the first step in the bank's journey to understand its natural capital risk. The bank can investigate an area of natural capital risk further by using local/granular data sets to assess a specific source of natural capital risk with higher accuracy. It can also look to quantify the potential impact of a source of natural capital risk flagged on certain sectors. Banks seeking a forward-looking assessment of natural capital risk may wish to understand the financial value of asset impairment under different environmental scenarios and adjust borrowers' probability of default and potential loss accordingly.

4.2 Embed natural capital risk management

The assessment sponsor, equipped with the risk process mapping conducted in Step 1 and the findings of the assessment, can reflect on how best to ensure the long-term management of natural capital risks within the bank.

Identify entry points for natural capital risk integration

The purpose of this step is to identify where and how natural capital risk can be best integrated into the bank's existing risk management framework in order to institutionalise the management of natural capital risks. The assessment sponsor should discuss with teams involved in developing the bank's risk assessment policies and models and with those responsible for applying the bank's risk management framework (who had been engaged in the process in Step 1). These discussions will clarify appropriate entry points and teams' appetite for leading the integration. There may be many adequate entry points for intervention, and the selection of an entry point may ultimately be a decision based on practicality.

The key to successfully embedding natural capital risk within the bank lies in following the core steps of any risk management framework. Figure 10 represents the risk management lifecycle (previously seen in Step 1) appended with examples of ways in which a bank can address natural capital risk in its processes.

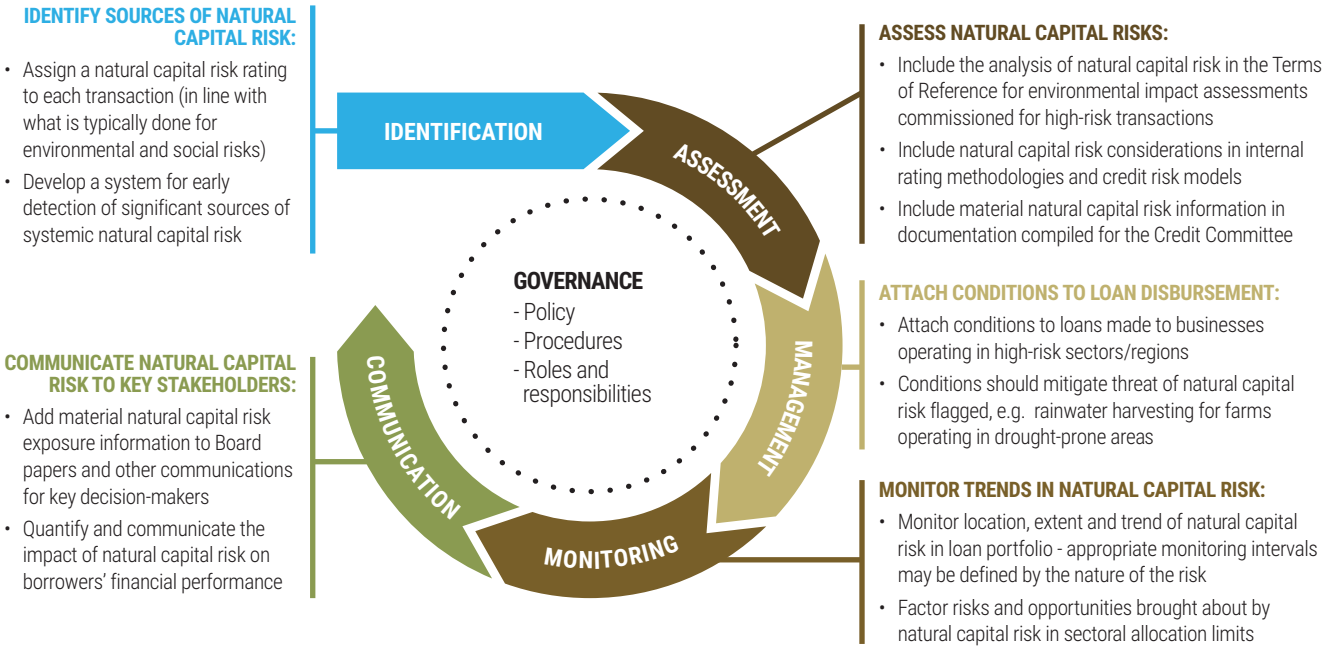


Figure 10: *Stages of the risk management lifecycle with examples of how to integrate natural capital risk considerations.*

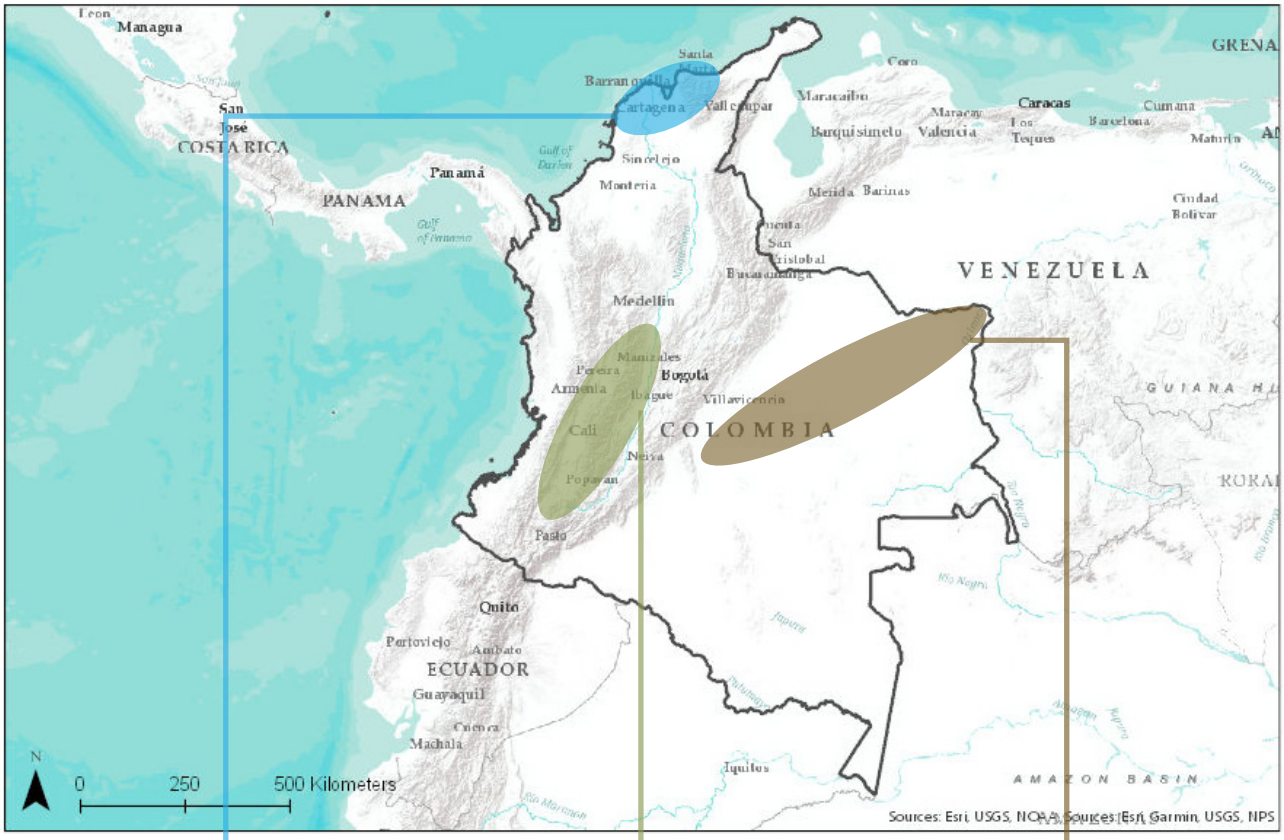
Train staff on natural capital risk

Successful organisational change cannot happen without the buy-in of staff who will be tasked with implementing the new policies and processes. For this reason, training and raising awareness of natural capital risk amongst staff is of paramount importance. In particular, dedicated risk teams should be effectively trained and educated on key natural capital concepts, the assessment methodology and its objectives and limitations. With this knowledge in hand, they will be best placed to innovate and create new methodologies for assessing natural capital risk and linking it to the bank's financial risk. Front-office staff should also be trained to identify early warning signs of natural capital risk in the transactions they assess. With the feedback of these teams, training can be refined over time based on needs identified.

APPLYING THE RAPID ASSESSMENT APPROACH: COUNTRY-LEVEL EXAMPLES

This section illustrates natural capital risk findings that may be derived from a rapid natural capital risk assessment, and the subsequent business insights they can generate. The figures below show examples of key sectors in the pilot study countries, and natural capital risks that may disrupt them based on data available in ENCORE. They are not intended to be an exhaustive assessment of natural capital risk in these countries, but an indicative snapshot of how these risks may affect key sectors of these countries' economy. Each dotted circle represents an area where the specified sector's operations are potentially at high risk of natural capital disruption. The colour of the circle denotes the natural capital risk and the sector that it may disrupt.

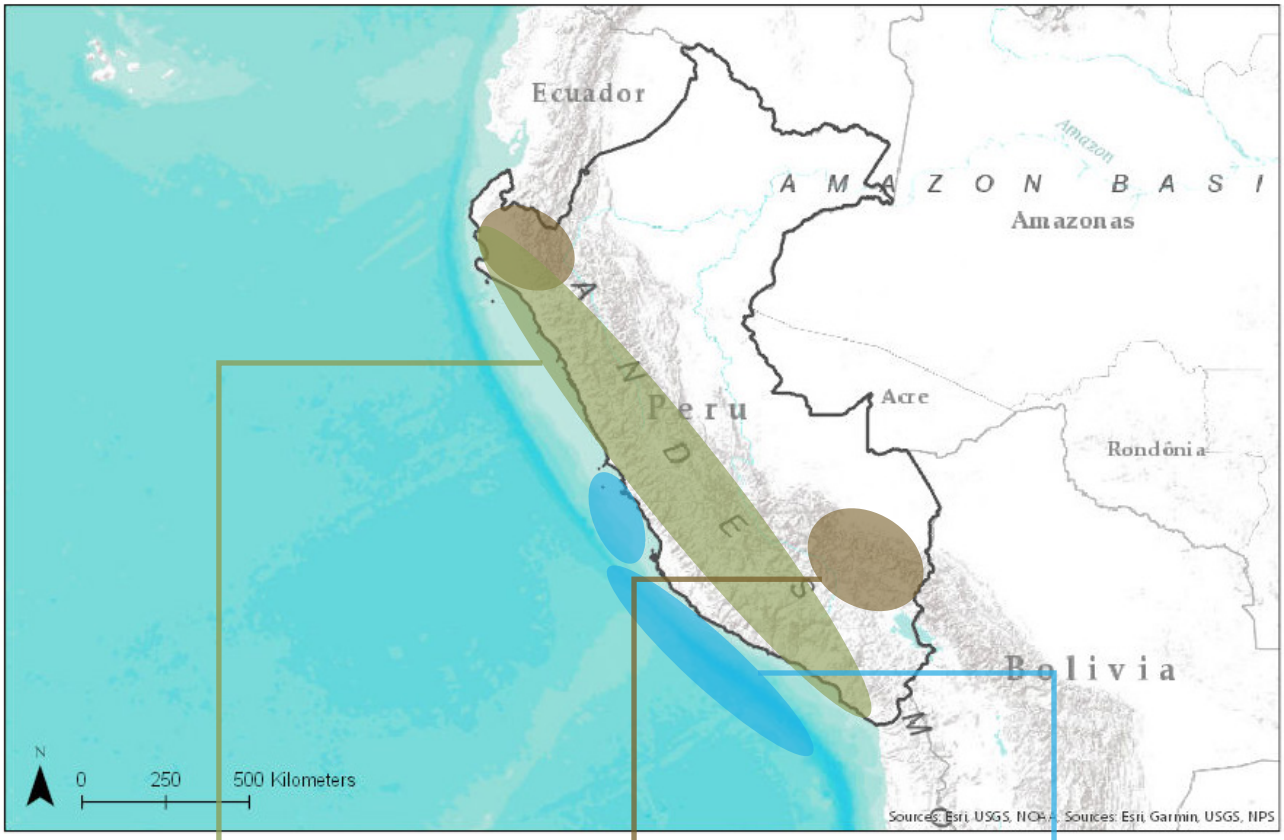
COLOMBIA



TOURISM	AGRICULTURE	OIL AND GAS
WIND SPEED INCREASE	**INCREASE IN TEMPERATURE SEASONALITY**	**DEGRADED HABITATS/FLOOD AND STORM PROTECTION**
Nature and location of natural capital risk: • Over recent decades, wind speed has increased significantly along key tourist destinations of the country's Caribbean coastline such as Cartagena and Santa Marta. **Impact on sector:** • Tourism is a key contributor to the economy of Colombia's Caribbean regions • Increased storms and wind speeds may result in unfavourable conditions for tourism to thrive, affecting hotels, cruise providers and tour operators based in these regions.	**Nature and location of natural capital risk:** • Variation of annual temperature range over the years and long-term temperature increase • Pockets in the east – corresponding to the country's 'coffee triangle' regions – have experienced both considerable inter-annual temperature variation and significant temperature increases overall **Impact on sector:** • Coffee crops are highly sensitive both to temperature increases and unpredictable temperature fluctuations within and between years • Increases in temperature seasonality may have significant impacts on coffee yields, both in isolated instances, and as a more systemic trend, resulting in reduced revenues. • Growers may also be forced to undertake costly mitigation measures such as re-planting coffee crops at higher altitudes and co-investing in the development of new strains of coffee species	**Nature and location of natural capital risk:** • Habitats act as storm surge and wind buffers and prevent or reduce the intensity of flooding • Habitats have been severely degraded in Colombia's portion of the Llanos grasslands in the east of the country **Impact on sector:** • The oil and gas sector is particularly susceptible to flood and storm damage, due to its exposed and extensive infrastructure. Disruption can affect all segments of the oil and gas value chain, in particular production and transportation. • Disruption to the sector can result in considerable financial losses due to: - The cost of repairs and the relative geographical isolation of affected facilities and hardware - The significance of the forgone revenue for every day production is halted

Figure 13: *Map of Colombia displaying areas of potential natural capital risk to key economy sectors.*

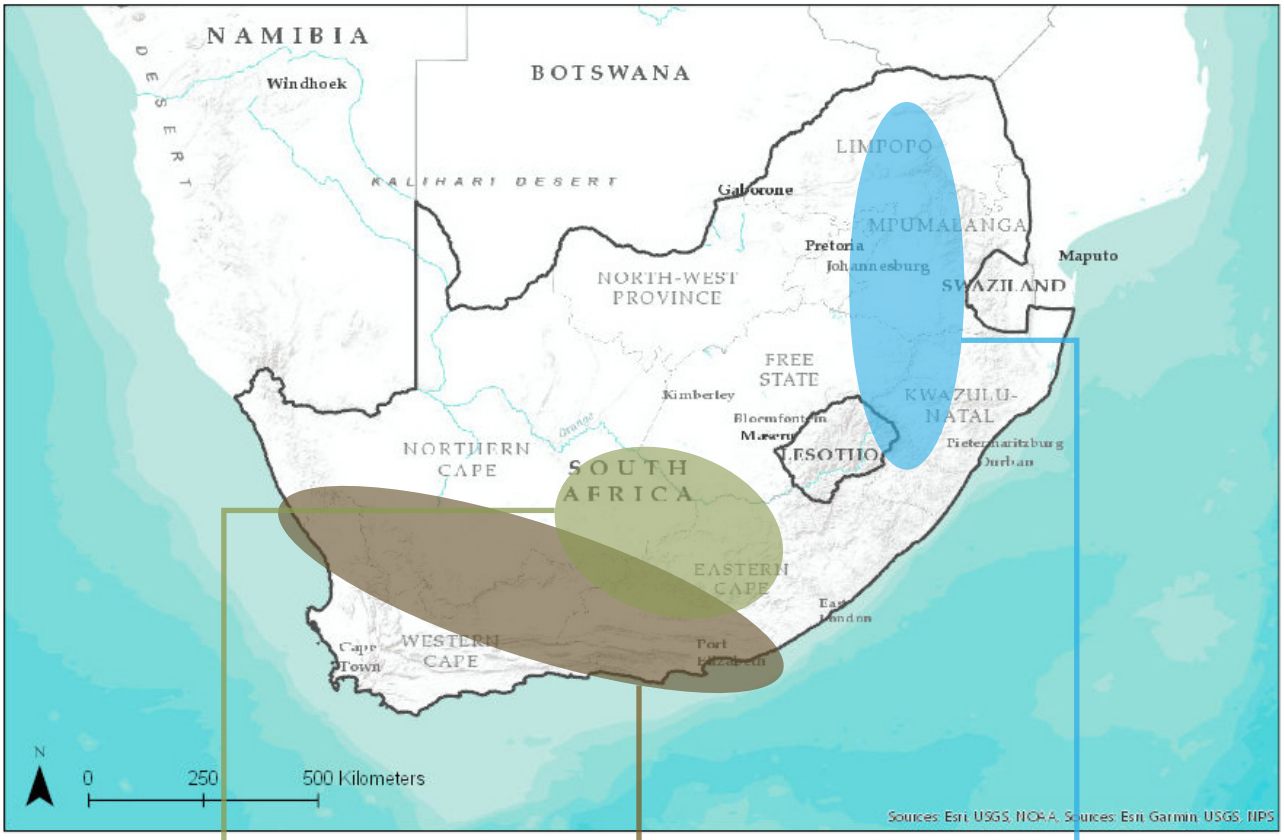
PERU



AGRICULTURE	MINING	FISHING AND FISH PRODUCTS
DROUGHTS	**CHANGE IN PRECIPITATION SEASONALITY**	**OCEAN POLLUTION**
Nature and location of natural capital risk: • Main areas of drought risk are located between the country's coastline and the Andes mountain range. • Droughts directly affect levels of surface water, and groundwater through reduced aquifer recharge rates. **Impact on sector:** • Both rainfed and irrigated agriculture will be affected by drought stress. Impacts include: - Reduced crop yield - Crop mortality - Increased operational expenditure associated with securing alternative water sources and replacement agricultural inputs.	**Nature and location of natural capital risk:** • Variation in the annual range in precipitation can result in significant localised increases or decreases in rainfall. • Pockets in the northwest and south of the country have experienced both a) considerable inter-annual variation in rainfall and b) significant rainfall increases (grey) and decreases (brown) respectively. **Impact on sector:** • Sudden increases in rainfall can result in flooding and trigger landslides. Impacts include: - suspension of operations due to flood damage - landslides cutting off vital transportation links for shipment of mining inputs and concentrates • Sudden decreases in rainfall can cause drought and aquifer depletion. Impacts include insufficient surface and groundwater availability for mines to be fully operational, resulting in reduced output and/or increased expenditure associated with securing alternative water sources.	**Nature and location of natural capital risk:** • Ocean pollution has increased considerably along Peru's southern coast in recent years. This can significantly reduce water quality, harming fish stocks. • In particularly severe cases (e.g. those resulting in harmful algal blooms), local stocks can be depleted. This has previously resulted in government-imposed bans on fishing activity in affected areas. **Impact on sector:** • The fishing and fish processing industries play a key role in Peru's economy. • Increasing ocean pollution may drive unpredictable disruption to fish stocks in the near term and result in more systemic declines in future, causing significant economic losses and unemployment.

Figure 12: *Map of Peru with text boxes indicating areas of potential natural capital risk to key economy sectors.*

SOUTH AFRICA



STORAGE, TRANSPORTATION AND COMMUNICATION	MINING	MANUFACTURING
FLOODING	**SOIL DEGRADATION**	**WATER STRESS**
Nature and location of natural capital risk: • Higher concentration of flood risk in the east of the country • Regions of Limpopo, Mpumalanga and KwaZulu-Natal have experienced the highest rates of flooding in the country over recent decades **Impact on sector:** • Sectors are highly susceptible to the effects of floods due to combination of costly hardware/facilities and widespread, exposed infrastructure • Floods can result in lengthy service outages and require long and expensive repairs, all of which have significant knock-on effects on other sectors of country's economy	**Nature and location of natural capital risk:** • Soil degradation leads to loss of soil quality and soil erosion. • South Africa has very high severity of soil degradation across swathes of the country. • There is a significant risk hotspot spanning the Cape Provinces in the country's south west regions. **Impact on sector:** • Increased soil stability allows for steeper slopes to be designed in open pit mines, which result in lower stripping ratios (ratio of units of waste material generated per unit of ore). Decreased soil stability may therefore increase a mine's design costs. • In extreme cases of soil degradation, landslides may occur, potentially obstructing access to mining facilities or necessitating costly measures to stabilise the designed slopes.	**Nature and location of natural capital risk:** • Groundwater stress occurs when demand for water exceeds the available amount during a certain period causing deterioration in both quantity and quality of groundwater resources. • Highest concentration of stress is clustered in the country centre, spanning the regions of Northern Cape, Eastern Cape and Free State. **Impact on sector:** • Groundwater is critical for the smooth operation of the manufacturing sector, where it is used as a production input and for cooling, cleaning, waste dilution and maintenance of facilities. • Disruption to the provision of groundwater may lead to constrained or suspended production and may require the costly procurement of alternative water supply or substitute resources.

Figure 11: *Map of South Africa displaying areas of potential natural capital risk to key economy sectors.*

EXPERIENCE ASSESSING NATURAL CAPITAL RISK FROM FOUR PARTICIPATING BANKS

The NCFA and PwC conducted rapid natural capital assessments with five participating banks in Colombia, South Africa and Peru. Four of these institutions also piloted further actions to deepen the natural capital risk assessments and explore options for practical integration in their existing risk processes.

The pilot studies have varying areas of focus and methodological approaches depending on each bank's interests and needs - these areas of focus are presented in the figure below.

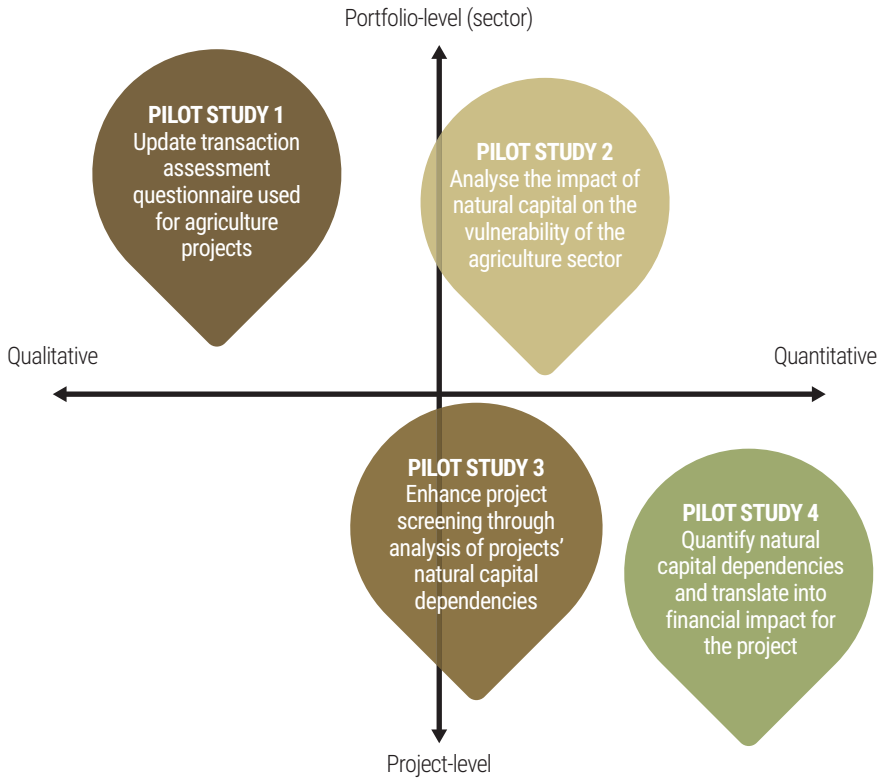


Figure 14. *Varying focuses and methodological approaches of pilot studies.*

The four pilot studies conducted with partnering financial institutions demonstrate the variety of practical applications for the information generated by the rapid natural capital risk assessment. Each institution was able to use the insights gained during the assessment process to strengthen key areas of their risk assessment and management process. By integrating natural capital risk considerations in loan screening, loan performance monitoring, or forward-looking strategy decisions, each institution was able to strengthen and complement existing processes in a practical manner that can be applied in their day-to-day operations.

Pilot study 1: integrating natural capital risk into client screening in the agricultural sector

This pilot study considered how the financial institution could use the results of the rapid natural capital risk assessment to enhance its existing process for screening clients and new loan proposals in the agricultural sector. The assessment provided a basis for reviewing the current information that is collected on borrowers to identify gaps and ensure that the main natural capital risks potentially affecting their production processes and geographical areas are adequately identified and evaluated.

The pilot study found that some aspects of natural capital risk were already being considered in the institution's existing process for loan screening. Using the information from the ENCORE tool, the pilot study was nonetheless able to identify additions that could improve the systematic consideration of the most material natural capital risks notably by complementing the information gathered from the prospective client with data on environmental conditions for the location of production.

Pilot study 2: exploring future water-related risks in the agricultural sector

This pilot study focused on the application of natural capital risk assessments in strategic, forward-looking decisions. By combining environmental scenarios with information from the rapid natural capital risk assessment, the financial institution was able to assess the likely evolution of water-related natural capital risk exposure in their agricultural portfolio. This assessment can potentially support the bank's future capital allocation decisions by providing insight on which regions or production processes are likely to be worse affected by predicted environmental change.

The information provided by ENCORE shows how changes in the environment can lead to lower revenues or higher production costs for producers in the agricultural sector. This enables banks to connect existing environmental scenarios, such as climate models or water availability previsions, to key financial ratios in their loan book. This type of environmental stress testing can assist financial institutions in making strategic decisions concerning future portfolio allocation decisions.

Pilot study 3: integrating natural capital risk in project screening

This pilot study focused on the loan approval process to explore how the integration of natural capital risk could complement existing environmental risk assessment procedures. The study found that a natural capital risk assessment highlighted dependency risks that could materially affect operations in the projects under review and that these risks were only partially identified through existing processes.

The study demonstrated how the information about natural capital risk available in the ENCORE tool can be used in the screening of new loans to enhance the existing process for environmental risk assessment. The enhanced process complements the current focus on risks related to environmental impacts of proposed loans by adding the consideration of dependency risks that arise if environmental change affects the operations of the project being financed.

Pilot study 4: exploring the integration of natural capital risk into credit risk assessment

This pilot study focused on an existing project financed by the financial institution and assessed how changing water availability could disrupt production, with a view to quantifying the effects of such a disruption on financial performance.

The pilot study demonstrated the feasibility of a quantitative approach to natural capital risk assessment. With precise enough information about the evolution of water availability at production location and the vulnerability of production processes to changes in water availability, robust estimations of the financial impact on operations can be developed. Cost of mitigation of these risks were also integrated into the assessment. This approach was found to be data intensive and may be best suited to sectors or companies who have been identified as highly exposed to natural capital risk through an initial assessment using the ENCORE tool.

CONCLUSION

Environmental change at both local and global scales is unpredictable and accelerating. The risk this creates for businesses may be passed on to financial institutions either at an asset or client level or at a portfolio level through systemic risks due to their exposure to large segments of the economy. Most financial institutions struggle to appropriately identify, assess, manage or mitigate these unfamiliar risks. As with any other material risk, financial institutions need to integrate natural capital risk management into their wider enterprise risk management frameworks at the asset, client and portfolio levels.

Accelerating environmental change may already be having an impact on the returns of some financial institutions, although may not be separately identified from wider financial impairments. Regulators are increasingly aware of the materiality of natural capital risks and have been developing and introducing rules that make financial institutions explicitly responsible for assessing and managing them. Whilst climate change is a high-profile example, financial regulators are also looking at wider environmental, social and governance (ESG) risks, including natural capital risks.

The work conducted in this study has confirmed that whilst natural capital risk can be complex, the rapid natural capital risk assessment framework and the ENCORE tool developed by the NCFA allow financial institutions to cut through this complexity and get an initial understanding of their natural capital risk exposure. The experience of piloting rapid natural capital risk assessments with banks confirmed that this approach can be valuable for any bank, regardless of its size, geography and existing risk processes.

Equipped with an initial understanding of key natural capital risks faced by their portfolios, leading financial institutions should continue to identify, assess and manage these risks as they evolve and as increasingly sophisticated risk mitigation approaches emerge. A recommended risk management framework is set out below. Those who embed natural capital thinking at the core of their organisational culture – with the aid of strong governance, clear processes and well-informed teams – are the most likely to succeed at turning natural capital risk into opportunity.

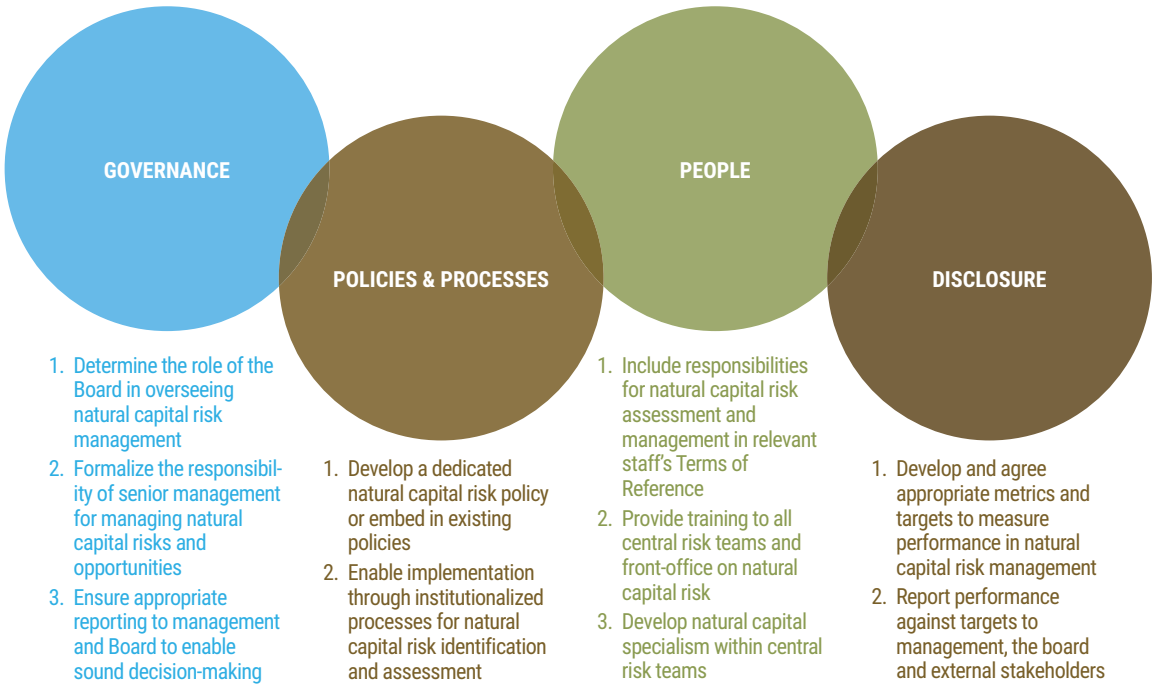


Figure 15: *Pillars of succesful risk management.*

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ABOUT THE NATURAL CAPITAL FINANCE ALLIANCE

The Natural Capital Finance Alliance (NCFA) is a finance sector led initiative, providing expertise, information and tools on material aspects of natural capital for financial institutions. It works to support these institutions in integrating natural capital considerations into their risk management processes and products as well as helping them to discover new opportunities. The NCFA secretariat is run jointly by the UN Environment Finance Initiative and Global Canopy.

For more information, contact the NCFA at: info@naturalcapital.finance

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At PwC, our purpose is to build trust in society and solve important problems. We're a network of firms in 158 countries with more than 250,000 people who are committed to delivering quality in assurance, advisory and tax services. PwC's sustainability and climate change advisory team combines 800 experts globally, with over 100 in the UK. Our specialists work with both public and private sector clients to bring fresh insight, improved understanding and greater resilience. For our work with the NCFA we brought together a unique international team including front-line finance risk experts, specialists in natural capital valuation and management, and experienced sustainable finance professionals.

For more information, visit https://www.pwc.co.uk/services/sustainability-climate-change.html

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ADDITIONAL CONTRIBUTIONS

Little Blue Research Ltd. provided expert input through the course of the project with a particular focus on supporting the natural capital risk assessment pilots with four participating financial institutions.

UNEP-WCMC provided expert input through the course of the project and facilitated access to environmental datasets for the rapid natural capital risk assessments and subsequent pilots.

The following Advisory Panel members provided their expert input and comments on the project methodology: Declan McGinn (PwC), James Spurgeon (SustainValue Ltd), Mark Gough (Natural Capital Coalition), Marwa Hammam (Cambridge Judge Business School), Alison Hester (James Hutton Institute) and Courtney Lowrance (Asian Infrastructure Investment Bank).

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