

Experience and reflections from piloting the TNFD's LEAP approach on an infrastructure development and finance organisation's portfolio





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Name of participating organisations: Private Infrastructure Development Group (PIDG) piloted the v0.4 beta TNFD recommendations in partnership with The Biodiversity Consultancy (TBC) - as lead consultant for the analyses, and Global Canopy (GC) responsible for commissioning, project management support and output review.

Overview

Scope

This case study explores the application of the TNFD LEAP approach to a sample of Private Infrastructure Development Group's (PIDG) infrastructure portfolio, which is comprised of projects financed through equity, debt and guarantees to banks and bond investors to support infrastructure project(s) development. It aims to support infrastructure sector players to interpret and gain insight on the TNFD recommendations, covering:

1. Challenges and opportunities related to data sources/tools/platforms available to support assessments;
2. Potential use and limitations of existing available data to inform Locate, Evaluate, and Assess analyses; and
3. The synergies between TNFD's recommended approach, and PIDG's impact management framework and process.

- **Geography:** South and Southeast Asia, and Australia only
- **Sector:** Financials, Infrastructure
- **Biome:** Tropical and subtropical forests (T1), Rivers and Streams (F1), and Intensive Land Use Systems (T7)

Pilot timeframe

March – September 2023

Business summary

PIDG is an infrastructure developer and investor, which mobilises private investment in sustainable and inclusive infrastructure in South and Southeast Asia, and sub-Saharan Africa. As of 2022, PIDG has committed \$5.2bn, bringing 211 infrastructure projects to financial close, which has mobilised \$24.5bn from the private sector and \$39.8bn overall.

PIDG's [approach to impact](#) is two-fold:

- to identify and mitigate the risk of negative impacts, through PIDG's health safety environment and social (HSES) management system; and
- to drive and demonstrate tangible positive impact on people and planet, the wider economy and infrastructure capital markets; through PIDG's sustainable development impact (SDI) framework.

PIDG is a signatory to the Operating Principles for Impact Management, aligns to the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (IFC PSs), and reports per the Task Force on Climate-related Financial Disclosures (TCFD). [PIDG's strategy for 2023-2030](#) includes nature protection and restoration as an integral part of the organisation's wider commitments. Fundamental to the strategy is the development of an integrated nature and climate approach, which is underway¹.

Key findings

This pilot allowed PIDG to understand challenges and opportunities related to the available datasets and tools to perform a qualitative assessment to inform the first three steps of the LEAP approach. An assessment of interface with nature at transaction level and an assessment of dependencies and impacts at sector level were conducted. This was followed by a qualitative physical and transition risk assessment that was later integrated with PIDG's existing impact management framework.

Determining sensitive locations

The method designed for the Locate phase can allow PIDG to report on the portfolio-level exposure to projects, and/or PIDG companies active in sensitive locations in alignment with the TNFD disclosure recommendation Strategy D and core disclosure metrics: such as total spatial footprint, extent of

¹PIDG (2022) [Annual Review](#).

land use change, ecosystem condition and species extinction risk there are existing global data and tools on biodiversity and water risk to support these assessments. A key requisite is the access to spatially-explicit location data of each project in the portfolio which was available to PIDG.

- The approach to applying the Locate and Evaluate phases should be tailored to fit the use case of each FI and their access to location-explicit data. Mapping sensitivities as part of the Locate phase need not necessarily entail prioritisation of transactions. In the PIDG context, rather than prioritising, the Locate phase was useful to identify and describe geography-related sensitivities across the portfolio.
- There should be more guidance on how to align good practice frameworks and guidelines such as IFC PS6², which is a widely adopted biodiversity risk management safeguard in the finance sector, to the LEAP approach.
- An FI could use the results of the Locate phase to help focus efforts on the most pertinent issue areas during due diligence, while helping to ensure that the positive environmental outcomes of an investment accounts for the ecological sensitivities associated with the location it invests and/or operates in.

Understanding impacts and dependencies

This pilot provides insights into potential sectoral exposure to nature-related dependencies and impacts, although current methods lack the depth required for informing comprehensive risk mitigation. Key blind spots included data to inform 'real' impacts and dependencies, supply chain traceability, as well as more granular understanding of production processes driving those impacts and dependencies.

- Despite data challenges, methods/tools are rapidly evolving and can be used to understand relative exposure to nature-related risks from dependencies and impacts at the sectoral level. Results from using tools like ENCORE and SMT are useful to inform 'hotspots' in terms of drivers of nature loss. However, these tools do not (yet) provide the deeper insights that are needed to inform proper risk mitigation. More testing is also needed with methods that would estimate supply chain impacts or dependencies on nature.
- Currently, available data and methods allow reporting of potential dependencies and impacts by sector or transactions' relative exposure. Reporting on 'real' (instead of potential or exposure-based) impact driver metrics at transaction level is feasible for water withdrawal and consumption from areas of water stress.
- PIDG should continue to leverage existing tools and processes used to manage adverse impacts on nature at the transaction level, such as Environmental and Social Impact Assessment (ESIA), Environmental and Social Due Diligence (ESDD), and Environmental and Social Action Plan (ESAP), elevating their quality of application to align with TNFD recommendations, including on actively improving the state of nature and enhancing synergies for nature and people.

Translating into risks and opportunities

Meaningful risk assessments should capture key factors driving transition and physical risks tailored to an FI's perspectives and aligned with TNFD. In this piloting, available data allows for exposure-based, potential transition risk assessment and physical risk assessment (for water only). A key data challenge to assessing real nature-related transition and physical risk was transaction-level quantitative impact drivers and dependencies data, how these relate to production processes, e.g., amount of

²IFC (2012) [Overview of Performance Standards on Environmental and Social Sustainability](#). Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

water consumption per megawatt installed capacity, and data on company management and performance. Improved guidance and more-detailed methods on Assess from TNFD is needed.

- Risk assessment can be highly tailored to an FI's context with pre-selected risk factors that are chosen based on TNFD's and the FI's own perspectives on what drives transition or physical risks.
- Where transaction-level data is available, real physical risk assessment could be performed for water-related services, in line with current climate-related risk assessment.
- There needs to be further guidance clarifying how applying the TNFD LEAP approach leads to risk mitigation from an FI's perspective, e.g. how it informs client engagement. From this pilot, a key area for the infrastructure sector to engage projects on would be on enhancing transactions' ESIA quality, aligning with TNFD's recommendations on nature dependencies, impacts, risks and opportunities identification, management, and disclosures.

About this case study: This case study forms part of a series of six case studies, run as part of Global Canopy's TNFD piloting program. The pilots tested the v0.4 beta TNFD recommendations and its accompanying 'LEAP' (Locate, Evaluate, Assess, Prepare) approach.





Business case

PIDG recognises the importance of nature, and the intrinsic role it plays in climate resilience and has made the integration of nature and climate considerations a core requirement of its 2023-2030 investment strategy.

As a sustainable infrastructure investor in developing and emerging economies where access to basic infrastructure is at unacceptably low levels (Songwe et al 2022), it has grown increasingly clear to PIDG that the natural world is under immense pressure, further undermining long-term sustainable development (IPBES 2019). There is an urgent need to establish rigorous assessment approaches and disclosures on nature to ensure that the infrastructure finance community can truly promote sustainable, resilient, and inclusive development.

An important step in PIDG's journey to consider nature more holistically across its investments is the need to understand and look at ways to apply evolving good practice recommendations to better assess the organisation's nature-related impacts, dependencies, risk, and opportunities. PIDG therefore set the following objectives for this TNFD pilot:

- To better understand approaches to assess supply chain impacts across the portfolio.
- Explore practical metrics and indicators to measure impacts, dependencies, risks, and opportunities at the transaction- and portfolio level.
- Explore preparedness for future disclosure in line with the TNFD disclosure recommendations.

Pilot scope

The most relevant entry points for PIDG, when considering a nature-related risk and opportunity assessment, are the sectors and geographies in which they invest and operate, and the nature of the financial products currently deployed in Asia via two [PIDG companies](#), [InfraCo Asia](#) and [GuarantCo](#) (Box 1). PIDG broadly provides funds and/or financial support to two general categories of projects/clients:

- a. specified project(s) or set of physical transactions; and
- b. corporate(s) with multi-site developments.

Box 1

For (a), asset location-based information is available, thereby allowing PIDG to rapidly progress to determining how its assets may interface with nature. For (b) a sector/geography-focused approach was considered more appropriate as PIDG focuses more on helping clients raise their own HSES management systems and performance for such transactions.

InfraCo Asia, PIDG's development arm, originates, develops, structures, invests, and manages projects. Taking on early project development, it provides management and capital to address early-stage risks and developing bankable projects that can attract debt and equity at financial close.

GuarantCo, PIDG's guarantee arm, provides local currency contingent credit solutions, including guarantees to banks and bond investors to develop local capital markets.

Figure 1: Summary of how LEAP approach was applied in this pilot

Scoping			
	Locate	Evaluate	Asses
Objectives	<ul style="list-style-type: none"> Spatially explicit asset-level assessment to characterise relevant areas 	<ul style="list-style-type: none"> Assessment of nature-related impacts and dependencies at sector and transaction level 	<ul style="list-style-type: none"> Identify specific project or transaction based on their potential physical and transition risks
Description	<ul style="list-style-type: none"> Sites characterised by biodiversity importance, ecosystem integrity and water stress 	<ul style="list-style-type: none"> Qualitative approach to dependencies and impacts Semi-quantitative deep-dive into impacts of land use change 	<ul style="list-style-type: none"> Transaction tagging Qualitative approach to nature-related risk complementary to PIDG's current risk assessment framework
Notes	<ul style="list-style-type: none"> Only location of direct operations, for characterisation purposes Location of supply chain and prioritisation are out of scope 	<ul style="list-style-type: none"> Due to lack of data, a quantitative assessment of dependencies and other impact pathways are out of scope 	<ul style="list-style-type: none"> Physical risk focused on water scarcity. It is not yet possible to perform quantitative assessment or scenario analysis

The analyses were undertaken in line with guidance given on the first three phases, the Locate (L), Evaluate (E), and Assess (A) phases, of the TNFD LEAP approach only. An opportunities assessment and the Prepare (P) phase was out of scope for this pilot.

Analysis

A summary of the pilot methods, tools/data, key findings and reflections are described in this section³.

Part 1: Determining sensitive locations

The aim of the Locate phase of LEAP is to identify and prioritise potential nature-related issues according to three filters: economic sector, value chain and geography. The Locate phase was applied to sites where geographic point location information was available for infrastructure projects and where PIDG has operational or financial control. Supply chain information (e.g., main material/production equipment suppliers/location) was not considered during this phase, as PIDG does not currently require its projects/clients to report on this aspect.

As part of its existing HSES management system, PIDG screens for biodiversity risks using the Integrated Biodiversity Assessment Tool (IBAT) and other information sources where appropriate as part of their early investment review and appraisal process.

Summary of methods applied for the Locate phase

Global environmental datasets are increasingly being used to support a rapid understanding of where an organisation's sites or activities closely interact with nature and help focus further assessment efforts. Sensitive locations were identified and characterised in line with the TNFD Locate phase recommendations using global datasets only. Findings and reflections from applying the approach sought to answer the following questions.

- How aligned is PIDG's existing risk screening framework to the TNFD guidance on the unit of analysis delineation and ecologically sensitive location criteria? How do the results of applying these criteria compare to PIDG's risk screening criteria?

³Please reach out to the PIDG and TBC team for further information on the methods and specific outputs of this pilot.

- How can the Locate phase better inform the project and/or client review and appraisal process?

The designed methodology was applied to a predetermined unit of analysis that ranged from a 5 to 30 km buffer around the infrastructure projects' geographic point coordinates. For hydropower projects, a freshwater buffer was delineated using the boundaries of the watershed in which the project is located. These were considered sufficient to account for the physical footprint of the project, its associated infrastructure, and the direct nature impacts caused by the project.

The TNFD guidance defines a 'priority location' as a location where an organisation has material nature-related issues in its direct operations and value chains, and/or where the assets or activities interface with areas which meet any of the following criteria: important for biodiversity, high ecosystem integrity, rapid decline in ecosystem integrity, high physical water risks or areas of importance for ecosystem service provision, including benefits to indigenous peoples, local communities and stakeholders. The best available global environmental datasets were used to estimate biodiversity importance, ecosystem integrity and water stress at transactions' locations across sites. Thresholds were defined to identify sites where each criterion was relevant (Figure 2). The most appropriate threshold to identify relevant locations for each dataset was defined based on the global distribution of values within datasets. Sites triggered by at least one indicator in any criteria were considered a 'priority location'.

Figure 2: Criteria, datasets, and thresholds to identify relevant locations within the portfolio

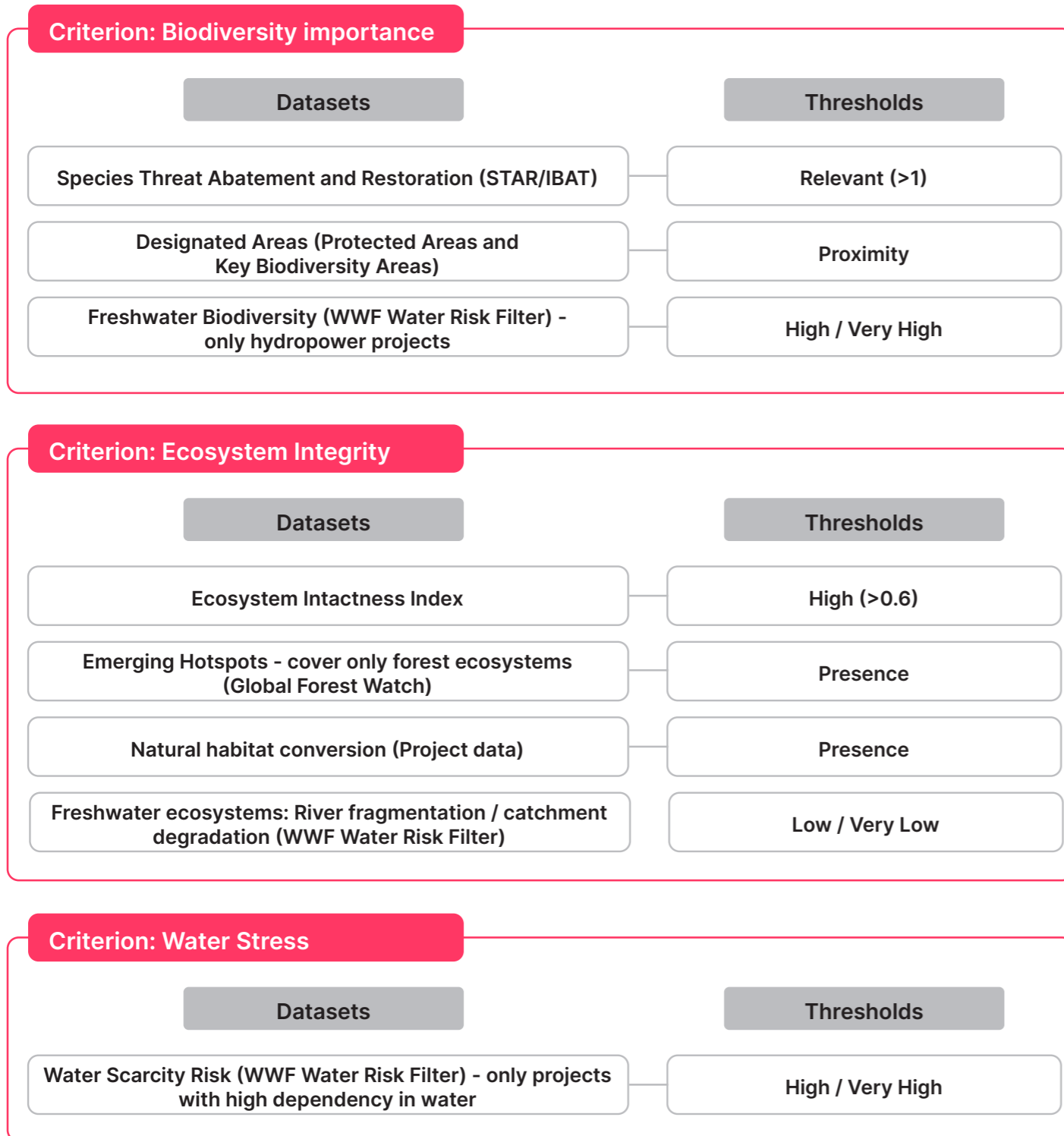


Figure 3: Ecoregion Intactness according to Beyer et al (2020) transactions locations.

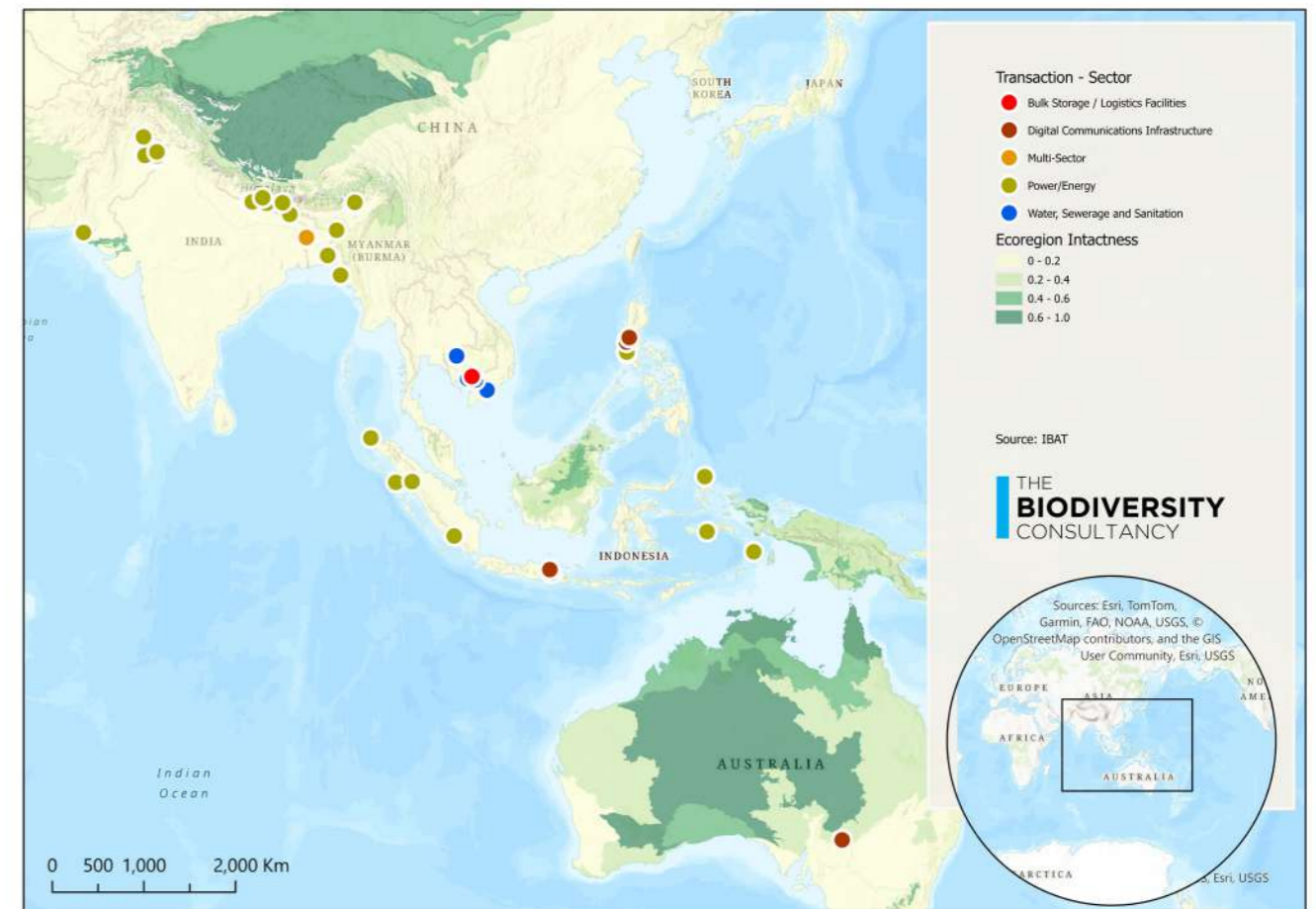
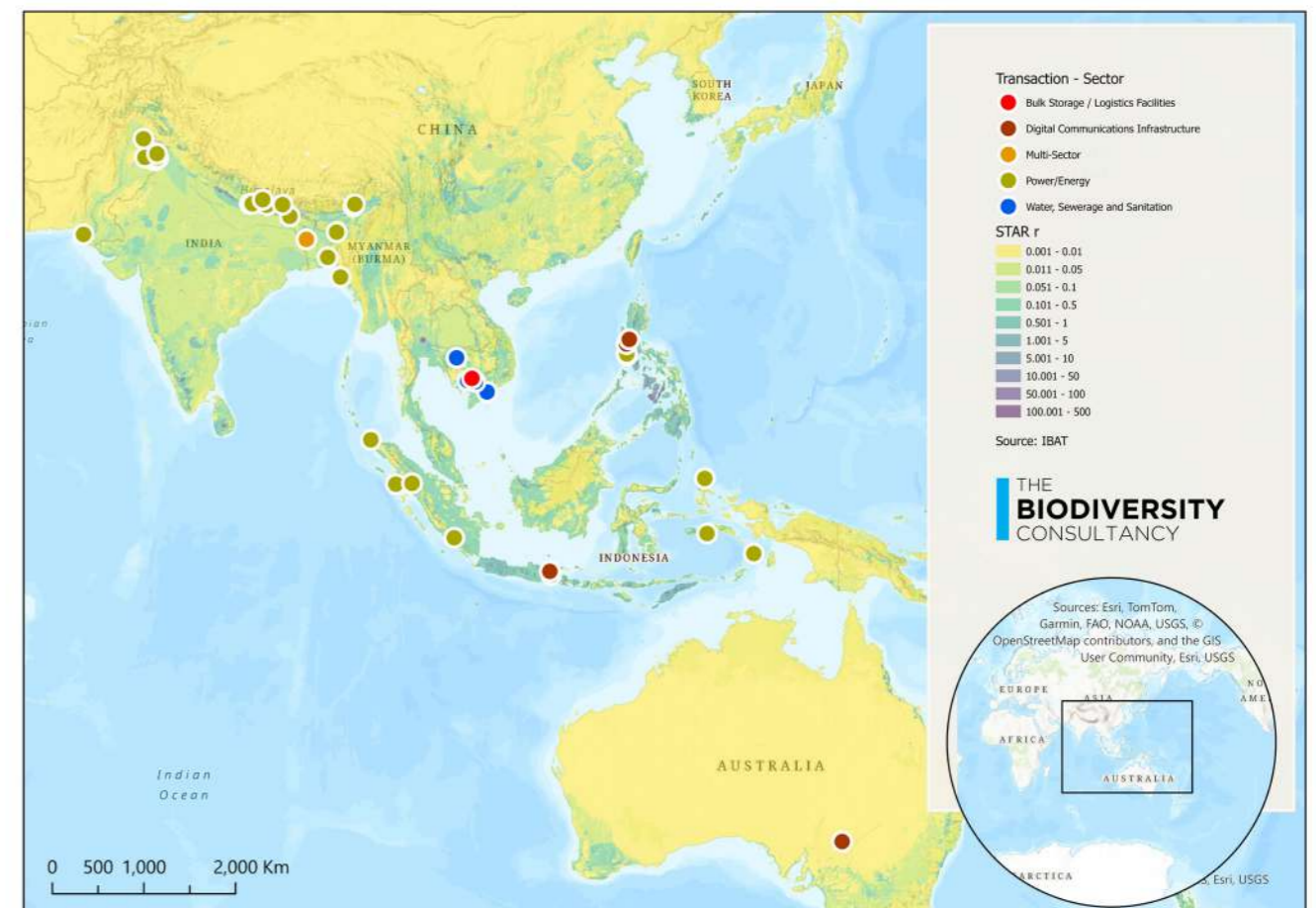


Figure 4: STAR_R indices where transactions are located.



Tools/Datasets used

Multiple datasets were used for this phase:

Table 1: Datasets and tools used in Locate phase

Dataset / Tool	Use in this pilot	Rights of use
Ecoregion Intactness Index	Estimate ecosystem integrity	Free
WWF Water Risk Filter	Estimate water stress	Free
IBAT – STAR (Species Threat Abatement and Restoration); WDPA (World Database of Protected Areas); KBA (Key Biodiversity Areas)	Estimate biodiversity importance	Subscription required, accessed through PIDG partnership with IBAT
Global Forest Watch	Estimate ecosystem loss	Free
Ecoregions of the World	Identify biomes	Free

Some limitations using these datasets were:

- The Ecoregion Intactness Index covers the period between 1993-2009. Therefore land conversion of forest habitats after 2009 could only be assessed using Global Forest Watch.
- The STAR dataset is based on species global range maps at 5 km resolution and therefore when focusing on threatened and near threatened species of amphibians, mammals, and birds, that have small global ranges, analysis may underestimate the biodiversity significance of an area. Furthermore, biodiversity significance may also be underestimated where the area supports threatened species not currently assessed through the IUCN Red List or those which are widely distributed threatened species. STAR still remains useful to compare across localities but is challenging to use for specific target setting due to its spatial resolution.
- The Water Risk Filter is based on global models and is not intended to assess real-time water risk conditions at a specific site-level location. See technical guidance for more details of the limitations.

Key findings and reflections

The method designed for the Locate phase can allow PIDG to report on the portfolio-level exposure to projects, and/or PIDG companies active in sensitive areas in alignment with the TNFD disclosure recommendation Strategy D and core disclosure metrics⁴: such as total spatial footprint, extent of land use change, ecosystem condition and species extinction risk.

Reflections on methods:

- Delineating the unit of analysis for portfolio-level Locate assessment would necessitate some assumptions when available asset location data does not capture the full extent of nature-related impacts associated with a transaction. Therefore, more guidance on how to appropriately make these assumptions for defining an appropriate unit of analysis is needed.
- PIDG, an FI with visibility over a relatively small portfolio that spans selected infrastructure sub-sectors, did not conduct a prioritisation exercise to narrow down sensitive locations. Prioritisation can be useful for FIs analysing larger portfolios, so that resources can be efficiently allocated on more sensitive sectors or geographies. This pilot suggests prioritisation should consider characterising ecological/environmental priorities and whether these are acceptable to an FI based on their risk appetite and capacity to manage those risks at portfolio - and transaction level.
- A specific challenge in this phase included a lack of clarity around how to align good practice frameworks and guidelines, such as the Critical Habitat framework of IFC PS 6 with the LEAP approach. A key question to address would be whether a Critical Habitat Assessment/Screening per IFC PS6 can be considered aligned with the Locate phase approach and if this information could be utilised in robust nature-related disclosures e.g., portfolio exposure to projects in Critical Habitat.

⁴ See [Recommendations of the Taskforce on Nature-related Financial Disclosures](#)

Reflections on PIDG use case:

1. How aligned is PIDG's existing framework to the TNFD guidance on the unit of analysis delineation and sensitive location criteria?

- A challenge regarding IFC PS6 and TNFD Locate phase alignment is that sometimes limited transaction information could hinder organisations' abilities to accurately delineate a transaction's Area of Influence (Aol) at the time of assessment. PIDG initially applied a 50 km unit of analysis to all transactions in-house using the Integrated Biodiversity Assessment Tool (IBAT) to identify the presence of potentially sensitive biodiversity features in proximity to the site. Applying a wider unit of analysis ensures that a sufficiently large area is considered to account for the direct and indirect impacts of a project given the limited project information known to PIDG at the time of screening. While this may serve as a practical way to rapidly screen for potential biodiversity impacts, the presence of false positives could give rise to overly precautionary results. Conversely, delineating a smaller unit of analysis at the outset could result in omitting key biodiversity features that may be affected by the transaction. Depending on the IBAT results, PIDG may then undertake a deeper screening using expert judgement, literature, and other data sources (as relevant), to enable a more accurate delineation of the transaction's Aol. This may be a sensible approach to consider for financiers looking to apply the Locate phase when limited project location information is available when screening for biodiversity impacts during early investment appraisal.
- PIDG's risk screening framework currently captures areas identified as critical habitat and similar criteria to TNFD's sensitive location criteria on Designated Areas (Protected Areas, Key Biodiversity Areas, World Heritage Sites, and Alliance for Zero Extinction sites). Including further criteria for water stress, deforestation/conversion, and freshwater-related biodiversity importance or ecosystem integrity (which was used for this pilot; see Figure 2 and Table 1), may be considered for enhancing PIDG's existing screening process.

2. How can the TNFD Locate phase better inform the project and/or client review and appraisal process?

- The Locate phase sensitive location criteria could help set focus for due diligence efforts and/or Environmental, Social, and Health Impact Assessment (ESHIA) on the potential key issue areas needed to effectively evaluate/assess a project's key nature-related issues. For example, transactions potentially exposed to deforestation/conversion or water stress could focus the scope of the due diligence study on evaluating the adequacy of the project/client's actions to assess and manage these issues, and/or include a deeper dive assessment to investigate in detail the significance of the impact of the transaction on exacerbating deforestation and water scarcity in the region, and actions to mitigate/manage these impacts.
- Contextual information on pre-identified key nature-related issue areas should be better integrated into PIDG's 'Impact' measurement framework. For example, strengthening early identification of a transaction in a high/extreme water stress area, and the extent to which it may exacerbate this issue through enhanced monitoring and assurance on reported project outcomes on water impacts.

Part 2: Understanding impacts and dependencies

The aim of the Evaluate phase was to identify and evaluate priority dependencies and impacts on nature, across the five drivers of nature change, and using '[assessment metrics](#)' that cover impact drivers, changes to the state of nature, as well as state of and change in ecosystem services. Typically, the Evaluate phase would comprise impacts and dependencies related to transactions' direct operations and value chain. Due to resource constraints, this pilot focused on PIDG's direct operations and on methods and tools feasible given data availability. Findings and reflections from applying the approach sought to answer the following questions:

- What methods and tools can be used to identify dependencies and impacts, and analyse their size and scales following the TNFD guidance?

- What approach can be used to assess supply chain impacts across the portfolio?
- What practical indicators/metrics can be used to measure impacts, dependencies, risks and opportunities at the transaction - and portfolio level to enable alignment with the TNFD guidance?
- How can PIDG's risk and impact management framework and processes better align with the TNFD recommendations?

Summary of methods

The design of the Evaluate phase methods in this pilot were based on the following considerations:

1. The Evaluate phase was undertaken for the investment portfolio, i.e., a prioritisation process was not undertaken to shortlist a subset of transactions with potentially material nature-related issues during the Locate phase analysis.
2. Reflecting the objectives set in Section 2, a portfolio-level assessment based on available data at the transaction level was the focus of this phase's analyses.
3. Focusing on direct operations the following approach was undertaken.
 - Qualitative approach to dependencies aimed at identification of nature-related dependencies of PIDG's portfolios at the sector level (not specific to priority location).
 - Quantitative estimation of size and scale of terrestrial land use impacts using a well-established method ([Biodiversity Extent Condition Significance \(BECS\) framework](#))⁵.
 - Qualitative impact pathways identification for impacts on other pressures on nature (beyond land use), with mapping of project level metrics to TNFD's core global disclosure metrics.

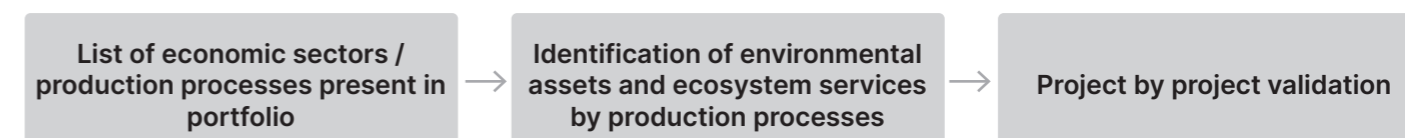
Wherever possible, suggestions have been provided on potential approaches to further address supply chain impacts, along with commentaries on other pertinent sources of data or approaches that PIDG may consider exploring in the future to enhance support for LEAP application and TNFD-aligned reporting.

⁵ University of Cambridge Institute for Sustainability Leadership (CISL). (2020, April). Measuring business impacts on nature: A framework to support better stewardship of biodiversity in global supply chains. Cambridge, UK: University of Cambridge Institute for Sustainability Leadership.

Dependencies

To identify nature-related dependencies, the relevant assets and ecosystem services, data from [ENCORE database](#) was used and triangulated using transaction-specific information and expert judgement to generate a list of most relevant environmental assets and ecosystem services (Figure 5).

Figure 5: Process of characterisation and refinement of ecosystem services related to industries and production processes



Quantitative data on ecosystem services was not available (especially for the regulating services), except for water-related provisioning services but with patchy coverage. Due to this limitation, analysis of dependencies' size and scale was only done using universal dependencies ranking from ENCORE (Very Low to Very High) combined with financial exposure to understand risk for PIDG.

Impacts

Using a similar approach to the above, to identify nature-related impacts from PIDG portfolios, data from SBTN Sectoral Materiality Tool (SMT) were used. [SMT](#) provides a sector-based universal ranking for impacts⁶ on nature covering both direct operations and (partly) upstream supply chains. To identify key impacts on nature, this ranking data (Very Low to Very High) was used combined with financial exposure to understand risk for PIDG.

Comprehensive quantitative impact driver data (e.g., quantification of indirect nature impacts caused by the project, volume of wastewater, pollutant load, etc.) of the transactions was not available. To illustrate how an analysis of impacts scale and size could be undertaken going forward, a method based on the BECS framework was designed to estimate land use impacts. Due to unavailability of detailed data on the extent of different land use classes within the project footprint, and pre- and post-development conditions across the transactions, a score based BECS

⁶A quantitative estimation for land use impacts is provided, using a well-established method that estimates impacts to biodiversity caused by changes in extent and condition of natural and semi-natural ecosystems, known as BECS framework.

approach was devised (not real footprint based) to roughly estimate size and scale of terrestrial ecosystem use/occupancy impacts.

To estimate ecosystem condition change, the proportion of biodiversity lost was assumed based on a combination of the type and intensity of land use before the development of infrastructures and the level of interference of the infrastructure on the environment (Table 2). Biodiversity loss coefficients are derived from global estimates of changes in mean species abundance (MSA) under different land-uses and intensities, provided by [Globio](#). These can be refined by using transactions' pre- and post-development measures of biodiversity indicators describing ecosystem conditions when they become available. This scoring-based approach used specialist input for determining which condition changes apply to a specific transaction based on available information provided by PIDG.

Table 2: Pre- and post-development change in land-use and resulting change in ecosystem condition

Land use before development	Land use after development	Change in ecosystem condition
Natural habitat	Solar farm	Very substantial
Mix of natural and modified habitats	Solar farm	Moderate
Agriculture or tree plantation	Solar farm	Modest
Urban	Any infrastructure	No change
Mix of natural and modified habitats	Hydropower plant	Substantial
Mix of natural and modified habitats	Wind farm	Modest
Any anthropic	Wind farm	Very low

Table 3: Scores used for levels of change in ecosystem condition before and after the development

Change	Change in condition (%)				
	Very small	Modest	Moderate	Substantial	Very substantial
	<1%	1 - <10%	10 - <20%	20 - <50%	>50%
Score	0.1	1	2	4	6

For evaluating significance, results from the Locate phase were used.

For each transaction, the available extent data, categorical scoring of change in condition, and significance rating are then combined and evaluated to assess relative scale and size of land use impacts across the portfolios.

Note that this approach assumes; (i) terrestrial ecosystem use/occupancy within a unit of analysis and therefore the change in condition is uniform; (ii) change in condition is negative or neutral (no change); (iii) no positive change in condition (e.g., from degraded land to semi-natural grassland) is captured. It is also important to note that land-use impacts are not the only material impacts of the economic activities of the transactions in PIDG's portfolio, e.g., it does not capture biodiversity impacts that could be even more material.

Tools/Datasets used

Multiple datasets, measurement frameworks and tools were used in the Evaluate phase (Table 4).

Table 4: Datasets, measurement frameworks and tools used in Evaluate

Dataset / Measurement Framework / Tool	Use in this pilot	Rights of use
ENCORE	Evaluate dependencies on ecosystem services	Free
SBTN Sectoral Materiality Tool	Evaluate impacts of direct operations and supply chain upstream on drivers of nature change	Free
BECS	Evaluate impacts of land use change at project level	Please reach out to TBC for more information on this framework
GLOBIO	Estimate ecosystem condition through mean species abundance index (MSA)	Free

Key findings and reflections

Quantitative assessment of nature-related dependencies and impacts across the pressures on nature at the transaction level using TNFD assessment metrics is challenging due to limited data. However, there are available tools to understand relative sectoral exposure to nature-related dependencies and impacts. In the future, standardised reporting following TNFD assessment metrics on dependencies and impacts from projects/transaction-level to financiers is needed to allow portfolio-level dependencies and impacts assessment that considers magnitude or scale. Sectoral dependencies and impacts exposure offers useful insights to help improve the existing risk management framework.

Reflections on methods:

What methods and tools can be used to identify dependencies and impacts and analyse their size and scales following the TNFD guidance?

1. Assessing nature-related dependencies and impacts using impact drivers and dependencies data is not currently feasible for PIDG at this time. Transaction-level impact drivers and dependencies data were only available for some pressures on nature, and coverage remains patchy. Encouraging standardisation of transaction-level impact drivers and dependencies data reporting to financiers could be an area of focus to explore to resolve this challenge going forward.
2. Despite challenges around data availability at the transaction-level, data sources, tools and platforms are rapidly evolving and can be used to understand relative exposure to nature-related risks from impacts and dependencies.
3. The ENCORE data platform is still the 'go to' method for identifying dependencies at the sectoral level and informing relative dependency rating. It does not however provide insights to identify key issue areas, e.g., drivers of those dependencies or provide means to quantify the magnitude of dependencies. Moreover, specialist input may be necessary to support the interpretation / triangulation of ENCORE outputs.
4. A portfolio-level assessment to characterise relative impacts rating is feasible using tools like the [Sectoral Materiality Tool \(SMT\)](#). However, results are only useful for identifying 'hotspots' in terms of drivers of nature loss and are not capable of providing detailed insights that could inform impact mitigation. Other approaches to quantify impacts at the portfolio-level across the pressures of nature are available but with limitations.
5. Material impacts to biodiversity may not be fully represented through use of tools such as SMT. This stresses the importance of standardising data collection on impacts to nature (including biodiversity) at the transaction/project-level as portfolio-level tools have critical gaps that must be filled with site-specific ground-truthed data.

What approach can be used to assess supply chain impacts across the portfolio?

1. Data available on the infrastructure supply chain is a major gap. It is not a common practice for infrastructure project financiers to require disclosures on upstream supply chains. The infrastructure sector should explore the feasibility of reporting such supply chain data from companies to investors as a standard practice. If this becomes a standard 'ask' of information by investors to the companies, it can help drive better traceability across the sector going forward.
2. Tools such as the [SBTN High Impact Commodity List \(HICL\)](#) could potentially be useful to understand thematic priorities for engagement with transactions. More testing on useful methods to understand supply chain nature-related dependencies and impacts would be needed to inform practical mitigation actions by financiers.

Reflections on PIDG's use case:

What practical indicators/metrics can be used to measure impacts, dependencies, risks and opportunities at the transaction- and portfolio level to enable alignment with the TNFD guidance?

1. Given data limitations (see above reflections on methods), it is not expected to currently be feasible for PIDG to assess transaction-level impact and dependencies using the assessment metrics recommended by the TNFD, i.e., transaction-reported impact drivers and dependencies data, and state of nature metrics.
2. The use of state of nature metrics (e.g., Mean Species Abundance-based metrics) is not believed to be readily verifiable, due to the high level of effort it would require to 'ground truth' the underpinning data (species richness).
3. Measuring dependencies and impacts at the transaction level using recommended assessment metrics would necessitate standardised reporting from transactions to financiers on impacts and dependencies. This would then enable portfolio-level assessments.
4. An alternative approach to assessing size/scale of impacts could be the [Quality x Hectare \(QH\)](#) or [Habitat Hectares \(HH\)](#) method, which is a relatively standard practice in the implementation of good practice

development project biodiversity safeguards such as the IFC PS6. This approach is a quantitative method aligned with the BECS approach applied in this pilot. More testing and guidance are needed to explore how best to leverage approaches to metrics development at the transaction-level from existing established good practice standards such as IFC PS6 to support portfolio-level assessment and reporting on land occupancy impacts that align with TNFD recommendations.

5. Selection of assessment metrics should consider the FI's objectives for undertaking the assessment and be representative of the relevant impact pathways from the transaction's activities. Potential material impacts associated with PIDG investment sectors include those that are species-specific such as bird and bat collision with wind turbines, and river fragmentation and barrier impacts on migratory fish species due to hydropower development. There needs to be more guidance on how to capture these species-specific impacts within TNFD-aligned assessments.
6. Overall, available data and methods would enable reporting of potential dependencies and impacts by sector or transactions relative exposure. Reporting on 'real' transaction-level impact driver metrics is feasible for water withdrawal and consumption from areas of water stress. Requiring this metric as part of standard transaction data disclosures to financiers could enable a more meaningful (quantitative) dependencies and impacts assessment per TNFD recommendations.
7. Issues identified through applying the Locate and Evaluate approach could be used for defining key performance areas where PIDG focuses its efforts in improving its clients' Health, Safety, Environmental and Social performance and management.

How can PIDG's risk and impact management framework and processes better align with the TNFD recommendations?

1. Relative sectoral exposure to dependencies and impacts can be integrated into an initial appraisal of a transaction's screening process to help set focus or priorities for due diligence. Similarly, information on 'hotspots' across pressures on nature in direct operations or upstream supply chain can be used as a starting point for identifying key themes or topics for engagements with projects/clients.

2. PIDG should continue to leverage existing key tools and processes applied to development projects to report on impact drivers and dependencies data per TNFD recommendations. FIs and infrastructure project developers adopt numerous tools and processes, e.g., Environmental and Social Impact Assessment (ESIA), Environmental & Social Due Diligence (ESDD), and Environmental and Social Action Plan (ESAP), to help assess, mitigate and/or manage the negative nature impacts on a transaction-by-transaction basis. FIs such as PIDG should continue to enhance the application of such tools and processes through encouraging the robust and consistent application of good practice, while moving beyond a narrow "do no harm" approach to including considerations for actions to actively improve the state of nature and enhance positive synergies between nature and people per TNFD recommendations.
3. PIDG's new strategy seeks to better value and embed nature considerations into the investment decision-making process. Indicated in this pilot, PIDG's investment portfolio in Asia is likely highly reliant on the water-related services that nature provides, with relatively higher impact on terrestrial ecosystem use and water use as well as biodiversity, compared to other drivers of nature loss. PIDG can therefore initially prioritise the collection of biodiversity and water-related data that are most useful for impact mitigation and management and reporting against the TNFD guidelines. In recognition that it is not yet feasible to quantify impacts and dependencies across all pressures on nature, and portfolio-wide assessment approaches are at a nascent stage of development, relative measures that captures degree of practice change could be a useful way to report on positive impacts, e.g., proportion of projects across portfolios that are performing water assessments per certain credible certification frameworks, such as CDP Water Security⁷, or the Alliance for Water Stewardship⁸, among others. This would enable PIDG to take action while keeping abreast of this evolving space.

⁷ CDP (2023) [Water security](#).

⁸ AWS (2023) [The AWS Standard 2.0](#).

Part 3: Translating into risks and opportunities

The aim of the Assess step was to undertake transaction (asset) tagging to define risk factors specific to PIDG' business and environmental context, and identify and prioritise specific transactions based on their potential physical and transition risks for engagement on key issues. Due to time and resource constraints, this pilot focused on designing a suitable TNFD-aligned risk assessment framework to complement PIDG's existing TCFD-aligned climate risk assessment framework.

The physical risk assessment focused on water scarcity and the water-related services that transactions are dependent on, whereas the transition risk assessment focused on policy/regulatory change and reputation risk factors. Due to data constraints, it is not currently possible for PIDG to perform a quantitative physical or transition risk assessment. In addition, as part of the Assess phase in this pilot, an analysis was undertaken to identify opportunities to streamline the TNFD-aligned nature-related risk assessment, and PIDG's existing climate risk assessment framework to identify potential synergies and help inform PIDG's pilot objectives.

Transition risks related to technology change and consumer/market demand change and specific opportunities assessment were not examined in this pilot.

Summary of Methods

A qualitative approach to assessing nature-related risks was developed, aiming to complement PIDG's existing risk assessment framework. The design process started with a conceptual framework to identify the most relevant qualitative risk factors to PIDG's context for physical risk and transition risk assessments. A methodology was devised to analyse indicators for each risk factor and then evaluate as a combined (aggregated) risk to inform overall potential physical or transition risks for each transaction.

Physical risk assessment

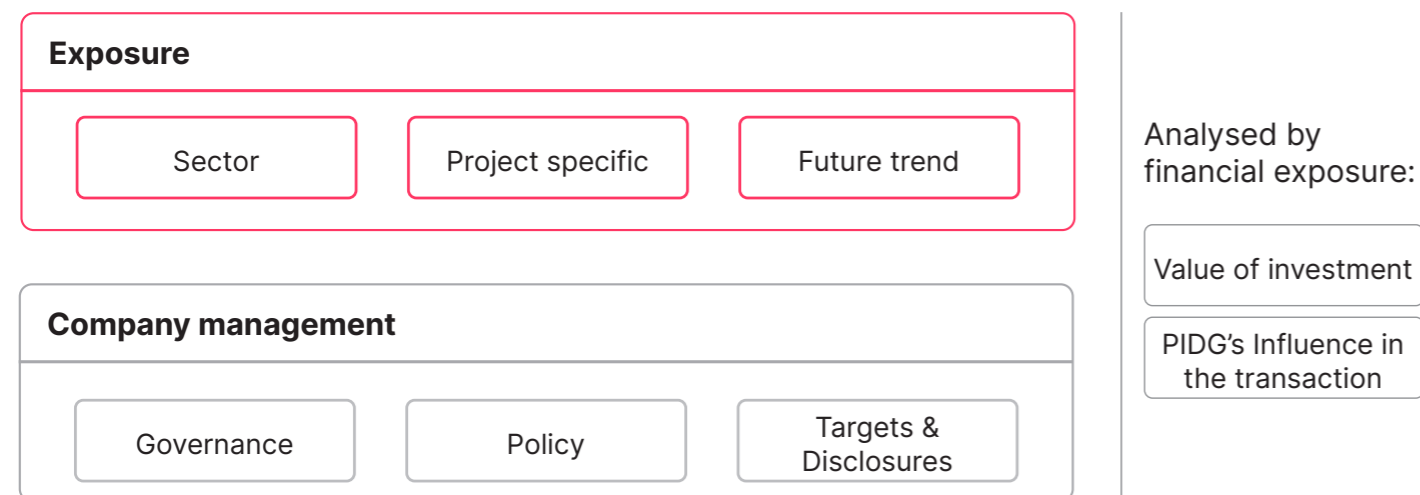
The following physical risk factors were selected (Figure 4) focusing on water use:

- **Sector exposure:** captures the relative degree of dependencies of production practices respective to each sector. Using relative risk ranking from ENCORE as an indicator (Very Low to Very High).
- **Transaction-specific exposure:** on water use, transaction, and location-specific relative dependence. Using Impact of Project on Aquatic Ecosystem assessed through PIDG's Risk Rank System.
- **Future trend:** predicted changes on the health of ecosystem assets supplying the ecosystem services. Using Scenarios Risk Assessment of Water Scarcity Index (available through the [WWF Water Risk Filter](#) tool) which is based on scenarios developed from the most relevant climate scenarios to represent future trend of supply of ecosystem services the transaction is dependent on.
- **Company governance (water):** Good practice corporate management on water issues would include executive oversight of water management and performance. Using a binary approach (y/n) this indicator is taken to represent leaders vs laggards on water management programs. It is assumed that if the water agenda is overseen by the executive, then management programs would be much more effectively implemented.
- **Company policy/management program (water):** public disclosures of water policy signify robust management due to the reputational risk it could bring if company backs down or is not aligned with their own policy. Whether or not the company has a publicly disclosed policy or commitment on water use is taken as an indicator.
- **Targets and disclosures (water):** Taken to differentiate leaders vs laggards, by disclosures with a credible standard (CDP water program) or having management programs certified (by Alliance for Water Stewardship), or whether the company is among first movers in adopting emerging best practice in terms of science-based targets for water (SBTN) and signing up to the TNFD.

These qualitative indicators are then aggregated to inform overall potential physical risk and interacted with financial exposure (value of investment) and weighted by PIDG's influence in the transaction (by transaction type).

Figure 6: Framework used to design physical risk assessment method

Physical Risk



Transition risk assessment

For transition risk, the following risk factors were selected (Figure 7).

- **Sector exposure:** Captures the relative degree of overall impacts to nature of production practices respective to each sector. Using relative risk ranking from SMT as an indicator (Very Low to Very High).
- **Jurisdictional policy change:** Informed by project team's knowledge on whether the relevant jurisdiction would likely apply more stringent regulatory requirements on nature that would affect the transaction to represent potential transition risk from policy change.
- **No Net Loss/Net Positive commitment:** No Net Loss (NNL)/net positive is an established best practice objective for biodiversity impact management (Narain et al. 2023), which is assumed to be more widely adopted in the future. Therefore, companies/projects with an existing NNL/net positive commitment could be considered to pose lower transition risk.

Although not directly a transition risk factor, in this pilot it was assumed that transactions that have already been applying best practice

management programs would be more resilient towards more stringent regulatory requirements in the future hence the following risk factors were also considered, also reflecting PIDG's current policy which requires alignment with IFC Performance Standards. Biodiversity is selected as a key issue area to focus as this often separates between leaders vs laggards being a complex issue that requires specific resources to manage:

- **Biodiversity policy:** Applying best practice (PS6) robustly would in practice, lead to a company-wide biodiversity policy. Therefore, whether or not the transaction has a specific biodiversity policy is taken as an indicator for this risk factor.
- **Specific mitigation measures:** Robust application of PS6 would entail applying the mitigation hierarchy, which would lead to specific mitigation actions. Using project information (ESIA) and select 'typical' mitigation actions relevant to the production processes of PIDG's transactions, such as whether the transaction assess collision risks and install proper mitigation, have offset program for residual impacts that are like-for-like, or assess and have proper mitigation for managing rivers systems fragmentation impacts to migratory species.

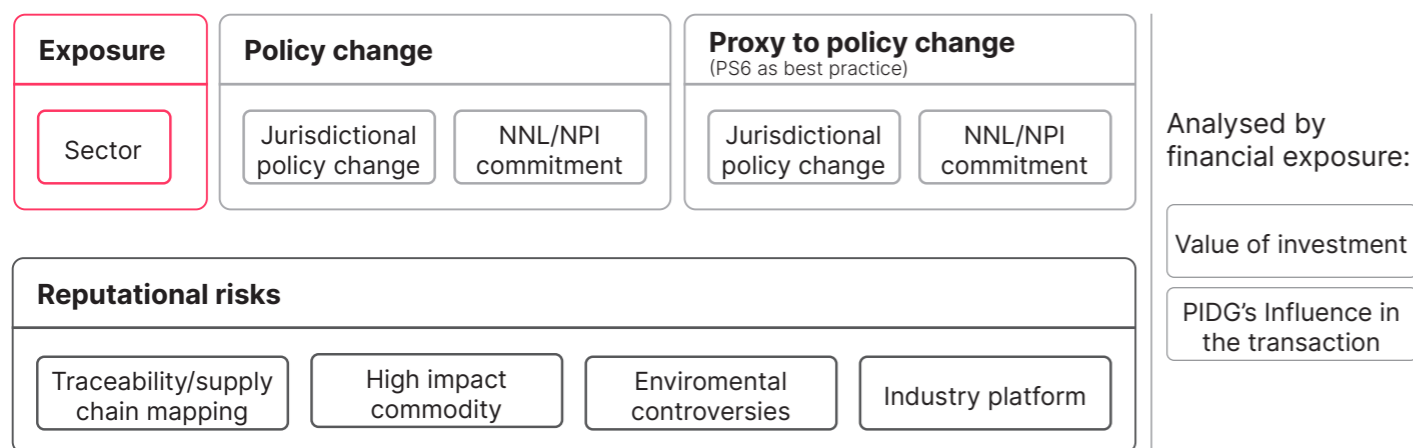
To represent potential reputation risks, the following risk factors were selected:

- **Traceability/supply chain mapping:** Companies could be considered to pose lower transition risk where despite challenges on traceability, remain committed to make advances in mapping their supply chain, and/or select suppliers based on sustainability considerations (e.g., certified products or do a suppliers' due diligence) as established industry good practice across sectors in managing supply chain impacts. Using project information on whether the transaction publicly commits to work on their supply chain mapping/traceability or whether the company/project selects suppliers based on sustainability considerations, this is taken as an indicator to inform this reputational risk factor.
- **High impact commodity:** These hidden risk factors from the supply chain could often lead to reputational risks. HICL is taken as a proxy to represent stakeholders' level of scrutiny based on whether or not the production process is associated with a high impact commodity.

- **Environmental controversies:** Companies associated with past environmental controversies are considered to pose higher reputational risks. Research on whether or not the company has ever been publicly scrutinised on an environmental issue is taken as an indicator.
- **Industry platform:** Companies committed to sustainability platforms will present higher readiness to adopt sector transformational actions and therefore reduce reputational risks.

Figure 7: Proposed framework for transition risk assessment

Transition Risk



Tools / Datasets

Table 5: Tools and datasets used in Assess phase

Dataset / Measurement Framework / Tool	Use in this pilot	Rights of use
ENCORE	Assess physical risk related to exposure to dependencies respective to each sector	Free
WWF Water Risk Filter	Assess physical risk related to future trend in water supply	Free
SBTN Sectoral Materiality Tool	Asses transition risk related to the degree of overall impact to nature	Free

Key findings and reflections

Although it is possible to tailor a qualitative assessment, there is still a need for universal quantitative approaches to assess physical and transition risks. Further work is necessary to understand the financial implications of nature-related risks and streamline assessment methods. The PIDG use case underscores the importance of enhancing transaction ESIA's, with PIDG developing in-house guidelines for good practices.

Targets, such as measuring increased transparency and preparedness to disclose, can drive wider adoption of TNFD recommendations, fostering engagement and signalling the need to align with best practices in the infrastructure sector.

Reflections on methods:

1. More guidance is needed for defining transition risk and designing methods for assessing them. Transition risk definition allows many different interpretations by stakeholders, which could lead to different assessment methods resulting in various outcomes that would not be comparable. There is a need for a country or sector level universal approach from which deeper dive assessments could be based on. This is something the infrastructure sector could explore as a collaborative action.
2. As qualitative physical and transition risk assessment methods can be highly tailored to an organisation's context, applying a systematic conceptual framework in selecting most relevant risk factors that reflects the organisation's objectives is an important step. Selecting risk factors that represent key issue areas pertaining to dependencies and impacts from specific production processes or certain topics such as biodiversity or supply chain management allows identification of engagement focus with transactions.
3. More testing and advances in methods are needed on quantitative physical and transition risk assessments to better guide market participants to apply TNFD-recommended approaches in practice. Comparing transaction average annual water use per installed capacity with that of the sector average might for example, be a way to capture physical risk more explicitly. Guidance and further testing are needed to clarify and investigate applicability of such an approach if it is indeed the 'direction of travel' market participants are expected to move toward with their risk assessments.
4. More work is needed to assess how nature-related risks 'translates' into financial risk. Examining the potential pathways of how nature-related risks affect transactions and results in financial risk (credit, market, liquidity or business) could help financiers determine the important course of action to mitigate such risks. More guidance exploring these linkages would be beneficial.

5. Further testing should be conducted to explore in more detail how nature and climate physical risk assessment methods could be streamlined in practice. Having specific 'lenses' for climate risk and nature-related risk may also be useful for ensuring no risks get overlooked.

Reflections on PIDG use case:

1. This pilot has shown that continuing to strengthen and enhance transactions' ESIA should remain a key area for engagement for FIs such as PIDG. Applying good practices for nature inclusive impact assessment and management planning in ESIA will enable the production of required data and information to assess and disclose nature-related issues against the TNFD guidance.
2. PIDG has developed an in-house guideline on ESIA good practices to help steer the quality of transactions' ESIA. Key 'hotspots' of dependencies and impacts, major pathways of nature impacts, and key topics/themes revealed through this pilot would be used to further improve in-house tools for improving PIDG's transactions' ESIA practice, PIDG's TCFD-aligned climate risk assessment framework, and overall delivery of the 2023-30 PIDG strategy. More lessons learned and further guidance from the infrastructure sector is needed on how financiers could work most effectively with transactions on this issue.
3. In the interim, setting targets using a relative indicator to measure transactions' increased transparency in resource use and improved preparedness to disclose would help 'push the bar' towards wider sector adoption of TNFD recommendations. For example, a target for all projects with potentially material water-related impacts to monitor their water usage, and report on an annual basis. On the FI side, reporting such indicators would incentivise stronger company engagement. This would send a strong signal to the wider infrastructure sector and beyond the need to encourage investees to develop a more sophisticated practice on nature-related dependencies and impacts, aligning with international best practice.





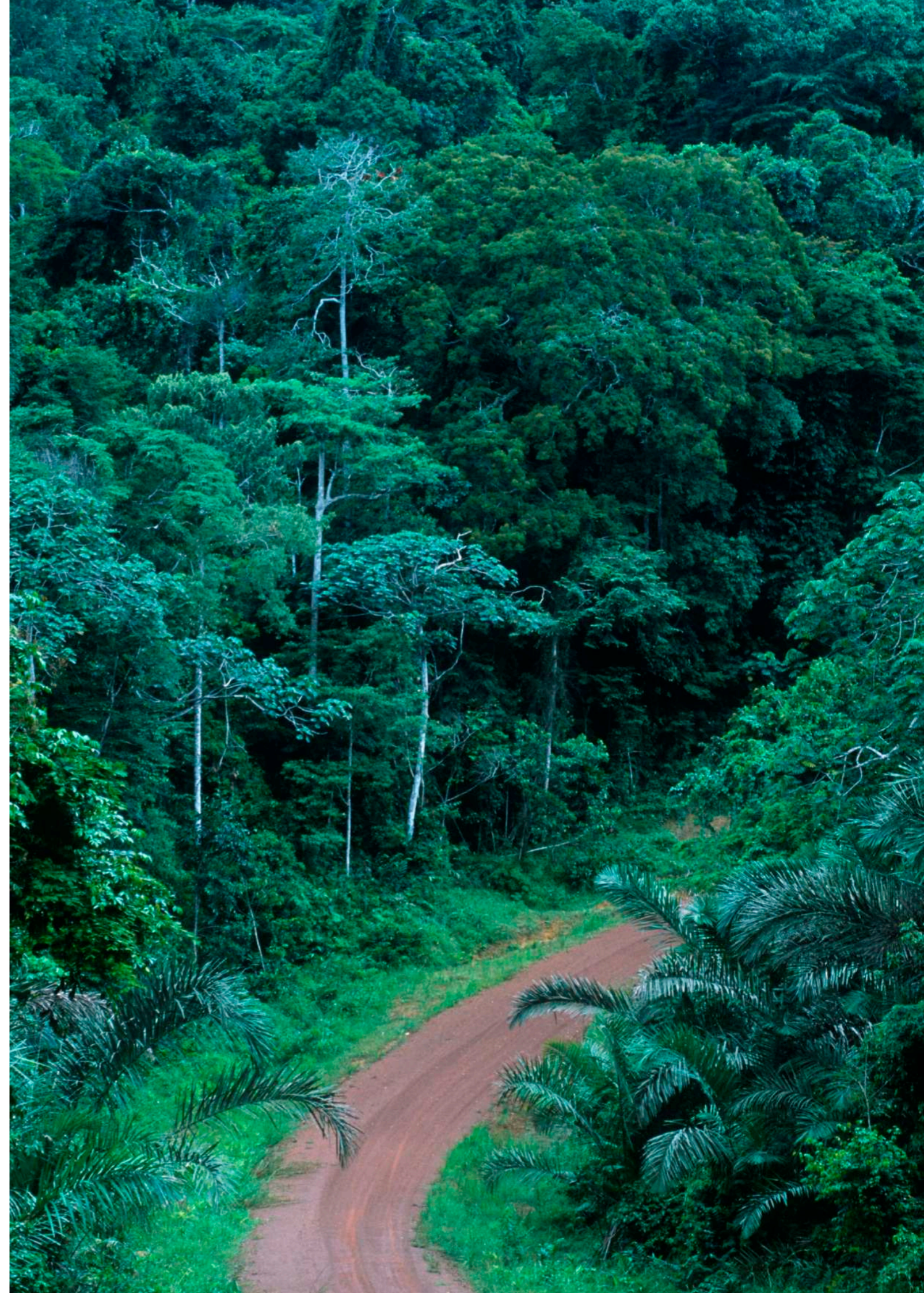
Conclusion

This pilot has achieved its objectives. Despite challenges in data availability, tools and approaches are available to start assessing an FI's preparedness to align with the TNFD recommendations and enhance actions on nature. TNFD's LEAP approach and associated guidance on assessment and disclosure metrics are useful to help ensure disclosures are feasible and can help identify key aspects or areas for improvements in an FI's existing risk management framework. In particular, the Locate phase and underpinning criteria are useful to inform in-house screening approaches and define priorities or expected level of scrutiny for due diligence. Albeit qualitatively, the Assess phase guidance was helpful for identifying priorities for engagement as well as informing how an in-house nature-related risk assessment could be strengthened.

A major barrier to assessing nature-related dependencies, impacts, and risks quantitatively is the lack of standardised transaction-reported data on nature-related impact drivers and dependencies reflecting TNFD's recommended assessment and disclosure metrics. In the project finance context, the ESIA, ESDD and ESAP are the key tools with which these get identified, assessed, and managed by investees. Therefore, a key interim focus for financiers is to continue to strengthen transactions' impact assessment, mitigation and management practice to a level of quality expected by good practice frameworks such as the IFC Performance Standards. Having interim targets and positive impact disclosures on this practice change could help transform the infrastructure sectors' management of nature-related risks and opportunities.

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