



BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA



WORLD BANK GROUP



A LEAP for Nature:

Advancing Nature-related
Financial Risk and Opportunity
Assessment in Malaysia



© 2026 The World Bank

1818 H Street NW, Washington, DC 20433, USA

Telephone: 202-473-1000; Internet: www.worldbank.org

Some rights reserved.

This work is a product of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent.

The World Bank does not guarantee the accuracy, completeness, or currency of the data included in this work and does not assume responsibility for any errors, omissions, or discrepancies in the information, or liability with respect to the use of or failure to use the information, methods, processes, or conclusions set forth. The boundaries, colors, denominations, links/footnotes and other information shown in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries. The citation of works authored by others does not mean the World Bank endorses the views expressed by those authors or the content of their works.

Nothing herein shall constitute or be considered to be a limitation upon or waiver of the privileges and immunities of The World Bank, all of which are specifically reserved.

Rights and Permissions

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given.

Attribution: Please cite the work as follows: “World Bank, UNDP BIOFIN, and Bank Negara Malaysia (BNM). 2026. A LEAP for Nature: Advancing Nature-related Financial Risk and Opportunity Assessment in Malaysia. Kuala Lumpur. © World Bank.”

Any queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2625; email: pubrights@worldbank.org.

Contents

Acknowledgements	i
Acronyms and Abbreviations	ii
Glossary	v
Executive Summary	1
Chapter 1: Report context and objectives	5
Context of the report	6
Objectives and targeted audience	8
PART I: Landscape of nature-related financial risks in Malaysia	10
Chapter 2: Nature-related context in Malaysia	11
I. Nature in Malaysia	12
II. Ecosystem services	12
III. Nature degradation	15
IV. Policies to protect and restore nature	15
Chapter 3: Nature-related financial risks in Malaysia	17
I. Assessment of Malaysian banks' exposure to nature-related risk	19
A. Dependencies of commercial loans upon ecosystem services	19
B. Pressures on nature associated with commercial loans	22
C. Risk transmission channel: Two highly exposed economic sectors	24
II. Navigating nature-related risk: An overview of Malaysia's assessment and disclosure landscape	25
PART II: Nature-related risk assessment and disclosure: Current state, practical guidance, and common obstacles	28
Chapter 4: Current state of nature-related risk assessments and disclosure in Malaysia	29
I. Financial institutions' readiness to assess and disclose nature-related Dependencies, Impacts, Risks and Opportunities (DIROs)	31
A. Understanding and assessment of nature-related DIROs	31
B. Integration of nature considerations into risk management and business decisions	33
C. Nature-related disclosure	33
D. Motivations to assess and disclose nature-related DIROs	33
II. Firms' readiness to assess and disclose nature-related DIROs	35
A. Understanding and assessment of nature-related DIROs	35
B. Integration of nature considerations into risk management and business decisions	35
C. Nature-related disclosure	35
D. Motivations to assess and disclose nature-related DIROs	35
III. Financial institutions and firms' approach to nature-related issues: Differences and interdependencies	36

Chapter 5: Implementation of the LEAP approach in Malaysia: A practical guide	37
I. LEAP for financial institutions	40
A. Scope the assessment	40
B. LOCATE interface with nature	40
C. EVALUATE dependencies and impacts	41
D. ASSESS risks and opportunities	46
E. PREPARE to respond and report	47
II. LEAP for firms	49
A. Scope the assessment	49
B. LOCATE interface with nature	53
C. EVALUATE dependencies and impacts	55
D. ASSESS risks and opportunities	60
E. PREPARE to respond and report	64
Chapter 6: Common obstacles to nature-related assessment and disclosure	65
I. Data availability, quality and accessibility gaps	67
II. Need for further methodological support	73
III. Capacity and resource constraints	74
IV. Lack of clear regulatory expectations	74
PART III: Ways forward	76
Chapter 7: Key findings and recommendations	77
I. Summary of Key Findings	78
LOCATE	79
EVALUATE	79
ASSESS	80
PREPARE	81
II. Recommendations	81
A. Recommendations for financial institutions	83
B. Recommendations for firms	84
C. Recommendations for public sector entities	85
References	88
Annexes	92
<i>Annex 1: Report methodology</i>	94
A. ENCORE assessment of Malaysian banks' lending	94
B. Financial institution and firm surveys	94
C. LEAP pilot assessments	96
<i>Annex 2: Dependencies and pressures of the Palm oil and Construction sectors</i>	97
A. Literature review	97
B. Assessment by LEAP pilot firms	101
<i>Annex 3: Nature-related risk assessments and disclosure within current regulations in Malaysia</i>	102
<i>Annex 4: Additional survey results</i>	105
A. Additional financial institution survey results	105
B. Additional corporate survey results	108



Acknowledgements

This report was prepared through a joint collaboration between Bank Negara Malaysia, World Bank, and the United Nations Development Programme's Biodiversity Finance Initiative (UNDP BIOFIN) by core team members Katie Lee Sheah Tsan, Keshia Jasmine Ashaari, Oh Ka Jun (BNM), Nepomuk Dunz, Martijn Regelink, Mathilde Salin (World Bank), and Eva Bortolotti, Clara Yan Yi Wei, Natalie Chan (UNDP BIOFIN), under the supervision of Madelena Mohamed (BNM), Judith Green and Ilias Skamnelos (World Bank), Edward Vrkić and Besian Xhezo (UNDP).

Philbert Tiki Yong, Muthukumara Mani and Emma Dalhuijsen (World Bank), Suraya Sani, Suhana Alia Sidek (BNM), Annabelle Trinidad (UNDP BIOFIN), Chong Yin Wei, Ashvinder Singh, Nur Izzati Roslan (UNDP), Emily McKenzie and Claudia Gray (TNFD) and Chiara Colesanti-Senni (University of Zurich) provided technical inputs in the design and development of this report. A special thanks also goes to the participating pilot companies and financial institutions, whose insights and learnings form an instrumental part of this report. The authors also want to thank the participants in the firm and financial institutions survey. The views, thoughts, and opinions expressed in the text belong solely to the authors, and not necessarily to the authors' employer, organisation, committee, or other group or individual.

This publication has been supported by the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN) via the United Nations Development Programme (UNDP) and the Global Program on Sustainability (GPS) multi-donor trust fund managed by the World Bank.



Acronyms and Abbreviations

ACMF	ASEAN Capital Markets Forum
AI	Artificial Intelligence
ASEAN	Association of Southeast Asian Nations
ATB	ASEAN Taxonomy Board
AZE	Alliance for Zero Extinction
BCX	Bursa Carbon Exchange
BER	Biodiversity Expenditure Review
BNM	Bank Negara Malaysia
CBD	Convention on Biological Diversity
CCPT	Climate Change and Principle-based Taxonomy
CCRIS	Central Credit Reference Information System
CDP	Carbon Disclosure Project
CFIL	Climate Finance Innovation Lab
CICES	Common International Classification of Ecosystem Services
CISL	Cambridge Institute for Sustainability Leadership
CMM	Capital Markets Malaysia
CRMSA	Climate Risk Management and Scenario Analysis
CSR	Corporate Social Responsibility
CSRD	Corporate Sustainability Reporting Directive
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Australia)
DFI	Development Finance Institution
DID	Department of Irrigation and Drainage (Malaysia)
DIROs	Dependencies, Impacts, Risks and Opportunities
DNSH	Do No Significant Harm
DOE	Department of Environment (Malaysia)
DOSM	Department of Statistics Malaysia
ECR	Environmental Compliance Report
EFRAG	European Financial Reporting Advisory Group
EIA	Environmental Impact Assessment
ENCORE	Exploring Natural Capital Opportunities, Risks and Exposure
EPD	Environmental Product Declaration
ERM	Enterprise Risk Management
ESA	Environmentally Sensitive Area
ESG	Environmental, Social and Governance
ESRS	European Sustainability Reporting Standards
EU	European Union
EUDR	European Union Deforestation Regulation
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FCC	Forest Conservation Certificate
FCO	Forest Carbon Offset
FFB	Fresh Fruit Bunches
FFI	Fauna & Flora International
FHC	Financial Holding Company
FI	Financial Institution
FRS	Financial Reporting Standard
FTE	Full-Time Equivalent

FTSE	Financial Times Stock Exchange
GBCA	Green Building Council of Australia
GBF	Kunming-Montreal Global Biodiversity Framework
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GLIC	Government-Linked Investment Company
GP3	Guiding Principle 3 (of the CCPT)
GRI	Global Reporting Initiative
GSBI	Global Soil Biodiversity Initiative
GWQI	Groundwater Quality Index
HCV	High Conservation Value
IAS	Invasive Alien Species
IBA	Important Bird and Biodiversity Area
IBAT	Integrated Biodiversity Assessment Tool
IFRS	International Financial Reporting Standards
IGO	Intergovernmental Organisation
INSPIRE	International Network for Sustainable Financial Policy Insights, Research, and Exchange
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
ISIC	International Standard Industrial Classification
ISO	International Organization for Standardization
ISSB	International Sustainability Standards Board
ITO	Insurer and Takaful Operator
ITPS	Intergovernmental Technical Panel on Soils
IUCN	International Union for Conservation of Nature
JC3	Joint Committee on Climate Change
KBA	Key Biodiversity Area
KeTSA	Ministry of Energy and Natural Resources (Kementerian Tenaga dan Sumber Asli)(Malaysia)
KLCI	Kuala Lumpur Composite Index
KPI	Key Performance Indicator
LBS	LBS Bina Group Berhad
LCA	Life Cycle Assessment
LEAP	Locate, Evaluate, Assess and Prepare
MDB	Multilateral Development Bank
MEA	Millennium Ecosystem Assessment
MMWQI	Manual Marine Water Quality Index
MNC+	Malaysia Nature-Based Carbon Credits Plus
MPOB	Malaysian Palm Oil Board
MSIC	Malaysia Standard Industrial Classification
MSPO	Malaysian Sustainable Palm Oil
MyBIS	Malaysia Biodiversity Information System
NbS	Nature-based Solutions
NBSAP	National Biodiversity Strategy and Action Plan
NDPE	No Deforestation, No Peat, No Exploitation
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
NGO	Non-Governmental Organisation
NPBD	National Policy on Biological Diversity
NRE	Ministry of Natural Resources and Environment (Malaysia)
NRECC	Ministry of Natural Resources, Environment and Climate Change (Malaysia)
NRES	Ministry of Natural Resources, Environment and Sustainability (Malaysia)
NSRF	National Sustainability Reporting Framework

PLC	Public Listed Company
PNB	Permodalan Nasional Berhad
POME	Palm Oil Mill Effluent
PRB	Principles for Responsible Banking
PRF	Permanent Forest Reserve
PS&D	Production, Supply and Distribution
QGIS	Quantum Geographic Information System
REDD+	Reducing Emissions from Deforestation and Forest Degradation, plus the sustainable management of forests and the conservation and enhancement of forest carbon stocks
RM	Malaysian Ringgit
RSPO	Roundtable on Sustainable Palm Oil
SBTN	Science Based Targets Network
SC	Securities Commission Malaysia
SCBD	Secretariat of the Convention on Biological Diversity
SDG	Sustainable Development Goal
SEEA-EA	System of Environmental-Economic Accounting – Ecosystem Accounting
SFWG	Sustainable Finance Working Group (G20)
SIA	Social Impact Assessment
SIMS	Sawit Intelligent Management System
SME	Small and Medium Enterprise
SPOTT	Sustainability Policy Transparency Toolkit
SRI	Sustainable and Responsible Investment
SSM	Companies Commission of Malaysia (Suruhanjaya Syarikat Malaysia)
SUT	Supply and Use Tables
SYABAS	Syarikat Bekalan Air Selangor Sdn Bhd
TCFD	Task Force on Climate-related Financial Disclosures
TLIF	Tiger Landscape Investment Facility
TNFD	Taskforce on Nature-related Financial Disclosures
TRASE	Transparency for Sustainable Economies
UNCCD	United Nations Convention to Combat Desertification
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNDP BIOFIN	UNDP Biodiversity Finance Initiative
UNEP FI	United Nations Environment Programme Finance Initiative
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
UNFCCC	United Nations Framework Convention on Climate Change
UOB	United Overseas Bank
USA	United States of America
USD	United States Dollar
USDA	United States Department of Agriculture
VBIAF	Value-based Intermediation Financing and Investment Impact Assessment Framework
VOC	Volatile Organic Compound
WDPA	World Database on Protected Areas
WEF	World Economic Forum
WHISP	What is in That Plot
WQI	Water Quality Index
WRI	World Resources Institute
WWF	World Wide Fund for Nature
ZSL	Zoological Society of London

Glossary

Biodiversity	The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. Source: Convention on Biological Diversity, Article 2.
Dependencies, Impacts, Risks and Opportunities (DIROs)	DIROs is a TNFD acronym covering: (i) Dependencies — aspects of ecosystem services and environmental assets that an organisation relies on to function; (ii) Impacts — changes in the state of nature (quality or quantity) that may alter nature's capacity to provide social and economic functions; (iii) Risks — potential threats to an organisation arising from its and wider society's dependencies on, and impacts on, nature; and (iv) Opportunities — activities that create positive outcomes for an organisation and for nature, by generating positive impacts or mitigating negative impacts on nature. DIROs are the thread connecting nature and business and form the foundation of nature-related disclosures.
Disclosure	The public communication of information by an organisation on its governance, strategy, risk management, and metrics and targets in relation to a given topic (e.g., nature- or climate-related issues), enabling investors, regulators and other stakeholders to assess performance and risk. Adapted from TNFD (2023b).
Double materiality	A combined assessment that considers both impact materiality and financial materiality. Source: European Commission (2023), Annex 1 to the Commission Delegated Regulation supplementing Directive 2013/34/EU as amended by Directive 2022/2464 (CSRD), as regards sustainability reporting standards (ESRS 1).
Ecosystem service	The range of material and non-material benefits that humans, directly and indirectly, obtain from nature and that sustain and fulfil human life. Ecosystem services are typically grouped into provisioning, regulating and maintenance, and cultural services. Adapted from NGFS (2024) and Millennium Ecosystem Assessment (2005).
ENCORE	An open-access database (Exploring Natural Capital Opportunities, Risks and Exposure) developed by the Natural Capital Finance Alliance — Global Canopy, UNEP FI and UNEP-WCMC — that maps how economic activities depend on ecosystem services and exert pressures on nature.
Environmentally Sensitive Area (ESA) / sensitive location	Areas important for biodiversity (including species), areas of high ecosystem integrity, areas of rapid decline in ecosystem integrity, areas of high physical water risk, or areas of importance for ecosystem service provision — including benefits to Indigenous Peoples, Local Communities and other stakeholders. Source: TNFD (2023a), Guidance on the identification and assessment of nature-related issues — the LEAP approach (V1.1, Oct 2023), Table 4.
Financial institutions	Entities whose primary business is the provision of financial services, including banks, insurers and takaful operators, fund managers, government-linked investment companies, and development finance institutions.
Financial materiality	A sustainability matter is financially material if it triggers, or may trigger, significant financial effects on the organisation — including risks or opportunities that influence future cash flows, development, performance, position, cost of capital or access to finance — in the short, medium or long term. Source: EFRAG, ESRS 1, paragraph 49.
Firms (non-financial corporates)	Throughout this report, the term 'firms' refers to non-financial corporate entities — including listed and non-listed companies of all sizes — whose primary activities are the production of goods or non-financial services, as distinct from financial institutions.
Impact materiality	A sustainability matter is material from an impact perspective when it pertains to the organisation's actual or potential, positive or negative impacts on people or the environment over the short, medium or long term. Adapted from EFRAG, ESRS 1, paragraph 43.

Impacts vs. pressures on nature	In nature-related assessments it is important to distinguish 'pressures' (or impact drivers) — the direct actions of an organisation that affect the environment, such as water use, land conversion, or pollutant emissions, which are typically measurable and are the focus of frameworks like ENCORE — from 'impacts', which are the resulting changes in the state of ecosystems and biodiversity (e.g., habitat degradation, species loss). The TNFD asks organisations to assess their 'impacts' as part of DIROs, but in practice initial assessments often measure pressures. This report uses 'pressures' when referring to the specific quantities measured (e.g., in ENCORE) and the broader term 'impacts' in general discussion, in line with TNFD terminology.
Locate, Evaluate, Assess, Prepare (LEAP) approach	An integrated, four-phase methodology developed by the TNFD to help organisations identify and assess nature-related issues across their direct operations, value chain and portfolios, and prepare to respond and disclose. A scoping phase typically precedes the four LEAP phases.
Materiality assessment	The process by which an organisation identifies the sustainability matters that are most important to its business and stakeholders, and that should therefore be reflected in its strategy, risk management and disclosure.
Nature	The natural world, with an emphasis on the diversity of living organisms (biodiversity) and their interactions among themselves and with their physical environment. Adapted from Díaz et al. (2015), The IPBES Conceptual Framework — Connecting Nature and People.
Nature-based solutions (NbS)	Actions to protect, sustainably manage and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. Source: IUCN.
Nature-positive	A high-level societal goal of halting and reversing nature loss by 2030 on a 2020 baseline, and achieving full recovery by 2050.
Nature-related risks	Risks to organisations linked to their, and wider society's, dependencies on nature and impacts on nature. They include physical risks, transition risks and systemic risks. Source: TNFD (2023b).
Physical risks	Risks resulting from the degradation of nature and the consequent loss of ecosystem services on which an organisation depends — either acute (e.g., a sudden drought, flood or pest outbreak) or chronic (e.g., gradual decline in soil fertility or pollination).
Public sector entities	In this report, this term covers government ministries and agencies, financial regulators (BNM and SC), supervisory authorities, and public development institutions.
Reporting	The process of preparing and publishing structured information on an organisation's performance — financial and/or non-financial — typically in line with a defined framework or standard (e.g., IFRS, GRI, TNFD). Reporting encompasses, but is broader than, disclosure.
Scenario analysis	A structured process of exploring how an organisation might perform under a range of plausible future states, used in the context of nature to test resilience to physical and transition risks.
Smallholder	In the palm oil context, an oil palm grower cultivating an area typically below 50 hectares, often farming alongside or in place of larger industrial plantations.
Systemic risks	Risks of disruption to entire systems (ecosystems, financial systems, economic systems) arising from cascading effects of nature loss, including ecosystem collapse, contagion and aggregation effects.
Taxonomy (sustainable finance)	A classification system that defines which economic activities can be considered environmentally sustainable, used to guide investment decisions and disclosure.
Transition risks	Risks arising from a misalignment of an organisation's activities with the transition to a nature-positive economy, including changes in policy and regulation, technology, markets, consumer preferences, and litigation.
Value chain	The full range of activities — upstream and downstream of an organisation's direct operations — required to bring a product or service from conception to end use and final disposal.

Executive Summary

Nature loss presents material economic and financial risks. Therefore, the effective management of these risks by both financial institutions and firms is important for strengthening the resilience of Malaysia's economy and financial sector. As one of the world's 17 megadiverse countries, Malaysia's economic prosperity is deeply intertwined with its rich natural capital. Over half of the nation's Gross Domestic Product (GDP) has a high or very high dependency on ecosystem services, creating physical risks for financial institutions and firms if these services degrade. Simultaneously, a global and national shift towards nature protection is creating transition risks for firms whose activities impact ecosystems.

This joint report by Bank Negara Malaysia (BNM), the World Bank, and United Nations Development Programme's Biodiversity Finance Initiative (UNDP BIOFIN) provides a guide for financial institutions and firms to assess and disclose nature-related dependencies, impacts, risks and opportunities (DIROs). It aims to: 1) Assess the current state of nature-related risk assessments and disclosures among Malaysian financial

institutions and firms; 2) Identify key gaps and challenges in these practices; and 3) Provide practical guidance and recommendations to accelerate progress across the financial ecosystem. The findings of this report are substantiated by several analytical components: an updated ENCORE analysis of nature-related dependencies and impacts within Malaysian banks' commercial lending portfolios¹; two surveys conducted with financial institutions and publicly listed companies; and five pilot LEAP assessments with three financial institutions and two firms.

The analysis in this report confirmed the substantial exposure of the Malaysian financial sector to nature-related risks as pointed out in BNM and World Bank (2022). As at end-2024, 54% of commercial loans were directed to sectors with high or very high dependencies on ecosystem services, while 36% of loans were to sectors with high or very high impacts on nature (Figure ES.1). The palm oil and construction sectors are identified as particularly significant sources of this risk exposure, justifying the further deep dive within the pilot assessments.



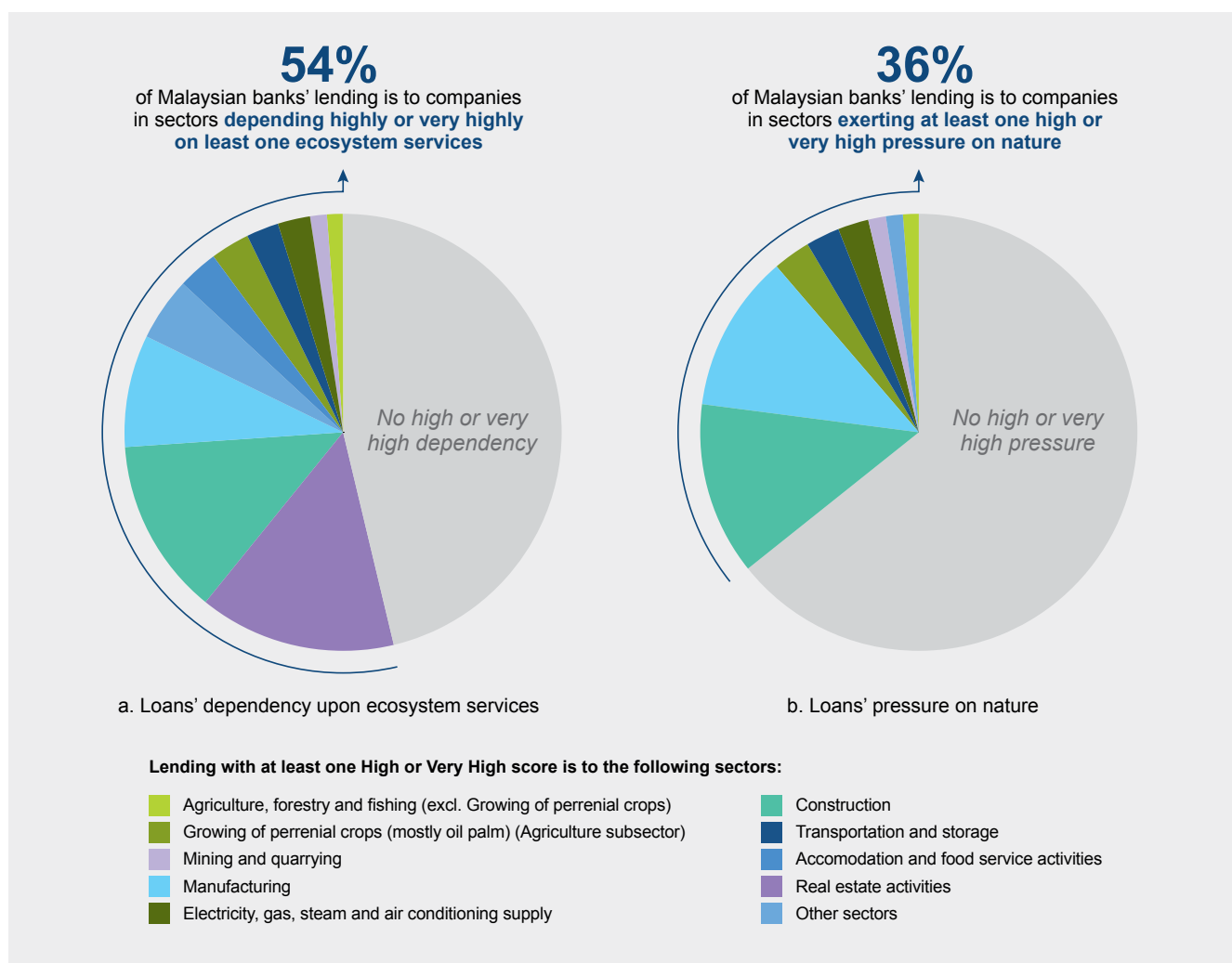
Credit: UNDP Malaysia

¹ These loans total RM816 billion (approximately USD183 billion).

Figure ES.1

54% of sectoral lending is highly or very highly dependent on ecosystem services, while 36% of loans were to sectors with high or very high pressures on nature.

Share of loans to sectors with high or very high dependency on ecosystem services (left) or pressures on ecosystems (right) (% of total lending)



Source: Authors' calculations based on ENCORE (2024 version) and BNM data on commercial loans for year-end 2024.

There is already an emerging policy landscape in Malaysia for assessing and disclosing nature-related DIROs, though these frameworks remain at an early stage and are largely voluntary. A central component of this evolution is the National Sustainability Reporting Framework (NSRF), which mandates the phased adoption of International Sustainability Standards Board (ISSB) International Financial Reporting Standards (IFRS) S1 and S2 as baseline sustainability disclosure standards for listed firms and large non-listed firms.

This report identifies 11 key findings structured around the LEAP assessment process, revealing a significant gap between conceptual awareness and the practical ability to manage nature-related risks, with data and methodological challenges being the primary obstacles

(Figure ES.2). While awareness is rising, understanding remains surface-level and is viewed primarily through a climate lens, particularly in how risks are identified and framed. Financial institutions and larger firms, particularly those in highly exposed sectors, are more advanced in their assessment and disclosure of nature-related risks due to stronger expectations from investors and buyers. A critical blind spot is the lack of granular, geolocated asset data, which prevents financial institutions from accurately assessing their exposure to localised risks such as water stress or biodiversity loss. Furthermore, while global screening tools like ENCORE provide a useful starting point, they lack the necessary country-specific context and sector-level granularity for key Malaysian industries like palm oil. A key challenge is not the complete absence of data, but its fragmentation; valuable information from Environmental Impact Assessments (EIAs)

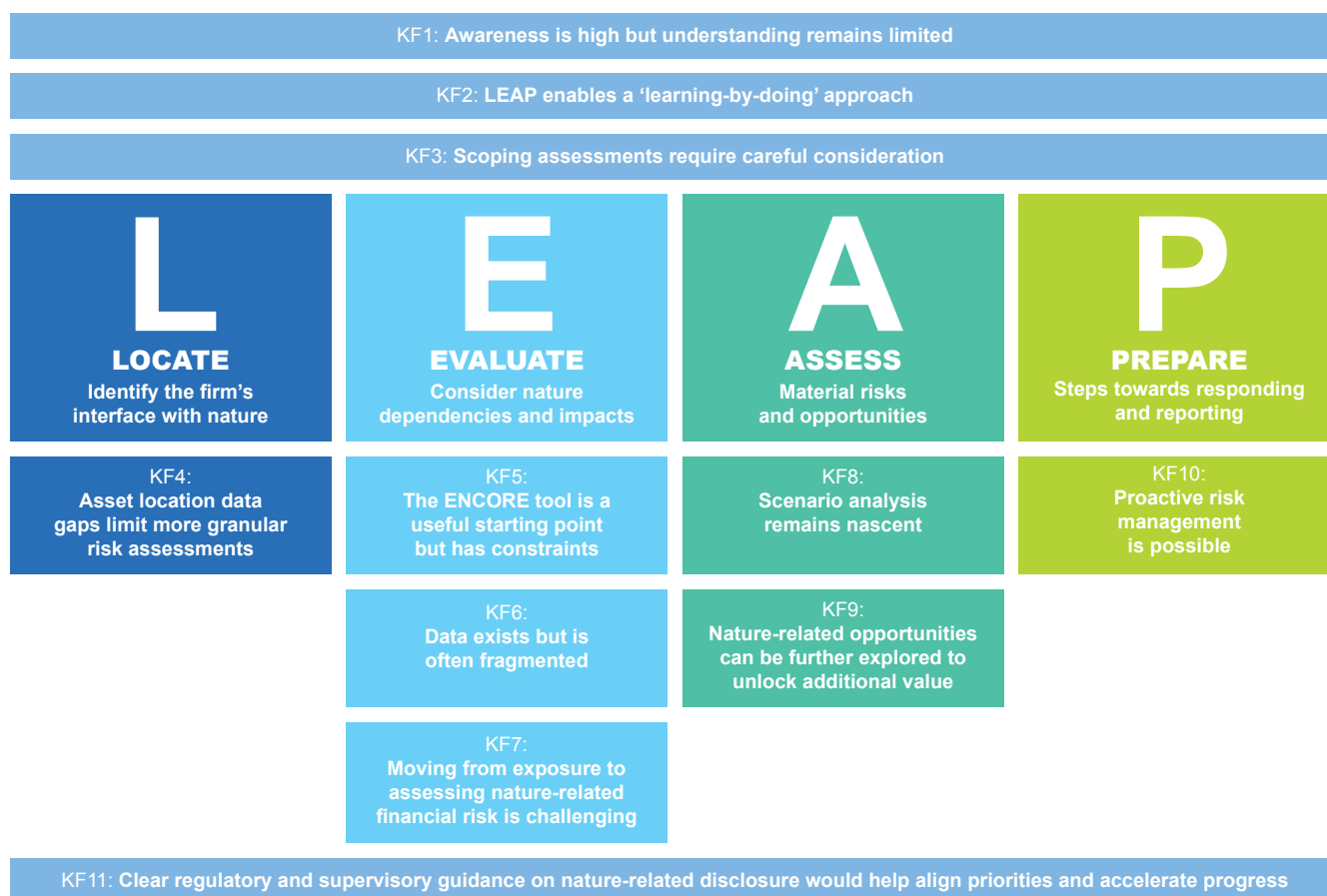
and certifications is often scattered across departments and not structured for risk analysis. This makes it difficult to move from identifying exposure to quantifying financial risk, a task further compounded by the absence of standardised, forward-looking scenarios for nature loss. Ultimately, the lack of clear regulatory guidance on disclosure creates a 'wait-and-see' approach, impeding resource allocation and proactive risk management.

Despite these hurdles, the pilot assessments confirm that a 'learning-by-doing' approach is both feasible and essential, with proactive financial institutions and

firms already demonstrating that progress is possible even with imperfect data. The iterative nature of the LEAP approach proved effective, allowing pilot participants to build internal capacity and refine their strategies over time. These pioneering efforts show that it is possible to start now, leveraging existing ESG governance structures and adapting them to include nature. The pilots also highlighted that nature-related opportunities, such as those in the circular economy or sustainable agriculture, remain largely underexplored, representing a significant area for future growth.

Figure ES.2

Key Findings (KF) structured following the LEAP approach



Source: Authors

To address these findings, the report proposes a detailed set of recommendations for financial institutions, firms, and public sector entities to collectively strengthen the ecosystem for nature-related risk assessment and disclosure (Table ES.1).

For financial institutions, a proactive and iterative approach is recommended to build capacity over time. They could begin by voluntarily integrating nature-related considerations into existing risk management and climate frameworks, thereby positioning themselves advantageously

for potential regulatory requirements in the future. A crucial role for these institutions is to actively help close data gaps by engaging with clients in high-risk sectors to collect granular location data. Over time, they should move beyond simple screening and work to embed nature-related risk assessments into core strategy and could adopt scenario analysis as it becomes more standardised. Furthermore, financial institutions can unlock new commercial value and drive positive change by strategically investing in and financing nature-positive outcomes.

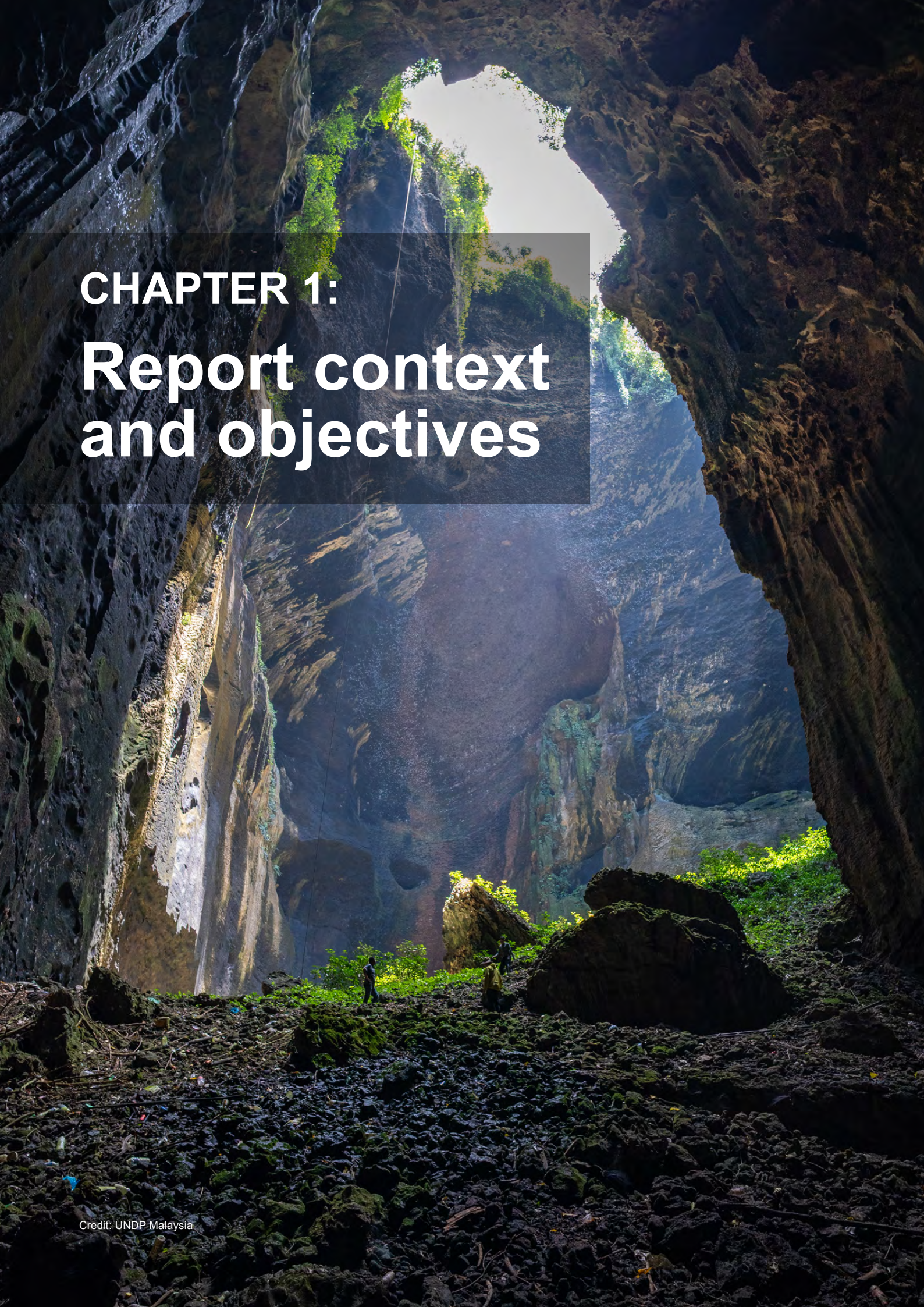
For firms, the focus should be on moving from general awareness to building concrete capacity for assessing and disclosing nature-related DIROs. Firms should actively assess their dependencies and impacts, leveraging internal workshops to bridge the “language barrier” between sustainability, finance, and operational teams. They could adopt a pragmatic, step-by-step approach to data by first inventorying existing internal information and then supplementing it with public tools and supplier engagement. Smaller, non-listed firms may apply the LEAP approach proportionately – calibrating depth of analysis to available resources, data, and capacity – though exploring material nature-related impacts and risks remains relevant for all entities, regardless of scale. It is also recommended that firms proactively engage with investors and clients as partners, focusing initial disclosures on the most material issues while remaining transparent about limitations. By leveraging existing ESG and climate governance structures, firms can stay ahead of regulatory trends and identify profitable business models in areas like the circular economy that generate both financial returns and nature-positive outcomes.

Public sector authorities are encouraged to create a strong enabling environment that makes nature-related data and guidance accessible, usable, and eventually, standard practice. Public entities can lead by developing hands-on training programmes and by establishing a centralised national data hub to make nature information more accessible and affordable. To further align finance with national goals, nature-related criteria should be integrated into the unified Malaysia Taxonomy. Regulators could spearhead the development of Malaysia-specific sectoral guidelines for high-impact industries. Furthermore, BNM and the Securities Commission Malaysia (SC) could strengthen financial sector guidance, starting with supervisory expectations that evolve over time, and could also establish a clear, phased path towards mandatory nature-related disclosure within the NSRF. Public sector authorities can also support the development of innovative financing instruments, such as blended finance models and biodiversity bonds, to unlock private capital for nature.

Table ES.1**Recommendations for strengthening nature-related risk assessment and disclosure**

Stakeholders	Recommendations
Financial institutions	1: Start now to build capacity over time
	2: Actively contribute to closing nature-related data gaps
	3: Integrate nature-related risk assessment into risk management and strategy over time
	4: Unlock commercial value by strategically investing in and financing nature-positive outcomes
Firms	1: Move from general awareness to building capacity
	2: Start by using and contributing to sector-specific guidance
	3: Build a pragmatic data plan by starting with existing information
	4: Engage investors, suppliers and clients as partners and disclose proportionately
	5: Leverage existing climate/ESG disclosure and broaden scope to nature
	6: Identify profitable business models to drive nature-positive outcomes
Public sector entities	1: Raise awareness and offer hands-on training
	2: Make nature data accessible, affordable and easily usable for financial risk assessment
	3: Integrate nature into the Malaysia Taxonomy
	4: Expand mandate of JC3 to mainstream nature
	5: Strengthen guidance on nature-related risk for the financial sector
	6: Support the development of innovative financing instruments for nature
	7: Establish a clear path toward mandatory disclosure
	8: Develop Malaysian economic sector-specific nature risk guidelines for firms

Source: Authors



CHAPTER 1: Report context and objectives

Context of the report

Nature loss poses significant risks to both the economy and the financial system – risks that are particularly material for Malaysia. Malaysia is one of the world's 17 megadiverse countries, boasting an exceptionally rich array of natural habitats and species (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 2018). Many economic activities depend on the country's rich ecosystems, creating significant *physical risks* if these ecosystems and the services they provide degrade. At the same time, activities that contribute to ecosystem degradation may face stricter regulations aimed at protecting nature and become increasingly exposed to *transition risks*.

Effective management of nature-related risks by financial institutions and firms – and their oversight by central banks and supervisors, as part of their financial stability mandate – is therefore essential. Since 2022, the Network of central banks and financial supervisors for Greening the Financial System (NGFS), now gathering 152 central banks and prudential supervisory authorities across over 95 countries, has encouraged all central banks and supervisors to assess and act on economic and financial risks stemming from nature loss (NGFS, 2022; 2024). Bank Negara Malaysia (BNM) and the World Bank initiated the analysis of nature-related risks in Malaysia in 2022 (BNM and World Bank, 2022) with an assessment of the dependencies on ecosystem services, and impacts on nature, associated with Malaysian banks' commercial loans at the end of 2020. This analysis pointed to the significant exposure of loans to nature-related risks.

A key starting point for managing nature-related issues is the assessment and disclosure of dependencies, impacts, risks, and opportunities (DIROs) linked to nature (Taskforce on Nature-related Financial Disclosures (TNFD), 2023b; NGFS, 2024).² Target 15 of the Kunming-Montreal Global Biodiversity Framework (GBF) calls on governments to require financial institutions and firms to monitor, assess, and disclose these nature-related factors by 2030 (Convention on Biological Diversity, 2022). Disclosure is not an end in itself but a means to multiple objectives: it improves transparency and risk management,

strengthens business resilience and investor confidence, and helps redirect financial flows away from activities that harm nature toward those that support nature-positive outcomes (TNFD, 2023b). Such a redirection of financial flows is consistent with Malaysia's National Policy on Biological Diversity (NPBD) 2022–2030 (Ministry of Natural Resources, Environment and Climate Change, 2022). It also aligns with global policy objectives – particularly Target 19 of the GBF, which calls for increasing all financial resources for biodiversity, including those from private sources.

Over the past few years, approaches such as the TNFD's LEAP approach have been developed to enable organisations to identify, assess, manage and disclose nature-related risks and opportunities in a structured way. The TNFD, launched in 2021, provides a risk management and disclosure framework for nature, mirroring the architecture of the Task Force on Climate-related Financial Disclosures (TCFD) across four pillars: Governance, Strategy, Risk and Impact Management, and Metrics and Targets. The TNFD framework draws from, and contributes to, emerging global standards that form the baseline for sustainability reporting (Box 1). To further assist organisations in identifying and assessing nature-related issues, the TNFD has developed an integrated approach known as LEAP – an acronym for its four phases: Locate, Evaluate, Assess and Prepare (see Box 3 in Chapter 5 for details). This report draws extensively on the TNFD LEAP approach as a guiding structure for analysis.

However, disclosing nature-related risks is a complex undertaking for financial institutions and firms alike. A primary challenge for financial institutions is their heavy reliance on client disclosures to accurately assess portfolio risks. Firms, in turn, grapple with the inherent complexity of nature, which is characterised by its multidimensionality³ and location-specificity.⁴ Addressing these challenges is crucial for Malaysian financial institutions and firms to effectively manage their nature-related risks and align with evolving international standards – in particular ISSB's recent announcement to propose requirements for nature-related risks and opportunities, building upon the TNFD framework.⁵

² DIROs represent the crucial link between nature and business, forming the foundation of nature-related disclosures. The acronym encompasses four key elements: Dependencies, which are the environmental assets and ecosystem services an organisation relies on to function; Impacts, meaning the changes to nature's state that can alter its capacity to provide social and economic functions; Risks, the potential threats to an organisation that arise from its and wider society's dependencies and impacts on nature; and Opportunities, which are activities that generate positive outcomes for both organisations and the environment by creating positive impacts or mitigating negative ones.

³ Multidimensionality refers to the diverse ways nature-related risks can manifest; for example, a business might be affected by the physical loss of a natural resource like clean water and simultaneously face transition risks as regulations shift to protect that same resource.

⁴ Location-specificity means that these risks can be highly localised; for instance, a company's operations might be concentrated in a region experiencing significant water stress or biodiversity loss, creating acute vulnerabilities that are not apparent from a broader, non-spatial analysis.

⁵ The IFRS recently stated that it plans to issue a Practice Statement. This Practice Statement would complement IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures, without changing the requirements in the Standards. When a company needs to provide information about nature-related risks and opportunities in accordance with IFRS S1, the Practice Statement would explain how to do this. This form of standard-setting therefore minimises disruption, which is particularly important because companies and jurisdictions are in the process of implementing and adopting the ISSB Standards.

BOX
1

Emerging frameworks and standards shaping nature-related reporting

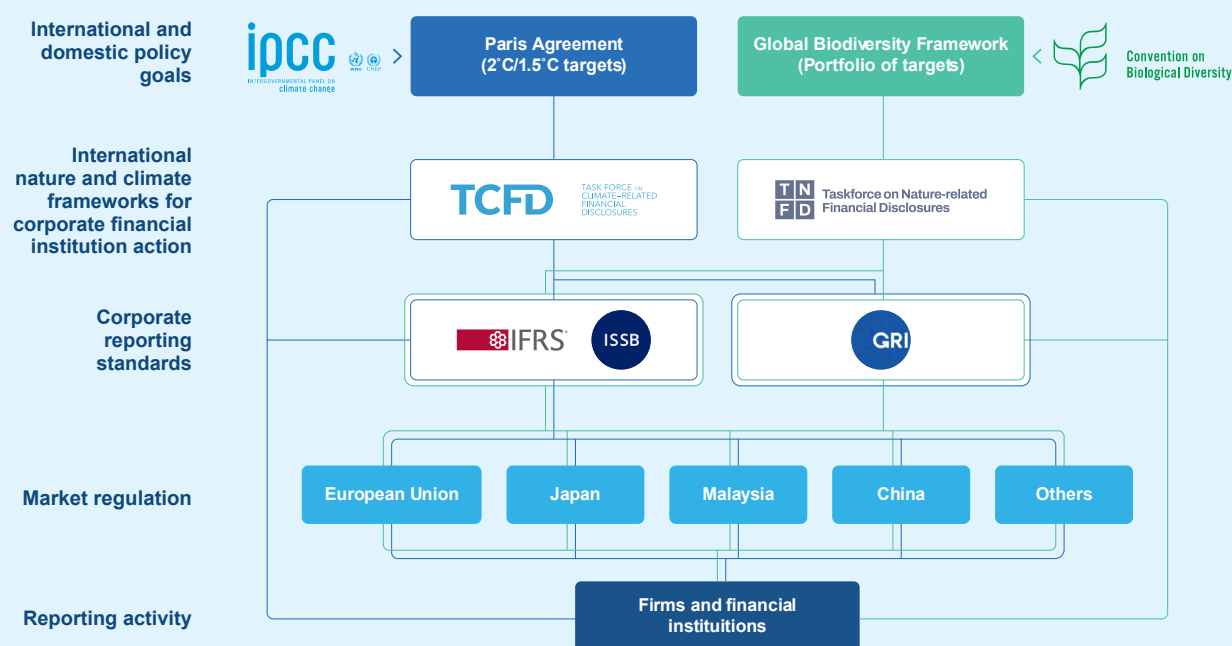
Reporting and disclosure frameworks, such as those from the TCFD and TNFD, play a crucial role in connecting internationally agreed climate and nature objectives with the business operations of financial institutions and firms (Figure B1.1). Likewise, these frameworks provide a standardised method for organisations to disclose potential physical and transition risks arising from climate change and nature loss. For example, the TNFD framework recommends nature-related disclosures across four pillars – Governance, Strategy, Risk and Impact Management, and Metrics and Targets. These pillars are closely aligned with the TCFD framework, which facilitates integrated reporting on both climate and nature (Figure B1.2). By enabling the disclosure of both physical and transition risks, these frameworks serve as essential tools for comprehensive risk management.

To further standardise the disclosure of climate- and nature-related risks, international reporting standards like the International Financial Reporting Standards (IFRS) from the International Sustainability Standards Board (ISSB) and the Global Reporting Initiative (GRI) have increasingly integrated these frameworks. For example, TCFD fed into IFRS S1 and S2, and the GRI has already drawn on the TNFD framework in updates to the GRI 101: Biodiversity Standard. This has helped establish a global baseline for voluntary, financially material sustainability disclosures.

These international standards are also progressively being adopted into national and regional regulations. As of mid-2025, over 30 jurisdictions had either adopted or were in the process of adopting the ISSB standards.⁶ In Malaysia, for instance, the NSRF has adopted ISSB Standards IFRS S1 and IFRS S2. This now requires listed firms, including financial institutions, and large non-listed firms in the country to report on their financially material sustainability risks.

Figure B1.1

The emerging nature-related disclosure and reporting architecture and its connection to global objectives and national reporting standards and regulation



Source: Authors adapted from TNFD (2023b), p. 20.

⁶ <https://www.ifrs.org/ifrs-sustainability-disclosure-standards-around-the-world/use-by-jurisdiction/>

Figure B1.2

TNFD Recommended Disclosures, aligned with the four pillars of the TCFD



Source: TNFD (2023b).

Objectives and targeted audience

In light of the above, this report has three main objectives:

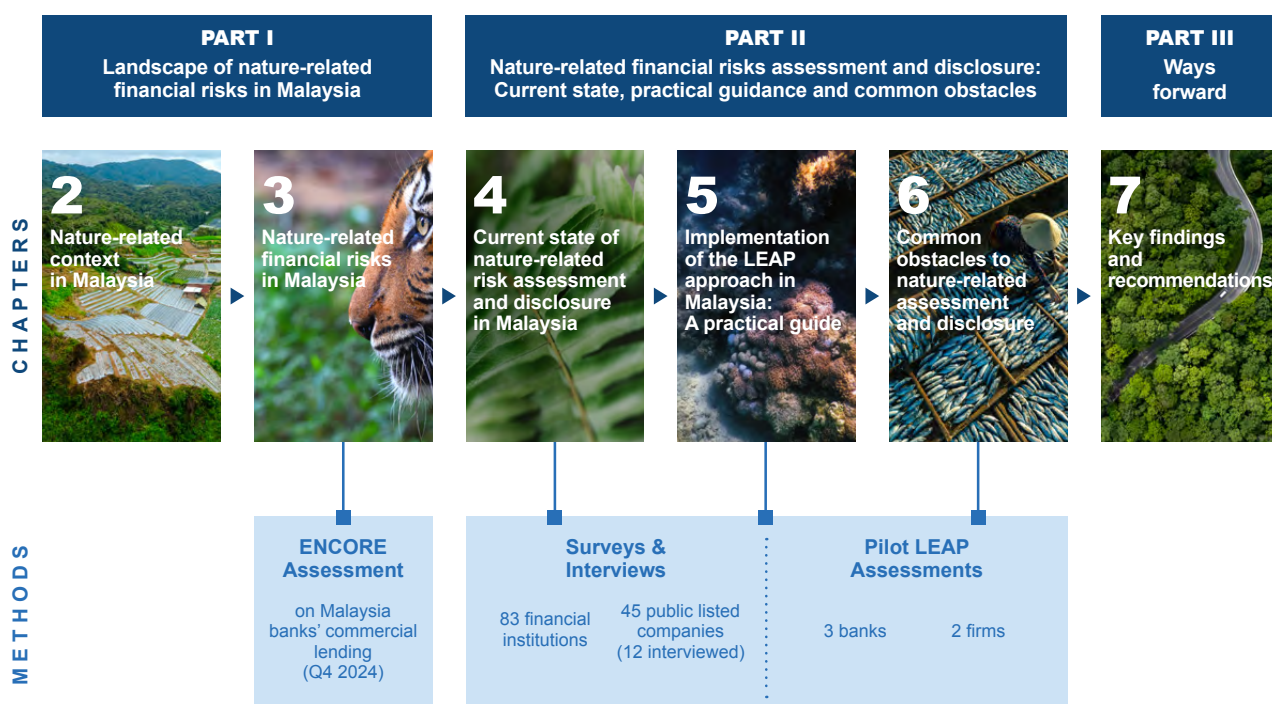
1. **Assess the current state** of nature-related risk and opportunity assessments and disclosures among Malaysian financial institutions and firms.
2. **Identify key gaps and challenges** in nature-related risk assessments and disclosures among Malaysian financial institutions and firms.
3. **Provide practical tools, case studies, and recommendations** to help financial institutions and firms advance their nature-related assessments and disclosures. This will also support financial supervisors in overseeing nature-related risks, as enhanced firm-level disclosure is essential for the financial institutions that lend to and invest in them.

These objectives are addressed through three parts, supported by quantitative analysis, surveys, and pilot assessments (Figure 1.1).

- **Part I** sets the landscape by describing Malaysia's nature-related context, including the current state of nature, relevant conservation policies, and the materiality of nature-related risks to the financial system – particularly through banks' lending to the palm oil and construction sectors. It draws on an updated high-level assessment of banks' commercial lending dependencies and impacts using the Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE) database, which links economic sectors to their dependencies on ecosystem services and the pressures they exert on nature.
- **Part II** examines current practices among Malaysian financial institutions and firms by analysing two dedicated surveys – targeting financial institutions and publicly listed companies – and five pilot TNFD LEAP assessments conducted with selected organisations between end-2024 and mid-2025, providing insights into how nature-related dependencies, impacts, risks, and opportunities are currently assessed and disclosed, as well as the main challenges faced.
- **Part III** builds on these analyses to synthesise key findings and present actionable recommendations for financial institutions, firms, and public-sector entities aimed at strengthening nature-related risk and opportunity assessments and disclosures across the Malaysian ecosystem.

Figure 1.1

Report outline and methods



This report should serve both as a reference document for policymakers and as a practical guide for financial institutions and firms.

- **For policymakers**, the report provides an overview of the nature-related risks facing the Malaysian financial system, along with an assessment of current nature-related disclosure practices and the key challenges encountered,

culminating in a set of recommendations to address these risks and overcome existing barriers (Chapters 3, 4, 6, and 7.II).

- **Financial institutions and firms will find practical guidance and illustrative examples to support the assessment and disclosure of nature-related risks, as well as targeted recommendations to strengthen these practices over time (Chapters 5, 7.I, and 7.II).**



Credit: World Bank Group

PART I:

Landscape of nature-related financial risks in Malaysia





CHAPTER 2: Nature-related context in Malaysia

Main takeaways of this chapter:

- Malaysia's nature is exceptionally rich and underpins the national economy through vital ecosystem services.
- However, rapid environmental degradation driven by unsustainable economic activity is eroding these natural assets and the services they provide.
- In response, Malaysia has introduced a range of strategies and policies to halt and reverse nature loss, including measures by the financial system.

I. Nature in Malaysia

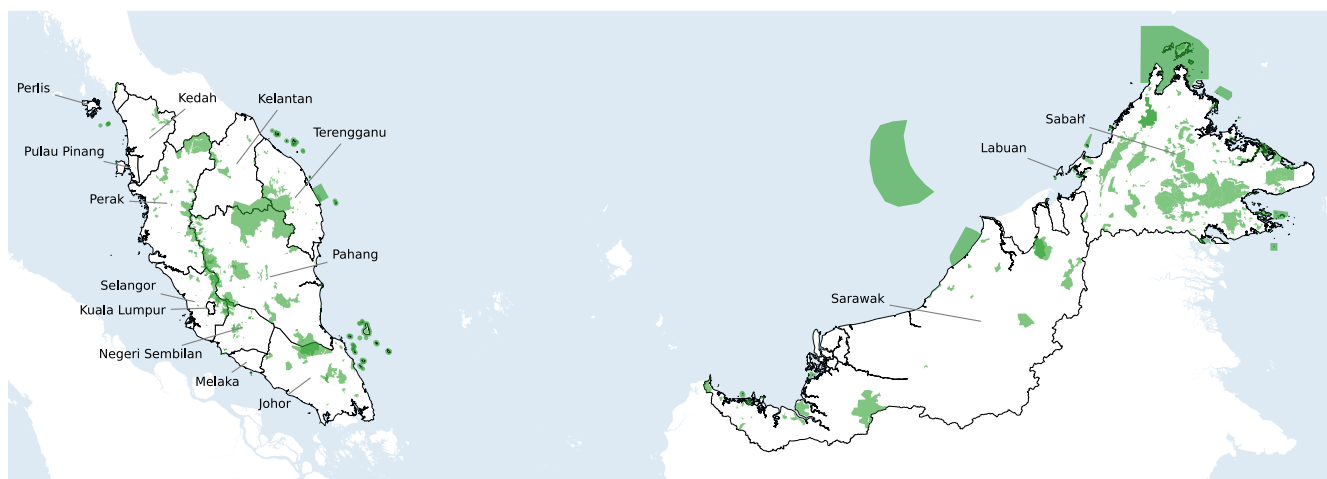
Malaysia is one of the world's 17 megadiverse countries, boasting an exceptionally rich array of natural habitats and species (IPBES, 2018; (Ministry of Natural Resources, Environment and Climate Change (NRECC), 2022). Its terrestrial landscapes are remarkably diverse, with forest cover standing at over 54% of the total land area (NRECC, 2022). These include biodiverse lowland dipterocarp, hill, and mountain forests, with specific regions like Mount Kinabalu in Sabah alone accounting for approximately 2.5% of the world's flora, and Peninsular Malaysia's Titiwangsa Range harbouring 25% of the country's known plant species (Ministry of Natural Resources and Environment (NRE), 2016). Malaysia's protected area coverage currently stands at 13% for terrestrial and 5% for marine ecosystems (Figure 2.1).

Beyond forests, Malaysia supports extensive tropical peatlands and freshwater swamps, and the nation's coastal and marine areas form part of the Coral Triangle, an area recognised for the greatest diversity of marine life globally (NRECC, 2022). These coastal ecosystems feature extensive mangrove forests, seagrass beds that are critical for endangered dugongs and sea turtles, and coral reefs with high diversity particularly in Sabah and Sarawak.

Malaysia's faunal community is also extensive (NRECC, 2022). It encompasses 361 known mammal species, including Malayan tigers in Peninsular Malaysia and orangutans in East Malaysia. The country is also home to 843 recorded bird species, and the forests of Borneo exhibit remarkable endemism, with 38 species found exclusively there.

Figure 2.1

Protected Areas of Malaysia (in green), per Malaysian States

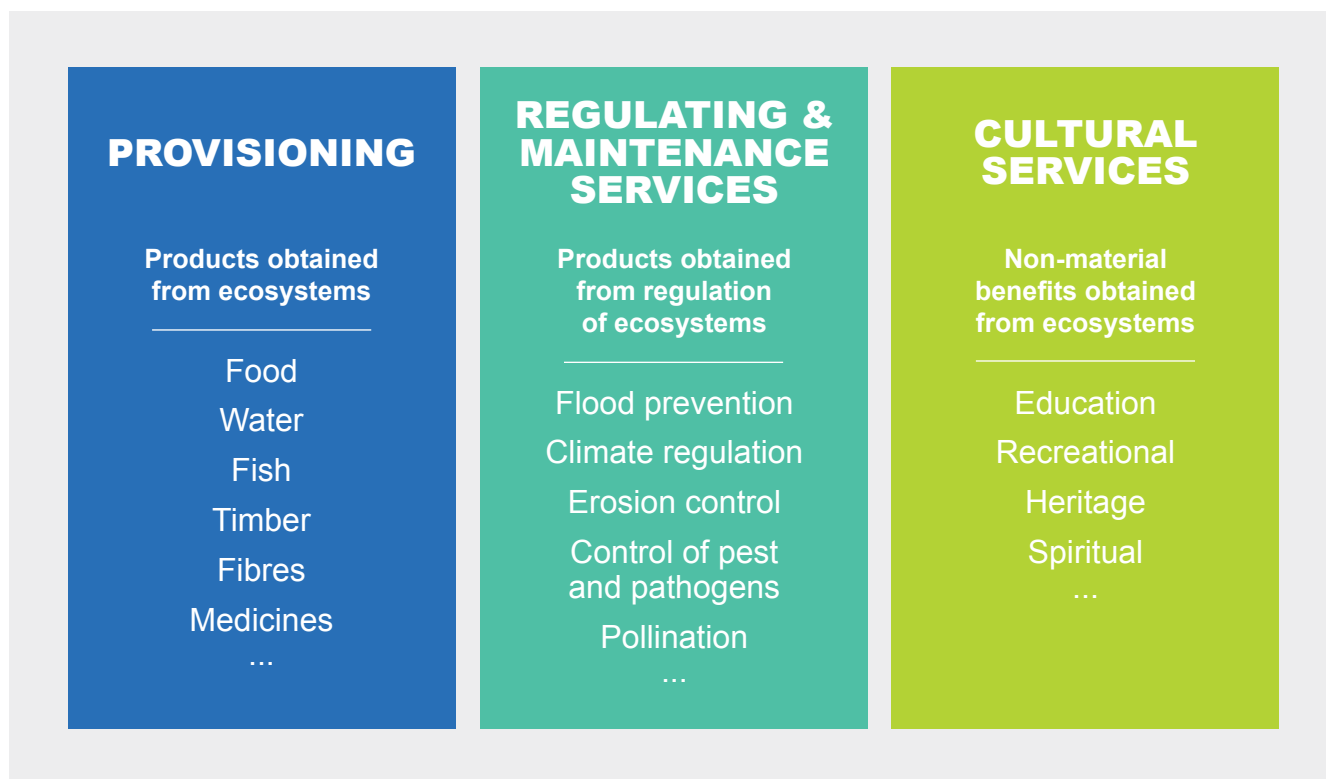


Source: Authors, based on data on protected areas from United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) and International Union for Conservation of Nature (IUCN) (2025).

II. Ecosystem services

Malaysia's rich biodiversity provides a wide array of essential ecosystem services upon which the economy and people's well-being depend. Ecosystem services are the range of material and non-material benefits that humans,

directly and indirectly, obtain from nature and that sustain and fulfil human life (NGFS, 2024; Millennium Ecosystem Assessment (MEA) 2005). They are typically split into three categories – provisioning, regulating and maintenance, and cultural services (Figure 2.2) (Haines-Young and Potschin, 2018).

Figure 2.2**Three categories of ecosystem services**

Source: Authors, building on Haines-Young and Potschin (2018).

Provisioning services are the tangible products obtained from ecosystems such as food, water, timber, and fibre. In Malaysia, ecosystems contribute significantly to food security through plants, animals, and fish. Forests yield timber and non-timber forest products such as rattan, agarwood and gums, collected for both domestic use and trade. Mangroves, seagrass beds, and coral reefs are feeding and nursery grounds for fish and shrimps, directly supporting seafood provision and Malaysia's significant fisheries industry (NRECC, 2022). Biodiversity is also a source of medicines, with plants and herbs like bitter melon and Hempedu Bumi showing potential for dengue treatment (NRE, 2016). Additionally, genetic diversity fuels biotechnology advancements for pharmaceuticals, antibiotics, and vaccines.

Regulating and maintenance services are the benefits obtained from the regulation and maintenance of ecosystem processes. In Malaysia, ecosystems like rainforests, peatlands, mangroves and the ocean are crucial for the sequestration of carbon, climate regulation, and the maintenance of air and water quality. Mangroves, coastal peat swamps, seagrass beds and coral reefs act as buffers that regulate extreme weather events and prevent coastline damage, including erosion. During heavy rainfall, rainforests also reduce the risk of flooding by acting as water

catchments (NRECC, 2022). Pollination is another important regulating ecosystem service, supporting the yields of several key Malaysian crops. For example, oil palm is pollinated by a specific weevil species (Klein et al. 2007), while durians rely on flying foxes – a species of bat – for pollination (NRECC, 2022).

Cultural services refer to the non-material benefits people gain from ecosystems through spiritual enrichment, education, recreation, and cultural identity. Malaysia's diverse natural environment is, for instance, a major draw for tourism. This sector contributes significantly to the national economy as the second-highest foreign currency earner (around 26.1 million tourists visited Malaysia in 2019, which amounted to RM86.1 billion in receipts) (NRECC, 2022).

Malaysia's economy is fundamentally reliant on nature, with over half of its GDP (51.3% in 2019) having a high or very high dependency on at least one ecosystem service (BNM and World Bank, forthcoming). This dependency creates significant economic risk. While primary sectors like agriculture, forestry, and tourism are directly tied to nature, other crucial sectors such as manufacturing, energy, and construction also depend on these services, either directly for resources like water and biomass or indirectly through their supply chains.



III. Nature degradation

Malaysia's rich biodiversity is in serious decline, threatening the provision of critical ecosystem services.

Nearly half of its highly endemic flora faces varying levels of threat (NRECC, 2022). Iconic fauna has suffered similarly: the Malayan tiger population has fallen to fewer than 150 individuals (WWF-Malaysia, 2022), the Sumatran rhinoceros and leatherback turtles are functionally extinct, and species such as dugongs and Bornean orangutans have faced severe declines. Terrestrial ecosystems have also been heavily impacted, with tree cover declining by 32% between 2001 and 2024 and humid primary forest area shrinking by 19% over 2002–2024 (Global Forest Watch, 2026). Marine ecosystems are also facing important threats: 2024 marked the second year of a declining trend in overall reef health. The abundance of most fish and invertebrate indicators remains low, suggesting either historical over-fishing or ongoing fishing pressure (Reef Check Malaysia, 2025; Food and Agriculture Organization of the United Nations (FAO), 2024).

Various anthropogenic pressures drive Malaysia's biodiversity decline, with habitat loss, degradation, and fragmentation being among the most significant contributors. Land-use change continues to pressure terrestrial biodiversity, even as the Malaysian economy has gradually shifted toward manufacturing and services. Historically, oil palm expansion drove much of this land-use change, accounting for 47% of national deforestation from 1972–2015 (Meijaard et al., 2018) and 57–60% in Malaysian Borneo between 1973–2015 (Gaveau et al. 2016). Rapid urbanisation now plays an important role: the urban population rose from 62% in 2000 to 75% in 2017 (Ministry of Energy and Natural Resources (Ministry of Energy and Natural Resources (KeTSA), 2019; NRECC, 2022). Increasing infrastructure development, such as roads and highways, fragments habitats and increases wildlife roadkill (KeTSA, 2019). Mining is also a source of ecosystem disruption: for example, the quarrying of limestone karsts for cement and marble products poses threats to endemic flora (Clements et al. 2006).

Overexploitation of environmental resources, climate change, pollution and invasive alien species pose additional threats. Poaching, driven by lucrative markets for food and exotic pets, affects iconic and endangered species (KeTSA, 2019). Coastal fishery resources are severely threatened, with many fish stocks already exploited beyond

maximum sustainable yield (KeTSA, 2019). Pressures from climate change, which affects temperature and precipitation patterns, have been increasingly observed (NRECC, 2022). Pollution from inland agriculture and industries (e.g. sewage and nutrients like nitrogen and phosphorus) degrades freshwater and marine ecosystems, impacting lakes, ponds, rivers, and coastal waters (NRECC, 2022). Plastic pollution is also a growing issue, with over 0.94 million tonnes of mismanaged plastic generated annually since 2018 – Malaysia's plastic manufacturing industry has one of the highest growth rates globally since 2000 (NRECC, 2022). Invasive alien species (IAS) also threaten local biodiversity by preying on or competing with native species and altering ecosystems, as seen with Kariba weed – a floating fern now widespread in Malaysian waters and impacting cultivated aquatic crops (NRECC, 2022).

Halting nature loss and restoring ecosystems in Malaysia is essential, as biodiversity decline threatens vital ecosystem services and risks causing large-scale economic impacts. Johnson et al. (2021) estimate that middle income countries like Malaysia could lose more than 6.5% of their national GDP by 2030 if only three major ecosystem services – pollination, timber provision, and fish stocks – were to collapse, underscoring the profound economic vulnerability associated with ecological degradation.

IV. Policies to protect and restore nature

The Malaysian government has enacted several policies and endorsed international agreements to better protect and restore its nature and biodiversity. As a Party to the Convention on Biological Diversity (CBD)⁷, Malaysia endorsed the GBF in 2022, which aims to halt and reverse nature loss by 2030. The GBF sets ambitious targets, including the restoration of 30% of ecosystems (Target 2) and the effective conservation of 30% of terrestrial, inland water, coastal, and marine ecosystems by 2030 (Target 3), often called the “30 by 30” goal. Nationally, these efforts are detailed in the National Policy on Biological Diversity 2022-2030 (NPBD)⁸, which includes goals to conserve at least 20% of terrestrial areas and inland waters, and 10% of coastal and marine areas by 2030.⁹ The NPBD also promotes sustainable practices in agriculture and fisheries, such as encouraging firms to adopt No Deforestation, No Peat, No Exploitation (NDPE) policies. The framework also seeks to reduce pressures on biodiversity by addressing issues like plastic pollution and chemical risks (Target 7).

⁷ The Convention on Biological Diversity (CBD), adopted in 1992, is a global treaty aimed at conserving biodiversity, ensuring its sustainable use, and equitably sharing benefits from genetic resources (see <https://www.cbd.int/secretariat>). It is one of the three “Rio Conventions”—alongside the UN Framework Convention on Climate Change (UNFCCC) and the Convention to Combat Desertification (UNCCD).

⁸ The NPBD 2022–2030 (Ministry of Natural Resources, Environment and Climate Change, 2022) outlines five strategic goals: (1) empowering and harnessing stakeholder commitment to biodiversity conservation; (2) significantly reducing direct and indirect pressures on biodiversity; (3) safeguarding all of Malaysia's key ecosystems, species, and genetic diversity; (4) ensuring the safe and equitable use of biodiversity and its benefits; and (5) improving the capacity, knowledge, and skills of all stakeholders for biodiversity conservation.

⁹ Currently, government data (DOSM, 2025) reports around 10% of land (in 2020) and about 5.5% of marine and coastal areas (2025) being protected (SDG indicators 15.1.2 and 14.5.1). Other global databases (UNEP-WCMC & IUCN, 2025) show similar results, estimating about 13.3% of land and inland waters and around 4.8% of marine and coastal areas currently protected.

Nature-related policy measures in other countries could indirectly impact Malaysia through international trade. For instance, regulations like the European Union Deforestation Regulation (EUDR) and the United Kingdom's due diligence law are set to prohibit the import of key commodities, such as palm oil and rubber, if they are linked to deforestation. These measures could have significant implications for Malaysian exports to these major markets.

The financial sector plays an important role in achieving Malaysia's nature goals, as recognised by both the national and global biodiversity frameworks. The GBF specifically calls on financial institutions and firms to assess and disclose their biodiversity-related risks and impacts (Target 15). It also aims to mobilise at least USD200 billion annually worldwide in public and private financial resources, with at least USD30 billion per year from international finance, including official development assistance (Target 19). Echoing this, the NPBD emphasises the need for a significant increase in funding for biodiversity conservation from both public and private sources (Target 17).

A whole-of-economy approach, including both public and private finance, is essential to fund Malaysia's nature objectives. A review of public and private spending on biodiversity by UNDP Biodiversity Finance Initiative (UNDP BIOFIN) Malaysia (2026) found that Malaysia spent an average of RM2.8 billion (USD0.7 billion)¹⁰ annually on restoring or protecting biodiversity between 2021 and 2025, with spending growing by 33% over the five-year period to RM3.2 billion (USD0.8 billion) in 2025, equivalent to roughly 0.2% of 2024 GDP. Despite this progress, a significant

financing gap remains: Malaysia's nature finance needs were estimated at RM19 billion (USD4.6 billion) between 2018 and 2025, leaving a gap of RM7.6 billion (USD1.8 billion) (UNDP BIOFIN, 2018). Building on this review, Malaysia's forthcoming Biodiversity Finance Plan (expected 2026) will provide a strategic, evidence-based roadmap to mobilise, reallocate, and manage financial resources in support of effective National Biodiversity Strategy and Action Plan (NBSAP) implementation.

Malaysia is also developing market-based financial instruments to mobilise capital for climate, nature and biodiversity conservation. For example, the Bursa Carbon Exchange (BCX) launched the first Malaysia Nature-Based Carbon Credits Plus (MNC+) from the Kuamut Rainforest Conservation Project, enabling tradable verified carbon credits that deliver climate and biodiversity co-benefits.¹¹ The Reducing Emissions from Deforestation and Forest Degradation (REDD+) Finance Framework integrates Forest Carbon Offset (FCO) and Forest Conservation Certificates (FCC) to incentivise forest conservation through market credits (NRES, 2020). Malaysia also pioneered a Climate Sukuk, a Shariah-compliant bond integrating carbon credit monetisation to fund green projects.¹² Complementing these instruments, initiatives such as the Climate Finance Innovation Lab (CFIL) by the Joint Committee on Climate Change (JC3) develops and accelerates innovative solutions to mobilise private and public finance, with nature-based solutions and biodiversity as a key thematic area. Together, these instruments and enabling platforms signal Malaysia's growing capacity to align capital markets with nature.



Credit: UNDP Malaysia

¹⁰ USD conversions are based on the average RM/USD exchange rate for December 2025 based on BNM data (RM4.1320 per USD).

¹¹ https://www.bursamalaysia.com/sites/5bb54be15f36ca0af339077a/content_entry5c11a9db758f8d31544574c6/66a22daae6414a1f128e4cf5/files/240725_PR_BCX_Kuamut_Auction_Outcome_vf_-_UPDATED_930_PM.pdf?1721914849

¹² <https://www.malaymail.com/news/money/2025/10/28/malaysia-launches-worlds-first-rm118m-climate-sukuk-blending-islamic-finance-carbon-credits-and-digital-innovation>



CHAPTER 3:

Nature-related financial risks in Malaysia

Main takeaways of this chapter:

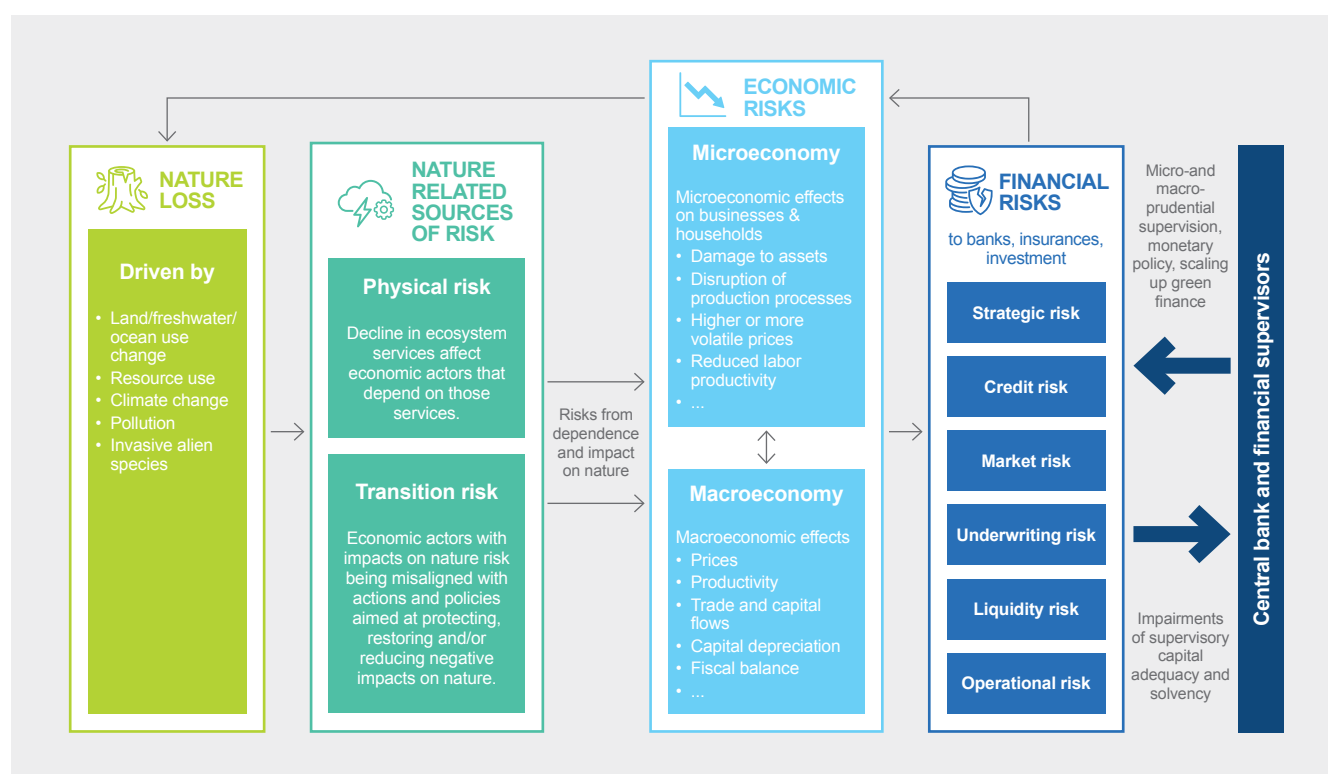
- Malaysian banks face significant nature-related physical risks. In 2024, 54% of bank lending went to firms that are highly or very highly dependent on ecosystem services, making these firms vulnerable to ongoing nature loss.
- Banks are also exposed to nature-related transition risks. In 2024, 36% of lending was to firms that exert high or very high pressures on nature, increasing the likelihood of misalignment with current and future nature protection policies.
- Exposure to nature risks is largely driven by lending to palm oil and construction sectors and their value chains. These sectors play a major role in the Malaysian economy but have significant impacts on – and dependencies upon – nature.
- The significant exposures to both physical and transition nature-related risks underscore the need for a deeper analysis to manage them effectively.
- Most commonly applied assessment and disclosure frameworks in Malaysia focus mainly on climate, leaving broader biodiversity- and ecosystem-related assessment and disclosures largely unaddressed and voluntary.

The degradation of natural ecosystems and the policy responses designed to protect them can both be major sources of risks to the Malaysian economy and financial system (Figure 3.1). On one hand, physical risks arise from the decline of ecosystem services, which can disrupt business operations dependent on them. For example, the destruction of coastal mangroves can expose corporate assets to erosion and submersion (Chaplin-Kramer et al. 2019; Islam et al. 2024; Mohammad Razi et al. 2023), while

a decrease in pollinators could severely impact crop yields (Klein et al. 2007), threatening the Malaysia's food system and economy (Murphy et al. 2022; Uwingabire and Gallai, 2024; Johnson et al. 2021). On the other hand, transition risks emerge from rapid policy, technology, or market shifts aimed at halting nature loss. These can include new regulations that restrict economic activities in protected areas, ban crops linked to deforestation, or impose new costs on firms for biodiversity impacts and product traceability.

Figure 3.1

Transmission channels: From nature degradation to economic and financial risk



Source: Authors, based on NGFS (2024) and NGFS & INSPIRE (2022).

I. Assessment of Malaysian banks' exposure to nature-related risk

A critical first step in evaluating nature-related financial risks is to examine the dependencies and pressures¹³ faced by financial institutions. This section updates the analysis originally conducted by BNM and World Bank (2022),¹⁴ focusing on the nature-related dependencies and pressures of outstanding commercial loans as of end-2024. These loans totalled RM816 billion (approximately USD183 billion). Their dependencies and pressures on nature were assessed using the latest version of the ENCORE tool (2024).¹⁵

A. Dependencies of commercial loans upon ecosystem services

The updated ENCORE assessment indicates that, as of end-2024, 54% of commercial loans were to firms operating in sectors with high or very high dependencies on at least one ecosystem service.¹⁶ This means that any decline in ecosystem service provision – driven by ecosystem degradation – could disrupt large parts of the economy, as many sectors rely on these services for production. Such disruptions could impair the ability of affected firms to meet

their financial obligations, creating nature-related physical risks for banks in the form of credit risk.

The Malaysian loan portfolio's dependency on nature varies significantly across different ecosystem services, with visual amenity, water-related services, and soil retention being particularly prominent. The portfolio shows a strong dependency on visual amenity services (Figure 3.2), such as landscape quality, largely driven by lending to the real estate sector (14.5% of the lending portfolio) and tourism-related activities (e.g. accommodation and food services represent 3% of loans) that rely on intact natural landscapes (Figure 3.3). Water-related ecosystem services are also critical, with 14% of the portfolio's value highly dependent on water purification and 12% on water supply, primarily due to financing to the perennial crops sector, including oil palm cultivation (Figure 3.3). Furthermore, loans to the construction sector account for a substantial portion of the portfolio's reliance on ecosystem services, explaining most of the dependency on soil and sediment retention (18% of lending) and flood and storm mitigation (10% of lending) (Figure 3.3).



Credit: UNDP Malaysia

¹³ The nature-related risks literature commonly uses the terminology of “dependencies and impacts”, rather than “dependencies and pressures”. However, the current assessment focuses on the pressures exerted by economic activities on nature (e.g. land-use change, pollution), rather than on the actual impacts of these pressures on ecosystems and biodiversity - which goes one step further. For the same amount of pressure, impacts can for example vary significantly by location. These actual impacts are not captured by ENCORE, but can be assessed through footprint analyses that link pressures to geolocated biodiversity metrics.

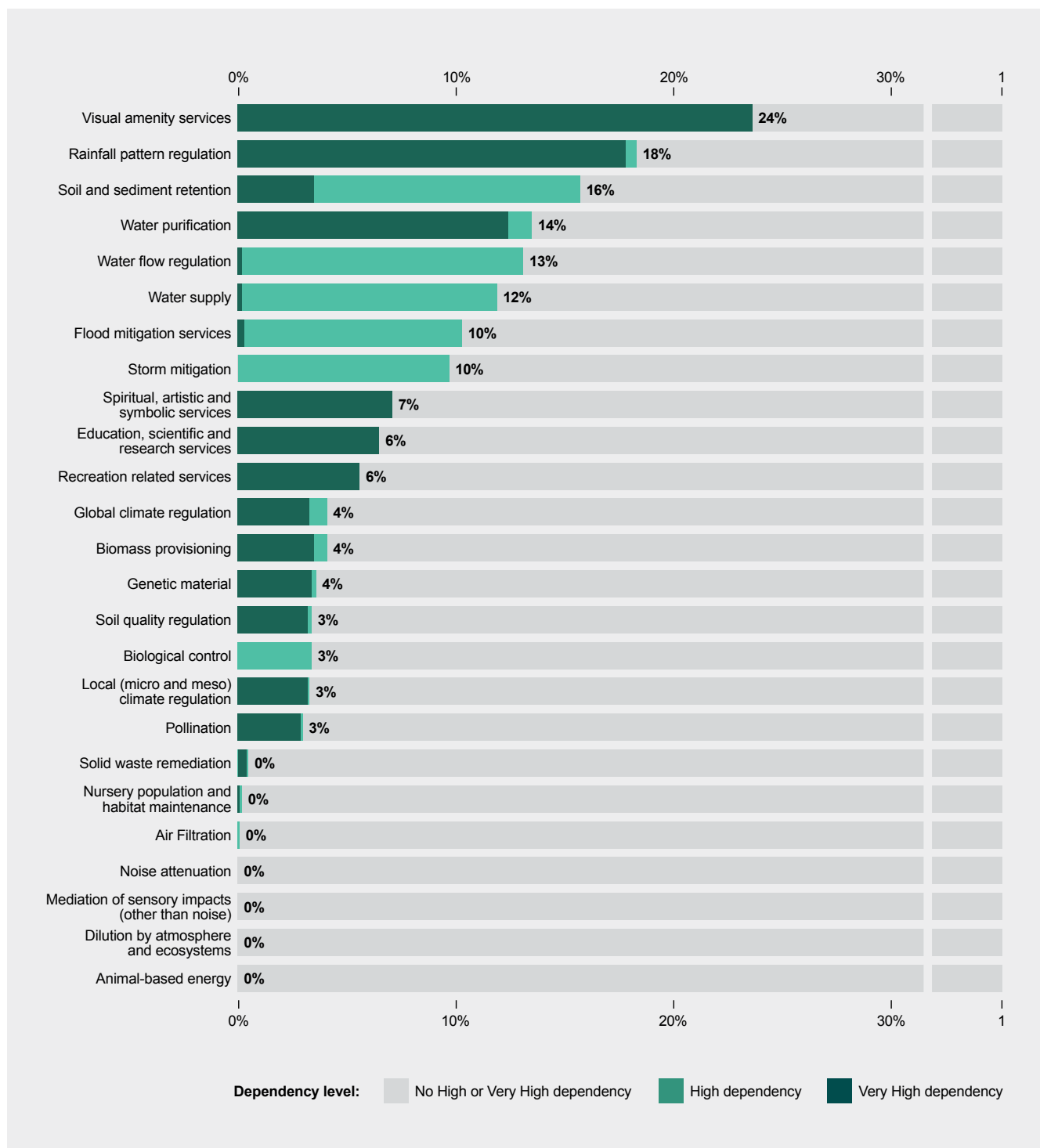
¹⁴ The previous analysis by BNM and WB (2022) differed from the current one in two main ways: (i) it analysed the dependencies and impacts of commercial loans in 2020 Q4 (against 2024 Q4 in the current assessment), and (ii) it relied on an older version of the ENCORE database of sectors' impacts and dependencies on nature, while the current assessment builds on ENCORE's updated version.

¹⁵ ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) is a free, online tool developed since 2018 by Global Canopy, UNEP FI, and UNEP-WCMC. It helps organisations understand their dependencies on and impacts on nature, serving as a first step in assessing exposure to nature-related risks. The tool covers 271 economic sectors, showing: (i) how material their dependency is on 25 different ecosystem services, and (ii) the materiality of the pressures they exert on nature, across 13 different pressure categories.

¹⁶ This result is identical with the result in the 2022 assessment (BNM and World Bank (2022)), which applied the previous version of ENCORE to 2020 loans.

Figure 3.2**Malaysia's loan portfolio is most dependent on visual amenity, water-related services, and soil retention ecosystem services**

High or very high dependency of the commercial lending portfolio to individual ecosystem services – Malaysia, 2024
(% of total loans)

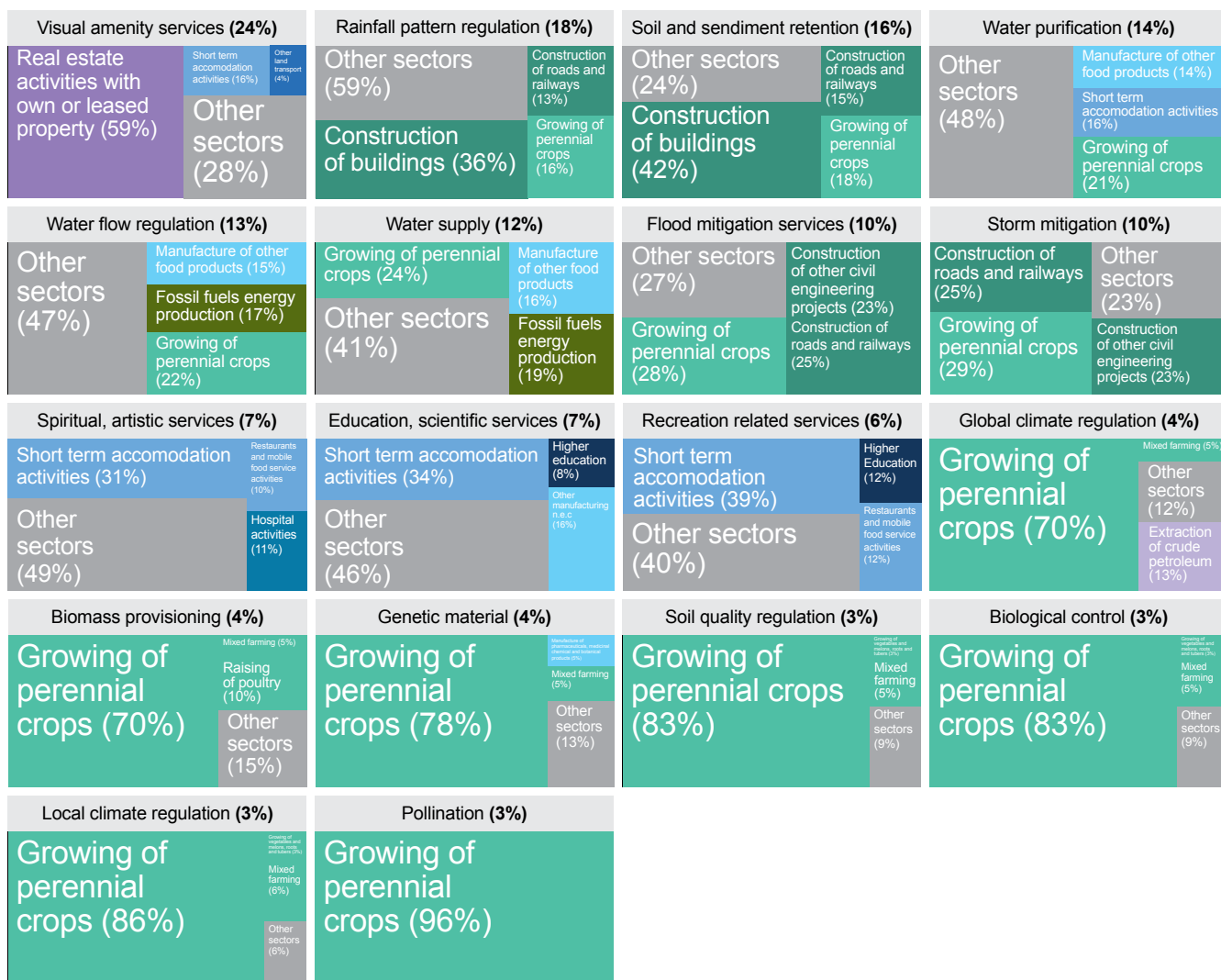


Source: Authors' calculations based on ENCORE (2024 version) and BNM data on commercial loans for end-2024.

Note: The graph can be read as follows: At the end-2024, 18% of the commercial loan portfolio in Malaysia was highly (0.5%, lighter green) or very highly (17.5%, darker green) dependent on the 'rainfall pattern regulation' ecosystem service. The remaining 82% of the portfolio (grey) did not have a high or very high dependency on this service.

Figure 3.3**Construction and perennial crop (primarily oil palm) sectors represent the largest contributors to banks' exposures to nature-related physical risks**

Sectoral contribution to loans' dependencies on ecosystem services – Malaysia, 2024 (% of total loans (top) and % of exposure explained by the sector (inside boxes))

**Large (1-digit) sector:**

- Agriculture, forestry and fishing
- Transportation and storage
- Accommodation and food service activities
- Construction
- Human health and social work activities
- Electricity, gas, steam and air conditioning supply
- Education
- Manufacturing
- Real estate activities
- Mining and quarrying

Source: Authors' calculations based on ENCORE (2024 version) and BNM data on commercial loans for end-2024.

Note: The graph can be read as follows: At the end-2024, 18% of the commercial loan portfolio in Malaysia was highly or very highly dependent on the 'rainfall pattern regulation' ecosystem service. 36% of this dependency came from loans dedicated to the construction of buildings.

17 This result differs strongly from those found by BNM and WB in 2022 (87% back then). This is primarily due to updates in the ENCORE database, rather than changes in the composition of the loan portfolio between 2021 and 2024. Recent updates to the ENCORE tool have significantly altered the database, particularly the materiality scores for sector-level pressures, while dependency scores remain largely unchanged. According to UNEP-WCMC, these changes stem from revisions in sector and pressure classifications, a shift from "impact drivers" in ENCORE version 1 to "pressures" in version 2, and enhancements to the materiality rating methodology, including additional research and the introduction of quantitative elements.

B. Pressures on nature associated with commercial loans

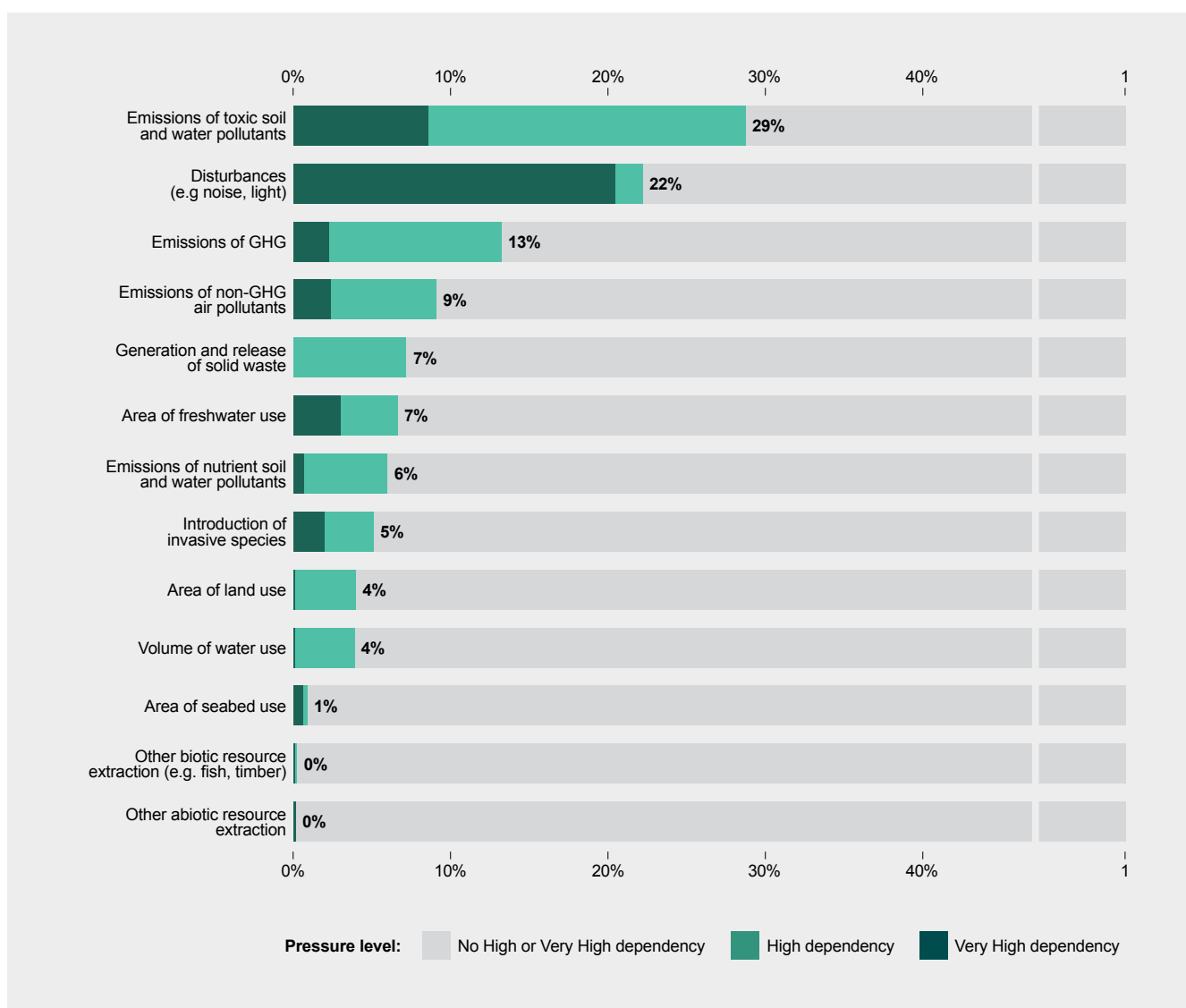
Assessing the environmental pressures exerted by financed firms can help banks evaluate their exposure to nature-related transition risks. Firms that do not align with nature-related transition pathways (such as policies or changes in consumer preferences, to protect nature) could see their profitability and business models affected. If this, in turn, affects their ability to repay loans, it may give rise to nature-related transition risks for banks in the form of credit risk.

As of end 2024, 36% of commercial loans are to firms exerting high or very high pressures on nature, for at least one pressure type.¹⁷ Commercial loans exert pressures on nature mostly via emissions of toxic soil and water pollutants (29% of loans are in sectors with a high or very high rating for this pressure), disturbances such as light and noise pollution (22% of the loan portfolio), followed by emissions of greenhouse gas (GHG) (13%) and non-GHG air pollutants (9%) (Figure 3.4).

Figure 3.4

Commercial loans in Malaysia put most pressure on nature via the emissions of toxic soil and water pollutants as well as noise and light disturbances

High or very high pressure of the commercial lending portfolio on nature via individual pressures – Malaysia, 2024 (% of total loans)



Source: Authors' calculations based on ENCORE (2024 version) and BNM data on commercial loans for end-2024.

Note: The graph can be read as follows: At the end of 2024, 29% of banks' commercial loan portfolio in Malaysia exerted high (20%, lighter green) or very high (9%, darker green) pressures on nature via the emission of toxic soil and water pollutants.

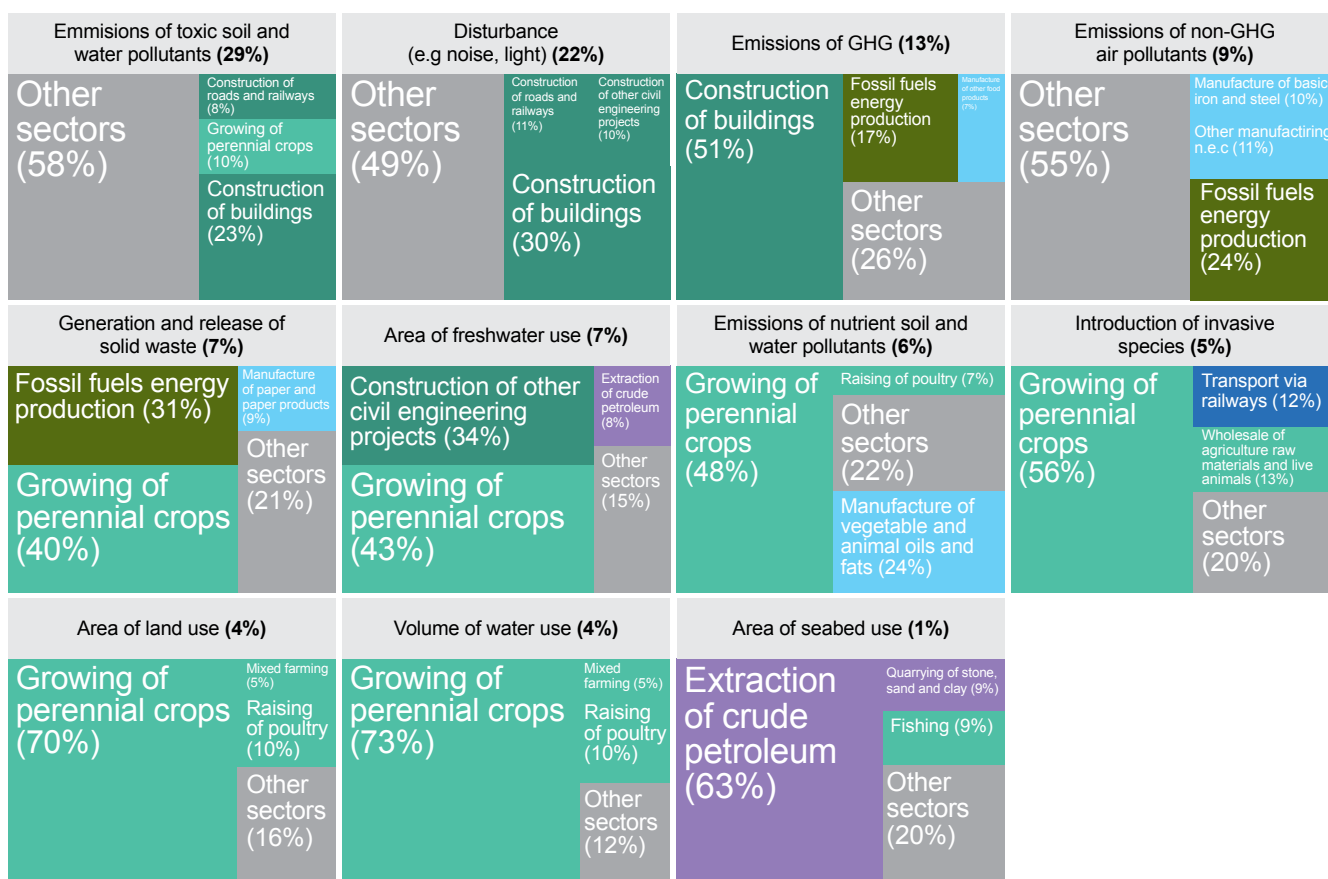
The construction, perennial crops, and fossil fuel sectors are the primary drivers of nature-related pressures within the commercial loan portfolio in Malaysia. The construction sector is a major contributor, accounting for 31% of the pressure from toxic soil and water pollutants, as well as significant impacts from disturbances, GHG emissions, and freshwater use (Figure 3.5). The perennial

crops sector, which includes oil palm, is responsible for 70% of the land-use pressure and 73% of the freshwater-use pressure attributed to loans. Finally, loans directed towards fossil fuel energy production and crude petroleum extraction also account for a substantial portion of the loan portfolio's overall impact on nature.

Figure 3.5

Construction, perennial crops, and fossil fuel sectors represent the largest contributors to banks' exposures to nature-related transition risks

Sectoral contribution to loans' pressure on nature through drivers of ecosystem degradation— Malaysia, 2024 (% of total loans (top) and % of pressure explained by the sector (inside boxes))



Large (1-digit) sector:

- Agriculture, forestry and fishing
- Wholesale and retail trade
- Transportation and storage
- Construction
- Manufacturing
- Electricity, gas, steam and air conditioning supply
- Mining and quarrying

Source: Authors' calculations based on ENCORE (2024 version) and BNM data on commercial loans for end-2024.

Note: The graph can be read as follows: At the end-2024, 29% of banks' commercial loan portfolio in Malaysia exerted high or very high pressure on nature through the emission of toxic soil and water pollutants. 23% of this pressure came from loans dedicated to the construction of buildings.

C. Risk transmission channel: Two highly exposed economic sectors

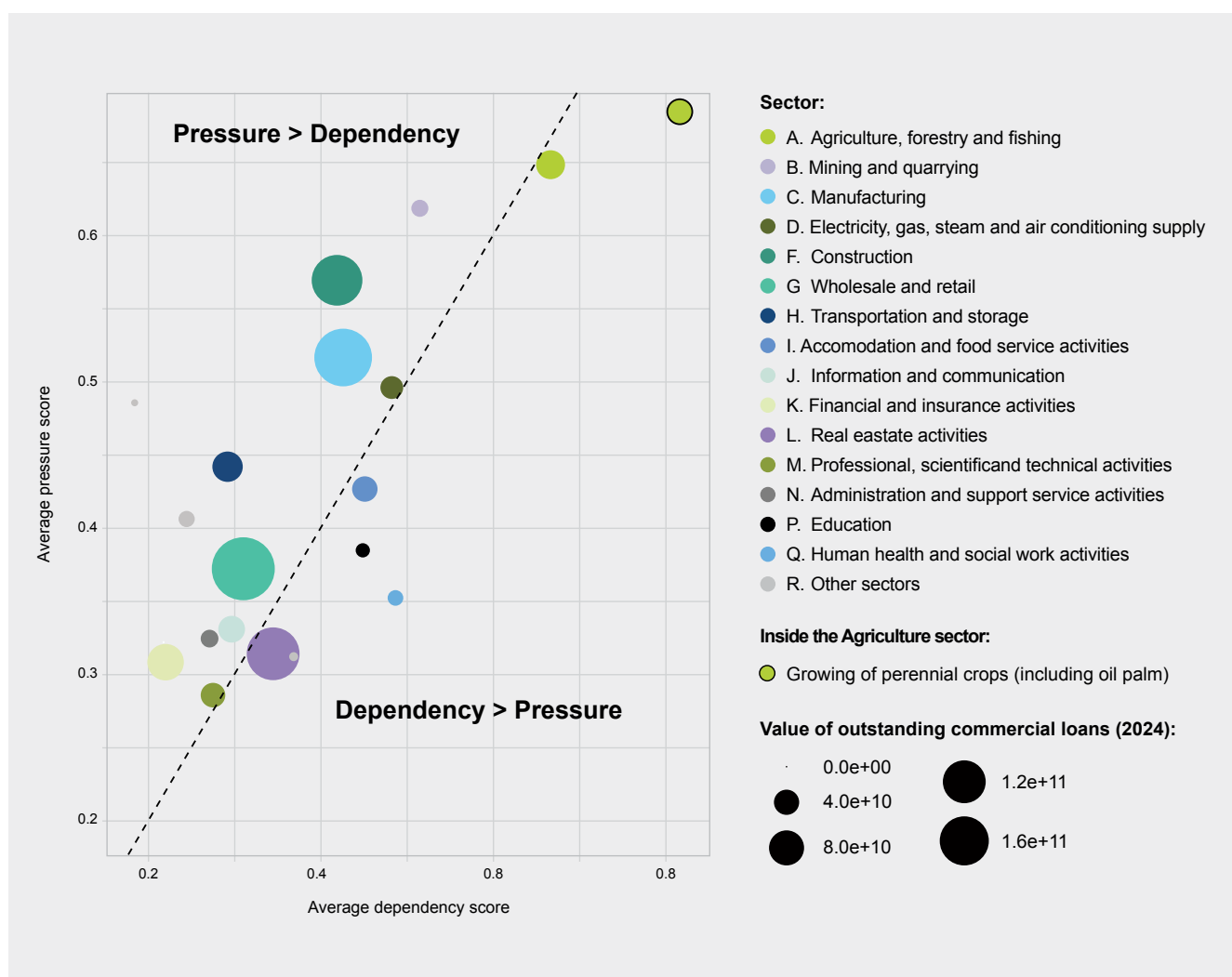
The previous findings show that the palm oil and construction sectors are large sources of nature-related risk exposure for Malaysian banks, warranting a more detailed analysis. The construction and palm oil industries are economically vital to Malaysia, with

construction comprising 4% of GDP in 2024 and palm oil being a top export (5.3% of Malaysia's total exports in 2024). Furthermore, both sectors represent a significant portion of bank lending in Malaysia¹⁸ and are identified as having some of the greatest dependencies on ecosystem services and the most substantial impacts on nature (Figure 3.6).¹⁹

Figure 3.6

The perennial crops and construction sectors exhibit high dependencies on nature, exert considerable pressure on ecosystems, and represent a substantial portion of loan portfolios

Average pressure and dependency scores, and total lending by sector in 2024



Source: Authors' calculations based on ENCORE (2024 version) and BNM data on commercial loans for end-2024.

Note: This figure illustrates the average dependency (x-axis) and pressure (y-axis) scores by sector. Scores are between 0 (very low) and 1 (very high). Averages are calculated by aggregating sub-sector scores to the 1-digit level. The bubble size indicates total lending to the sector in MYR. Oil palm plantations are singled out and appear as a light green bubble outlined in black in the top-right corner.

¹⁸ These two sectors, while of particular importance for the Malaysian economy, represent an even larger share of commercial lending.

¹⁹ However, these preliminary results should be interpreted with caution, especially regarding oil palm, as ENCORE does not explicitly account for the unique pressures and dependencies associated with this sector crucial to Malaysia within its broader assessment of the perennial crops sector.

The Malaysian palm oil value chain

Malaysia is the world's second-largest palm oil producer, behind Indonesia. In 2025, the country accounted for 25% of global palm oil production (USDA Foreign Agriculture Service, 2025), with 5.1 million hectares harvested for oil palm fruit in 2024 (FAOSTAT, 2026). Palm oil and related agricultural products are a significant exporting sector, with palm oil and palm-based products representing 7.6% of Malaysian total exports value in 2024 (DOSM, 2025, Table 8). The palm oil value chain in Malaysia typically involves several stages: plantations, mills, collection ports, refineries, and manufacturers (Meijaard et al. 2018, building on Roundtable for Sustainable Palm Oil (Roundtable on Sustainable Palm Oil (RSPO)) infographic). Plantations cultivate oil palm trees: these are primarily industrial plantations (60%) and smallholder farms (40%), with industrial operations historically concentrated in Peninsular Malaysia but expanding into Sabah and Sarawak (Meijaard et al., 2018). Fresh fruit bunches (FFB) are processed at local mills, where they are crushed to produce crude palm oil and palm kernel oil. Refineries then process crude palm oil into various consumer goods and intermediate products for food and chemical industries, such as cooking oil, margarine, cosmetics, and detergents. The oleochemical industry further refines these into specialised chemicals (Fold and Whitfield, 2012). Importantly, many Malaysian firms involved in the palm oil value chain also have significant core operations overseas, particularly in Indonesia.

The palm oil sector's significant dependencies and impacts on nature could result in substantial physical and transition risks for palm oil firms and their financiers (Annex 2). A recent scenario developed by the Cambridge Institute for Sustainability Leadership (CISL, 2025) with support from the Monetary Authority of Singapore and three Singaporean banks, assessed the impact of a hypothetical event of a severe El Niño event on the palm oil sector in Malaysia and Indonesia. The analysis projected production declines of 20% under a mild scenario and 40% under a severe scenario, due to disruptions in soil quality regulation and pollination services. While upstream plantations were found to be most vulnerable, integrated firms were found to have lower exposure. On the transition risk side, regulations like the European Union Deforestation Regulation (EUDR) could disrupt supply chains and increase costs for Malaysian palm oil producers. However, these risks may be mitigated by the Malaysian Sustainable Palm Oil (MSPO) certification, which largely aligns with EUDR requirements.

The Malaysian construction sector and value chain

The construction sector has been a significant contributor to Malaysia's economic output and has recorded sustained growth over the past decade. In 2024, the sector expanded by a notable 17.5%, driven primarily by

residential and specialised building construction activities, making it one of the key drivers of the country's overall economic growth (DOSM, 2025). This strong performance reflects a longer-term trend: between 2010 and 2022, the construction sector experienced substantial expansion, with total gross output more than doubling from RM91.3 billion (USD22.1 billion) to RM205.1 billion (USD49.6 billion) (DOSM, 2025). However, the intensity of construction activity has varied considerably across Malaysia's states and federal territories. States such as Selangor, Kuala Lumpur, Johor, Penang, and Sarawak have consistently led construction output, supported by stronger economies, rapid urbanisation, and government-backed development projects (DOSM, 2025).

The construction sector is exposed to significant nature-related physical and transition risks due to its dependencies and pressures on multiple ecosystems (Annex 2). Construction activities exert severe, often irreversible, pressures on nature throughout their value chain – from material extraction and production (upstream activities) to building use and eventual demolition (downstream activities). The direct operations of the sector notably contribute to land-use change, the primary driver of nature loss globally. In future years, some projections estimate that Malaysia – particularly the urban area of Kuala Lumpur – is among the global hotspots where future urban expansion could put strong pressure on nature (Simkin et al. 2022). These pressures on ecosystems can degrade the very ecosystem services the construction sector relies on, leading to direct physical risks like damage from floods, storms, and landslides. This degradation can also increase operational costs (e.g. for water purification or invasive species removal) and reduce property values, ultimately affecting profitability and asset valuation for building owners and tenants.

II. Navigating nature-related risk: An overview of Malaysia's assessment and disclosure landscape

While high-level sector analysis is a useful starting point, financial institutions require more granular, firm-specific data and disclosures to accurately assess and manage their nature-related risks. The ENCORE analysis helps pinpoint high risk sectors in banks' lending portfolio. However, to gain a more accurate understanding, financial institutions need to move beyond these aggregate approaches and conduct more detailed, differentiated assessments that account for individual firms' specific locations and operational practices.²⁰ Enhanced and granular disclosure by both financial institutions and firms is therefore essential for a meaningful evaluation and management of nature-related risks and opportunities across the financial system.

20 See also Chapter 6 for more details on ENCORE's limitations.

Malaysia's landscape for nature-related risk assessment and disclosure is rapidly evolving (Table 3.1), with several key frameworks from financial regulators guiding the integration of sustainability into financial supervision and market development. These include the Climate Change and Principle-based Taxonomy (CCPT) for institutions regulated by BNM²¹ (BNM, 2021) and the Guidelines on Sustainable and Responsible Investment (SRI) Funds for fund issuers and fund management companies

(Securities Commission Malaysia (SC), 2023). A central component of this evolution is the NSRF, which mandates the phased adoption of International Sustainability Standards Board (ISSB) International Financial Reporting Standards (IFRS) S1 and S2 as baseline disclosure standards for listed firms and large non-listed firms, further embedding sustainability reporting into the corporate landscape (SC, 2024).

Table 3.1

Nature's integration in the policy landscape for financial institutions and firms in Malaysia

Market Participant	Applicable Risk Assessment and Disclosure Policy (Regulatory Authority)
FINANCIAL INSTITUTIONS	
Bank, Insurers and Takaful Operators	Climate Change and Principle-based Taxonomy (CCPT) , Climate Risk Management and Scenario Analysis (CRMSA) , Value-based Intermediation Financing and Investment Impact Assessment Framework (VBIAF) , Value-based Intermediation Financing and Investment Impact Assessment Framework (VBIAF) Sectoral Guides (BNM)
CCPT includes Guiding Principle 3 on 'No Significant Harm to the Environment' (GP3), including objectives on healthy ecosystems and biodiversity. The Joint Committee on Climate Change (JC3)) developed Due Diligence Questions and Guidance Notes to facilitate assessments of Guiding Principle 3 (GP3) compliance. The voluntary VBIAF and its Sectoral Guides list due diligence expectations, including disclosure on biodiversity loss and deforestation risks in high-impact sectors.	
Government-Linked Investment Companies (GLICs)	None, or own policies (e.g. Permodalan Nasional Berhad (PNB)'s Nature and Biodiversity Policy)
PNB has set a list of expectations for its companies, derived from the LEAP approach of the TNFD, and adopts a No Deforestation, No expansion on Peat, No Exploitation (NDPE) commitment.	
Fund Managers (including PNB but excluding other GLICs)	Guidelines on SRI Funds , Guidance Note on Managing Environmental, Social and Governance (ESG) Risks for Fund Management Companies (SC)
Frameworks are climate-first, with voluntary integration of biodiversity only when material; SRI Funds may include biodiversity risks in sustainability strategies but not mandated unless financially material.	
Venture Capital/Private Equity	SRI Guide for Private Markets (SC)
Encourages sustainability integration in due diligence and investment decisions; nature-related considerations included only on a voluntary, materiality-driven basis and typically sector-specific.	
FIRMS	
Corporate Bond/Sukuk Issuers	SRI Taxonomy , Association of Southeast Asian Nations (ASEAN) Taxonomy (SC)
Taxonomies include biodiversity protection as an Environmental Objective; SRI Sukuk frameworks permit nature-related use of proceeds and Key Performance Indicators (KPIs); ASEAN Taxonomy includes Do No Significant Harm (DNSH) and Remedial Measures to Transition criteria covering ecosystems and biodiversity. However, these only apply to issuers who decide to adopt these criteria at point of issuance.	
Corporate Loan Issuers	CCPT , ASEAN Taxonomy (BNM)
DNSH principle explicitly includes biodiversity and ecosystems; due-diligence considerations for ecosystem impacts through CCPT implementation guidance. For ASEAN Taxonomy, see above.	
Public Listed Companies (PLCs) (Main and ACE Market)	NSRF (SC, Bursa)
Large Non-Listed Companies	NSRF (Companies Commission of Malaysia (SSM))
NSRF mandates the phased adoption of ISSB's IFRS S1 and S2 as baseline disclosure standards for all PLCs on Bursa's Main and ACE Market. Firms are required to disclose nature and biodiversity-related information only if material, consistent with IFRS S1. Potential expansion to nature through forthcoming ISSB's standards. Bursa Sustainability Reporting Guide provides guidance on assessing material nature-related impacts.	
SMEs in Supply Chains	Simplified ESG Disclosure Guide (SC/CMM)
Voluntary disclosure of nature-related-impacts (e.g. water, waste, land-use); nature aspects included at a basic/introductory level to support supply chain transparency, and with the guide aligning with IFRS standards.	

Source: Authors' analysis, based on respective policies/regulations.

²¹ The CCPT is applicable to licensed banks, investment banks, ITOs, reinsurers, retakaful operators and development financial institutions.

However, existing frameworks and guidance in Malaysia face several key challenges that need to be addressed:

- **Malaysia's sustainable finance frameworks are fragmented, which complicates the development of a unified approach to nature finance.** Mandatory frameworks currently differ between the banking and insurance regulator (BNM) and the capital markets regulator (SC). To address this, the Joint Committee on Climate Change (JC3) is working to harmonise domestic requirements through the unified Malaysia Taxonomy, and align them with regional (ASEAN) and global standards.²²
- **Current sustainability frameworks have a limited focus on nature, remaining primarily climate centric.** For instance, the NSRF takes a 'climate-first' approach, making disclosures on other topics like nature dependent on a firm's own materiality assessment. While some frameworks mention nature, the requirements often lack depth, apply only to certain sectors, or are based on high-level principles like 'do no significant harm' without providing detailed guidance, metrics, or targets.
- **In the absence of mandatory requirements, nature-related risk assessment and disclosure are largely voluntary, led by pioneering firms using international frameworks.** Despite policy gaps, a growing number of Malaysian firms are proactively adopting the TNFD recommendations. As of end-2025, five Malaysian firms – namely Gamuda, LBS Bina Group Berhad, Sunway Berhad, Top Glove Corporation, and Yinson – have committed as TNFD adopters. They intend to publish their first TNFD-aligned disclosures alongside financial statements for FY2025,²³ following the TNFD LEAP approach (Box 3). Beyond TNFD, Malaysian firms also turn to other global voluntary standards – such as the Global Reporting Initiative (GRI)²⁴ and the Carbon Disclosure Project (CDP)²⁵ – to report on nature-related issues. The GRI has strengthened its focus on biodiversity with the publication of a dedicated standard in 2024. Similarly, CDP operates as a global disclosure system covering climate, water, forests, and biodiversity – addressing issues such as deforestation risks and water resource management.

Anticipating future nature-related disclosure requirements is critical for financial institutions and firms. Recent global developments – particularly the work of the IFRS Foundation through ISSB – signal a shift toward complementing nature-related considerations in mainstream reporting.

Having established the materiality of nature-related risks in Malaysia, this report examines how financial institutions and firms can effectively assess and manage them. Part I of this report has demonstrated the materiality of nature-related economic and financial risks in Malaysia, highlighting how these risks are increasingly shaping the priorities of supervisors and financial regulators. As such risks grow more pronounced, robust assessment by financial institutions and firms becomes essential for effective risk management. Building on this foundation, Part II examines current assessment and disclosure practices among financial institutions and firms, and provides practical guidance to support the conduct – and enhancement – of nature-related risks and opportunities assessment and disclosure.



Credit: UNDP Malaysia

²² Joint Committee on Climate Change, 2025, "The JC3 Remains Committed to Advancing the Climate Agenda through Coordinated and Collaborative Efforts", 11 August, <https://www.jc3malaysia.com/news/the-jc3-remains-committed-to-advancing-the-climate-agenda-through-coordinated-and-collaborative-efforts>.

²³ Taskforce on Nature-related Financial Disclosures. "List of Adopters". https://tnfd.global/engage/tnfd-adopters-list/?_sfm_adoption_year=2025

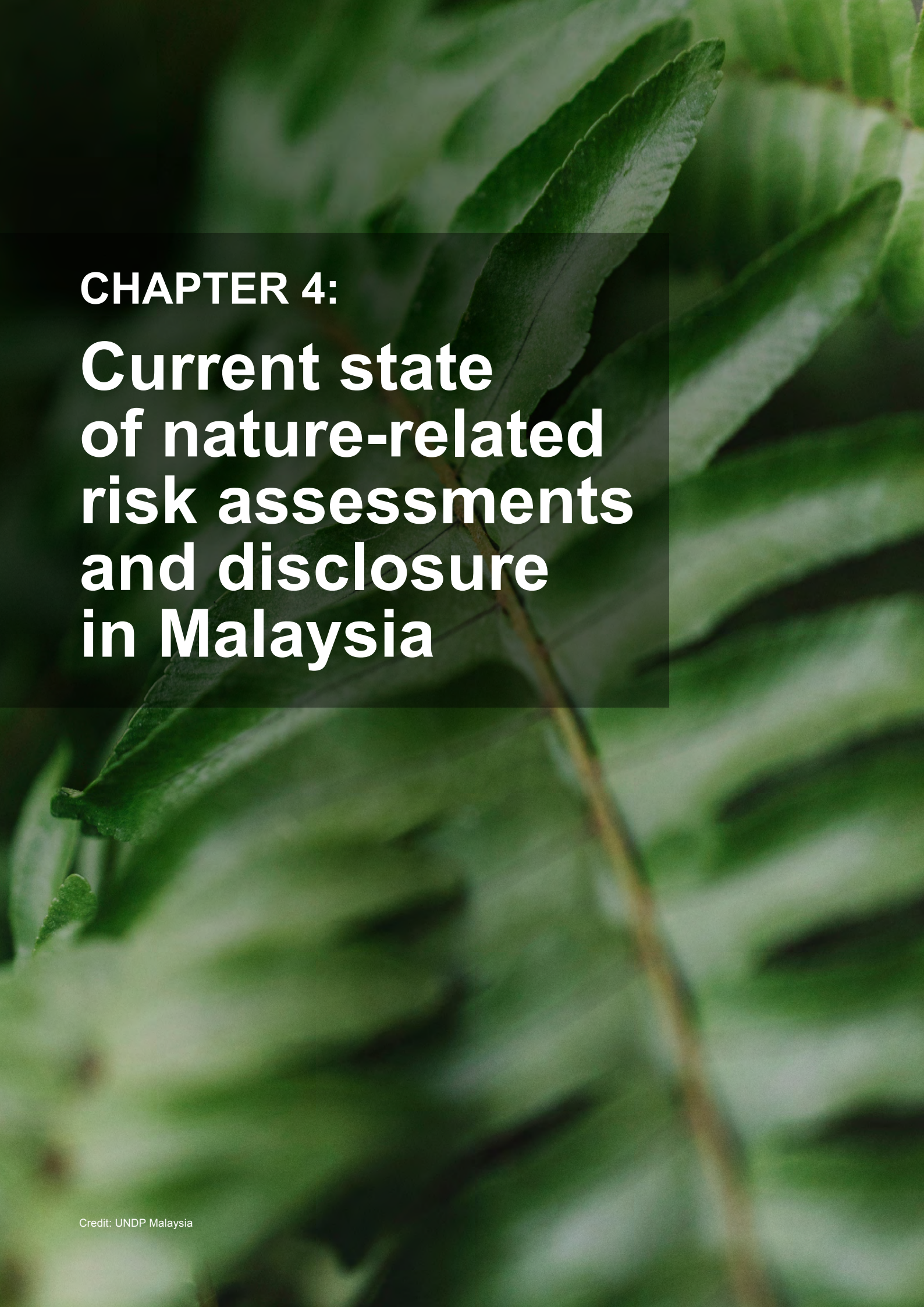
²⁴ Global Reporting Initiative, <https://www.globalreporting.org/>

²⁵ Carbon Disclosure Project, <https://www.cdp.net/en>

PART II:

Nature-related risk assessment and disclosure: Current state, practical guidance, and common obstacles





CHAPTER 4:

Current state of nature-related risk assessments and disclosure in Malaysia

Main takeaways of this chapter:

- While awareness of nature-related risks and opportunities is widespread and growing among Malaysian financial institutions and firms, understanding is often surface-level and viewed primarily through a climate lens, particularly in how risks are assessed and framed.
- Governance is ahead of risk management, strategy, and metrics. Financial institutions and firms are building on existing climate and Environmental, Social and Governance (ESG) governance structures, which are relatively more advanced than the practical integration of nature into risk management, strategy, and metrics.
- Financial institutions and larger, internationally-exposed firms, are more advanced in their assessment and disclosure of nature-related risks. This is also driven by stronger expectations from investors and buyers. In contrast, domestically-focused firms or those in the services sector tend to lag behind, as they perceive nature as less relevant to their operations.



Credit: UNDP Malaysia

This chapter assesses how far Malaysian financial institutions and firms have progressed in identifying, assessing and DIROs. It draws on a survey of 83 financial institutions regulated by BNM and a survey of 45 PLCs on the Main Market of Bursa Malaysia, complemented by in-depth interviews with 19 firm representatives (see Annex 1 for more methodological details).

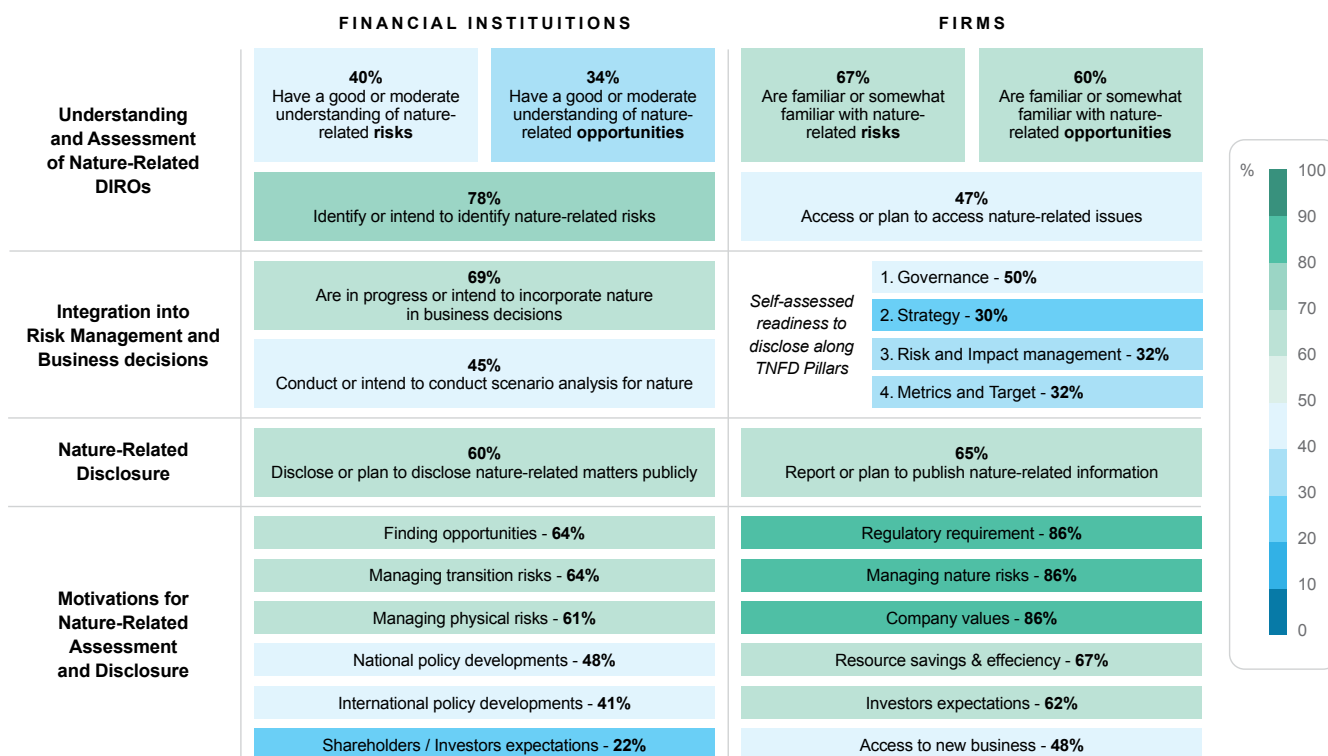
While both financial institutions and firms are increasingly aware of nature-related risks, their current capabilities, disclosure practices, and underlying motivations reveal important differences (Figure 4.1). Although general awareness is high across the board, financial institutions currently appear more advanced in

understanding and managing these risks. Nearly two-thirds of both groups either already disclose or plan to within two years, however the depth and specificity of this information vary significantly. Their motivations also diverge. Financial institutions are more strongly driven by the pursuit of financial opportunities, whereas firms are more heavily influenced by regulatory requirements and reputational concerns. While both are motivated by risk management and investor expectations, firms also place a stronger emphasis on achieving resource savings and operational efficiency, reflecting their different business model and close operational linkages to nature.

Figure 4.1

Financial institutions tend to have a more advanced understanding of nature-related risks compared to firms and are often more motivated by the pursuit of nature-related opportunities

Summary of financial institutions' and firms' understanding, assessment, disclosure practices, and motivations regarding nature-related DIROs



Source: Authors, based on financial institution survey (n = 83) and corporate survey on Malaysia's TNFD readiness (UNDP BIOFIN, 2025) (n = 45).

Note: This graph summarises responses from financial institutions and firms across two different surveys, which asked similar questions but with different framings. As a result, the figures are not 100% comparable.

I. Financial institutions' readiness to assess and disclose nature-related Dependencies, Impacts, Risks and Opportunities (DIROs)

A. Understanding and assessment of nature-related DIROs

Financial institutions are increasingly identifying nature-related risks as awareness of their relevance and potential materiality grows. Nearly 80% of surveyed financial institutions are either currently identifying nature-related DIROs (42%) or intend to do so (36%) (Figure A4.1b in Annex). Of the institutions that have started, most consider these risks to be at least moderately material, acknowledging their potential to affect traditional financial risks like credit, operational, market, and reputational risk.

Despite growing awareness, most financial institutions are still in the early stages of understanding and assessing nature-related risks and opportunities. About 60% of surveyed financial institutions report to having only a limited or no meaningful understanding of these complex issues (Figure A4.1a and A4.2a). This knowledge gap means that current identification or assessments of nature-related

DIROs are often limited to high-level screenings or focus narrowly on climate-linked physical hazards like floods and storms affecting collateral values and business continuity. Other nature-related risks – such as nature loss affecting agricultural productivity, water scarcity disrupting operations, or transition risks from new biodiversity and deforestation regulations – are less consistently identified.

Although most financial institutions see the value in nature-related scenario analysis for understanding long-term risks, its adoption remains limited. More than half of the institutions surveyed have no immediate plans to conduct such analysis (Figure A4.3). A major obstacle is the absence of globally agreed-upon nature-related scenarios, which has prevented the development of a standard methodology. While a small minority (10%) have begun piloting approaches, often guided by the TNFD, the practice remains at an early, exploratory stage.

Compared to risks, nature-related opportunities are less explored. There could be numerous opportunities associated with nature in Malaysia (Box 2). However, only 32% of surveyed financial institutions currently identify nature-related opportunities (Figure A4.2b) – compared with 42% that identify risks (Figure A4.1b). The opportunities

explored tend to be framed through familiar climate themes (for example, financing renewable energy and electric-vehicles, or disaster-risk insurance). More explicitly nature-positive opportunities, such as financing sustainable agriculture, watershed management, ecosystem restoration or nature-based tourism, receive less attention.

BOX 2

Nature-related opportunities in Malaysia

A nature-related opportunity, in the context of nature risk assessment and disclosure, is an activity undertaken by an organisation that results in positive outcomes for both nature and the organisation pursuing the opportunity (TNFD, 2025a). Nature-related opportunities are often incorrectly perceived as being narrowly focused on conservation and restoration, or as initiatives intended to support corporate social responsibility (CSR) objectives, failing to account how they can generate tangible financial benefits to the organisation.

In this context, nature-related opportunities, whether pursued by a financial institution or a firm, can be grouped in the following categories:

1. **Operational efficiency and resilience:** Improving internal cost structures, compliance, or operational performance by addressing dependencies and impacts on nature within existing business models. For example, water-resource efficiency measures (such as effluent water reuse, precision monitoring, and intensity targets) can optimise water use and enhance operational resilience for palm oil firms.
2. **New product or service markets:** Developing and scaling new materials, products, or services that deliver improved outcomes by addressing key drivers of nature change. For instance, sustainable building materials (e.g. recycled steel, tiles, and Tetra Pak-based roofing solutions) offer economically viable alternatives to traditional materials such as timber, cement, and steel for construction firms.
3. **Supply chain resilience:** Enhancing the sustainability and resilience of suppliers. For example, prioritising local suppliers can reduce transport distances, thereby minimising emissions and supply-chain risks.
4. **Business model innovation:** Restructuring organisational practices or value chains to create new revenue streams or value-creation pathways. This includes the use of natural systems for stormwater management to reduce long-term infrastructure and maintenance costs.
5. **Financial innovation:** Applying traditional financial products in new nature-related contexts, as well as developing innovative financial solutions that support nature-positive outcomes. Examples include biodiversity offsets and green incentives.

While nature-related opportunities can take many forms, they often remain undocumented. Financial innovation in particular can be difficult to explore in the context of ensuring biodiversity-positive outcomes. The UNDP BIOFIN Catalogue of Finance Solutions²⁶ and the Multilateral Development Bank (MDB) Common Nature Finance Taxonomy²⁷ provide a comprehensive list of instruments, tools and strategies relevant to biodiversity finance, and can serve as valuable references for organisations exploring innovative financial structures to support nature.

²⁶ <https://www.biofin.org/finance-solutions>

²⁷ <https://www.worldbank.org/en/topic/environment/publication/mdb-common-nature-finance-taxonomy>

B. Integration of nature considerations into risk management and business decisions

Financial institutions have made faster progress on governance than on strategy and active business decisions. Board and senior management oversight structures are increasingly in place, often building on existing climate risk and responsible finance policies. However, this governance has yet to translate into concrete action. While about 70% of surveyed financial institutions report that they are in progress or plan to incorporate nature into their business decisions (Figure A4.4), their efforts are often limited to Corporate Social Responsibility (CSR) programmes and high-level exclusion policies. The critical work of setting clear strategic objectives, defining risk appetite, and establishing measurable metrics for nature remains at an early stage.

Financial institutions are still in the early stages of integrating nature-related risks into their core risk management processes and business functions such as investment, credit approval, and pricing. While around 40% of surveyed financial institutions assess their corporate clients for these risks, the analysis is rarely specific to nature. Instead, most institutions rely on broader ESG or climate assessments that do not capture the nuances of nature-related dependencies and impacts. The gap is even more pronounced for small and medium enterprise (SME) clients, where only a quarter of financial institutions conduct any assessment, and a mere 8% perform one specifically focused on nature. This proportional, risk-based approach is pragmatic but underscores how nascent the integration of nature-related risk still is.

C. Nature-related disclosure

A small but growing number of financial institutions currently disclose nature-related DIROs, though these are typically presented as part of broader sustainability-related disclosures. About 23% of surveyed financial institutions currently disclose nature-related DIROs in publicly available reports, and a further 37% plan to begin disclosure in the coming years (Figure A4.5). Among those that do disclose, the information is typically embedded within broader sustainability or climate-related reports rather than presented as a standalone nature-related reporting.

Financial institutions often use climate-related or broader sustainability frameworks as a starting point for nature-related disclosure. For instance, the 'do no significant harm' principle from the CCPT is one of the most cited references for nature-related assessments and disclosure (Figure A4.6). While general sustainability standards such as IFRS and GRI provide the overarching standards, the TNFD framework is widely recognised as the benchmark for nature specifically and is now being drawn on by both GRI and ISSB in standard setting. However, despite more than half of surveyed firms acknowledging TNFD's relevance, only a small fraction (4%) has started to fully align their disclosures with its recommendations.

D. Motivations to assess and disclose nature-related DIROs

A combination of risk management, opportunity-seeking, and external pressure motivates financial institutions to address nature. Over 60% of financial institutions are driven by the dual goals of managing nature-related risks and finding new nature-related investment opportunities (Figure A4.7). Furthermore, evolving regulations are a key catalyst, with over 40% citing policy developments as a major driver, alongside demands from shareholders and investors (22%).

“Our region has substantial natural capital – nature dependencies pose risks to our clients and therefore to us. That’s a key reason we’re looking at this.”

- Chief Sustainability Officer, Financial Institution

By contrast, client demand is relatively muted: nearly 80% of financial institutions report that their clients have not yet expressed explicit concerns about nature-related risks, with notable exceptions in sectors such as agriculture, forestry and fisheries.



II. Firms' readiness to assess and disclose nature-related DIROs

A. Understanding and assessment of nature-related DIROs

Among Malaysian firms, awareness and familiarity with nature-related DIROs is high, but detailed understanding remains nascent. Although approximately two-thirds of firms report at least some familiarity with nature-related risks (67%) and opportunities (60%), a much smaller portion report to be not equipped for practical application (20% for risks and 13% for opportunities) (Figure A4.9). This suggests a significant gap between conceptual awareness and the capacity to translate these concepts into concrete business strategies and financial metrics.

Most firms are yet to conduct a nature-related DIROs assessment due to perceived low materiality and a lack of regulatory clarity. Only 22% of surveyed firms have conducted a nature-related risk assessment, with another 25% planning to do so within the next two years (Figure A4.10). In subsequent interviews, firms that had no plans to conduct such assessments offered two primary justifications: they either considered nature to be a non-material issue for their specific sector, or they pointed to a lack of clear government regulations and guidance on the matter.

Of the firms that have conducted nature-related risk assessments, the adoption of formal frameworks is rare. Only 4% have piloted the TNFD LEAP approach, with a further 13% planning to do so (Figure A4.10). Most firms rely on internally developed methods, such as integrating environmental factors into existing enterprise risk management (ERM) processes or conducting hazard-specific assessments, particularly for flooding.

Assessment readiness is higher among firms with significant international exposure, particularly those serving global value chains and export markets (Figure A4.11). These firms are more likely to have undertaken or planned nature-related assessments, reflecting stronger expectations from global buyers, investors and ESG ratings agencies.

B. Integration of nature considerations into risk management and business decisions

Similar to financial institutions, firms are more advanced in integrating nature-related risks into governance practices than into risk management, metrics and targets (Figure A4.12). About half of the surveyed firms have board-level oversight and dedicated management roles, often by extending existing ESG or climate committees, and sustainability units. However, these structures have yet to drive substantive changes in strategy or business decision-making. Risk management is more advanced for direct operations but lags significantly for supply chains, where

data and traceability pose major challenges. Furthermore, while most firms track basic environmental metrics such as waste and water usage, nature-related indicators such as ecosystem health or pollution are rarely measured.

C. Nature-related disclosure

While Malaysian firms have begun to disclose nature-related DIROs, these disclosures are typically embedded within broader sustainability reporting and often lack depth. Around half of surveyed firms include some nature-related details in their public reporting, with another 16% planning to do so in the future (Figure A4.13). These disclosures generally follow overarching frameworks like GRI and IFRS S1 Standards, which are most familiar to firms (Figure A4.14) and align with emerging domestic reporting requirements (such as the NSRF, see Chapter 3). Frameworks like the TNFD on the other hand, are sometimes referenced but yet to be adopted comprehensively, with many firms viewing them as relevant only for nature-intensive industries. There is also a significant gap in the scope of reporting, with larger firms producing more comprehensive disclosures than smaller counterpart firms (World Bank and Securities Commission Malaysia, 2024).

Despite the slow adoption of the TNFD framework in Malaysia, local firms report a level of readiness comparable to global peers (Figure A4.15). A significant majority (73%) of surveyed Malaysian firms feel prepared to report on at least one of the four main TNFD disclosure areas (see Box 1). On average, these firms indicate they can meet seven out of the 14 specific recommended disclosures. This is not far behind the global average of nine out of 14, as reported in a worldwide survey by the TNFD (TNFD, 2025c).

D. Motivations to assess and disclose nature-related DIROs

A main driver for firms to assess and disclose nature-related risks and opportunities is regulatory requirements. For over 85% of surveyed firms, the primary driver is regulation and compliance (Figure A4.16). Firms see nature-related reporting as an extension of existing environmental regulations and a response to emerging sustainability disclosure requirements. Some firms are explicitly waiting for clearer regulatory mandates ('in black and white') before taking action.

“We follow regulatory requirements. Unless they are clearly mandated ‘in black and white’ I don’t think companies will act.”

- Sustainability Manager, Property Developer

Beyond compliance, concerns around risk management and business resilience are powerful motivators for 86% of firms, particularly for those whose business models depend directly on natural resources. These firms are more acutely aware that environmental degradation can translate into tangible financial risks, affecting input costs, operational reliability, and brand reputation. Consequently, they are often more advanced in establishing governance structures to manage these issues. This commercial driver is amplified by growing pressure from investors, lenders, and international buyers, who increasingly embed nature-related criteria into financing terms and supply chain requirements, especially for export-oriented firms.

“It’s business – entirely business. Once we know what the buyer wants, we do it; now we’re asking our supplier to do it as well.”

- Head of Sustainability, Agribusiness Firm

Firm values and leadership also play a crucial role.

Proactive firms frame their engagement with nature not just as a risk management exercise but as a core component of their long-term competitiveness, corporate values, and reputation (86% of surveyed firms). For these firms, transparent disclosure is a means to demonstrate accountability and build lasting trust with stakeholders, positioning themselves as leaders in a changing market.



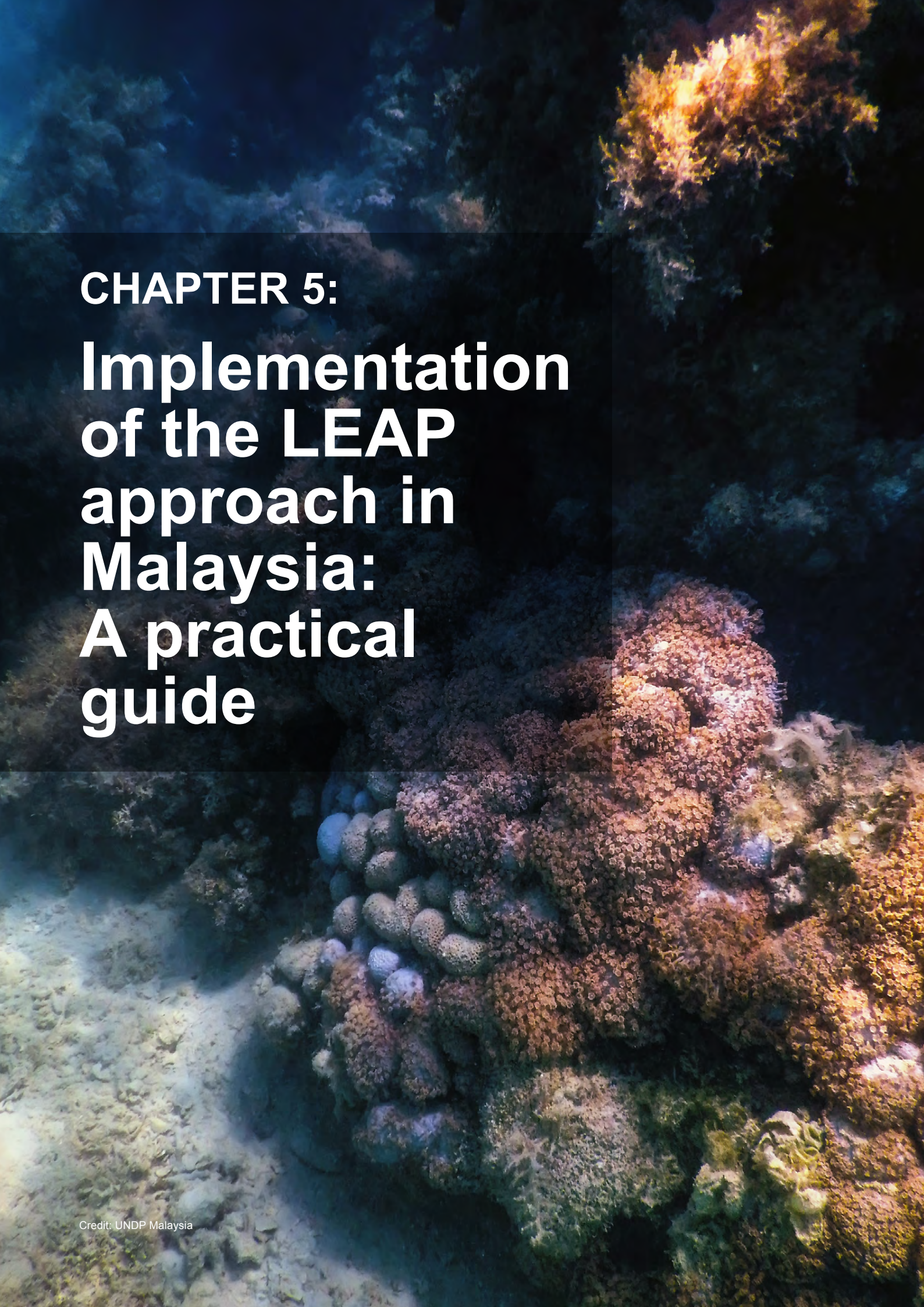
Credit: UNDP Malaysia

III. Financial institutions and firms’ approach to nature-related issues: Differences and interdependencies

The approaches of financial institutions and firms to nature-related risk assessment and disclosure differ due to several key factors:

- **Directness of exposure:** Firms – especially in resource-intensive sectors – face nature-related risks directly through their operations and supply chains, while financial institutions are exposed indirectly via their clients and portfolios. This makes financial institutions’ risk assessments heavily dependent on the quality of firm-level disclosures.
- **Integration points within the business:** Firms typically embed nature into operational risk management, compliance, and project-level assessments such as EIAs. Financial institutions, by contrast, seek to integrate nature considerations into credit, investment, underwriting, and portfolio-level risk management – differences that shape their respective data needs and methodologies.
- **Primary motivations:** Firms are primarily driven by direct regulatory compliance, corporate values, and operational necessity. Financial institutions are more prominently driven by supervisory expectations from financial regulators and portfolio-wide risk considerations. Despite these different starting points, converging reporting standards and regulatory developments are increasingly aligning both groups.

These differences mean that enabling conditions should be designed with the whole financing relationship in mind – supporting financial institutions and the firms they finance. Improving disclosure on nature-related DIROs, especially in high-dependency sectors and among larger firms, can significantly enhance financial institutions’ ability to assess and manage nature-related risks in their portfolios. In turn, financial institution expectations and engagement can incentivise firms to strengthen their own assessment and disclosure practices.

A vibrant underwater photograph of a coral reef. The scene is dominated by various types of coral, including large, rounded, brain-like corals in shades of blue and purple, and smaller, branching corals in warm orange and yellow tones. The water is clear, and the lighting creates a dramatic effect, highlighting the textures and colors of the marine life. The overall composition is rich and detailed, capturing the beauty of an underwater ecosystem.

CHAPTER 5:

Implementation of the LEAP approach in Malaysia: A practical guide

Main takeaways of this chapter:

- The LEAP approach is not a rigid, but an iterative process. Moving back and forth between steps is part of the learning process and allows financial institutions and firms to progressively deepen their understanding and management of nature-related risks and opportunities over time.
- For smaller, non-listed firms, the scoping phase may help determine how to apply the LEAP approach proportionately, calibrating the depth of analysis to available resources, data, and capacity.
- A successful implementation of the LEAP approach requires a collaborative, cross-functional effort within financial institutions and firms. It extends beyond the sustainability team, demanding diverse knowledge and data from across the organisation.
- The exercise highlighted key challenges, especially in scoping assessments across upstream and downstream value chains and securing relevant data. Even with a limited number of sites, defining value chain boundaries proved complex. Financial institutions also faced limited firm-specific nature data, underscoring the need for deeper client engagement. The exercise also shows the importance of complementing global tools with localised analysis to achieve a complete risk assessment.
- Nevertheless, financial institutions and firms were able to generate meaningful insights by starting with existing data and using qualitative approaches to identify risk and opportunities. The assessment showed that firms are not beginning from scratch. Existing requirements and standards – such as Roundtable on Sustainable Palm Oil (RSPO)/Malaysian Sustainable Palm Oil (MSPO) certifications and EIAs – provide useful information for progressing from identifying interactions with nature to assessing their materiality. In the absence of mature scenarios to quantify nature-related risks and opportunities, pilot participants used qualitative methods, which proved a practical and valuable first step.

This chapter presents insights from a pilot implementation of the LEAP approach, conducted with three financial institutions and two firms. Although the previous chapter showed that the LEAP approach is currently used only sparingly, it can be a core tool for understanding nature-related dependencies, impacts, risks and opportunities. These pilots increase awareness of its value and offer a practical guide for advancing nature-related risk assessment and disclosure in Malaysia. To provide concrete, sector-specific insights, the pilots focused on the palm oil and construction value chains, identified in Chapter 3 as among the sectors with the highest dependencies and impacts on nature, while also accounting for a large share of Malaysian banks' lending. Each firm represented one of these sectors, while the financial institutions assessed their financed activities within the same two value chains.

The findings are structured around the distinct phases of the LEAP approach (Box 3) – Locate, Evaluate, Assess, and Prepare – to guide other organisations considering a similar exercise. A scoping phase usually precedes the other phases to identify available data and the scope of assessment. It is important to note, however, that these steps were not always conducted in a strictly linear

fashion and phases can be executed in an iterative manner. The insights and practical recommendations gleaned from each phase of the pilot assessments are presented to share the hands-on experience gained.

The application of the LEAP approach is tailored to the distinct ways in which financial institutions and firms interact with nature. Financial institutions primarily apply the LEAP approach at the portfolio or client level to assess nature-related risks across different sectors, geographies, and asset classes, reflecting their indirect linkage to nature through financing activities. Since a detailed assessment relies heavily on client asset data, financial institutions play a crucial role in incentivising their clients to enhance their own nature-related risk management practices. In contrast, firms utilise the LEAP approach to evaluate their direct operational footprint and value chain, mapping both upstream and downstream activities to pinpoint the most significant nature-related dependencies and impacts, and the associated risks and opportunities. Given the complexity of global value chains, TNFD recommends a risk-based reprioritisation to focus on the most material segments and geographies of the portfolio or the business operations.

BOX
3

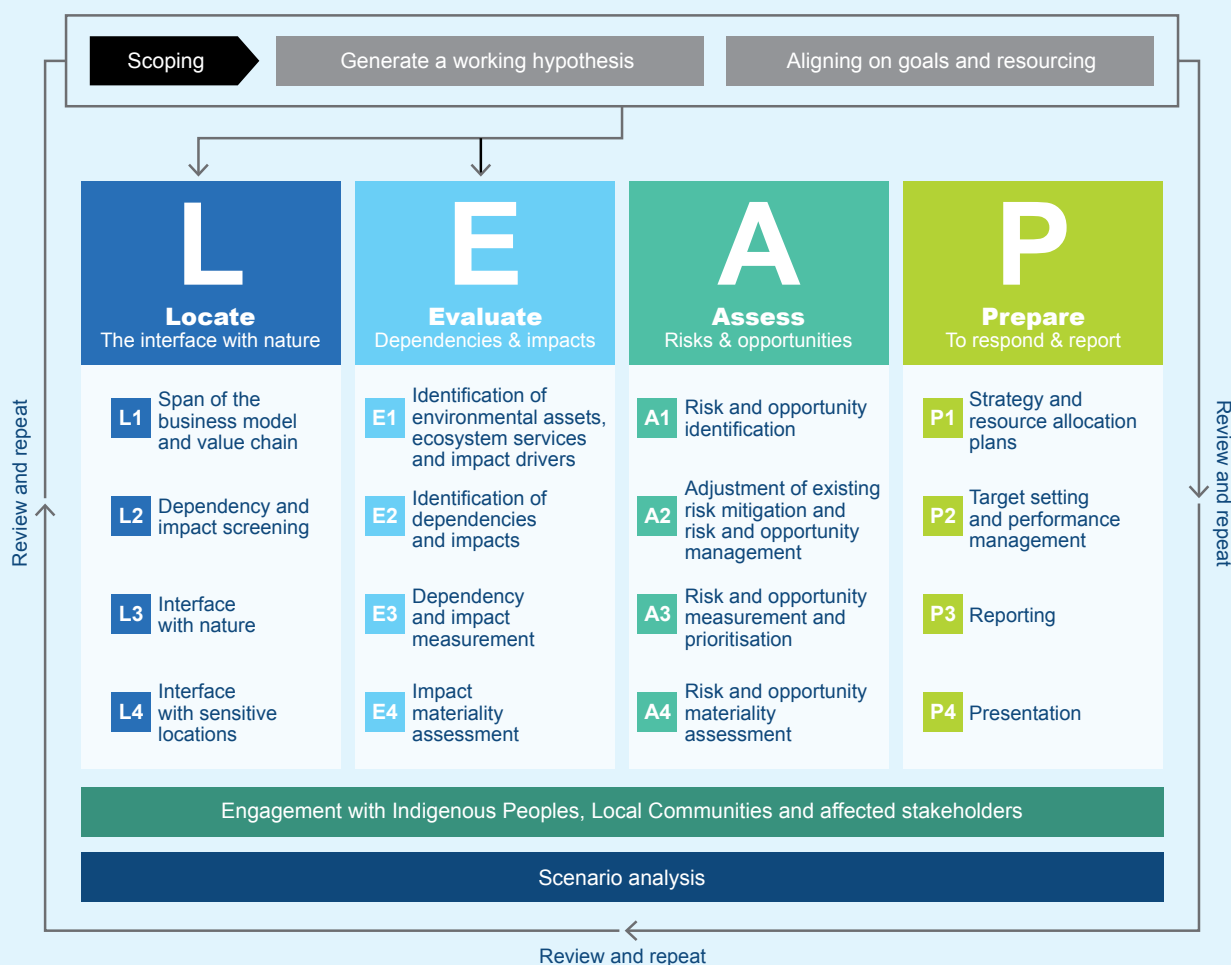
The TNFD LEAP approach – An integrated approach for the assessment of nature-related issues

The LEAP (*Locate, Evaluate, Assess, and Prepare*) approach is a practical, four-phase methodology to help organisations identify, assess, manage and disclose nature-related dependencies, impacts, risks and opportunities, referred to as DIROs in this report. The TNFD developed this methodology incorporating consistent feedback from market participants and with input from 240 pilots (TNFD, 2023a). While the TNFD pillars and recommendations (Box 1) define what should ultimately be disclosed to markets, LEAP is the detailed assessment process organisations use to identify and assess nature-related issues.

The LEAP approach guides users in *Locating* their interfaces with nature across value chains and portfolios, *Evaluating* dependencies and impacts on ecosystems and ecosystem services, *Assessing* nature-related risks and opportunities to business performance or financial assets, and *Preparing* responses and disclosures aligned with TNFD recommendations. A *Scoping* phase is also recommended at the outset to understand available internal and external data, reference sources, and outline the areas to conduct further deep dives across the four phases. An illustrative figure of the LEAP approach, composed of 16 components from 'L1' to 'P4', is provided in the diagram below (Figure B3.1).

Figure B3.1

Illustrative diagram of the TNFD LEAP approach



Source: TNFD (2023a).

I. LEAP for financial institutions

This section presents the main insights drawn from the pilot LEAP assessment conducted by three Malaysian financial institutions: CIMB, United Overseas Bank (UOB) and FI A²⁸. The assessment focused on their assets in the palm oil and construction value chains. The section provides learnings from those assessments as well as practical tips for financial institutions looking to begin or improve their assessment.

A. Scope the assessment

The Scoping phase is a critical first step for financial institutions, establishing the boundaries of the LEAP assessment to effectively navigate the diverse nature-related risks within their portfolios. In this phase, financial institutions use their professional judgment to determine the assessment's breadth, depth and resources needed. For instance, they may define timeline and milestones for the assessment, identify internal staff and external human resources needed, and perform a high-level scan across sectors and value chains that are more likely to have medium to high levels of nature-related dependency and impact. A key decision during this Scoping phase is also to define the materiality approach – such as single or double materiality – that will guide the entire assessment.

Even with a pre-determined focus on the palm oil and construction sectors (see Chapter 3), pilot financial institutions found it essential to further refine the assessment boundaries. This additional scoping was necessary to create a more targeted and manageable analysis within the broader sector categories.

Example: FI A focused its assessment on the top three clients, determined by potential exposure in both the palm oil and construction portfolios.

Example: Prior to the pilot, CIMB had already independently identified key sectors with potentially material intersections with nature, using four criteria: 1) Criticality for Net Zero and Nature Risks; 2) Relevance to CIMB's portfolio and the ASEAN economy; 3) Alignment with TNFD and Principles for Responsible Banking (Principles for Responsible Banking (PRB)) focus sectors; and 4) Potential for nature positive impact (CIMB, 2026). CIMB had also pre-defined its materiality approach, adopting a double materiality lens, reflecting both financial materiality (outside-in) and environmental and social materiality (inside-out), in view of rising regulatory expectations and evolving stakeholder demand.

B. LOCATE interface with nature

In the Locate phase, financial institutions identify which of their financed assets have significant interactions with nature. This involves mapping of physical locations against nature data (e.g. maps of ecosystems or ecosystem services). This process reveals, for instance, whether assets are situated in sensitive locations like Environmentally Sensitive Areas (ESAs), allowing financial institutions to screen for potential physical risks from ecosystem degradation and transition risks from future environmental regulations. This assessment requires both granular asset location data and nature data.

1. Asset location data

While pilot financial institutions had collected location data for their financed assets during initial client assessments, the information was often incomplete and insufficiently granular for a detailed analysis. For example, some data was limited to a point location rather than coordinates of the asset's boundary or the asset's specific characteristics, allowing for only a high-level overview of potential intersections with sensitive ecosystems. Other pilot financial institutions conducted geographic assessments at the country level. Ideally, these assessments should be conducted with more comprehensive and precise location data for each of the financial institution's assets to be truly effective. In addition to the Malaysia-focused assessment, financial institutions are also advised to assess nature-related risk exposures within their global portfolios.

Example: Adopting a pragmatic approach, FI A focused its assessment by selecting three key firms from its palm oil and construction portfolios to progress its location assessment. The specific data gathered was tailored to the financing type: for project financing, the project's location was required, while for corporate financing, the coordinates of the firm's three largest assets were gathered. This location data was then used to conduct an in-depth assessment of the assets' proximity to sensitive locations such as ESAs.

Example: To analyse its palm oil portfolio, CIMB used the location data of its top 10 clients as a representative proxy for the broader sector portfolio.

To enhance future Locate assessments, financial institutions would need to engage clients to obtain more complete asset location data. Recognising the time and capacity constraints involved, a pragmatic and proportionality aligned starting point would be to focus on the largest clients, highest-value exposures, or most risk-sensitive sectors.

²⁸ The third participating financial institution has opted to remain anonymous and is referred to throughout as FI A.

2. Nature data

To identify the interface between financed activities and nature, financial institutions utilised asset location data in conjunction with global mapping tools like the Integrated Biodiversity Assessment Tool (IBAT), World Resources Institute (WRI) Aqueduct, and Global Forest Watch. By overlaying client asset coordinates onto these maps, financial institutions could determine if assets are situated within or near ESAs, such as regions experiencing water stress, key biodiversity areas, or legally protected zones. This geographical context, particularly regarding the availability of water and other natural resources, enabled a more granular and accurate analysis in the subsequent Evaluate, Assess, and Prepare phases of their risk management and disclosure process.

Example: FIA used WRI Aqueduct²⁹ to assess whether the coordinates of the selected firms were located in water-stressed areas.

Example: CIMB used Global Forest Watch³⁰ and the WWF Biodiversity Risk Filter³¹ to screen whether financed activities were located in or near areas that are at risk of deforestation and to assess the level of biodiversity intactness of the locations.

Tip 1: The LEAP approach may not need to be applied by financial institutions strictly in sequence; the assessment can involve moving back and forth between steps. For example, financial institutions may start with the Evaluate phase to identify priority portfolios, sectors, or value chains – such as those with the highest dependencies and impacts on nature – before returning to the Locate phase. At that phase, they can focus on the prioritised scope and identify assets that interact most with nature.

C. EVALUATE dependencies and impacts

The Evaluate phase builds on the previous phase by assessing the specific dependencies and impacts of the located assets. Financial institutions utilised the materiality ratings in ENCORE, focusing on 'High' and 'Very High' ratings to determine which sectoral dependencies and impacts along the value chain of construction and palm oil sectors were most significant. To further refine this analysis, financial institutions employed global tools like the WWF Biodiversity Risk Filter to adjust risk scores based on an

asset's geographic location. This comprehensive evaluation of nature-related interfaces within their financed portfolios lays the groundwork for identifying risks and opportunities in the subsequent Assess phase.

Example: Using the ENCORE tool to pinpoint the most significant nature-related dependencies and impacts, FI A focused its analysis on key segments of its portfolio. For the construction sector, it prioritised the mid-stream value chain, specifically direct construction activities, which were identified as having a high impact on land use change. In the palm oil value chain, FI A concentrated on upstream activities, particularly oil palm planting, which ENCORE highlighted as exerting the greatest pressure on nature and having the highest dependencies.

To gain a more comprehensive understanding of nature-related risks, financial institutions could complement high-level global tools with more detailed, localised analysis. While global tools like ENCORE offer a valuable starting point, their reliance on global data necessitates more detailed, localised analysis to capture the nuances of nature-related dependencies and impacts.³² This additional layer of analysis is also critical to determine the magnitude and materiality of specific nature-related impacts to individual institutions, leading to a more accurate risk and opportunity assessment. To achieve the required granularity, financial institutions would need to supplement initial ENCORE findings with context-specific data from academic studies, grey literature, and local data sources. For instance, databases like Sustainability Policy Transparency Toolkit (SPOTT) (Box 4) or the Nusantara Atlas (TheTreeMap) can provide detailed insights needed for key commodity sectors, such as palm oil.

Example: CIMB (2026) complemented ENCORE findings with sector-specific research, scientific literature, and assessments of clients' alignment with international and national standards (e.g. RSPO/ MSPO for palm oil). In engagements with prospective palm oil clients, CIMB also used tools such as the WWF Biodiversity Risk Filter and Global Forest Watch to identify high-risk geographies and assess whether proposed project sites overlapped with or encroached upon Key Biodiversity Areas (KBAs), including protected areas, or globally mapped peatlands (Figure 5.1). This enabled CIMB to identify potential ecosystem degradation and biodiversity impacts, allowing for a more nuanced, contextualised portfolio analysis tailored to the palm oil sector.

²⁹ <https://www.wri.org/data/aqueduct-water-risk-atlas>

³⁰ <https://www.globalforestwatch.org/>

³¹ <https://riskfilter.org/biodiversity/home>

³² See Chapter 6 for elaboration on ENCORE and its limitations.

Figure 5.1

Illustrative example of CIMB spatial risk analysis of high-risk geographies for agricultural clients



Source: CIMB (2026).

Note: CIMB overlaid the asset locations of prospective palm oil clients with tools such as Global Forest Watch to assess whether proposed sites were located in geographies associated with high physical or reputational risk.



Credit: UNDP Malaysia

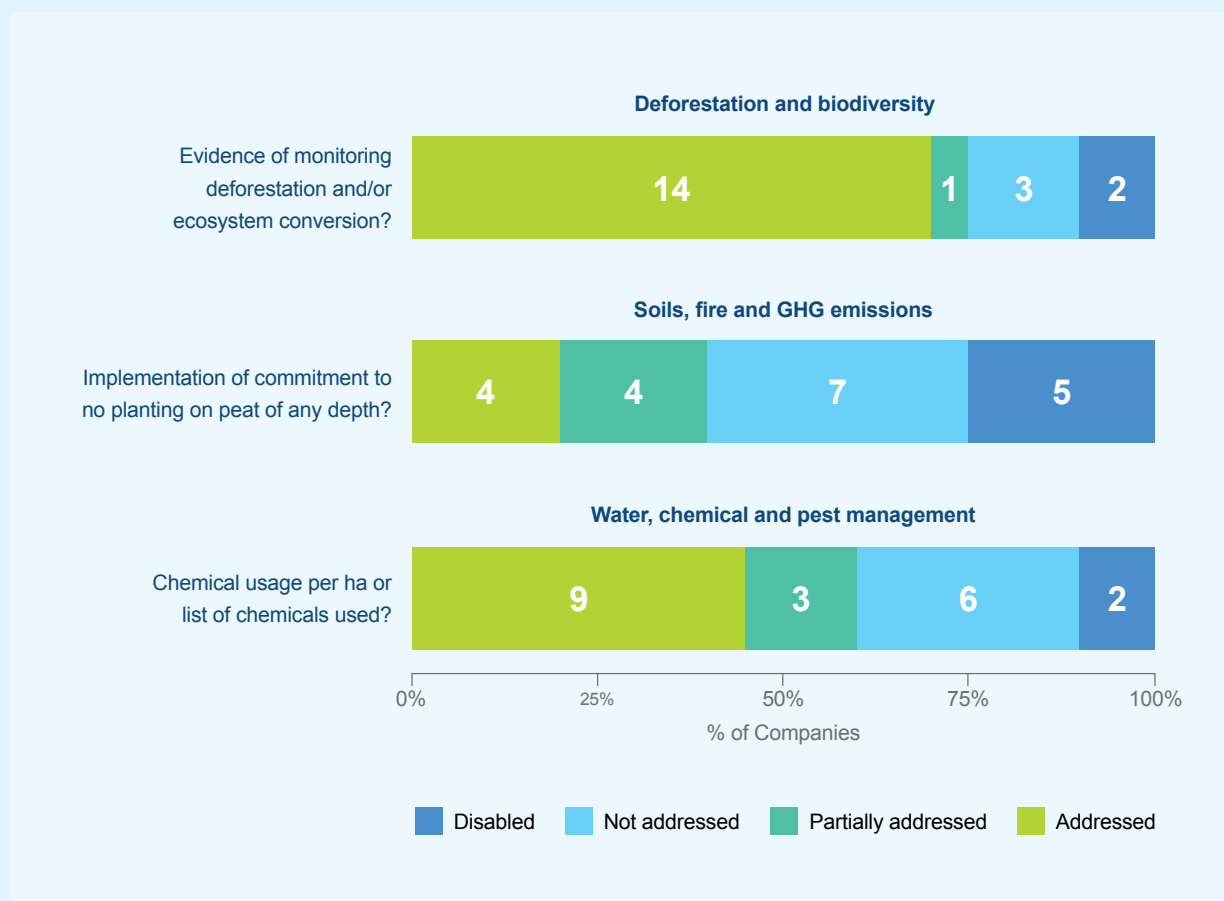
**BOX
4****The SPOTT Database (ZSL) applied to the palm oil sector**

SPOTT is a free, online platform developed by the Zoological Society of London (ZSL) to assess the transparency of companies in high-impact commodity sectors. It scores companies involved in palm oil, timber and pulp, and natural rubber – including producers, processors, and traders – based on their public disclosures on an annual basis. The assessment covers 100 ESG indicators, organised into 10 categories.³³ These categories are further broken down into 186 specific questions, providing a detailed and structured evaluation of corporate sustainability practices.

The SPOTT database is a useful tool for financial institutions to zoom into the sustainability practices of palm oil companies in their portfolios. It enables benchmarking large producers against various nature-related impact indicators, as illustrated in Figure B4.1, which highlights the performance of 20 MSPO-certified companies. Individual company performance can also be evaluated using this tool.

Figure B4.1

Distribution of answers to a set of selected questions on sustainability practices among 20 MSPO-certified firms



Source: Authors, based on SPOTT (ZSL).

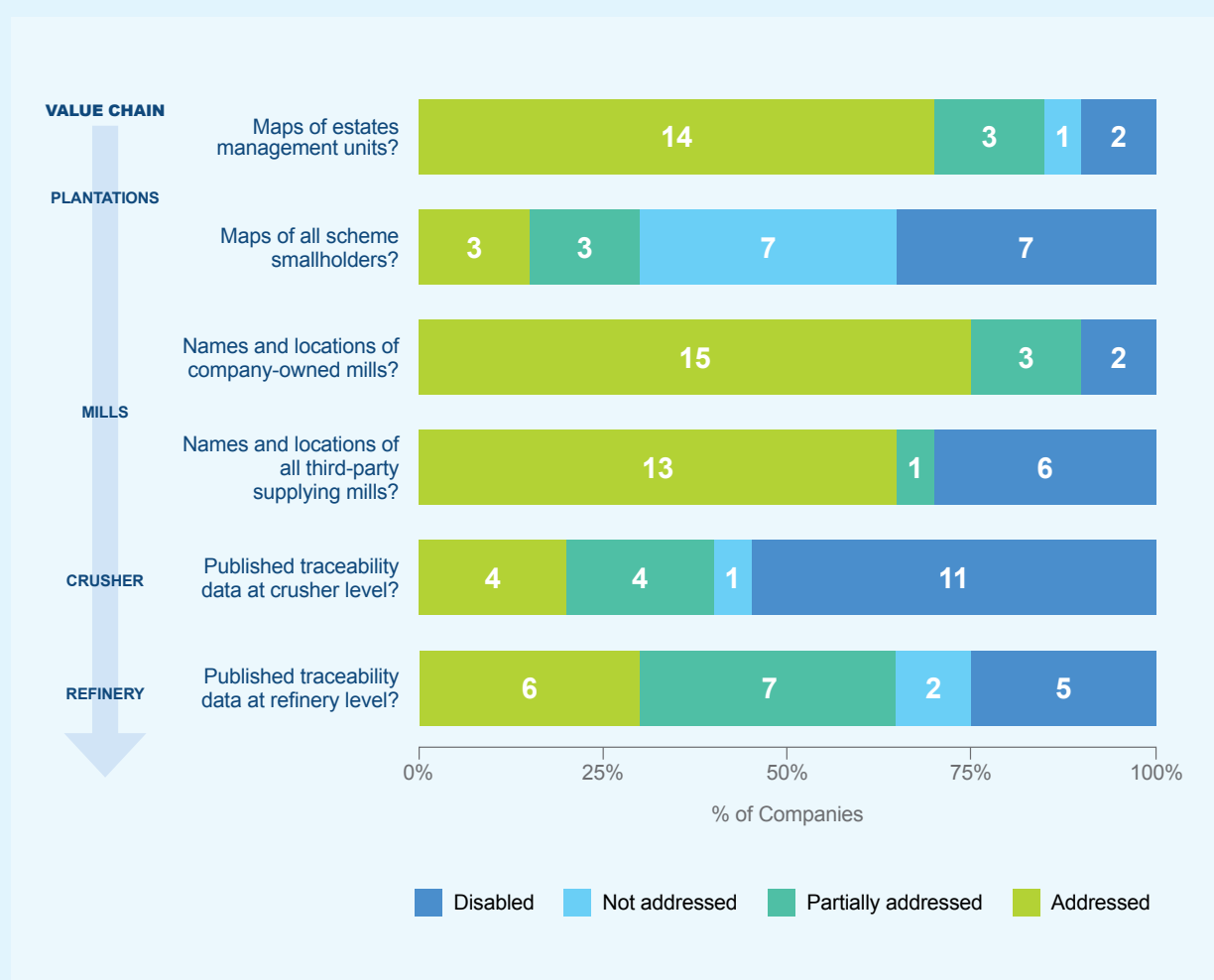
Note: 'Disabled' means the field was not applicable to the assessed company.

33 1. Sustainability policy and leadership; 2. Landbank, maps and traceability; 3. Certification standards; 4. Deforestation and biodiversity; 5. HCV, HCS and impact assessments; 6. Peat, fire and GHG emissions; 7. Water, chemical and pest management; 8. Community, land and labour rights; 9. Smallholders and suppliers; 10. Governance and grievances.

The SPOTT database also shows that many companies in the palm oil sector have data available on the location of their assets (Figure B4.2). Most MSPO certified companies in the sample map their estate units and list the names and locations of their company owned mills. However, they often lack comprehensive data on the location of their small-holder suppliers.

Figure B4.2

Traceability and availability of asset maps across the 20 MSPO-certified oil palm companies covered by SPOTT – Per type of value chain player



Source: Authors, based on SPOTT (ZSL).

Note: 'Disabled' means the field was not applicable to the assessed company.

The analysis of corporate sustainability disclosure reports can also help financial institutions move beyond the generic, sector-level ratings of global models and refine insights on dependency and impacts at the client level. Financial institutions can achieve a more firm-specific assessment by directly analysing corporate sustainability disclosures to evaluate factors like actual land use change,

water consumption, and emissions. This process can be streamlined by using specialised tools like the AskNature AI model (Box 5) or databases such as SPOTT (Box 4). These tools enable the benchmarking of firms based on their publicly disclosed information, though the results still require careful evaluation.

BOX
5

The AskNature AI model

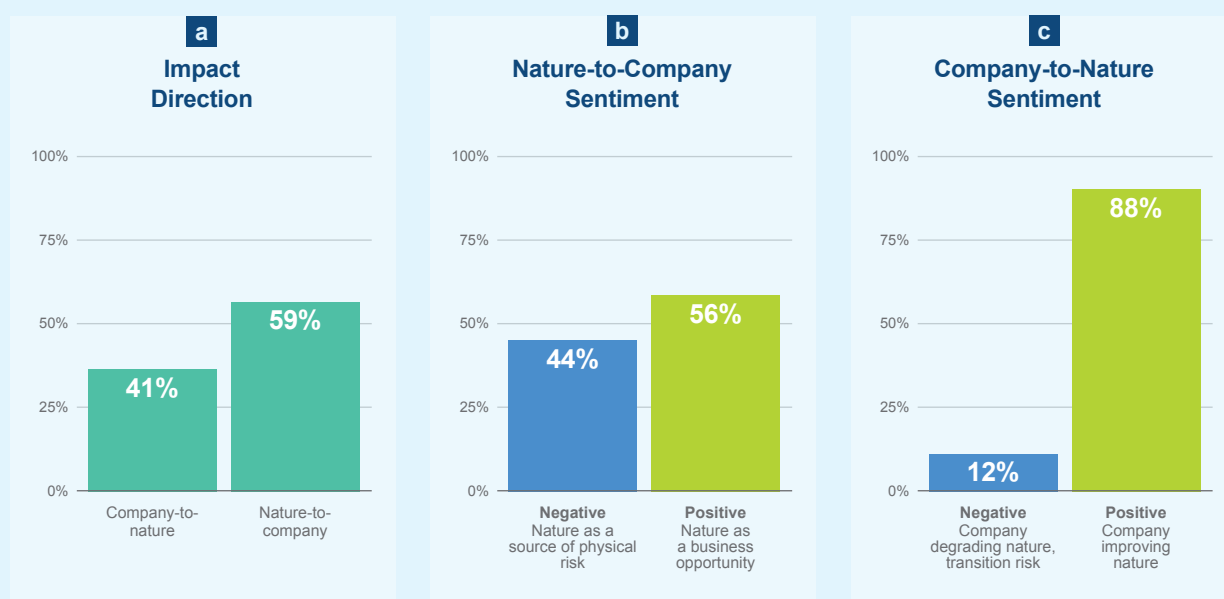
For financial institutions, the AskNature model can be a valuable tool to support large-scale analysis of company disclosure on nature-related issues, in line with TNFD recommendations. The AskNature model is an AI-powered tool developed by researchers from the University of Zürich and the Swiss Finance Institute (Colesanti Senni et al. 2025).³⁴ It uses Retrieval-Augmented Generation on corporate sustainability reports to (i) assess how they deal with nature, using sentiment analysis,³⁵ and (ii) evaluate whether they are aligned with TNFD recommendations. Here, the model is applied on the 2024 corporate sustainability reports of the 30 Malaysian companies listed in the Financial Times Stock Exchange (FTSE) Bursa Malaysia Kuala Lumpur Composite Index (KLCI).

Sentiment analysis of the analysed corporate sustainability reports shows that firms focus more on nature's impact on their business than their business's impact on nature (Figure B5.1.a). Corporate sustainability reports tend to highlight the positive opportunities from nature while downplaying the negative physical risks (Figure B5.1.b).³⁶ Conversely, when discussing their own impact, firms emphasise their positive contributions (like conservation) and give less attention to their negative impacts, which could represent transition or liability risks (Figure B5.1.c).

Figure B5.1

The biggest Malaysian companies tend to report more on how nature affects them (through risks and opportunities) than on their own impact on nature.

Sentiment scores across the corporate sustainability reports of the top 30 Malaysian companies.



Source: Authors, based on AskNature results.

Note: Sentiment analysis reviews corporate sustainability reports to assess whether disclosures focus more on the company's impacts on nature or nature's impacts on the company (Figure (a)). Within each category, it then evaluates the predominant sentiment – whether the discussion is predominantly framed in terms of positive or negative impact (Figures (b) and (c)). The x-axis describes the sentiments, while the y-axis shows the percentage of the 30 companies for which the sentiment is dominant in their corporate sustainability reports.

³⁴ <https://chattnfd.app/>

³⁵ Sentiment analysis, performed by an AI model (such as a Large Language Model, LLM), assesses whether a piece of text expresses positive, negative, or neutral sentiment toward a given topic, based on context rather than keywords alone.

³⁶ This result differs from the LEAP pilot assessment of the two companies (Chapter 5, Section II), which indicates that firms focused more on the companies' impacts on nature than on how nature could affect their businesses. This discrepancy may be due to several factors. First, there may be a selection bias. The two companies in the LEAP pilot may be more advanced in their environmental practices or more conscious of their impacts on nature than the 30 companies included in the AskNature analysis. Second, the LEAP pilot firms might have been more motivated to emphasize their positive contributions to nature and their efforts to mitigate negative impacts. In contrast, the corporate sustainability reports used for the AskNature analysis, which are primarily intended for investors, may have focused more on how nature-related risks affect profitability and resilience. Because CSRs are publicly available, companies may be less willing to disclose the full extent of their impacts on nature in these reports.

Based on firms' corporate sustainability reports, AskNature can also help financial institutions analyse how firms in a portfolio perform against the 14 TNFD recommendations and assess firms' nature-related commitments. The corporate sustainability report analysis shows that the 30 listed firms score well on governance but less well on risk management, metrics, and targets, especially concerning their specific impacts and dependencies on nature – these findings are consistent with those from the corporate survey in Chapter 4. While these companies have made nature-related commitments, the AskNature analysis also shows that these pledges often lack specificity and binding frameworks are needed to ensure meaningful action.

D. ASSESS risks and opportunities

In the Assess phase, financial institutions are required to translate their analyses of nature-related dependencies and impacts into a clear view of material risks and opportunities. This involves evaluating how identified nature interactions could manifest as specific financial risks – such as credit, market, or operational risks – and potential business opportunities. A critical step in this phase is for financial institutions to determine which of these risks and opportunities are most material to their portfolios and the institution as a whole.

1. Risk identification

Lacking usable quantitative scenarios, the pilot financial institutions focused on a qualitative assessment to inform their risk management strategies, a practical and valuable first step. While quantitative risk quantification and measurement is the ultimate goal, qualitative identification and initial prioritization serves as a valuable and practical starting point. Pilot financial institutions determined that nature risks primarily manifest as traditional credit and reputational risks for their portfolios. For instance, all participating financial institutions recognised evolving policies, such as the European Union Deforestation Regulation (EUDR) and Malaysia's Sustainable Palm Oil (MSPO) certification, as a key transition risk for their palm oil portfolios, flagging the potential for both credit and reputational damage.

Example: During the risk identification and prioritisation stage, CIMB identified the palm oil sector as high priority given its strong dependency on ecosystem services, significant environmental footprint, and material relevance to the portfolio – while the construction sector was less prioritised due to its more localised risks, typically managed through project-level compliance. CIMB therefore focused its value chain analysis on palm oil, evaluating upstream and downstream interactions with nature and aggregating risk scores based on expert judgment.

This process highlighted that shifts in rainfall timing and intensity threaten yields and heighten flood and drought exposure, while the loss of pollinators and natural pest predators due to ecosystem degradation can reduce crop productivity and increase reliance on agrochemicals – feedback loops that may ultimately translate into elevated credit risk.

Example: For the construction sector, FI A identified several key risks driven by stricter biodiversity regulations and evolving client expectations. These include: credit risk, arising from increased operational costs or project delays that could impact a borrower's ability to repay debt; reputational and liability risks, stemming from non-compliance with nature-related regulations; market risk, as demand increasingly shifts toward nature-positive construction projects, potentially devaluing assets that do not meet these new standards.

2. Opportunities identification

Pilot financial institutions identified tangible financing opportunities in nature-related initiatives³⁷, particularly in sectors with established sustainability frameworks like palm oil. By capitalising on these opportunities, financial institutions can enhance business value through increased operational efficiency, greater resilience, and innovations in business models and financial products. For example, in the well-regulated palm oil sector, profitable ventures include financing the production of biomass energy and biofuels from agricultural waste, as well as supporting operations certified by the RSPO and MSPO, which often command premium market access. Similarly, in the construction sector, financial institutions identified opportunities in financing green buildings and the use of sustainable materials, projects that benefit from growing market demand and potential regulatory advantages. Exploring innovative financial products that generate positive nature outcomes represents another promising avenue for financial institutions to drive both environmental benefits and financial profits.

³⁷ This contrasts with the survey results presented in Chapter 4, which indicate that financial institutions generally have a limited understanding of nature-related opportunities. This difference likely reflects the broader survey coverage, which includes many institutions that may be less advanced on nature-related topics than the three pilot financial institutions.

Tip 2: Sector-specific sustainability standards and certifications can prove valuable for assessing portfolio risks and opportunities and for guiding risk management strategies.

For example, the pilot financial institutions utilised MSPO and RSPO standards as essential guidance to inform their assessment of risks and best practices within the palm oil value chain.

Following risk and opportunity identification, the next step involves assessing and measuring their severity through methods such as asset tagging and scenario-based risk assessment. Severity is typically determined by the intersection of magnitude, likelihood, and additional criteria, helping financial institutions identify which nature-related risks and opportunities are material given their current and anticipated financial position. For instance, the CISL (2025) study assessed the impact of a severe El Niño event on Malaysia's and Indonesia's palm oil sector, projecting production declines of 20% under a mild scenario and 40% under a severe scenario, driven by disruptions to soil quality regulation and pollination services. In this pilot here, participating financial institutions did not advance to this measurement stage, largely due to the absence of available tools and scenarios (see Chapter 6). Where possible, a qualitative assessment drawing on the latest available tools and guidance – such as the TNFD Scenario Analysis Guidance³⁸ and the NGFS Nature Package³⁹ – can provide a useful starting point.

E. PREPARE to respond and report

In the Prepare phase, financial institutions should build on their previous assessment steps for developing risk management strategies and disclosing nature-related risks and opportunities. While the pilot exercise did not require a full implementation of the Prepare phase due to the selective deep dive on the palm oil and construction value chains, the three participating financial institutions have begun integrating key learnings into their risk management processes and aligning their disclosures with the TNFD framework.

Example: CIMB has already published a Nature and Biodiversity Report (CIMB, 2026) in efforts to align with TNFD and the Kunming-Montreal Global Biodiversity Framework (GBF). The report is structured around the pillars of the TNFD with three main sections covering the topics of 'Governance', 'Strategy', 'Risk and Impact Management' and 'Metrics and Targets', with a cross-reference table to show alignment with

TNFD recommended disclosures and GBF Targets. Furthermore, the report has dedicated chapters for a double materiality assessment of the entire portfolio, and separate sectoral assessments for the identified focus sectors of palm oil, forestry, power, and oil and gas. A 2025-2030 'Nature and Biodiversity Roadmap' is provided at the end to outline strategic phased actions moving forward to ensure alignment with international standards and frameworks and the GBF.

Example: UOB has implemented a Group-wide Responsible Financing Policy that includes sector-specific guidance for higher-risk value chains, such as palm oil. In addition, through LEAP process, the identification and assessment of qualitative risks associated with the palm oil value chain was used to assess the adequacy of existing policy requirements. This was complemented by follow-up discussions with business units to surface potential nature-related dependencies and impacts in the context of selected client engagements.

While existing standards like GRI provide a foundation for sustainability reporting, the TNFD LEAP approach offers the specific guidance needed to achieve standardised and detailed nature-related assessments and disclosure (Box 3). Although standards such as GRI have introduced reporting on nature-related impacts and are widely applied (see Chapter 4), the level of detail and specificity they require on non-climate nature dimensions can vary. The TNFD LEAP approach is therefore particularly useful as it provides financial institutions with a clear, structured process, which allows nature-related DIRO assessments and promotes more exhaustive assessment, including supporting the preparatory stages for reporting in line with TNFD recommended disclosures.

Tip 3: Leveraging peer-learning and case studies through collaborative platforms is an effective way for financial institutions to build their capacity in managing nature-related issues. Resources and working groups such as the TNFD ASEAN consultation group, the TNFD Knowledge Hub, and other public materials offer practical examples and guidance on how to assess, manage, and report on nature-related issues.

³⁸ <https://tnfd.global/publication/guidance-on-scenario-analysis/>

³⁹ <https://www.ngfs.net/en/publications-and-statistics/publications/ngfs-2026-nature-package>



The LEAP approach's iterative design allows financial institutions to continuously strengthen their understanding and management of nature-related issues. Pilot financial institutions used the exercise to build internal capacity, with the expectation of progressively deepening assessments over time. This foundational work is key to embedding nature considerations into core functions – including underwriting, risk appetite, and governance – in support of a broader transition to a nature-positive economy.

A recurring challenge for financial institutions throughout the LEAP assessment was the limited availability of firm-specific data, emphasising the need

for deeper engagement with clients. This collaboration is essential for improving the quality of both the financial institutions' LEAP assessments and their subsequent disclosures. Although Malaysian firms often have a high awareness of nature-related risks, their capacity to identify, assess, manage and disclose them is still developing (see Chapters 4 and 6 for details). Therefore, applying the TNFD LEAP approach directly with clients is a crucial step; it not only builds their internal capabilities but also generates the vital data that financial institutions require for their own analysis. The following section details the key insights gained from conducting these LEAP pilots with clients.

II. LEAP for firms

This section details key insights from the pilot LEAP assessments with two Malaysian firms: Company A⁴⁰ from the palm oil value chain and Gamuda from the construction and property industry. By examining their experiences, this section extracts broader lessons on applying the LEAP approach across different value chains and provides practical, actionable tips and insights for other firms beginning their own nature-related assessments and disclosures.

A. Scope the assessment

The Scoping phase for firms follows a similar logic to that of financial institutions, but with important distinctions. Both begin with a high-level filtering process – screening across sectors, activities, value chains, and geographies – to identify where material nature-related dependencies, impacts, risks, and opportunities are most likely to arise. For firms, however, value chain scoping tends to be more complex, reflecting the intricacies of the specific value chains in which they operate. At this stage, filtering tools and available national guidance serve as inputs to inform initial hypotheses rather than to conduct deeper analysis.

The Scoping phase also involves taking stock of available internal resources to identify knowledge gaps, capacity constraints, data limitations, and costs. For firms, this means compiling existing knowledge and data from across the organisation and engaging teams that may have limited familiarity with nature-related concepts. The depth of the assessment that follows should be calibrated to these realities – with firms applying the LEAP approach proportionately, scaling the scope and level of analysis to

what is feasible given their size, capacity, and available data, provided that any such boundaries are clearly articulated and agreed with senior management.

1. Scoping covered business activities and operations

A thorough understanding of a firm's nature-related issues necessitates an assessment of all its business activities and value chains, though at varying degrees of granularity. Much like financial institutions, firms can conduct a preliminary high-level screening, of high-risk sectors or value chains with significant nature-related relevance. Furthermore, they can also leverage existing EIAs or indicators of hazardous materials to pinpoint the most critical sectors for evaluation. Ideally, this assessment should extend across all global regions where the firm operates or has supplier and client networks.

In practice, the pilot firms adopted a narrow site-specific approach, acknowledging it as a limitation but a necessary starting point due to the intricate nature of the construction and palm oil value chains. A small number of pilot sites were chosen based on practical considerations, including data availability and their potential interaction with nature, such as proximity to sensitive locations. This Scoping phase also required firms to map their activities to standard industry classifications (e.g. International Standard Industrial Classification (ISIC), Malaysia Standard Industrial Classification (MSIC)) (Figures 5.2 and 5.3). This created a common reference point that facilitates the use of tools like ENCORE to identify dependencies and impacts in the subsequent Evaluate phase.

⁴⁰ This company has opted to remain anonymous and is referred to throughout as Company A.

Example: Gamuda, the pilot firm in the construction and property value chain, chose a housing area called Site A and a building of Site B within a township. Gamuda has direct operations within several MSIC sectors, particularly within the midstream and downstream value chain. Some examples include construction of buildings (MSIC code 410), demolition and site preparation (MSIC code 431), landscape care and maintenance service activities (MSIC code 81300), and real estate activities (MSIC code 681).

Example: Company A, the pilot firm in the palm oil value chain, selected one palm oil plantation on which to conduct its LEAP assessment. Company A identified that it was operating within various MSIC sectors, including the growing of perennial crops (MSIC sector 012), but also for instance the sector plant propagation (MSIC sector 013), as part of its activity of oil palm nurseries.

Tip 4: A pragmatic first step can be to scope the analysis to specific activities or locations to build capacity and learn from such a pilot exercise. It can also be helpful as a starting point for smaller firms with limited resources. Eventually, and especially for listed firms, the analysis should be expanded to all firm's operations for a comprehensive assessment of nature-related issues.

2. Scoping the value chain

Even when focusing on just a few sites, determining the scope of upstream and downstream activities for a LEAP assessment can be challenging. The pilot firms developed a set of criteria to guide this selection process, focusing on three key factors: 1) Materiality: Prioritising business activities with the most significant nature-related dependencies and impacts. 2) Influence: Selecting activities where the firm has a tangible ability to influence its clients or suppliers. 3) Representation: Ensuring the chosen activities accurately reflect a typical value chain for their sector (e.g. palm oil or construction).

Example: Gamuda decided to focus its LEAP assessment on its entire construction and property value chain, including upstream and downstream activities, recognising the significant impact of suppliers (Figure 5.2). However, defining these boundaries is challenging. The construction value chain is complex and project-specific, intersecting with industries like mining and manufacturing, which makes it difficult to prioritise key areas. Additionally, in Malaysia, compared to long-standing environmentally regulated sectors like palm oil that have structured sustainability certification and traceability systems (such as MSPO), the construction industry generally lacks standardised and comprehensive environmental data – especially relating to biodiversity and nature impacts – which complicates reliable assessment of nature-related risks and opportunities.⁴¹

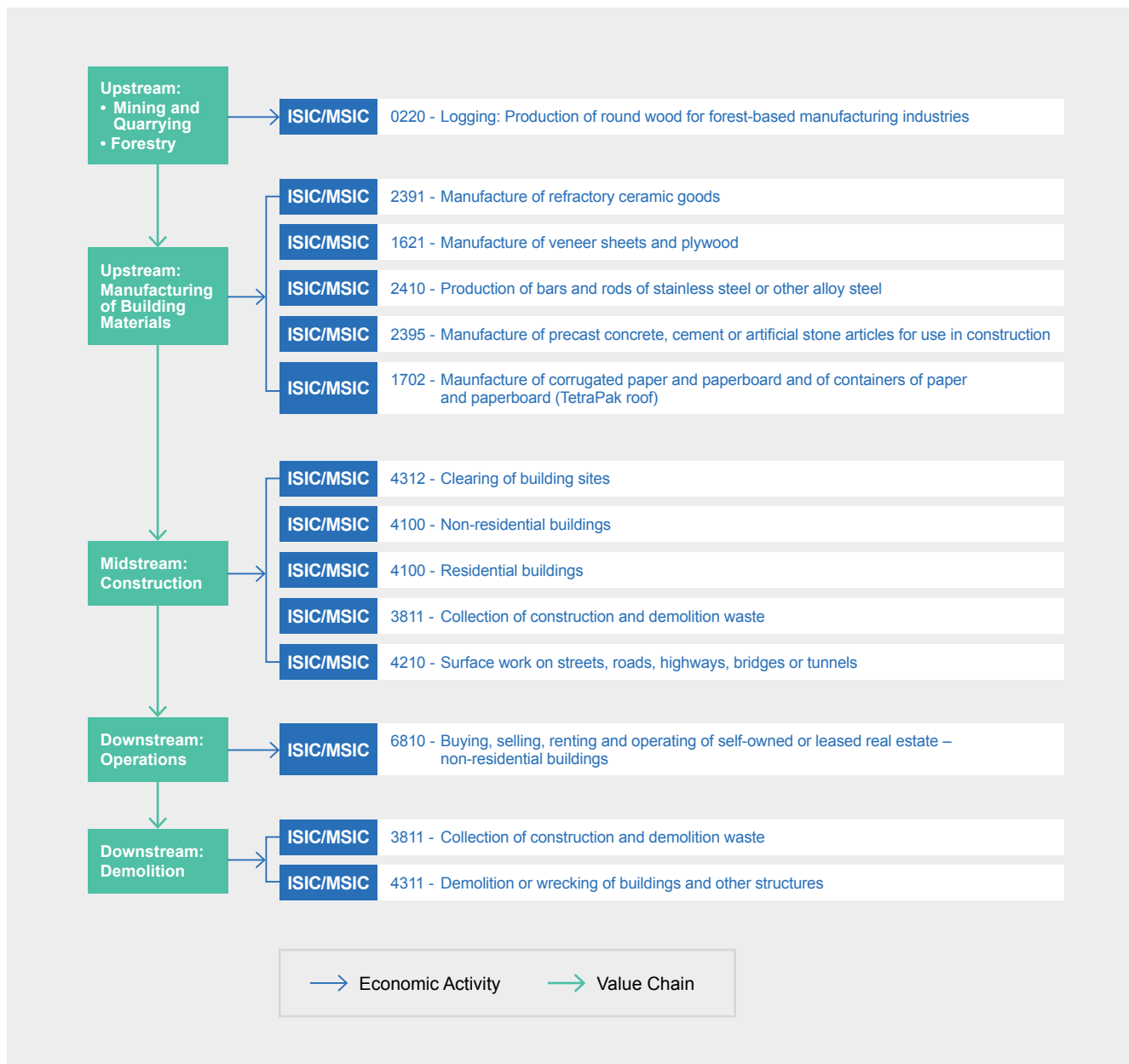


⁴¹ The environmental impact comparisons presented in this report reflect differing value chain structures and assessment boundaries. The palm oil sector is evaluated across a continuous agricultural and processing lifecycle, while the construction sector reflects project-based, site-specific impacts. As such, direct comparisons should be interpreted with consideration of these structural differences.

Figure 5.2

The scope of the construction and property value chain can be complex, involving a large set of both upstream and downstream sectors

Scope of value chain for the construction pilot firm



Source: Authors, based on pilot LEAP assessment by Gamuda.

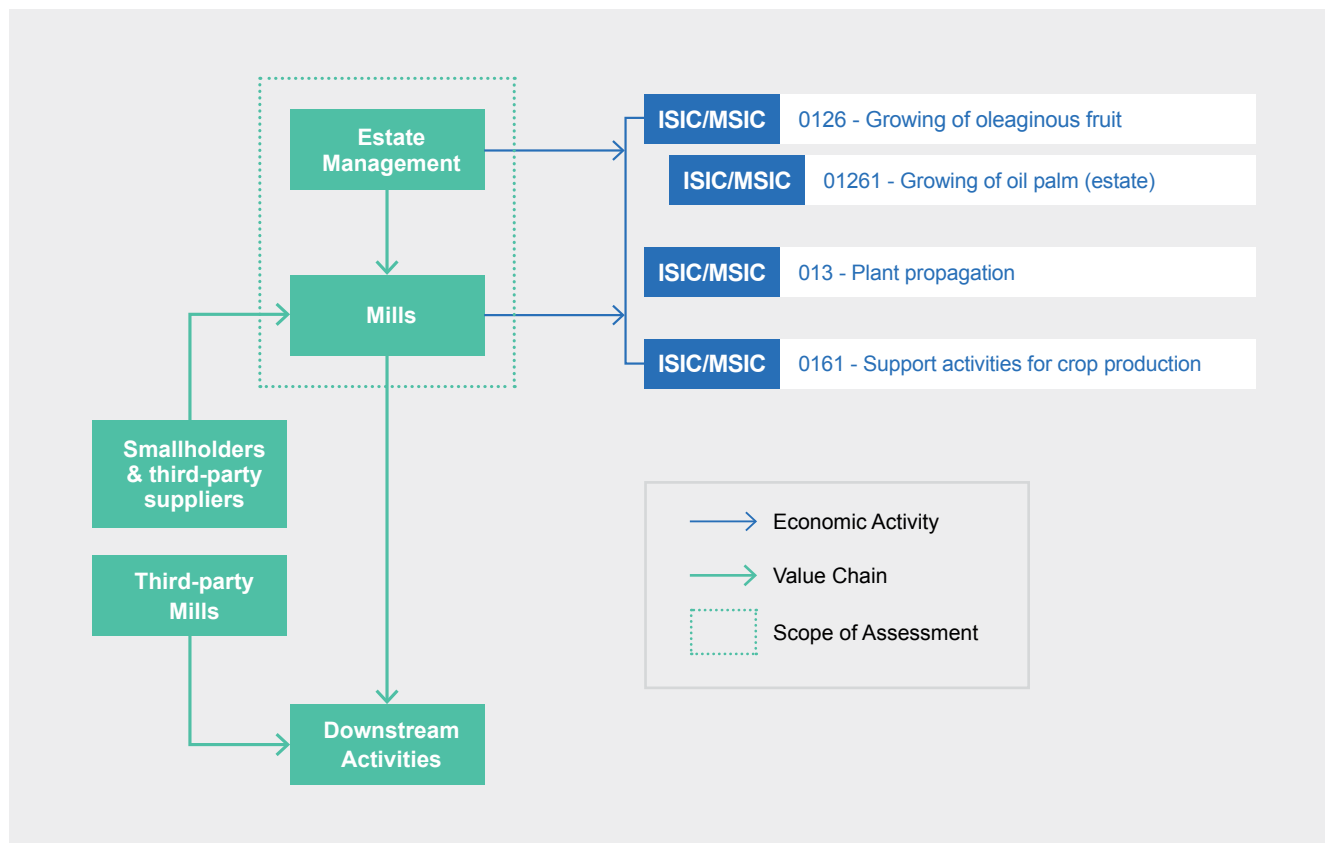
Example: Company A concentrated its LEAP assessment on its upstream value chain, which was identified as having the potential to generate the most significant and direct impacts and risks (Figure 5.3). The palm oil value chain's linear structure – from planting to downstream products – made it simpler to define than

the complex construction sector. High awareness and readily available, structured data, thanks to standards like RSPO and MSPO, further streamlined the process. However, data gaps remained for smallholders and third-party suppliers.

Figure 5.3

The palm oil value chain is more linear, comprised of a smaller, sequentially connected set of sectors

Scope of value chain for the palm oil pilot firm



Source: Authors, based on pilot LEAP assessment by Company A.

Tip 5: Actively engage with key stakeholders, including suppliers and regulators, to gather the data and information necessary for a comprehensive mapping of potential risks throughout your supply chain. It is crucial to ensure these engagements include Indigenous Peoples, Local Communities, and other affected stakeholders. This process should align with global best practices, such as the UN Guiding Principles on Business and Human Rights⁴² and the TNFD's specific guidance on engagement,⁴³ which outlines recommended actions for each phase of the LEAP approach.

3. Scoping available resources

Conducting a LEAP assessment is a cross-functional effort that extends far beyond the sustainability team, requiring diverse knowledge and data from across the organisation. This can be particularly challenging for large firms with diverse value chains and extensive supplier networks. Therefore, the initial Scoping phase is critical not only for identifying the necessary internal expertise and human resources but also for securing the commitment and participation required from all relevant departments to ensure a successful assessment.

For smaller firms, the scoping phase is about applying the LEAP approach proportionately. This may mean limiting the scope to core activities, key operational sites, and primary upstream suppliers rather than full value-chain coverage. Firms with limited nature data can start with hypotheses and proxies, building coverage incrementally – and where possible, leverage AI and technology-based nature data tools to reduce costs and fill data gaps.

⁴² https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf

⁴³ https://tnfd.global/wp-content/uploads/2023/08/Guidance_on_engagement_with_Indigenous_Peoples_Local_Communities_and_affected_stakeholders_v1.pdf?v=1695138220

Tip 6: SMEs with limited resources and data access may benefit from AI and other technology tools to support their LEAP assessment. TNFD, UNDP, and Conservation X have identified several accessible, low-cost solutions – from AI-powered risk platforms to mobile field applications – that can help smaller firms initiate key steps of the process.⁴⁴ These tools are not a substitute for a full LEAP assessment, but can be a practical starting point, particularly during scoping, to identify relevant data sources and evaluate trade-offs across different stages.

B. LOCATE interface with nature

As for financial institutions, the Locate phase focuses on firms' business processes and value chains that have significant interactions with nature.

1. Locating direct operations' interface with nature

A first step for firms is to map the precise location of their operations and identify any proximity to ESAs.⁴⁵

During the pilot, the firms mapped their selected sites and identified nearby sensitive locations, including Permanent Forest Reserves (PRFs), Key Biodiversity Areas (KBAs), and Indigenous Peoples' settlements. Additionally, global mapping tools like Global Forest Watch or WRI Aqueduct can be used (see Chapter 5.1 for details). For a fully-fledged assessment, the Locate phase should ideally be applied more holistically to identify priority locations across the full range of a firm's operations, not just a few selected sites.

Pilot firms leveraged several existing data points from complying with environmental and social safeguards.

These data are collected due to regulatory requirements and internal driven nature assessments and include High Conservation Value Area (HCV) assessments, Environmental

Compliance Reports (ECRs), EIAs, Social Impact Assessments (SIAs), biodiversity audits, internal policies on sustainable procurement, environmental protection and restoration, as well as community engagement amongst others. Firms could also capitalise on data collected for other purposes, like climate assessments. This process was relatively straightforward for the firms due to the small number of selected sites. However, applying it across all of a firm's operations would likely present greater challenges (see Chapter 6 for further details).

Tip 7: A good starting point to conducting a LEAP assessment is to take stock of relevant information already available within the organisation. Often, a firm has already gathered various types of data, but the primary challenge is consolidating this information from scattered sources and aligning it with the LEAP approach. This existing data, which can include EIAs, certifications, HCV assessments, and other environmental and social evaluations, can serve as the foundation for identifying key interfaces with nature.

2. Locating value chain's interface with nature

Mapping the interaction between nature and an entire value chain is inherently more complex than assessing direct operations, yet some sectors have made significant strides.

The palm oil industry, for instance, operates under stricter environmental regulations than sectors like construction, which has driven the development of sophisticated tools. These tools, often created by non-governmental organisations (NGOs) and the firms themselves, go beyond mapping direct operations to trace supplier sites and evaluate their proximity to forests and protected areas. Notable examples include the Nusantara Atlas, developed by TheTreeMap, and CrossCheck, a tool developed by SD Guthrie (Box 6).

⁴⁴ <https://www.conservationxlabs.com/natureintelligence>

⁴⁵ Sensitive locations are defined by TNFD as areas important for biodiversity, including species; and/or areas of high ecosystem integrity; and/or areas of rapid decline in ecosystem integrity; and/or areas of high physical water risks; and/or areas of importance for ecosystem service provision, including benefits to Indigenous Peoples, Local Communities and stakeholders. See p.57 and Table 4 of the TNFD LEAP Guidance *Guidance_on_the_identification_and_assessment_of_nature-related_issues_The_TNFD_LEAP_approach_V1.1_October2023.pdf*



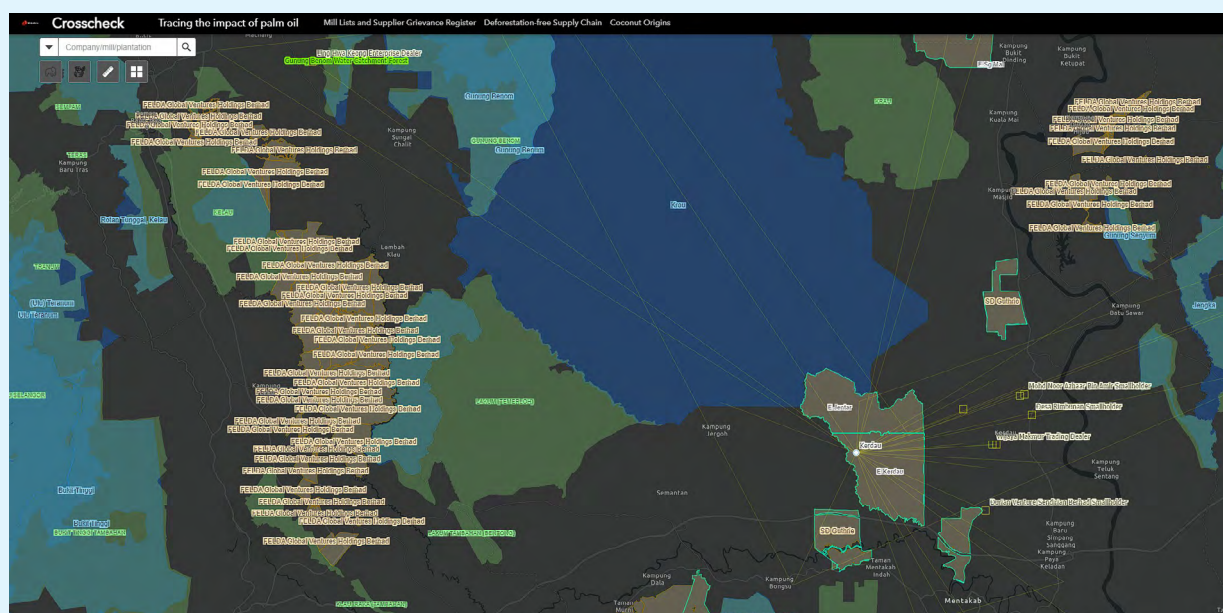
BOX
6

The Crosscheck tool

SD Guthrie developed an online tool called CrossCheck (Figure B6.1), which maps the locations of its own mills and plantations as well as those of its suppliers. The tool also enables users to assess their proximity to forest areas and monitor deforestation risks.

Figure B6.1

Screenshot of the CrossCheck traceability tool developed by SD Guthrie



Source: Authors' Screenshot from Crosscheck.

Note: Crosscheck is an online traceability dashboard that provides transparency of the location of the fruits and crude palm oil processed by SD Guthrie (highlighted in orange and yellow), enabling the firm to identify where supply chains are linked to deforestation on the ground (forests and reserve names are highlighted in green).

C. EVALUATE dependencies and impacts

In the Evaluate phase, firms pinpoint their operational dependencies on ecosystem services and assess the pressures and impacts their located activities exert on nature. The Evaluate phase advances the work done in the Locate phase, transitioning from an initial mapping of locations to a more comprehensive evaluation of the materiality of those nature-related impacts. In practice, they form an iterative loop, with the findings from each phase continuously informing and refining the other. For the pilot firms, screening these dependencies and impacts – such as determining if an activity results in high land-use pressure or low pollutant emissions – was a relatively straightforward process, particularly given their small subset of sites. The more significant challenge, however, lies in precisely quantifying these impacts, which involves tasks like calculating the exact land area used, measuring the volume of pollutants released, and determining their subsequent effects on ecosystems.

1. Initial screening of dependencies and impacts with ENCORE

To enhance the accuracy of their nature-related assessments, pilot firms supplemented ENCORE's generalised analysis with more detailed, context-specific data. While these firms utilised ENCORE for an initial screening of potential dependencies and impacts, in some cases they found it necessary to conduct more thorough, location- and activity-specific analyses. This is because ENCORE's analysis is limited to a generalised, sector-level view and does not provide country-specific details.⁴⁶ Consequently, a more granular and context-specific adjustment of the ENCORE ratings can be performed, for instance, based on available firm-specific information (see below) or global datasets. However, it is crucial that any such adjustments are clearly justified and documented to explain why the original ratings were altered.

⁴⁶ See also Chapter 6 for more details on ENCORE's limitations.

Example: For the construction value chain, Gamuda significantly adjusted the ENCORE pressure and dependency materiality ratings (Table 5.1) to reflect the firm's actual value chain, type of project, location of project, financial partnerships, regulatory requirements and project requirements. For example, the impact driver (or pressure) 'land ecosystem use' was adjusted to 'very high' materiality rating – instead of 'low' in ENCORE – given that the construction of buildings typically involves clearing large areas of land.

Example: For the palm oil value chain, ENCORE only provides materiality ratings for the 'perennial crops' sector rather than specific crops like oil palm. Company A selected the most relevant dependencies from the ENCORE's list for growing of i) perennial crops, ii) plant propagation and iii) support activities for crop production, according to their experience (Annex 2B). Scores provided by ENCORE were only marginally changed.

Table 5.1

To better align with its internal evaluation, Gamuda adjusted the ENCORE ratings

a) Gamuda's adapted materiality rating for its construction and property value chain's pressures

Value chain segment	MSIC economic activity	ENCORE Sector	Land ecosystem use	GHG emissions	Non-GHG emissions	Water pollutants	Soil pollutants	Disturbance	Solid waste generation	Toxicity and health ¹	Intro of invasive sp
Upstream Forestry	Production of round wood for forest-manufacturing industries	Logging	VH	H (M)	H (VH)	H (M)	H (M)	N/A (H)	N/A (L)	N/A	N/A (M)
Upstream: Building materials	Manufacture of precast concrete, cement of artificial stone articles for use in construction	Manufacture in non-metallic mineral products n.e.c	N/A (L)	VH (H)	H	H (VH)	H (VH)	L (M)	N/A (M)	N/A	N/A
	Production of bars and rods of stainless steel or other alloy steels	Manufacture of basic iron or steel	N/A (L)	VH (H)	H	H (VH)	N/A (VH)	L (VH)	H (M)	N/A	N/A
	Manufacture of refractory ceramic goods	Manufacture of non-metallic mineral products n.e.c	N/A (L)	M (H)	L (H)	N/A (VH)	H (VH)	L (M)	H (M)	H (N/A)	H (N/A)
	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard (recycled carton roofing ²)	Manufacture of paper and paper products	N/A (L)	L (M)	L (H)	M	N/A (M)	L (M)	M (H)	N/A	N/A
	Manufacture of veneer sheets and plywood	Manufacture of products of woods, cork, straw and plaiting materials	N/A (L)	H (M)	H (M)	H (M)	H (M)	L (H)	N/A (M)	N/A	N/A
Construction	Clearing of building sites	Demolition and site preparation	VH (L)	H (M)	N/A (L)	H	N/A (H)	H (VH)	N/A (M)	N/A	H (L)
	Surface work on streets, roads, highways, bridges or tunnels	Construction of road and railways	H (L)	N/A (M)	N/A (L)	N/A (H)	N/A (H)	N/A (VH)	N/A (M)	N/A	N/A (L)
	Non-resident buildings (Site B)	Construction of buildings	N/A (L)	H	N/A (L)	L (H)	L (H)	L (VH)	N/A (M)	N/A	H (L)
	Resident buildings (Site A)	Construction of buildings	N/A (L)	H	N/A (L)	L (H)	L (H)	L (VH)	L (M)	N/A	H (L)
	Collection of construction and demolition waste	Waste collection	N/A (M)	M (H)	M	M	M	N/A (H)	M	N/A	N/A (M)
Downstream: Operations	Ongoing management: Buying, selling, renting and operating on self-owned or leased real estate - non residential building	Real estate activities with own leased property	L	N/A (VL)	N/A (VL)	N/A (L)	M (L)	N/A (L)	VL	N/A	L (N/A)
	Tenant activities: Buying, selling, renting and operating on self-owned or leased real estate - non residential building	Real estate activities with own leased property	N/A (L)	H (VL)	N/A (VL)	L	L	N/A (L)	H (VL)	N/A	N/A
Downstream: Demolition	Demolition or wrecking of buildings and other structures	Demolition and site preparation	M (L)	N/A (M)	N/A (L)	H	H	N/A (VH)	H (M)	N/A	N/A (L)
	Collection of construction and demolition waste	Waste collection	N/A (M)	M (H)	M	M	H (M)	N/A (H)	H (M)	N/A	N/A (M)

Very high
 High
 Medium
 Low
 Very Low
 Not Applicable
 () ENCORE rating, when different from Gamuda's rating
 N/A Not Available

¹ Added by Gamuda as an additional impact - but relates to air pollution and non GHG emissions.
² Recycled carton roofing only used in Site B.

b) Gamuda's adapted materiality rating for its construction value chain's dependencies

Value chain segment	MSIC economic activity	ENCORE Sector	Provision of raw materials		Water supply	Flood and storm mitigation	Local climate regulations services ¹
Upstream: Mining and quarrying	Cement: Extraction and dredging of industrial sand, sand for construction and gravel	Quarrying of stone, sand and clay	L (N/A) Site B	H (N/A) Site A	N/A (H)	Flood N/A (H) Storm N/A (M)	N/A (L)
	Cement: Quarrying, crushing and breaking of limestone	Quarrying of stone, sand and clay	L (N/A) Site B	H (N/A) Site A	N/A (H)	Flood N/A (H) Storm N/A (M)	N/A (L)
	Steel: Mining of ores valued chiefly for iron content	Mining of iron ores	H (N/A)		N/A (H)	Flood N/A (H) Storm N/A (M)	N/A (L)
	Ceramic tiles: Mining and quarrying of abrasive materials	Other mining and quarrying n.e.c	H (N/A)		N/A (H)	Flood N/A (H) Storm N/A (M)	N/A (L)
Upstream: Forestry	Production of round wood for forest-based manufacturing industries	Logging	H (VH)		N/A (M)	Flood N/A (M) Storm N/A (L)	N/A
Upstream: Building materials	Manufacture of precast concrete, cement or artificial stone articles for use in construction	Manufacture of non-metallic mineral products n.e.c	N/A		H (M)	Flood N/A (M) Storm N/A (M)	N/A (L)
	Production of bars and rods of stainless steel or other alloy steel	Manufacture of basic iron and steel	N/A		H	Flood N/A (M) Storm N/A (M)	N/A (L)
	Manufacture of refractory ceramic goods	Manufacture of non-metallic mineral products n.e.c	N/A		H (M)	Flood N/A (M) Storm N/A (M)	N/A (L)
	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard (recycled carton roofing ²)	Manufacture of paper and paper products	H (N/A)		M	Flood N/A (M) Storm N/A (M)	N/A (L)
	Manufacture of veneer sheets and plywood	Manufacture of products of wood, cork, straw and plaiting materials	N/A		L	Flood N/A (M) Storm N/A (M)	N/A (L)
Construction	Non-residential buildings (Site B)	Construction of buildings	N/A		H (M)	Flood N/A (M) Storm N/A (M)	N/A (L)
	Residential buildings (Site A)	Construction of buildings	N/A		H (M)	Flood N/A (M) Storm N/A (M)	N/A (L)
Downstream: Operations	Tenant activities: Buying, selling, renting and operating of self-owned or leased real estates – non-residential buildings	Real estate activities with own or leased property	N/A		L (VL)	Flood L (VL) Storm L	H (L)

Very high

High

Medium

() ENCORE rating, when different from Gamuda's rating

¹ Peat fire mitigation and overheating.² Recycled carton roofing only used in Site B.

Low

Very Low

Not Applicable

N/A Not Available

Source: Authors' based on Gamuda's assessment.

Note: The assessment draws on the original ENCORE materiality ratings (in brackets), which however are modified by Gamuda (non-bracket rating and relevant colour code) in line with their own assessment.

2. Public global databases and guidance for more detailed assessment

Global databases offer a valuable complement for firms by providing detailed, often geospatially specific data to assess their impacts and dependencies on nature. Unlike sector-level tools such as ENCORE, these global resources allow companies to overlay their operational locations with relevant spatial data on the natural environment. For instance, pilot firms utilised tools like the WWF Biodiversity Risk Filter and the Aqueduct Water Risk Atlas. These platforms offer valuable insights into nature-related factors, such as areas of deforestation and regions at risk of water stress, which helped the firms better understand their relationship with the environment. Furthermore, specialised datasets are available to assess risks for particular commodities. The pilot firms used resources like the WWF Wood Risk Tool⁴⁷

or TRASE⁴⁸ to identify their commodities that are listed on the Science Based Targets Network (SBTN) High Impact Commodity List.⁴⁹

Tip 8: To begin assessing a firm's relationship with nature, leverage publicly available tools for an initial screening of dependencies and impacts. Resources such as ENCORE, IBAT, WWF Risk Filters, the Aqueduct Water Risk Atlas, or WHISP (see Box 7) can help pinpoint the most relevant ecosystem services and geographic locations for a firm and its value chain. For a detailed overview of tools applicable to Malaysia, refer to Chapter 6.

⁴⁷ <https://www.woodrisk.org/>

⁴⁸ <https://www.woodrisk.org/>

⁴⁹ <https://sciencebasedtargetsnetwork.org/wp-content/uploads/2024/07/High-Impact-Commodity-List-v1-1.xlsx>

3. Readily available firm-specific information and data

The TNFD's 'Additional Sector Guidance'⁵⁰ provides valuable, sector-specific recommendations on which metrics firms should disclose. This guidance helps firms identify relevant indicators to measure their exposure to nature-related dependencies and impacts, including changes to the state of nature, such as water volumes, land use surfaces, waste production quantities, and changes in species counts.

Firms can build upon existing information to move beyond simply locating interactions with nature to actively evaluating their materiality. This is a key distinction from the Locate phase, as it involves using readily available data to determine the materiality of nature-related dependencies and impacts. Firms are not starting from zero; a wealth of information is already generated through existing regulatory and industry requirements, such as those for RSPO or MSPO certifications, EIAs, and HCV assessments. The pilot firms confirmed this, noting that they already monitor specific metrics like water consumption and GHG emissions as part of their internal Environmental Management Plans, providing a solid foundation for this deeper evaluation.

However, the pilot assessments indicated a critical data imbalance: while information on firms' impacts on nature seems relatively abundant, data on firms' dependencies on nature is scarce. This disparity stems from historical regulatory frameworks that have prioritised monitoring environmental and social impacts over understanding the ecosystem services and natural resources that firms fundamentally rely upon. Consequently, beyond direct natural resource consumption, there is a significant gap in information regarding how firms depend on the broader services that nature provides.

Example: For its direct operations, Gamuda had substantial data on the impacts of its activities (Table 5.2). However, this information was distributed across various internal departments and external entities, and stored in multiple systems, from in-house software to external utility bills, presenting opportunities for greater consolidation and integration.



Credit: UNDP Malaysia

⁵⁰ See https://tnfd.global/tnfd-publications/?_sft_framework-categories=additional-guidance-by-sector#search-filter

Table 5.2
Gamuda used a large amount of existing internal data and information, spread across different departments

Excerpt of Gamuda's data availability assessment for the evaluate phase

Impact / Dependencies Driver		Activities	Pressure from activities	Data		Data source
Land, freshwater and ocean use change	Land ecosystem use	Construction - Land clearance for infrastructure and urbanization	Land clearance to make space for construction	Surface of existing habitats removed to make space for construction		Action by: Landscape team Data Source: Approved development order; construction drawing softscape
		Construction - Creation of sealed surfaces	Buildings and the application of hard surfacing to land	Percentage of softscape and hardscape surfaces		Action by: Project team
		Construction - Construction of building	Construction works can involve green and blue space creation, landscape restoration, and building of animal crossing points.	Percentage of green areas created		Action by: Landscape team
		Infrastructure Operation - Green space maintenance	Biodiversity can be improved by green space maintenance	Improved biodiversity		Action by: Landscape team Data Source: Maintenance contract and routine
		Demolition - Demolition of project	Demolition changes the land use and structures on the land.	Soil microbes contents - pH - moisture content		Action by: Landscape team Data Availability: Soil study result from UIA
Resource use	Water use	Construction - Construction of building	Construction processes can include significant water use extracted directly from marine and freshwater ecosystems or obtained indirectly through third party suppliers	Water consumption		Action by: Project team Data Source: Syarikat Bekalan Air Selangor Sdn Bhd (SYABAS) - Note: Data not archived after two years.
		Infrastructure Operation - Tenant activities	Users of real estate consume water and other resources.	Site A	Site B	
Invasive alien species	Introduction of invasive alien species	Construction - Construction of building	Vehicles during construction can spread plant pathogens and invasive species.	a. Tree Quantity b. Tree species c. Native species / International Union for Conservation of Nature (IUCN) Species		Action by: Landscape team Data Source: Construction drawing softscape.
		Infrastructure Operation - Ongoing management	Linear infrastructure such as roads, railways and canals can facilitate the distribution of invasive alien species	d. Planting design		Action by: Landscape team Data Source: Construction drawing softscape.

Source: Authors, based on Gamuda's LEAP pilot assessment

Note: Colour represents the level of effort for Gamuda to obtain the data, with light green representing low effort and turquoise, medium effort.

D. ASSESS risks and opportunities

Like financial institutions, the Assess phase requires firms to translate their analysis of nature-related dependencies and impacts into a clear view of material risks and opportunities for their business operations. This involves evaluating how the previously identified environmental interactions could evolve into concrete operational or reputational risks, as well as potential business opportunities.

1. Risk identification

Lacking usable quantitative scenarios, the pilot firms relied on qualitative methods to identify their nature-related risks and opportunities across the value chain (Figure 5.4 and 5.5). While this approach was high-level, it proved useful for creating an initial overview and guiding future resource and data collection efforts. However, the assessments were limited to identifying the types of risks; they lacked the detail to estimate key dimensions like the likelihood, magnitude, or speed of onset of these hazards, or the firm's specific vulnerability to them (see Chapter 6 for more details on obstacles), which would be required for prioritising and measuring risks going forward.

Example: Company A identified sources of physical risks (e.g. loss of pollinators and introduction of invasive alien species), which could potentially cause lower crop yield and production, leading to loss in revenue. They also identified sources of transition risk (e.g. pollution events, waste mismanagement and other non-compliance-related fines) that can lead to increased costs for remediation.

2. Opportunities identification

Pilot firms qualitatively identified a range of business and sustainability opportunities, particularly within their direct operations (Figure 5.4 and 5.5). They pinpointed potential improvements in areas like capital flows, reputation, and resource efficiency. For example, firms in both the palm oil and construction and property sectors found it straightforward to identify opportunities in activities they directly control, such as construction and real estate management. They also recognised opportunities for enhanced sustainability performance, including ecosystem protection and the sustainable use of natural resources.

Example: Gamuda identified strategic business opportunities linked to improved environmental performance, particularly through enhanced water efficiency and more effective material management, which can deliver direct cost savings and operational efficiencies across project lifecycles. Beyond these immediate financial benefits, the company recognised that integrating green and blue infrastructure into construction projects – such as vegetated areas, natural drainage systems, and retention features – can strengthen asset resilience by mitigating flood risks and reducing soil erosion. These measures help protect ecosystems and sustain related ecosystem services while also potentially lowering maintenance and insurance costs, improving regulatory compliance, enhancing asset value, and supporting biodiversity outcomes, thereby generating both financial and environmental co-benefits.

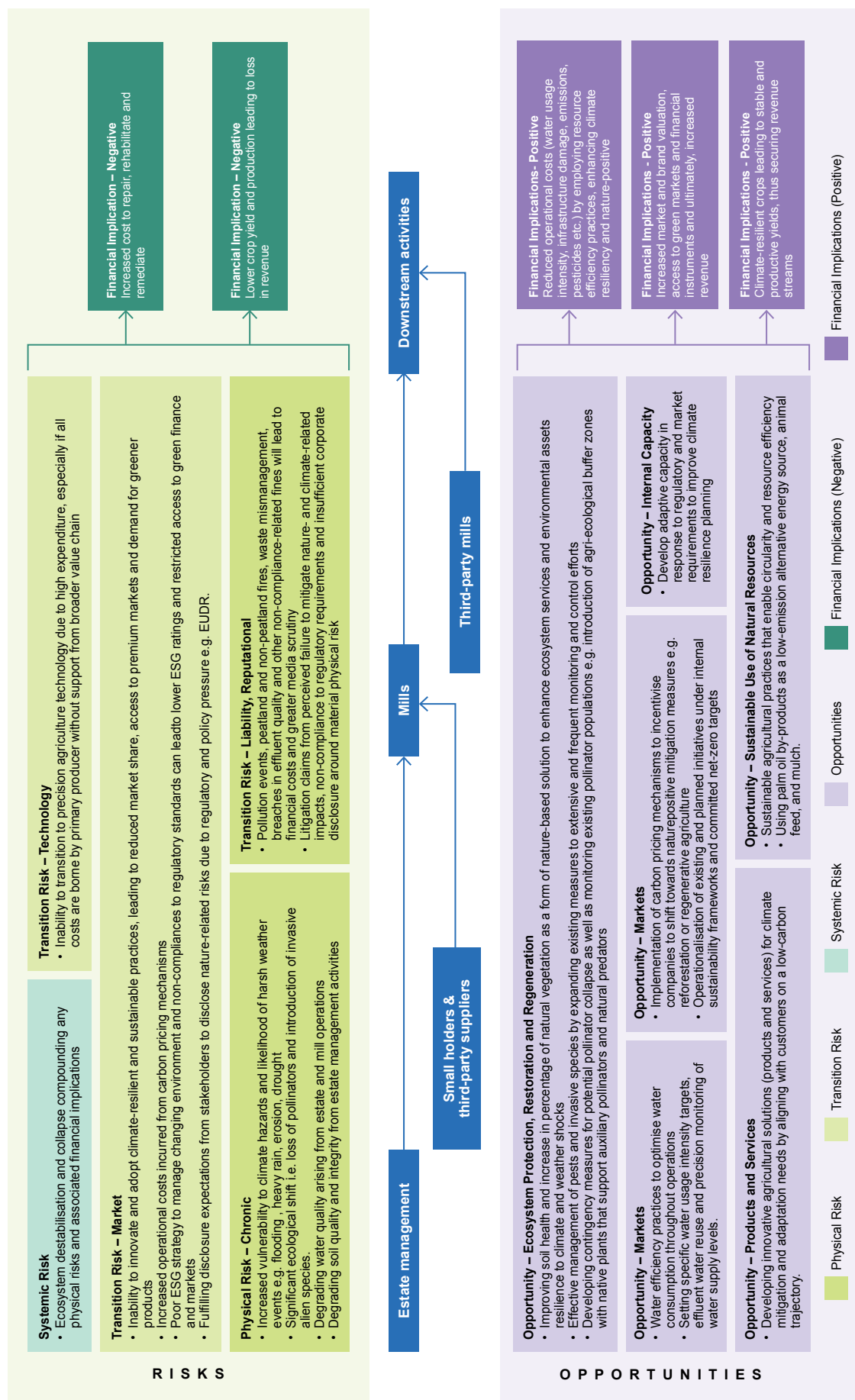
The pilot firms initially adopted an 'inside-out' perspective, concentrating on their positive and negative impacts on nature, while giving less attention to the 'outside-in' view of how nature creates risks and opportunities for their business. This initial focus is noteworthy because a comprehensive assessment requires both viewpoints. Interestingly, this tendency contrasts with the findings from the AskNature analysis (see Box 5).⁵¹

Even with existing, structured processes for nature risk management, the qualitative LEAP assessment proved valuable as a validation exercise for pilot firms. In some cases, the process helped identify specific risks and opportunities that were not previously monitored, prompting these firms to consider expanding their current management and mitigation strategies to address these new findings.

⁵¹ In that study, the 30 companies whose sustainability reports were analysed demonstrated a stronger inclination to report on nature's impact on their business rather than their business's impact on nature. As explained in Box 5, this may be due to the different context in which firms provided information (pilot LEAP to comply with TNFD guidance vs. corporate sustainability reports aimed at investors and made public), or to a different sample composition.

Figure 5.4**The LEAP approach helped to comprehensively identify nature-related risks and opportunities along the palm oil value chain**

Qualitative mapping of nature-related risks, opportunities and financial implications for the palm oil value chain based on the findings from the pilot firm



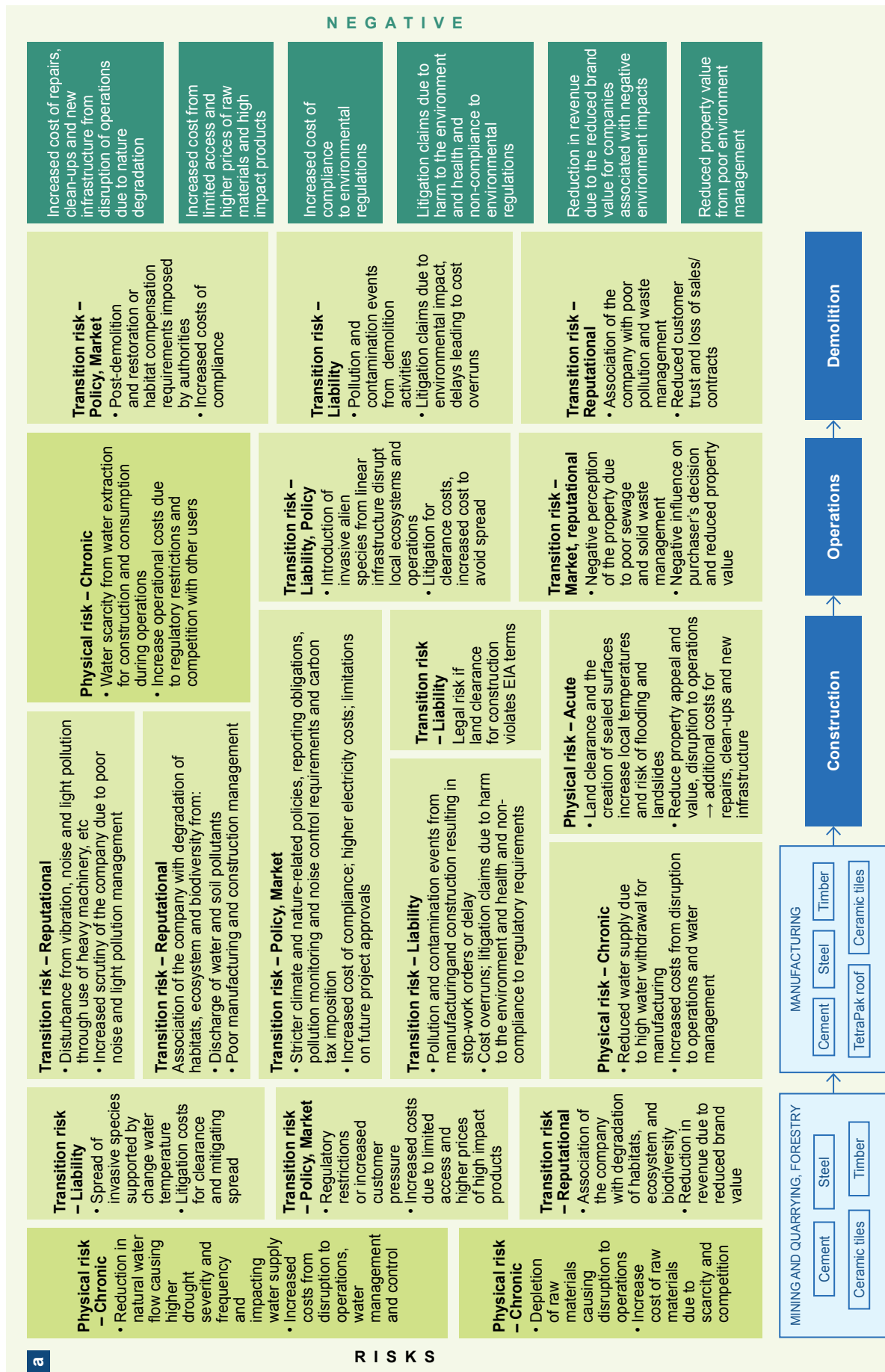
Source: Authors, based on Company A's LEAP pilot assessment.

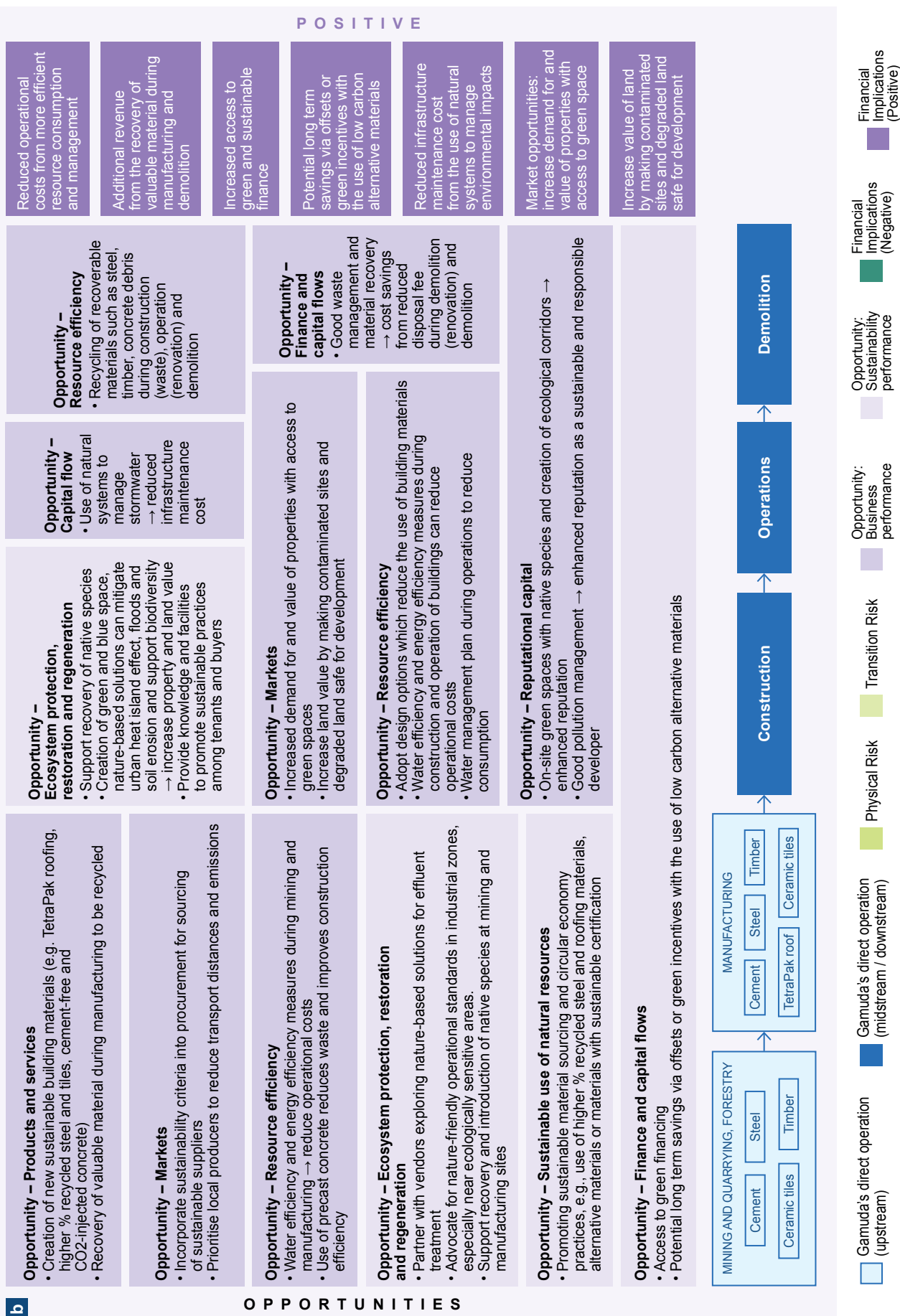
Note: The risks and opportunities shown are reflective of the upstream activities of a palm oil value chain. Each colour denotes a different type of risk, opportunity, and the respective positive and negative financial implications.

Figure 5.5

The construction and property value chain proved to be more complex, reflected in a more extensive set of risks and opportunities

Qualitative mapping of nature-related risks, opportunities and financial implications for the construction value chain based on the findings from the pilot firm





Source: Authors, based on Gamuda's LEAP pilot assessment.
 Note: The risks and opportunities shown are reflective of the whole construction and property value chain. Each colour denotes a different type of risk and opportunity. Both positive and negative financial implications are described in no particular order nor correlation with adjacent columns.

A subsequent key part of this phase is determining which nature-related risks and opportunities are most material to the firm's operations, strategy, and financial performance. This involves identifying physical, transition, and systemic risks across operations and value chains, and evaluating their likelihood and magnitude – using qualitative or quantitative methods – before integrating findings into existing enterprise risk management processes. Firms participating in the pilot relied on qualitative methods, conducting in-depth risk mapping across the value chain that generated valuable insights for risk management. As assessments mature, a natural next step is to quantify exposure at the level of specific assets, revenues, and expenditures.

E. PREPARE to respond and report

In the Prepare phase, firms are expected to leverage their prior assessments to formulate risk management strategies and prepare for the disclosure of nature-related risks and opportunities. However, this phase was not the central focus of the pilot exercise. The participating firms were tasked with understanding the assessment process itself, rather than being required to produce a formal TNFD-aligned disclosure report.

Despite the pilot's limited scope, both participating firms are already taking steps to integrate nature-related considerations into their risk management frameworks, building upon their existing experience with environmental reporting. These firms are accustomed to meeting national regulatory standards for environmental data⁵² and have indicated their intention to further align with the TNFD framework over the next few years by embedding its principles into their current processes. For example, Gamuda has registered as a TNFD adopter, thus committing to TNFD-aligned disclosure(s) by the end of the 2025 financial year, and has started to disclose initial information on nature as part of its 2025 ESG Impact Report (Gamuda Berhad, 2025).

However, it is important to recognise that for firms, the role of risk management can differ substantially from that in financial institutions. In financial institutions, risk management is a core, heavily regulated function central to the business model. In contrast, within large firms, it often operates as a supportive function, and in smaller firms, a formal risk management structure may be absent altogether. This distinction shapes how nature-related risks are identified, assessed, and managed within different types of organisations.

Tip 9: Review existing risk management and mitigation strategies to explore where nature-related considerations can be embedded. For example, this could include exclusionary policies for high impact activities and improved procurement processes.

The LEAP approach's iterative design enables firms to continuously strengthen their understanding and management of nature-related issues. Pilot firms embraced this approach, using the exercise to build internal capacity and awareness. This brings firms into a position to meet emerging regulatory expectations and unlock new nature-positive business opportunities, well before a comprehensive, firm-wide assessment is complete. Similar to financial institutions, the core principle is a commitment to ongoing improvement, with firms aiming to regularly expand and deepen their assessments proportionally to develop a more sophisticated understanding of risks and opportunities over time. This foundational work is crucial for progressively embedding nature-related considerations into core business processes, such as strategy, risk management, and operations.

Tip 10: Even with incomplete data and limited capacity, start with a LEAP assessment of nature-related issues. The process of conducting these assessments itself helps to build capacity and address data gaps. Enhance this internal learning by actively engaging with external resources. Learn from peers and explore case studies through platforms like the TNFD ASEAN consultation group,⁵³ the TNFD Knowledge Hub,⁵⁴ and the Case Study Library,⁵⁵ which offer practical examples of how to assess, manage, and report on nature-related issues.

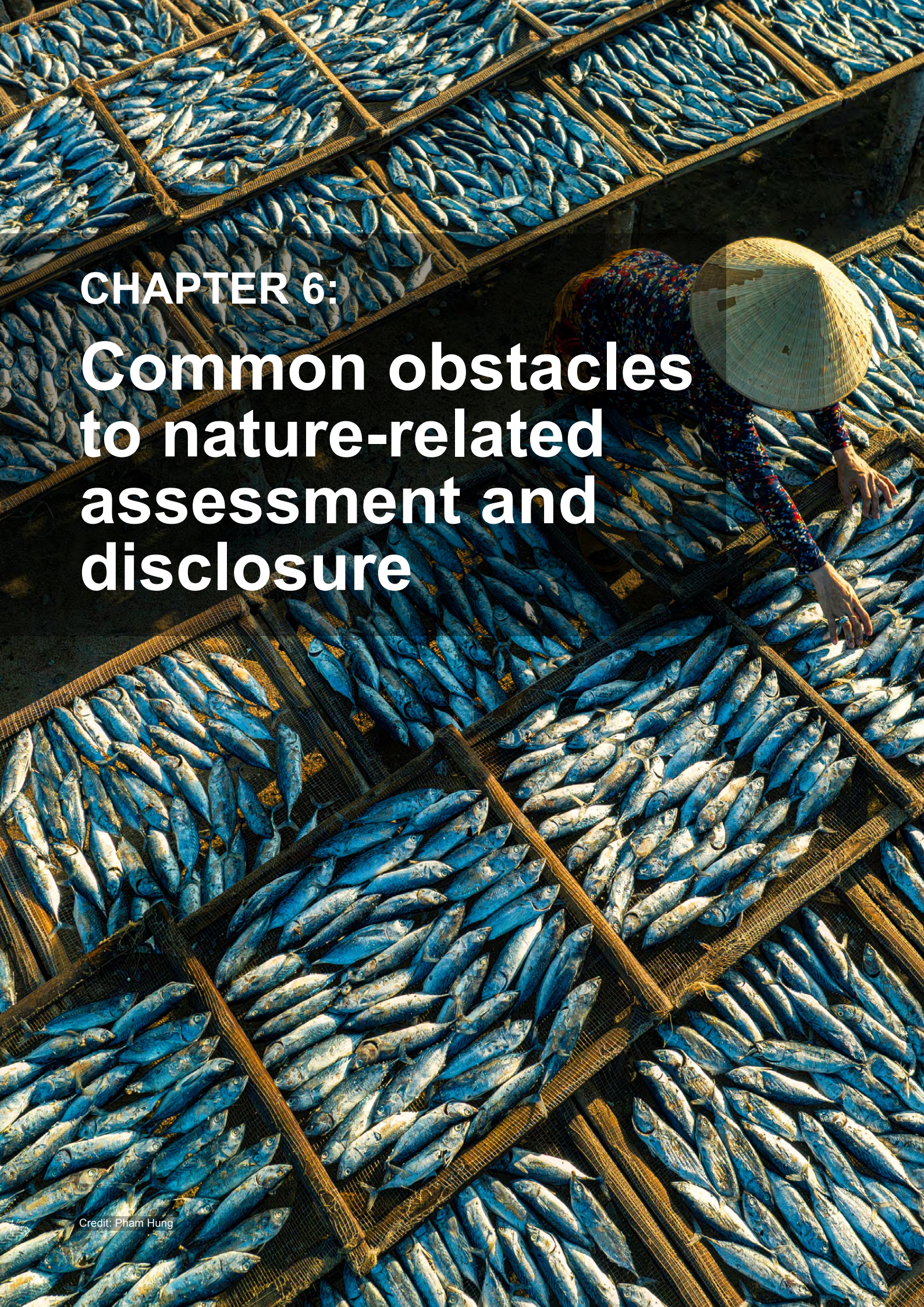
While it is crucial for firms to begin this journey without delay, the pilot exercise also brought to light several significant obstacles to conducting a fully-fledged LEAP assessment. The following chapter will delve into these challenges in detail, and Chapter 7 will then present a series of recommendations designed to address them.

⁵² Examples include the Environmental Quality Act 1974 e.g. Environmental Quality (Prescribed Premises) (Crude Palm Oil) (Amendment) Regulations 1982; Environmental Quality (Industrial Effluents) Regulations 2009; and Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987, along with enactments and ordinances specific to Sabah and Sarawak.

⁵³ See <https://tnfd.global/engage/tnfd-consultation-groups/>

⁵⁴ See <https://tnfd.global/knowledge-hub/>

⁵⁵ See <https://tnfd.global/knowledge-hub/case-studies/>



CHAPTER 6: Common obstacles to nature-related assessment and disclosure

Credit: Pham Hung

Main takeaways of this chapter:

- While a substantial amount of data is available, significant challenges persist. These include adapting global datasets for the Malaysian context, making local data suitable for financial risk assessment, enhancing the quality of asset-level location data, and consolidating firm-specific impact and dependency data, which is often fragmented across various departments.
- Even with existing guidance, financial institutions and firms require more direct, practical support to effectively translate raw data into meaningful metrics. This hands-on assistance is crucial for them to advance beyond initial risk screening to a more rigorous, quantitative risk assessment.
- Assessing nature-related risks is time- and resource-intensive, limiting uptake, particularly for smaller institutions.
- Clear supervisory expectations, regulatory guidance or incentives would be needed to drive more systematic assessment and disclosure for both financial institutions and firms.

This chapter examines the primary obstacles that financial institutions and firms are currently encountering – or anticipate encountering – when assessing and disclosing nature-related risks. The insights presented are drawn from survey responses (Chapter 4) and the findings of the LEAP pilot assessments (Chapter 5).

Financial institutions and firms face a number of common challenges in addressing nature-related risks: a lack of quality data, difficulties navigating methodologies, insufficient internal resources, and

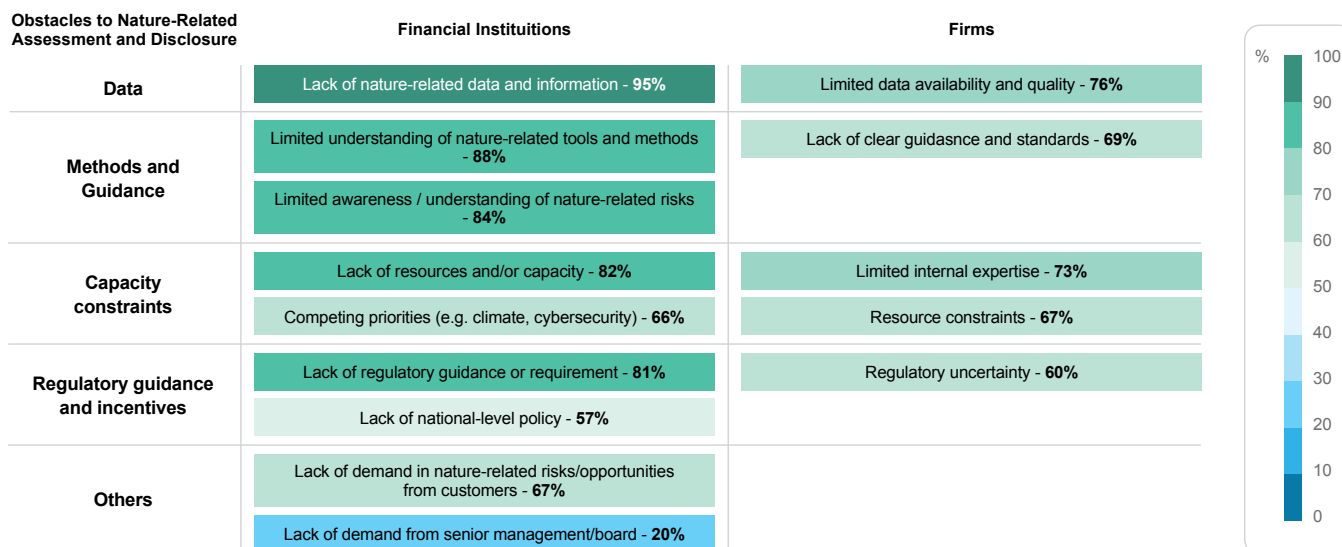
unclear regulatory guidance (Figure 6.1, A4.18 and A4.17). A common challenge for financial institutions and firms is the scarcity and incompleteness of nature-related data, cited by 95% and 76% respectively. This is compounded by a lack of internal capacity and resources, a challenge cited by over two-thirds of those surveyed. Furthermore, responding financial institutions and firms pointed to insufficient regulatory guidance and requirements as a common obstacle. For financial institutions in particular, competing priorities with other risks, such as cybersecurity, and a lack of client demand present additional difficulties.



Figure 6.1

Financial institutions and firms commonly cite data gaps, methodological complexity, limited internal capacity, and unclear regulatory guidance as the principal challenges to nature-related risk assessment and disclosure

Key challenges reported by financial institutions and firms in nature-related assessment and disclosure



Source: Authors, based on financial institution survey ($n = 83$) and Corporate Survey on Malaysia's TNFD Readiness (UNDP BIOFIN 2025) ($n = 45$).

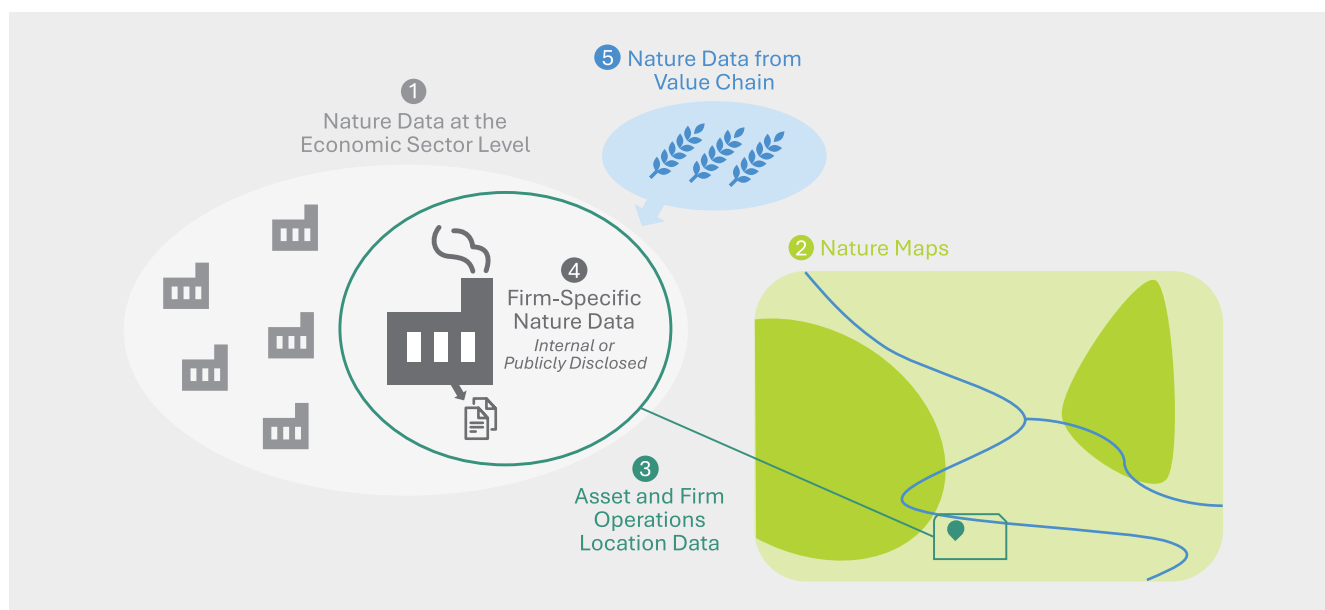
I. Data availability, quality and accessibility gaps

Data gaps are the most cited barrier to nature-related risk and opportunity assessments, but the challenge is more nuanced than a simple absence of data. The real issue seems to lie in the uneven availability, granularity, and

quality of data across different data types (Figure 6.2) – each presenting its own distinct challenges. Insights from the LEAP pilots confirm that nature assessments draw on a wide range of data, and not all of it is equally difficult to obtain.

Figure 6.2

Data inputs for nature-related risk and opportunity assessments



Source: Authors, using icons from <https://icons8.com/>.

1. Nature data at the economic sector level

A key challenge in assessing nature-related impacts is the lack of specific detail in global tools like ENCORE. For instance, ENCORE groups activities into broad categories, such as ‘growing of perennial crops’ instead of ‘growing of oil palm,’ which forces a general assessment for a range of perennial crops, including cocoa and coconut, rather than one specifically for palm oil. To address this, financial institutions, firms, and regulators could conduct additional, subsector-specific analyses for key industries like palm oil, utilising available scientific literature (see Annex 2). While datasets like Malaysia’s Supply and Use Tables (SUT) offer some quantitative insights into the environmental impacts of economic activities, their broad sectoral categories are too coarse to provide a detailed analysis, and they do not cover all dependencies and impacts on nature.

A second issue is that ENCORE’s global framework does not account for country-specific contexts, such as the local state of nature or a sector’s specific vulnerabilities. ENCORE relies on global expert assessments and averages. Furthermore, it does not consider the concrete vulnerability of a sector to environmental risks, such as the ease or difficulty of substituting a natural resource, in a particular context. This makes ENCORE more of a preliminary screening tool than a detailed assessment instrument.

2. Nature maps

Although a good amount of nature-related data exists in Malaysia, notably maps describing the state of nature and ecosystem services, its fragmentation and lack of accessibility create a major barrier to effective risk assessment. Both financial institutions and firms consistently identify the absence of localised data as a primary obstacle to conducting nature-related risk and opportunity assessments. While a rich set of relevant nature maps exists in Malaysia that could be utilised (Table 6.1), this information is often difficult to access. National biodiversity and ecosystem services maps are often unavailable for public access, fragmented across various government agencies, unavailable in machine-readable formats, and challenging to integrate into the portfolio-level screening processes used by financial institutions.

The fragmentation and the lack of clear guidance for hands-on use of country-specific nature maps make financial institutions and firms turn often toward more accessible global resources. For instance, pilot financial institutions and firms frequently refer to maps provided by tools like the WWF Biodiversity Risk Filter and the WRI Aqueduct. The drawback, however, is that these global maps often lack the contextual specificity required for a country like Malaysia. They may not provide sufficient detail on the nation’s unique ecosystems, local water sources, or critical policy aspects such as alignment with national land-use plans. This reliance on generalised data means that even the pilot firms struggled to accurately assess the impact of their operations on environmentally or culturally sensitive areas.



Credit: UNDP Malaysia

Table 6.1
Malaysia-specific nature datasets and maps: Potential uses for financial risk assessment and related obstacles

Environmental focus of data (Data provider)	Data description	Potential uses for financial risk assessment and related obstacles
Energy use (DOSM: Department of Statistics Malaysia)	Physical Supply and Use Tables, describing the supply and use of energy (by energy source and energy products) of 5 production sectors, households and exports in 2015. Access here (create an account, then 'Publications' 'FreeDownload' and search for 'SEEA'), additional documentation here.	Possible uses: - Quantification of actual energy and water use by economic sectors. - Derivation of efficiency metrics (e.g. 'on average, Malaysia's agriculture sector uses X m³ of groundwater per RM of output'), which can be used to benchmark firms.
Water Use, Wastewater (DOSM)	Physical Supply and Use Tables, describing the use of water (surface water, groundwater, sea water) and production of wastewater of 7 production sectors and households in 2015. Access here (create an account, then Publications' 'FreeDownload' and search for 'SEEA'), additional documentation here.	Obstacle: Data is only for a few large economic sectors, in 2015 . Note that data for 2020-2025 (including: expanding energy Supply and Use Tables (SUT) to 124 sub-sectors; developing accounts of air emissions from energy use; developing sector-level Land accounts) is currently planned.
Air Quality (DOE: Department of Environment)	Map showing today's Air Pollution Index (API) for several air quality monitoring stations throughout Malaysia. Access here, and additional documentation here.	Possible uses: - Financial institutions and firms can overlay the location of assets that depend on or impact air and water quality (e.g. food and beverage manufacturing) with these maps to identify exposure to physical and transition risks. - Sector-level data from the EQR could be used to refine ENCORE's impact and dependency assessments and tailor them to the Malaysian context. Obstacles: - The interactive maps provided online are not directly downloadable (e.g. in.shp format). Online maps support day-to-day monitoring of environmental quality but do not provide annual averages or trends. Annual averages for 2020–2024 are available in the EQR reports, but not in interactive or downloadable map formats. - The map of Groundwater Quality Index (GWQI) is currently unavailable.
River water quality (DOE)	Map showing today's Water Quality Index (WQI) for several river quality monitoring stations throughout Malaysia. Access here, and additional documentation here.	
Marine water quality (DOE)	Map showing today's Manual Marine Water Quality Index (MMWQI) for stations throughout Malaysia. Access here, and additional documentation: here.	
Groundwater quality (DOE)	The Groundwater Quality Index (GWQI) is monitored nationwide. Access: map is unavailable, but elements can be found here.	
Coral Reefs (Department of Fisheries Malaysia and Reef Check Malaysia)	Interactive map showing the status of live coral cover throughout Malaysian coasts and information on the evolution of various substrates (hard coral, soft coral, sponges, etc.), fish and invertebrate species over the past year. Access here and Additional documentation: Reef Check 2024 report	Possible use: Financial institutions or firms can overlay the location of assets that depend on or impact coral reef health (e.g. tourism, fishing sectors) with these maps, to identify exposure to physical and transition risks . Obstacle: The interactive map provided online is not directly downloadable (e.g. in.shp format). Live coral cover is for 2024, but the map does not show past years or trends .

(continued)

Species, including Invasive alien species (Malaysia Biodiversity Centre)	Malaysia Biodiversity Information System (MyBIS) is a repository for biodiversity information in Malaysia. Available data includes a list of the species present in Malaysia with their characteristics, sometimes including their location by State with maps. Species can be filtered to keep only invasive species. Access to MyBis here.	Possible uses: Financial institutions or firms can overlay the location of assets that can introduce invasive alien species (IAS) or can be negatively affected with IAS (e.g. palm oil can be impacted by Fusarium oxysporum, see The National action plan on invasive species in Malaysia) with the maps showing the State where these IAS are , to identify exposure to physical and transition risks . Obstacle: Maps are only available for a few species , and location is not granular (only at the State level). Maps cannot be downloaded (e.g. in.shp format).
River basins (DID: Department of Irrigation and Drainage)	Map showing the location of river basins throughout Malaysia, and their geographic characteristics (e.g. State, transboundary nature). Access via MyWater portal. Additional data is available on the website, including the location of dams and hydrology stations in Malaysia	Possible uses: As it stands, this map can hardly be used for financial assessment . It can complement other data analyses, for example, river basins' geography, interacted with data on river water quality (by DOE, see above) can allow to capture water quality downstream the water quality monitoring station and expand coverage. Obstacle: No data is provided on water quality or flow at the water basin level. The map is not downloadable .
Coastal erosion (DID)	Map of current coastal erosion in Malaysia. Access via MyWater portal is unavailable, but statistics on the length of coastal erosion (in km) by State for the year 2025 are provided here, distinguishing between 3 categories of erosion.	Possible uses: Financial institutions or firms can overlay the location of assets (production facilities, buildings) located in coastal areas with such a coastal erosion map, to identify exposure to physical risks . Obstacle: It is unclear whether the map is public, as it is not visible in the viewer, and not downloadable .
Floods (DID)	Map showing the recently experienced floods in the country. Access here (click on legend for data to appear). A list of flood events experienced in the country, and their characteristics (state, district flood cause, river basin, data) can also be found here.	Possible uses: Financial institutions or firms can overlay the location of assets (production facilities, buildings) with a such flood map, to identify exposure to physical risks . Obstacle: The map cannot be downloaded. It is unclear which period is covered and what is the magnitude of the floods shown on the map.
Droughts (DID)	A list of the droughts experienced by dams throughout Malaysia, with information on alert status and dam characteristics. A list of the number of consecutive days with absence of rain by monitoring station (with info on district and state), classified by alert status. Access here (a map should be here but is currently unavailable).	Possible uses: Financial institutions or firms could overlay the location of assets (production facilities, plantations) with a droughts map, to identify exposure to physical risks . Obstacle: The visualization tool does not show the expected data . Data in the map seems to be only available for Peninsular Malaysia . The list of consecutive days without rain is only shown for 2025 .

Source: Authors.

Note: This review of available datasets is non-exhaustive and may not capture all relevant sources.

3. Asset and firm operations location data

While firms often possess detailed location data for their operations, they typically lack corresponding financial information at a local level, creating a data gap for risk assessment. For the pilot firms, information on the specific location of their sites was already digitised within internal systems, making it relatively straightforward to overlay their operational data with geospatial data on ecosystem conditions. However, such sophisticated data management systems may not be found in all firms, particularly smaller organisations. Furthermore, a common challenge for firms is the difficulty in estimating financial metrics – such as profit or revenue – for individual production sites. This is a critical gap, as having site-specific financial data is key for accurately assessing the materiality of nature-related financial risks to a firm.

In contrast to the firms they lend to, financial institutions often lack the granular location data required to accurately map the nature-related risks of the assets they finance. Beginning in December 2023, financial institutions reporting to the Central Credit Reference Information System (CCRIS)⁵⁶ are required to provide address-level asset location of loan utilisations and physical collateral. However, for all existing financing prior to December 2023, financial institutions' initial client risk assessments do not consistently require detailed geospatial information. This creates significant blind spots when these institutions later attempt to evaluate their nature-related risk exposure, particularly during the Locate and Evaluate phases of the LEAP approach.

Even when location data is provided for pre-December 2023 loans, it is often incomplete and lacks the necessary detail for a thorough risk assessment. For financial institutions, the data they receive from clients typically focuses on the location of firm headquarters, or is a point location. This overlooks the vast network of operational sites – such as plantations, factories, and offices – where the actual business activities occur. Furthermore, this high-level data fails to capture the true geographic footprint of assets (e.g. the total surface area of a plantation) and the specific revenue generated by them, complicating a precise evaluation of nature-related financial risk.

Example: FI A's oil palm plantation clients were recorded with a single coordinate point rather than the broader area involved, making it difficult to assess the true extent of environmental impacts and dependencies.

4. Firm-specific nature data

Internal fragmentation of nature-related data and a lack of standardised processes make nature-related assessments a highly labour-intensive and manual exercise for most firms. Interviews with both pilot and non-pilot companies revealed that existing data relevant to nature risk and opportunity assessments, such as information on environmental pressures (e.g. water use, waste production), is often scattered internally across various departments and externally among different service providers. This dispersal creates a significant challenge in coordinating and aggregating data from multiple sources. The problem is compounded by a lack of interoperability and connectivity between existing data systems, which makes integration into centralised risk management frameworks difficult. Furthermore, a 'language' barrier often exists between sustainability departments, who understand the disclosure requirements, and on-site operational staff, such as engineers, who possess the raw data (e.g. information on the origin of building materials) but may be unfamiliar with the terminology and purpose of the assessment. Finally, the complexity of aligning this fragmented data with a specific reporting framework like LEAP means that assessments frequently require extensive manual work.

Example: Gamuda emphasised the wide range of departments involved in nature data gathering (see Table 5.2 in Chapter 5). It also stressed that much of its available data is collected under different regulatory frameworks – such as approved development orders, environmental reports to the DOE, and EIAs – which often do not align with TNFD formats or metrics. For example, EIAs are typically conducted at the township level, making them difficult to use for project- or firm-level reporting.

Although pilot firms are collecting a substantial amount of environmental data, significant gaps remain in tracking key operational pressures on nature, particularly concerning pollution. Consistently with the firm survey findings (Figure A4.17), pilot companies indicated that they now commonly track metrics on greenhouse gas emissions, water consumption, solid waste, and to a lesser extent, land-use change. In contrast, pollution-related data – such as soil and water contamination, including the use of nutrients and pesticides – remains far less assessed and is frequently underreported. Closing these gaps will require targeted efforts to improve data collection and coverage.

⁵⁶ CCRIS is a system owned and operated by Bank Negara Malaysia to facilitate credit risk management among banks. CCRIS collects credit information on borrowers from participating financial institutions and supplies the information back to them.

Gathering quantified data on clients' environmental pressures, dependencies, and mitigation strategies remains difficult for financial institutions due to poor data quality, limited client capacity, and a lack of standardisation. Access to this client-specific data would enable financial institutions to base their assessments on precise, activity-level information from their portfolios, rather than depending on more general, sector-based global databases that do not capture local contexts or individual client efforts. However, financial institutions find it difficult to gather such precise information. This is partly because acquiring such data requires resource-intensive, in-depth engagement, and partly because many clients lack the capacity or incentive to provide it. Consequently, poor-quality client disclosures on nature represent a significant data gap. The pilot financial institutions reported that disclosures were often incomplete or inconsistent, particularly among SMEs and non-listed firms. The problem is further compounded by the absence of verification mechanisms and standardisation, as much of the data is self-reported and unverified.

5. Nature data from value chain

For firms, significant data gaps persist in value chain segments which are beyond their direct oversight. To date, the downstream part of firms' value chains has largely been excluded from assessments. However, Gamuda indicated that it could access downstream information, such as the water and energy consumption of building users,

through their utility bills. Regarding the upstream value chain, suppliers such as non-listed firms, SMEs, and palm oil smallholders often lack reliable environmental data and accurate information on facility location and size. In complex value chains involving multiple stakeholders – middlemen, traders, suppliers, customers, smallholders – data is fragmented, disaggregated, and varies in quality. While multinational suppliers, especially those operating in regions with strict environmental regulations like Europe, may provide more robust data, it is often completely missing for other suppliers, particularly local SMEs. Emerging tools, like the recently developed WHISP Ground app for palm oil plantation locations (Box 7), can help overcoming this challenge.

Example: Gamuda discovered that while information on emissions and resource use of suppliers can sometimes be found in their Life Cycle Assessment (LCA) and Environmental Product Declarations (EPDs), these are uncommon for Malaysian products. Furthermore, pollution data from suppliers is particularly difficult to obtain, but it is unclear if suppliers do not monitor it or are unwilling to share the information.

Example: Traceability within Company A's supply chain is complicated by a lack of formal registration and digitised land records for many third-party suppliers, especially smallholders.⁵⁷ This absence of clear demarcation for plot boundaries introduces significant legal and land ownership challenges.

BOX 7

WHISP

The open-source WHISP (What is in that Plot) solution, developed by FAO's Open Foris, is a digital tool for EU deforestation compliance, using geospatial analysis to monitor land use and minimise deforestation risks. WHISP can be used by palm oil companies and financial institutions with access to plantation location data to robustly and easily assess the risk of deforestation, as well as the evolution of land-use and ecosystem disturbances, on specific parcels.

Using a Convergence of Evidence approach, WHISP integrates multiple Earth Observation geospatial [datasets](#) to offer a reliable view of deforestation risks for specific land parcels. Dataset used are categorised into:

1. Forest and tree cover at the end of 2020
2. Deforestation before and after 2020
3. Crop plantations and agricultural uses
4. Conservation significance areas

The tool performs zonal statistics to analyse the evolution of the land cover, before or after 2020 (the cut-off date within the EU Deforestation Regulation), on the polygons provided by the user (Figure B7.1). Users can access WHISP in three different ways: via the [EarthMap](#) platform; an [API](#) (including a [QGIS plug-in](#)); or the [Ground](#) app. Depending on the tool, users can either manually draw polygons or upload GeoJSON files containing a list of polygons (more detail can be found [here](#)).

⁵⁷ Systems like the Sawit Intelligent Management System (SIMS), developed by the Malaysian Palm Oil Board (MPOB), aim to improve value-chain traceability and support better monitoring of sustainability-related information. See <https://sims.mpob.gov.my/about-sims/>

Figure B7.1

Screenshot of the Earth Map Platform: Application of the ‘Whisp – Supply chain due diligence’ analytics on a manually drawn parcel (in yellow)



Source: Screenshot from <https://whisp.earthmap.org/>.

II. Need for further methodological support

While a perceived lack of methodologies is often cited as a bottleneck, the primary challenges are rather a lack of awareness of existing frameworks and the need for clearer guidance on specific measurement and quantification techniques. Surveyed financial institutions and firms pointed to a ‘lack of methodologies’ as a major obstacle to conducting nature assessments. However, several comprehensive guidance documents are already available, most notably those developed by the TNFD. This suggests that the more pressing need is to raise awareness of these resources and provide practical training on their application. Despite this existing guidance, two key methodological gaps continue to hinder progress for both corporations and financial institutions: the need for clearer methodological guidance for i) constructing relevant metrics and ii) quantifying financial risk, which remain critical for advancing nature-related risk assessment and disclosure.

1. Methodological guidance for building relevant metrics

Despite the availability of frameworks like the TNFD, both financial institutions and firms require more specific guidance and support to translate raw data into meaningful, comparable, and decision-useful metrics for nature-related risks. A primary challenge is structuring and converting existing data – such as data from project-specific EIAs – into the firm-wide perspective required for comprehensive disclosure, a significant aggregation task that demands additional training. Financial institutions and firms also face persistent uncertainty around which metrics

to prioritise for monitoring and disclosure. For example, while the TNFD sector guidance is detailed, its large set of proposed indicators can be difficult to navigate, and it primarily focuses on a firm’s impacts on nature, leaving the metrics needed to assess physical risks underdeveloped. Likewise, frameworks like the CCPT GP3 offer only limited support by treating nature primarily under a ‘do no significant harm to the environment’ principle, rather than providing granular, sector-relevant metrics.

2. Methodological guidance for quantifying financial risks

Both financial institutions and firms face major challenges in converting impacts and dependencies into quantified economic and financial risks. To date, most assessments have remained at exposure level, while actual economic and financial risk assessments have remained qualitative. Transitioning to a quantified approach is complicated by several factors: limited data (e.g. revenue by location, as noted above), the absence of scenarios to identify the most likely nature-related shocks for countries and sectors, and the lack of methodological guidance to help firms assess their vulnerability to these scenarios. Firms may face a decrease in ecosystem services under a given risk scenario, but they may not be vulnerable if they can adapt, for instance, by finding a substitute for the affected resource. Therefore, it is crucial for firms to evaluate their ability to adapt technically, economically, and financially if nature-related risks occur.

“Finding good examples of financial risk quantification is a challenge for nature-related issues. For heatwaves, drought and carbon tax, I have a sense of how to do it.”

- Senior sustainability executive, multinational firm

The absence of readily available, tailored scenarios for the Malaysian context⁵⁸ makes it particularly difficult to assess the potential economic and financial

consequences of nature-related impacts. To advance their risk assessments, financial institutions and firms need access to practical and commonly agreed-upon scenarios – whether global, industry, or sectoral – that can translate nature loss or transition risks into quantifiable financial outcomes. Without this quantification, nature-related risks may appear to have low materiality and be deprioritised, despite growing evidence to the contrary (TNFD, 2025b). For instance, the corporate survey indicates that many firms consider nature only indirectly material – particularly those in the service sector. Among firms not planning an assessment, more than half cite low relevance as the main reason.

III. Capacity and resource constraints

Significant capability and capacity constraints also hinder progress, as assessing complex nature-related risks requires mobilising substantial and often costly resources. Pilot financial institutions highlighted a lack of specialised knowledge and technical expertise on nature risk within the financial sector. Expertise in specific ecosystems is difficult to source locally and can be expensive, with even large consultancies still developing their TNFD-specific capabilities. This challenge is mirrored on the firm side: among surveyed PLCs not planning an assessment, 63% cite limited internal expertise and 58% cite resource constraints as key deterrents. Dedicated staffing is scarce – about 40% of surveyed corporates had no dedicated staff for nature-related work in the past year, and most others had only one to two full time equivalents (FTEs), typically within broader ESG roles.

The high cost of data can also pose a significant barrier to conducting detailed nature-related risk assessments. Some high-quality geospatial data products are prohibitively expensive. This lack of capacity and the need for costly new resources affect even the advanced pilot firms assessed in this report; hence these obstacles are likely to be even more pronounced for other large firms less familiar with nature-related issues, and SMEs.

“Some data is quite costly...our business operate in ringgit, but data providers charge in USD. Some datasets use European-developed software, which adds cost. That is not a healthy situation.”

- Head of corporate sustainability, consumer products and services firm

IV. Lack of clear regulatory expectations

The lack of clear national regulatory guidance is a primary barrier often cited by both financial institutions and firms to prevent them from advancing their nature-related risk assessments. A significant majority of surveyed financial institutions – 81% – identified the absence of regulatory requirements as a key limitation to conducting and disclosing nature-related risks. This sentiment is mirrored in the corporate sector, where 69% of firms cited unclear guidance as a major issue, highlighting a widespread need for a clear and incentivising policy framework (Figure 6.1).

Some financial institutions and firms call for standardised guidance and mandatory nature disclosure, which can help create a level playing field, raise awareness and improve reporting quality. It would ensure that all firms face the same compliance costs, eliminating the current imbalance where proactive firms incur expenses that

others avoid. Mandatory disclosure would also raise awareness and strengthen the perceived weak business case for addressing nature-related risks, a critical step given that over 70% of surveyed financial institutions report their clients express little to no concern about these issues. Furthermore, establishing regulatory and supervisory sector-level standards or benchmarks would enhance the consistency, reliability, and comparability of data and reporting across the board.

Example: Pilot financial institutions were able to share deeper insights based on higher quality data in the more environmentally regulated palm oil sectors arising from the commonly applied MSPO and RSPO standards in Malaysia.

⁵⁸ Although some scenarios are beginning to emerge for assessing financial risks in the Malaysian palm oil sector (see CISL, 2025).

Mandatory disclosure on specific aspects of nature would elevate nature-related risks and opportunities to a level of priority comparable to climate – particularly relevant given the deep interconnection between the two and their associated risks. Currently, some financial institutions note that their clients' immediate priority is preparing for upcoming sustainability and climate-related disclosures (in line with IFRS S1 and S2, incorporated within the Malaysian NSRF)⁵⁹, leaving nature-related risks and opportunities as a relevant consideration only where considered financially material by the firm.

For nature-related disclosure to be effective, requirements need to be proportionate to an organisation's risk materiality, size, and capacity. While some financial institutions and firms favour mandatory

disclosure, many are still in the early stages of integrating nature considerations into their risk frameworks – a challenge compounded by growing reporting load. A phased and proportionate approach, with particular consideration for SMEs, is therefore seen as more likely to produce practical and meaningful outcomes. At the same time, exploring material impacts and risks remains relevant for all entities, regardless of scale, as a foundation for long-term business sustainability.

“We are spending so many resources on reporting that we are not actually reducing our impacts or working with our suppliers to reduce their nature risk.”

- Senior sustainability executive, multinational firm



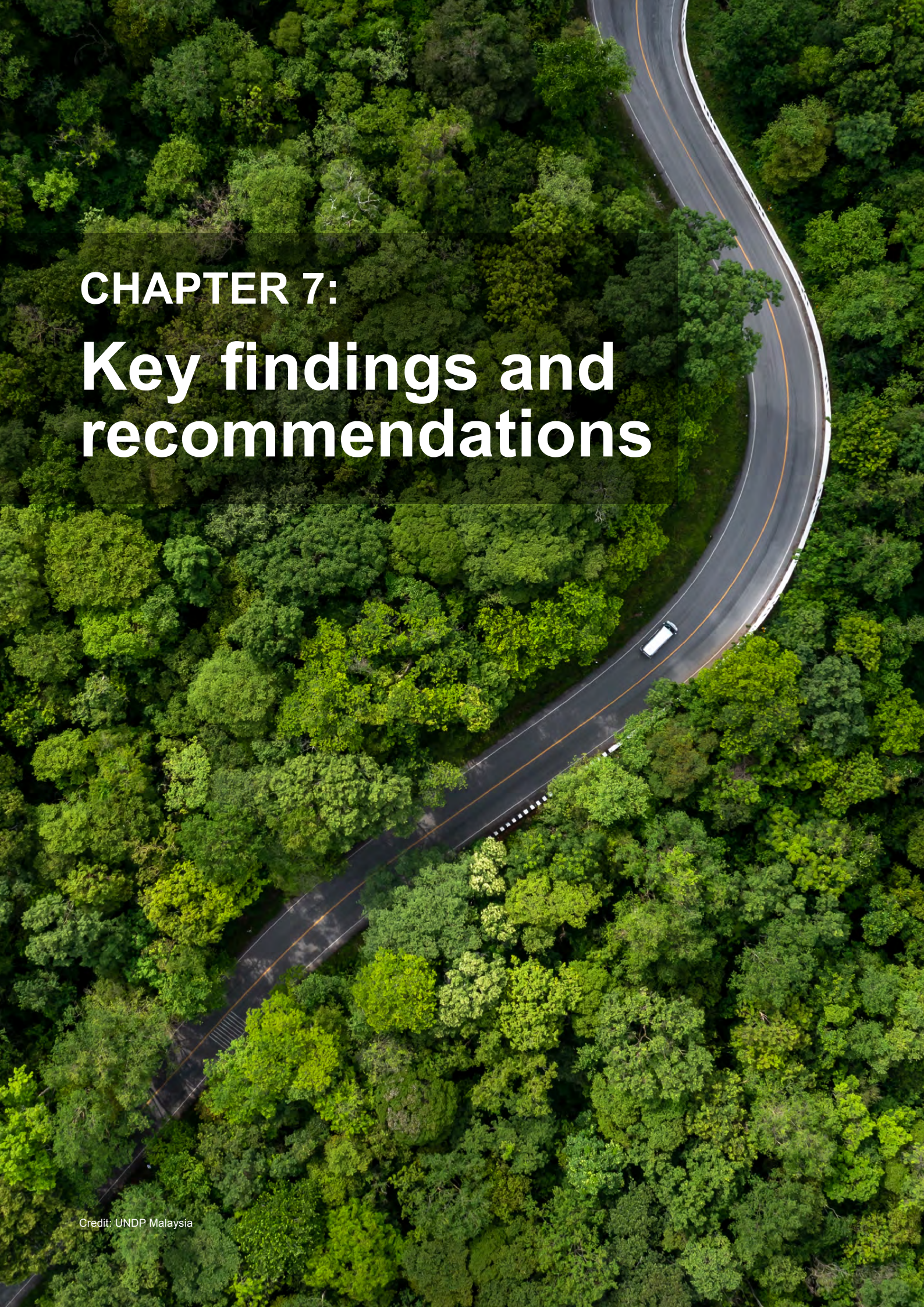
Credit: UNDP Malaysia

⁵⁹ As outlined above, [the IFRS recently stated](#) that it plans to issue a Practice Statement, building upon the TNFD framework. This Practice Statement would complement IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures, without changing the requirements in the Standards.

PART III:

Ways forward



An aerial photograph of a two-lane asphalt road that curves through a dense, lush green forest. The road has yellow center and edge lines. A white car is visible on the road, moving away from the viewer. The forest is thick with various shades of green trees.

CHAPTER 7:

Key findings and recommendations

Nature loss poses a significant and material risk to the Malaysian economy and its financial system, making the effective management of these risks by financial institutions and firms a critical priority for long-term sustainable development in Malaysia. At the same time, opportunities arising from nature-positive actions remain an unexplored avenue for several institutions. A key starting point for exploring these considerations is the robust assessment and disclosure of nature-related DIROs, for which global frameworks like the TNFD provide a structured approach. This report assessed the utilisation

of such frameworks in the Malaysian context, drawing on direct engagement with market participants through surveys, interviews, and pilot applications of the TNFD LEAP approach to understand current practices, challenges, and opportunities for improvement in nature-related risk assessments and disclosures. While grounded in Malaysia's context, the insights from this report may also be relevant for other jurisdictions that intend to deepen their understanding of nature-related risks and opportunities and formulate effective policy responses.

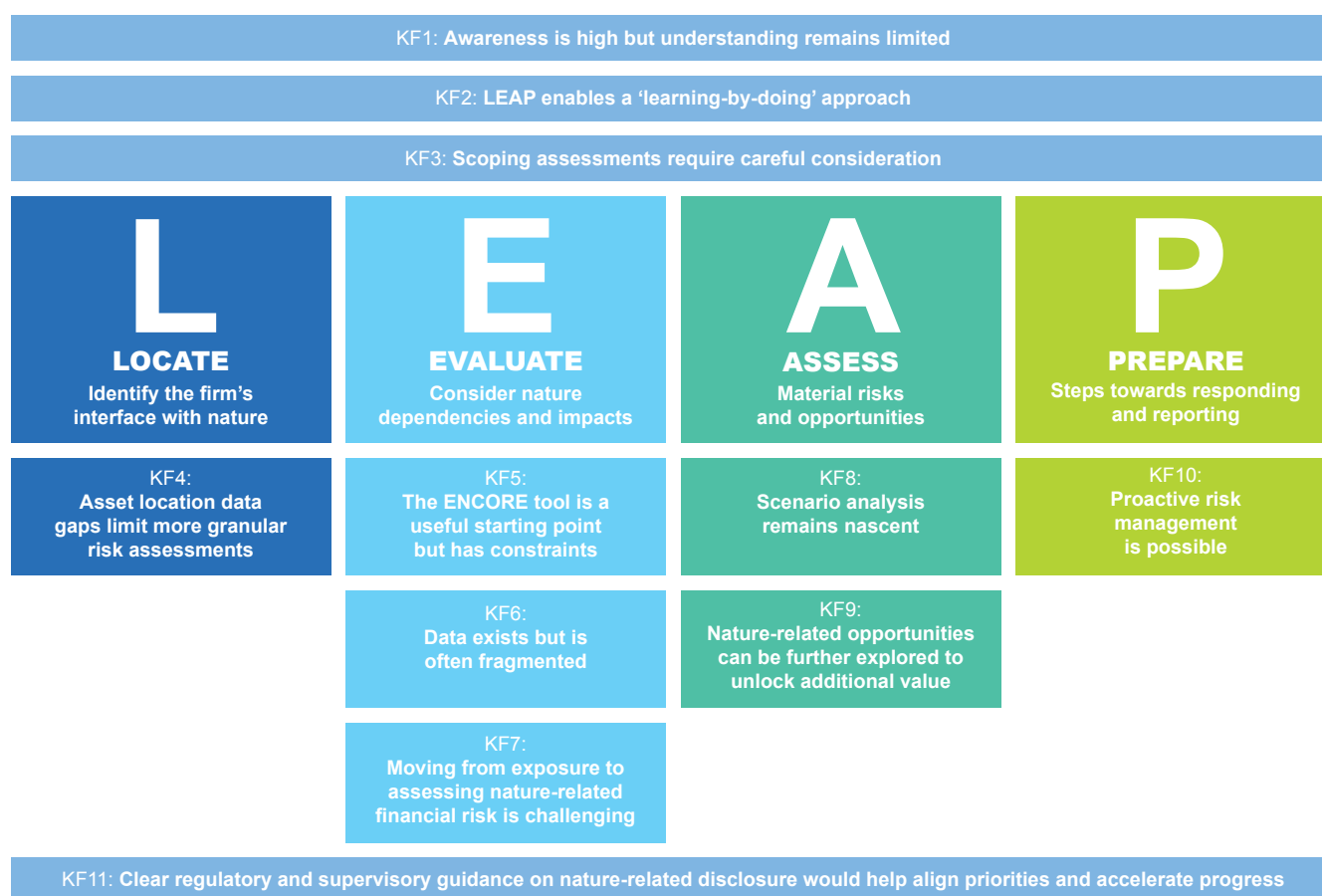
I. Summary of Key Findings

The analysis yielded eleven key findings (KF) that highlight the current state of nature-related risk management in Malaysia. These findings are structured

below according to the LEAP approach to provide a clear understanding of the challenges and learnings at each stage of the assessment and disclosure process (Figure 7.1).

Figure 7.1

Key Findings (KF) structured following the LEAP approach



Source: Authors

KF1: Awareness is high but deeper understanding remains limited

While awareness of nature-related DIROs is growing among Malaysian financial institutions and firms, many are still in the early stages of comprehending the full implications for their business or portfolios. A gap persists in the ability to report on nature, with capabilities varying widely across sectors and firm types. Larger, internationally-focused financial institutions and firms are more advanced in assessing and disclosing nature-related risks, driven by investor and customer expectations. In contrast, service-sector and domestically-oriented firms tend to be less advanced, often perceiving nature as less relevant to their operations.

KF2: LEAP enables a ‘learning-by-doing’ approach

Adopting a ‘learn-by-doing’ approach is crucial for managing nature-related risks and the iterative design of the LEAP approach specifically facilitates this. The LEAP process is not a rigid, one-time assessment but a continuous learning loop, allowing financial institutions and firms to deepen their understanding and refine their strategies over time. The process of conducting a LEAP assessment itself builds corporate capacity and helps firms recognise the materiality of these risks, even when data is incomplete. For more advanced institutions with existing risk management processes, the LEAP approach serves as a valuable validation and structuring tool, helping organisations identify appropriate starting points, prioritise key locations and activities, and progressively enhance their nature related risk assessments.

KF3: Scoping assessments require careful consideration

Determining the scope of a nature-related risk analysis can be challenging, especially for firms with intricate supply chains. A pragmatic first step can be to scope the analysis to specific activities to build capacity and learn from such a pilot exercise. However, a firm-wide evaluation that includes both upstream (suppliers) and downstream (customers, distributors) activities is necessary to gain a complete strategic overview and conduct a comprehensive DIROs assessment. Yet, it is significantly more data- and resource-intensive and complex. Large firms with diverse and overlapping business lines face the additional challenge of identifying the most critical components of their value chain to prioritise for this analysis. It is therefore critical at this stage to obtain internal buy-in and identify the necessary resources commensurate to the scope of the assessment.

LOCATE**KF4: Asset location data gaps limit more granular risk assessments**

The absence of location data for many financial assets creates a critical blind spot in financial institutions’ risk assessments. Firms often struggle to assign revenue streams to their various business locations. Until recently, financial institutions have rarely collected systematic location data for the assets they finance, creating significant blind spots in their risk assessments. Starting December 2023, participating financial institutions are required to provide address-level asset location data for loan utilisations and physical collateral as part of reporting to BNM under CCRIS, increasing financial institutions’ awareness and data pool on asset location information. Pilot financial institutions also show an increasing awareness of the criticality of granular, geolocated asset data for accurate nature-related risk assessment. Nevertheless, financial institutions are still rarely able to obtain information on a client’s profit share derived from each location, as even firms struggle to estimate this and seldom share this granular data with their financiers. Consequently, current practices often default to using firm headquarters or point locations as a proxy, a method that fails to capture the true geographic footprint of assets and their associated revenue streams.

EVALUATE**KF5: The ENCORE tool is a useful starting point but has constraints**

While the ENCORE tool is a valuable starting point for assessing nature-related impacts, its constraints necessitate incorporating the country-specific context of Malaysia. ENCORE’s key drawbacks include a lack of geographical specificity – assuming uniform ecosystem pressures globally – and limited sector granularity, with gaps in areas such as palm oil. Furthermore, the tool does not directly translate high dependency into high financial risk; this requires further analysis of an ecosystem’s degradation likelihood and a firm’s vulnerability. Therefore, to be effective in the Malaysian context, companies and financial institutions should use ENCORE as an initial screening tool. It is then important to enrich their analysis with additional data from firm disclosures, Malaysia-specific geospatial information, and expert consultations to achieve a more accurate understanding of nature-related risks.

KF6: Data exists but is often fragmented

The main challenge in nature-related risk assessment lies in effectively using existing data, not in a lack of data itself. Many firms already gather relevant information to comply with regulations, such as EIAs, or to meet certification standards like the MSPO. The primary obstacle is the difficulty of consolidating, standardising, and enhancing this information for risk assessment purposes.

Several barriers hinder the effective use of this data. First, aggregating information from disparate internal departments, clients, and supply chains can be cumbersome. Even when the necessary information is available, a ‘language barrier’ frequently separates sustainability, risk and operational departments. While sustainability experts understand what needs to be disclosed, on-site personnel like engineers – who possess the raw data – may not be familiar with the specialised terminology or the overall goal of the assessment. Second, critical data types, like pollution metrics, remain significantly underreported or lack granularity, requiring targeted efforts to improve their collection and coverage.

KF7: Moving from exposure to assessing nature-related financial risk is challenging

Translating exposure data into specific financial risk metrics remains a significant challenge for financial institutions and firms. While tools like WWF Water Risk Filter can help assess the nature-related exposure of specific business or asset locations, moving from this general understanding to a concrete quantification of financial risk is challenging. The TNFD provides some sector-specific guidance on this,⁶⁰ but many companies are either unaware of it or find it too complex to implement effectively. A key difficulty is understanding the complete risk picture, which requires integrating three distinct types of information: the firm’s operational data (e.g. high water usage), the local ecosystem’s condition (e.g. declining freshwater availability), and the operation’s vulnerability to environmental changes (e.g. how a water shortage would impact production). This makes it difficult to determine the value of assets, liabilities, or revenues that are vulnerable to nature-related risks, as asked for in TNFD core global disclosure metrics C7.0 and C7.1 (TNFD, 2023b, Annex 1). As such, financial institutions and firms require more direct, practical support to effectively translate raw data into meaningful risk metrics and actions.

ASSESS**KF8: Scenario analysis remains nascent**

The absence of forward-looking scenarios for nature-related risks presents another challenge to quantifying potential economic and financial consequences for financial institutions and firms. Although a few leading financial institutions in Malaysia are beginning to develop their own sector-level scenarios, and global bodies like the NGFS are working on standardised nature-related scenarios, there is currently no readily available equivalent for the broader set of nature-related risks. Just as with climate analysis, standardised nature-related risk scenarios would establish a common reference point. This would enable individual financial institutions and firms to subsequently develop more bespoke scenarios that are directly applicable to their unique operational environments. Yet, the lack of such off-the-shelf, scientifically-grounded scenarios means that most financial institutions and firms need to rely on qualitative assessments, leaving a significant blind spot in their ability to conduct forward-looking quantitative stress testing and truly understand their financial vulnerability to nature-related shocks, which are expected to become more severe in the years to come.

KF9: Nature-related opportunities can be further explored to unlock additional value

Most financial institutions and firms are still in the early stages of identifying and capitalising on nature-related opportunities. While a few pilot financial institutions have begun to explore tangible financing opportunities – particularly in sectors with established sustainability frameworks like palm oil – a broader understanding remains limited. Some financial institutions are starting to look beyond traditional business to finance emerging areas such as the circular economy, nature-based solutions, and ecological offsets. Similarly, pilot companies have identified that improving resource efficiency not only enhances their sustainability performance but also reduces operational costs, revealing a clear business case for investing in nature-positive practices. Yet, most firms still struggle to understand opportunities for their business operations arising from nature investments.

⁶⁰ See https://tnfd.global/tnfd-publications/?_sft_framework-categories=additional-guidance-by-sector#search-filter

PREPARE

KF10: Proactive risk management is possible

Leading organisations prove that meaningful action is possible, even without perfect data or fully developed metrics. For instance, FI A has begun piloting nature-related assessments into its risk acceptance criteria for priority sectors, while the construction firm Gamuda has actively changed its supply chain to mitigate identified nature impacts. These examples show that financial institutions and firms can start with available information and improve their approach as they learn. However, such proactive measures are not yet widespread.

KF11: Clear regulatory and supervisory guidance on nature-related disclosure would help align priorities and accelerate progress

The absence of detailed regulation and clear supervisory guidance and expectations on nature-related disclosure poses a barrier to building capacity and effective risk management. Clear national standards and supervisory expectations can help financial institutions and firms to prioritise actions and allocate the necessary resources for robust nature-related risk assessment and reporting.

II. Recommendations

Based on the key findings identified in this report, this section provides a set of targeted recommendations, outlined in Table 7.1. These recommendations are specifically tailored for key stakeholder groups – including financial institutions, firms, and public sector entities – and outline clear, actionable steps to accelerate progress

on nature-related risk assessment and disclosure across Malaysia. By addressing the specific challenges and opportunities highlighted in this report, these actions are designed to build capacity, improve data quality, and foster a more robust and transparent approach to managing nature-related risks.

Table 7.1

Recommendations for strengthening nature-related risk assessment and disclosure

Stakeholders	Recommendations
Financial institutions	1: Start now to build capacity over time
	2: Actively contribute to closing nature-related data gaps
	3: Integrate nature-related risk assessment into risk management and strategy over time
	4: Unlock commercial value by strategically investing in and financing nature-positive outcomes
Firms	1: Move from general awareness to building capacity
	2: Start by using and contributing to sector-specific guidance
	3: Build a pragmatic data plan by starting with existing information
	4: Engage investors, suppliers and clients as partners and disclose proportionately
	5: Leverage existing climate/ESG disclosure and broaden scope to nature
	6: Identify profitable business models to drive nature-positive outcomes
Public sector entities	1: Raise awareness and offer hands-on training
	2: Make nature data accessible, affordable and easily usable for financial risk assessment
	3: Integrate nature into the Malaysian taxonomy
	4: Expand mandate of JC3 to mainstream nature
	5: Strengthen guidance on nature-related risk for the financial sector
	6: Support the development of innovative financing instruments for nature
	7: Establish a clear path toward mandatory disclosure
	8: Develop Malaysian economic sector-specific nature risk guidelines for firms

Source: Authors



Credit: World Bank Group

A. Recommendations for financial institutions

Recommendation 1:

Start now to build capacity over time

Financial institutions could start integrating nature-related considerations into their risk management and reporting processes. Financial institutions can leverage their experience with climate risk to address nature-related risks, as both share common elements like the need for asset location data. The TNFD's ongoing collaboration with the ISSB and its potential for future alignment with standards like the NSRF underscore its emerging importance. Proactive adoption of the TNFD framework will position financial institutions advantageously for potential regulatory requirements, foster the development of internal capabilities, and fortify their capacity to manage nature-related risks and opportunities effectively. Pilot initiatives have validated TNFD as a useful framework in this regard.

Recommendation 2:

Actively contribute to closing nature-related data gaps

Financial institutions have a crucial role to play in addressing the data gaps that currently hinder robust nature-related risk assessments. This requires a multi-faceted approach focused on enhancing data collection and client engagement.

- **Prioritise granular location data collection:** A good starting point for financial institutions would be to focus on collecting precise location data for the parts of their portfolios with the highest nature-related impacts or dependencies. Instead of using a firm's headquarters as a proxy, it is important to gather exact asset coordinates and link revenue streams to specific sites. This is essential for accurately estimating the financial impact of localised, nature-related disruptions.
- **Engage proactively with clients:** Financial institutions are advised to directly engage with clients in high-risk sectors and locations to understand their specific nature-related dependencies and impacts. This dialogue, which should be proportional to the client's size (with careful consideration for the more limited capacities of SMEs), can be structured around existing standards like MSPO. This engagement helps build awareness and gather crucial data on operational practices and risk mitigation efforts that are not available in standard disclosures.
- **Systematically analyse client disclosures:** Financial institutions could also review client annual and sustainability reports for valuable, though often unstructured, information on nature-related issues. Using specialised databases such as SPOTT (see Box 4) and AI tools like AskNature (see Box 5) can help efficiently screen this information, contributing to a broader, sector-wide understanding of nature-related risks.

Recommendation 3:

Integrate nature-related risk assessment into risk management and strategy over time

Over time, financial institutions could build on their DIROs assessment to embed nature-related considerations into their core risk management and strategic planning. Even with incomplete nature-related data and risk assessments, financial institutions can start with available information to refine strategic planning and decision making across the organisation. Over time, institutions should use scenario analysis to stress test their portfolios against severe but plausible nature-related impacts, such as ecosystem degradation or new regulations. For instance, when assessing investments in the palm oil sector, institutions can leverage existing resources like the CISE (2025) scenarios as a practical starting point. As more standardised scenarios from groups like the NGFS become available, they could also be adopted.

Recommendation 4:

Unlock commercial value by strategically investing in and financing nature-positive outcomes

The most valuable opportunities for financial institutions are those where ecological benefits and financial returns intersect. These areas can unlock new markets, diversify revenue streams, enhance brand reputation, and secure long-term, sustainable benefits. High-potential areas include the circular economy and sustainable resource use. To capture this value, institutions would need to develop innovative financial solutions, such as sustainability-linked loans with nature-specific criteria, blended finance structures that de-risk private capital, and bespoke solutions for clients leading the transition. For example, the TNFD Discussion Paper on Nature-Related Opportunities provides a comprehensive stock take of case studies of financial innovation for nature examples of blue bonds, sustainability-linked loans in the agricultural sector, nature-related investment funds, biodiversity approaches to venture capital transactions, and innovative insurance products for wildlife conservation.⁶¹ See also Box 2 for more details on nature-related opportunities in the context of Malaysia.

61 <https://tnfd.global/publication/discussion-paper-on-nature-related-opportunities/>

B. Recommendations for firms

Recommendation 1:

Move from general awareness to building capacity for nature-related DIROs

Firms should move beyond awareness to actively assess and disclose nature-related risk and opportunities.

While most firms recognise the importance of nature, they struggle to translate this understanding into action. A key challenge is the internal ‘language barrier’ between sustainability teams, who understand reporting requirements, and operational staff, who hold the data but often lack context – hindering effective use of information. To overcome this, firms could conduct internal workshops to build capacity and create a shared understanding (potentially also with support from public sector entities, see recommendation below). Furthermore, beginning the assessment process (see Recommendation 2), even with incomplete data, is a practical step that builds momentum and internal capability for more robust reporting in the future. Smaller, non-listed firms can apply the LEAP approach proportionately, calibrating the depth of analysis to their available resources, data, and capacity. Regardless of scale, however, exploring material nature-related impacts and risks remains relevant for all entities as a foundation for long-term business sustainability.

Recommendation 2:

Start by using and contributing to sector-specific guidance

Firms could initiate their nature-related DIROs by utilising established international resources, particularly the TNFD’s sector guidance⁶² and case study library, to map their DIROs. While Malaysia-specific guidance is lacking, companies can start by applying the TNFD’s existing guidance for 16 sectors and adapting their current climate risk assessment processes to also address nature (see Recommendation 5). To address the local context gap, it is crucial for firms to also engage proactively with regulators, industry bodies, and researchers to help develop and shape Malaysia-specific sectoral guidance (see Recommendation 8 for public sector entities).

Recommendation 3:

Build a pragmatic data plan by starting with existing information

Firms could adopt a step-by-step approach to data assembly. Based on the findings in this report, there is a common misconception among firms that nature-related data is unavailable. To address this and leverage already existing data sources, firms could begin by inventorying internal resources such as EIAs, International Organization

for Standardization (ISO) certifications, utility records, and procurement data. This can be supplemented by publicly available datasets from recognised sources like the WRI Aqueduct, Global Forest Watch, the WWF Biodiversity Risk Filter, or the FAO’s WHISP tool (see Box 7), which can be found through resources like the JC3 Climate Data Catalogue and the TNFD’s resource hub. For more specific insights, firms can also engage priority suppliers for location data and partner with local universities or NGOs. Crucially, documenting all data sources and assumptions is essential to prepare for future assurances.

Recommendation 4:

Engage investors, suppliers and clients as partners and disclose proportionately

Firms could proactively engage investors, suppliers, and key clients to identify shared nature-related priorities and collaborate on gathering data across the value chain. This stakeholder feedback is essential for aligning near-term Key Performance Indicators (KPIs) and disclosures with market demands such as sustainable palm oil. Adhering to the principle of proportionality, firms could focus initial disclosures on the most material issues where credible data is available. Disclosure must be transparent on the scope, methods, and limitations of the metrics used. Crucially, firms would also need to publish a timeline detailing their plan to enhance their metrics over time, particularly by integrating data from upstream suppliers and downstream clients. This approach firmly positions their nature strategy as a forward-looking driver of growth and resilience, not merely a compliance exercise.

Recommendation 5:

Leverage existing climate disclosures and broaden scope to nature

Firms could leverage their existing governance, risk, and reporting structures for climate or ESG (e.g. IFRS S1 and S2, Enterprise Risk Management (ERM)) as the backbone for their nature-related disclosures. A strategic starting point is to incorporate nature into the current materiality assessment process and report relevant information under IFRS S1, adapting existing risk controls and governance roles, until additional guidance on nature is provided by ISSB. This involves extending current risk registers, controls, and roles to cover nature-related issues. This approach accelerates implementation, prevents redundant systems, and streamlines assurance. By acting now, firms can stay ahead of regulatory trends, such as the planned standardisations under development by ISSB – drawing from TNFD, and potential future national standards (NSRF).

⁶² TNFD sector guidance covers by now over 50% of Sustainable Industry Classification System (SICS) industries.

Recommendation 6: Identify profitable business models to drive nature-positive outcomes

Firms could also actively seek commercial opportunities that generate both financial returns and positive nature outcomes.⁶³ By innovating and developing new business models, products, and services, firms can create new revenue streams while addressing nature loss. To capitalise on these opportunities, firms can embed nature-positive criteria into their product design, pursue green certifications that command premium pricing, and explore markets for ecosystem services like carbon and biodiversity credits or water quality improvements. Financial institutions could support this by offering targeted financial products (see Recommendation 4 for financial institutions above). This strategic approach positions sustainability as a core driver of growth and profitability, attracting investment, enhancing brand reputation, and securing a long-term competitive advantage in a nature-conscious economy.

C. Recommendations for public sector entities

Recommendation 1: Raise awareness and offer hands-on training

To effectively integrate nature-related considerations into business practices, public sector entities can develop and promote comprehensive training programs. International organisations can provide guidance and support on best practices and technical content, while national training institutions and regulators can explore opportunities for long-term training institutionalisation to increase accessibility and reach wider audiences. For instance, the UNDP BIOFIN programme is supporting training development and delivery across 13 developing countries in collaboration with national partners.

While public seminars can raise general awareness, firms have expressed a clear need for practical, case-based learning. These advanced training sessions can be designed to provide clear, step-by-step guidance on collecting and analysing relevant data and connecting these findings to financial decision-making. To ensure these insights are validated and embedded across the organisation, this capacity-building would need to extend beyond sustainability teams to include finance and technical departments, integrating these new metrics into core planning and risk management processes.

Recommendation 2: Make nature data accessible, affordable and easily usable for financial risk assessment

Public sector entities should gather all available nature-related data and tools on a single, open-access platform, accompanied by clear, practical guidance on how to use it.

Currently, financial institutions face a fragmented landscape of global tools, such as the sector-specific SPOTT or the newer WHISP. A curated national platform could solve this by offering a comprehensive inventory of both global and local tools and datasets, complete with guidance on their respective strengths and applications. While the JC3 Climate Data Catalogue⁶⁴ provides a strong starting point, it could be improved by incorporating more Malaysia-specific data (such as maps of water quality, coral reef health or coastal erosion in Malaysia, see Table 6.1), removing non-essential sources, and adding robust filtering capabilities to help users easily find the datasets relevant to their needs.

In parallel, public-sector entities could work to address shortcomings in Malaysian-produced nature-related data to ensure data is open, standardised, and usable for nature-related financial risk analysis. This information is often outdated, or contains significant gaps, limiting its use for financial risk assessment. Feedback could be collected from key stakeholder groups to identify these shortcomings and establish clear pathways for transforming existing datasets into practical, decision-useful tools for financial institutions and firms. This effort would enhance disclosure quality and comparability across institutions, increase confidence, and ensure that local data can be effectively leveraged for financial risk assessment.

Recommendation 3: Integrate nature into the Malaysia Taxonomy

To mobilise capital toward nature-positive outcomes and provide clarity for financial institutions, BNM and SC could integrate clear nature-related criteria into the national taxonomy for sustainable finance. Financial institutions have expressed strong interest in this, as it would create a consistent framework for identifying, financing, and reporting on nature-related investments. Both BNM and SC are already working to unify the Climate Change Principles-based Taxonomy (CCPT) for financial institutions and the Sustainable and Responsible Investment (SRI) Taxonomy for capital markets into a single Malaysia Taxonomy for Sustainable Finance. This unification presents a critical opportunity to embed nature at the core of the framework from the outset.

Recommendation 4: Expand mandate of JC3 to mainstream nature

A highly effective option would be to expand the mandate of the Joint Committee on Climate Change (JC3) to formally include nature. This would create a dedicated platform for structured dialogue on nature-related financial risks, mirroring the successful model already in place for climate. It would enhance coordination between BNM, SC and financial institutions on nature, facilitate peer-to-peer learning among financial institutions, and help align strategic direction across the industry.

⁶³ See for instance the *Multilateral Development Bank Common Nature Finance Taxonomy* or the *IFC Biodiversity Finance Reference Guide* for examples of projects and activities.

⁶⁴ <https://www.jc3malaysia.com/data-catalogue>



Recommendation 5: Strengthen guidance on nature-related risk for the financial sector

BNM could begin by issuing clear supervisory guidance for financial institutions to adopt a risk-based approach to identify, assess, and manage their exposure to nature-related risks. Initially, this can be achieved through principles-based guidance that encourages financial institutions to build internal capacity and integrate nature into their existing risk management and governance frameworks. Supervisors could start by conducting thematic reviews or surveys to gauge the sector's current level of preparedness and identify best practices. As both the industry and methodologies mature, this can evolve into more prescriptive regulations, such as setting expectations for stress testing and scenario analysis that incorporate severe but plausible nature-loss scenarios. This phased, risk-based approach would ensure that regulatory and supervisory actions are proportional and allow the market to develop the necessary capabilities without causing undue disruption.

Recommendation 6: Support the development of innovative financing instruments for nature

To bridge the significant financing gap for nature, regulators and public sector entities could catalyse the development of innovative financial instruments that unlock private capital. This can be achieved by promoting and scaling blended finance models, such as the Tiger Landscape Investment Facility (TLIF), which uses public funds to de-risk and incentivise private lending to nature-positive enterprises. Malaysia's development finance institutions, its investor base, and collaborative platforms like the Malaysia Climate Finance Innovation Lab (CFIL) can be leveraged to design and accelerate new solutions, including specialised funds and green or biodiversity bonds and sukuk with nature-focused covenants.

Recommendation 7: Establish a clear path towards mandatory disclosure

Public sector entities could take steps for the formal incorporation of nature-related risks into Malaysian reporting standards. As global standards and frameworks from the ISSB and the TNFD mature and converge, Malaysia could update its NSRF to include mandatory nature-related reporting and disclosure requirements. This move is supported by many financial institutions who favour mandatory guidance over voluntary approaches to reduce ambiguity and ensure a level playing field. Crucially, as emphasised by both financial institutions and firms, this

integration must follow a phased and gradual rollout – like the current implementation of climate-related standards – to give organisations sufficient time to adapt their systems, processes, and reporting capabilities for effective compliance.

Recommendation 8: Develop Malaysian economic sector-specific nature risk guidelines for firms

Relevant agencies and ministries could develop detailed, sector-specific risk maps and guidelines that address Malaysia's unique environmental and economic landscape in collaboration with industry stakeholders. Firms in Malaysia have consistently identified the need for sector-specific guidance as the most critical form of support for assessing nature-related risks. These can also be leveraged by financial institutions to facilitate risk assessments of their clients. High-exposure sectors can be prioritised, such as agriculture, forestry, fisheries, oil and gas, and construction, before expanding to others. Existing global resources, such as the TNFD additional sector guidance⁶⁵, can be used as a foundation to build Malaysia-specific guidelines.

Four components are crucial:

- 1. Detailed sector and sub-sector mapping:** Adapt and expand resources like ENCORE into a Malaysia-specific database that maps the distinct impacts and dependencies for each key sub-sector. This will provide a consistent, efficient foundation for risk screening for financial institutions and firms in Malaysia.
- 2. Provide prioritised and practical metrics:** Simplify the comprehensive TNFD metric list by pre-selecting priority indicators that align with Malaysia's national policies and data availability. Offer practical guidance through clear visuals like mind maps, sample reports, and data templates to demonstrate how companies can calculate these metrics.
- 3. Provide forward-looking scenarios:** Equip organisations to anticipate future challenges by developing practical, sector-specific scenario narratives. These tools should build on existing examples and integrate Malaysia's national biodiversity priorities, leveraging resources like the NGFS work on nature risk scenarios.
- 4. Offer simplified and proportional guidance for SMEs:** These should include simplified methodologies, recognising that SMEs have fewer resources for detailed assessments.

⁶⁵ [TNFD's Additional sector guidance – TNFD](#).

References

- Abram, N. K., Meijaard, E., Wells, J. A., Ancrenaz, M., Pellier, A.-S., Runting, R. K., Gaveau, D., Wich, S., Nardiyono, Tjiu, A., Nurcahyo, A., & Mengersen, K. (2014). Spatially explicit perceptions of ecosystem services and land cover change in forested regions of Borneo. *Ecosystem Services*, 7, 116–127. <https://doi.org/10.1016/j.ecoser.2013.11.004>
- Adhikari, S., & Ozarska, B. (2018). Minimizing environmental impacts of timber products through the production process “From Sawmill to Final Products”. *Environmental Systems Research*, 7(1), 6.
- Ahmad, A. L., Ismail, S., & Bhatia, S. (2003). Water recycling from palm oil mill effluent (POME) using membrane technology. *Desalination*, 157(1–3), 87–95.
- Bank Negara Malaysia (BNM). (2021). Climate Change and Principle-based Taxonomy. Bank Negara Malaysia. <https://www.bnm.gov.my/documents/20124/938039/Climate+Change+and+Principle-based+Taxonomy.pdf>
- Bank Negara Malaysia (BNM) and World Bank. (2022). An Exploration of Nature-Related Financial Risks in Malaysia. Kuala Lumpur. World Bank.
- Bank Negara Malaysia (BNM) & World Bank. (forthcoming). Future report.
- Bursa Malaysia. (2024). Bursa Carbon Exchange — Kuamut Auction Outcome. <https://www.bursamalaysia.com/>
- Cambridge Institute for Sustainability Leadership (CISL). (2025). Building Capacity to Identify and Assess Nature-Related Financial Risks. University of Cambridge Institute for Sustainability Leadership (CISL).
- Chaplin-Kramer, R. Sharp, R. P. Weil, C. Bennett, E. M. Pascual, U. Arkema, K. K. Brauman, K. A. Bryant, B. P. Guerry, A. D. Haddad, N. M. Hamann, M. Hamel, P. Johnson, J. A. Mandle, L. Pereira, H. M. Polasky, S. Ruckelshaus, M. Shaw, M. R. Silver, J. M. ... Daily, G. C. (2019). Global modelling of nature's contributions to people. *Science*, 366(6462), 255–258. <https://doi.org/10.1126/science.aaw3372>
- Chen, G., Li, X., Liu, X., Chen, Y., Liang, X., Leng, J., Xu, X., Liao, W., Qiu, Y., Wu, Q., & Huang, K. (2020). Global projections of future urban land expansion under shared socioeconomic pathways. *Nature Communications*, 11(1), 537.
- CIMB. (2026). Banking on Nature: Advancing our Nature-Linked Journey (Version 1.1). CIMB Group Holdings Berhad.
- Clements, R. Sodhi, N. S. Schilthuizen, M. & Ng, P. K. L. (2006). Limestone Karsts of Southeast Asia: Imperiled Arks of Biodiversity. *BioScience*, 56(9), 733. [https://doi.org/10.1641/0006-3568\(2006\)56%255B733:LKOSAI%25D2.0.CO;2](https://doi.org/10.1641/0006-3568(2006)56%255B733:LKOSAI%25D2.0.CO;2)
- Colesanti Senni, C. Schimanski, T. Bingler, J. Ni, J. & Leippold, M. (2025). Using AI to assess corporate climate transition disclosures. *Environmental Research Communications*, 7(2), 021010. <https://doi.org/10.1088/2515-7620/ad9e88>
- Convention on Biological Diversity. (2022, December 19). Kunming-Montreal Global Biodiversity Framework. <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>
- Cook, P. A. (2018). Tropical peatlands and oil palm: Carbon stocks, emissions and policy implications. PhD Thesis, University of Leicester.
- Darmawan, B., Tanika, L., Mulia, R., & Sirait, M. (2017). Soil erosion and earthworm populations in oil palm landscapes. *Agroforestry Systems*, 91(5), 1009–1023.
- de Jonge, M. M. J., Benítez-López, A., Hennekens, S., Santini, L., Huijbregts, M. A. J., & Schipper, A. M. (2022). Conditional load of habitat fragmentation on biodiversity. *Conservation Biology*, 36(3), e13889.
- Department of Statistics Malaysia. (2025). Final External Trade Statistics 2025. https://www.dosm.gov.my/uploads/release-content/file_20250729105822.pdf
- Department of Statistics Malaysia (DOSM). (2025). Malaysian Economic Statistics Review, Vol. 4, 2025. Putrajaya: DOSM.
- Dhileepan, K. (1994). Variation in populations of the introduced pollinating weevil (*Elaeidobius kamerunicus*) and its impact on fruit set of oil palm in India. *Bulletin of Entomological Research*, 84(4), 477–485.
- Diaz, S. et al. (2015). The IPBES Conceptual Framework — connecting nature and people. *Current Opinion in Environmental Sustainability*. Volume 14. Pages 1-16, ISSN 1877-3435, <https://doi.org/10.1016/j.cosust.2014.11.002>.
- Dislich, C., Keyel, A. C., Salecker, J., Kisel, Y., Meyer, K. M., Auliya, M., Barnes, A. D., Corre, M. D., Darras, K., Faust, H., Hess, B., Klasen, S., Knohl, A., Kreft, H., Meijide, A., Nurdiansyah, F., Otten, F., Pe'er, G., ... Wiegand, K. (2017). A review of the ecosystem functions in oil palm plantations, using forests as a reference system. *Biological Reviews*, 92(3), 1539–1569.
- Dominati, E., Patterson, M., & Mackay, A. (2010). A framework for classifying and quantifying the natural capital and ecosystem services of soils. *Ecological Economics*, 69(9), 1858–1868.
- European Commission. (2023). Commission Delegated Regulation (EU) 2023/2772 supplementing Directive 2013/34/EU as regards sustainability reporting standards (ESRS). Official Journal of the European Union.

- European Financial Reporting Advisory Group (EFRAG). (2022). European Sustainability Reporting Standard 1 — General Requirements. European Financial Reporting Advisory Group.
- Famiglietti, J. S. (2014). The global groundwater crisis. *Nature Climate Change*, 4(11), 945–948.
- FAO. (2024, October). Fishery and Aquaculture Country Profiles—Malaysia Country Brief. <https://www.fao.org/fishery/en/facp/mys?lang=en>
- FAO, Intergovernmental Technical Panel on Soils (ITPS), Global Soil Biodiversity Initiative (GSBI), Secretariat of the Convention on Biological Diversity (SCBD), & EC. (2020). State of knowledge of soil biodiversity – Status, challenges and potentialities, Report 2020. Rome: FAO.
- FAO Open Foris. (2024). WHISP — What is in That Plot? Food and Agriculture Organisation of the United Nations. <https://openforis.org/solutions/whisp/>
- FAOSTAT. (2026). FAOSTAT Data: Area harvest for palm fruit oil production, Malaysia (2024). <https://www.fao.org/faostat/en/#data/QCL>
- Fargione, J., Hill, J., Tilman, D., Polasky, S., & Hawthorne, P. (2008). Land clearing and the biofuel carbon debt. *Science*, 319(5867), 1235–1238.
- Fold, N. & Whitfield, L. (2012). Developing a palm oil sector: The experiences of Malaysia and Ghana compared. Danish Institute for International Studies, DIIS Working Paper Vol. 2012 No. 08.
- Fowler, D., Nemitz, E., Misztal, P., Di Marco, C., Skiba, U., Ryder, J., Helfter, C., Cape, J. N., Owen, S., Dorsey, J., Gallagher, M. W., Coyle, M., Phillips, G., Davison, B., Langford, B., MacKenzie, R., Muller, J., Siong, J., Dari-Salisburgo, C., ... Hewitt, C. N. (2011). Effects of land use on surface–atmosphere exchanges of trace gases and energy in Borneo. *Philosophical Transactions of the Royal Society B*, 366(1582), 3196–3209.
- Gamuda Berhad. (2025). ESG Impact Report 2025. Cascading Value Regionally. https://gamuda.listedcompany.com/misc/esg_impact_report_2025.pdf
- Gaveau, D. L. A. Sheil, D. Husnayaen, Salim, M. A. Arjasakusuma, S. Ancrenaz, M. Pacheco, P. & Meijaard, E. (2016). Rapid conversions and avoided deforestation: Examining four decades of industrial plantation expansion in Borneo. *Scientific Reports*, 6(1), 32017. <https://doi.org/10.1038/srep32017>
- Gharibreza, M., Raj, J. K., Yusoff, I., Othman, Z., Tahir, W. Z. W. M., & Ashraf, M. A. (2013). Land use changes and soil redistribution estimation using ¹³⁷Cs in the tropical Bera Lake catchment, Malaysia. *Soil and Tillage Research*, 131, 1–10.
- Green Building Council Australia. (2024). Nature, Buildings and the Built Environment: A Practical Guide. Sydney: GBCA.
- Global Forest Watch. (2026). Malaysia country dashboard. World Resources Institute.
- Greathead, D. J. (1983). The multi-million dollar weevil that pollinates oil palms. *Antenna*, 7(3), 105–107.
- Haines-Young, R. & Potschin, M. (2018). Common International Classification of Ecosystem Services (CICES) V5.1 Guidance on the Application of the Revised Structure. Fabis Consulting.
- Harsono, S. S., Grundman, P., & Soebronto, S. (2014). Anaerobic treatment of palm oil mill effluents: Potential contribution to net energy yield and reduction of greenhouse gas emissions from biodiesel production. *Journal of Cleaner Production*, 64, 619–627.
- Hassett, K. A., Hubbard, R. G., & Mathur, A. (2025). The economic value of urban green space: A meta-analysis. *Journal of Urban Economics*, 138, 103612.
- IPBES (with Karki, M. Sellamuttu, S. S. Okayasu, S. & Suzuki, W.). (2018). The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) regional assessment report on biodiversity and ecosystem services for Asia and the Pacific. Zenodo. <https://doi.org/10.5281/ZENODO.3237373>
- IPCC. (2013). Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.
- Islam, M. A. Billah, M. M. Idris, M. H. Bhuiyan, M. K. A. & Kamal, A. H. M. (2024). Mangroves of Malaysia: A comprehensive review on ecosystem functions, services, restorations, and potential threats of climate change. *Hydrobiologia*, 851(8), 1841–1871. <https://doi.org/10.1007/s10750-023-05431-z>
- Johnson, J. A. Ruta, G. Baldos, U. Cervigni, R. Chonabayashi, S. Corong, E. Gavryliuk, O. Gerber, J. Hertel, T. Nootenboom, C. & Polasky, S. (2021). The Economic Case for Nature: A Global Earth-Economy Model to Assess Development Policy Pathways. World Bank. <https://openknowledge.worldbank.org/handle/10986/35882>
- Joint Committee on Climate Change. (2025). The JC3 Remains Committed to Advancing the Climate Agenda through Coordinated and Collaborative Efforts, 11 August. <https://www.jc3malaysia.com/news/the-jc3-remains-committed-to-advancing-the-climate-agenda-through-coordinated-and-collaborative-efforts>
- Klein, A.-M. Vaissière, B. E. Cane, J. H. Steffan-Dewenter, I. Cunningham, S. A. Kremen, C. & Tscharntke, T. (2007). Importance of pollinators in changing landscapes for world crops. *Proceedings of the Royal Society B: Biological Sciences*, 274(1608), 303–313. <https://doi.org/10.1098/rspb.2006.3721>
- Malaysia Biodiversity Centre. (n.d.). Malaysia Biodiversity Information System (MyBIS). <https://www.mybis.gov.my/>

- Mantel, S. K., Hughes, D. A., & Muller, N. W. J. (2007). Ecological impacts of small dams on South African rivers, Part 1: Drivers of change—Water quantity and quality. *Water SA*, 36(3), 351–360.
- Meijaard, E. Garcia-Ulloa, J. Sheil, D. Wich, S. A. Carlson, K. M. Juffe-Bignoli, D. & Brooks, T. M. (2018). Oil palm and biodiversity. A situation analysis by the IUCN Oil Palm Task Force. IUCN oil Palm Task Force. <https://doi.org/10.2305/IUCN.CH.2018.11.en>
- Millennium Ecosystem Assessment (Ed.). (2005). *Ecosystems and human well-being: Synthesis*. Island Press.
- Ministry of Energy and Natural Resources. (2019). Sixth National Report of Malaysia to the Convention on Biological Diversity. <https://www.mybis.gov.my/pb/4382>
- Ministry of Energy and Natural Resources. (2020). Malaysia REDD+ Finance Framework. Putrajaya: NRES.
- Ministry of Natural Resources and Environment. (2016). Malaysia National Policy on Biodiversity 2016-2025. [nres.gov.my/PustakaMedia/Penerbitan/NationalPolicyonBiologicalDiversity2016-2025.pdf#search=NationalPolicyonBiologicalDiversity](https://www.nres.gov.my/PustakaMedia/Penerbitan/NationalPolicyonBiologicalDiversity2016-2025.pdf#search=NationalPolicyonBiologicalDiversity)
- Ministry of Natural Resources, Environment and Climate Change. (2022). Malaysia National Policy on Biodiversity 2022-2030. [https://www.nres.gov.my/ms-my/pustakamedia/Penerbitan/NPBD%202022-2030%20\(Spread%20View\).pdf](https://www.nres.gov.my/ms-my/pustakamedia/Penerbitan/NPBD%202022-2030%20(Spread%20View).pdf)
- Mohammad Razi, M. A. Rahmat, S. N. Jamal, M. H. Tajul Baharuddin, M. F. Wang, M. & Husin, T. M. (2023). Evaluation of Mangroves Effectiveness in Strengthening Coastal Bund Using Geophysical Method (Non-Destructive Testing) at Tanjong Laboh, Batu Pahat, Johor. *International Journal of Integrated Engineering*, 15(6), 160–167.
- Montanarella, L. (2007). Trends in land degradation in Europe. In: *Climate and Land Degradation* (pp. 83–104). Springer.
- Murphy, D. J. (2021). The future of oil palm as a major global crop: Opportunities and challenges. *Journal of Oil Palm Research*, 33(3), 1–26.
- Murphy, J. T. Breeze, T. D. Willcox, B. Kavanagh, S. & Stout, J. C. (2022). Globalisation and pollinators: Pollinator declines are an economic threat to global food systems. *People and Nature*, 4(3), 773–785. <https://doi.org/10.1002/pan3.10314>
- NGFS. (2022, March 24). Statement on Nature-Related Financial Risks. https://www.ngfs.net/sites/default/files/medias/documents/statement_on_nature_related_financial_risks_-_final.pdf
- NGFS. (2024). Nature-related Financial Risks: A Conceptual Framework to guide Action by Central Banks and Supervisors. NGFS & INSPIRE. (2022). Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability. Final Report of the NGFS-INSPIRE Study Group on Biodiversity and Financial Stability [NGFS Occasional Paper]. https://www.ngfs.net/sites/default/files/medias/documents/central_banking_and_supervision_in_the_biosphere.pdf
- Paterson, R. R. M. (2020). Future climate effects on suitability for growth of oil palms in Malaysia and Indonesia. *Scientific Reports*, 10(1), 9776.
- Peng, S., Piao, S., Ciais, P., Friedlingstein, P., Ottle, C., Bréon, F.-M., Nan, H., Zhou, L., & Myneni, R. B. (2012). Surface urban heat island across 419 global big cities. *Environmental Science & Technology*, 46(2), 696–703.
- Priya, U. K., & Senthil, R. (2025). Urban green spaces and the urban heat island effect: A review. *Sustainable Cities and Society*, 112, 105612.
- Rahman, S., Khan, M. T., & Akib, S. (2019). Water consumption in the construction industry: A case study. *International Journal of Construction Management*, 19(2), 137–143.
- Rahutomo, S. (2016). Climate change and oil palm productivity in Indonesia. *Indonesian Journal of Agricultural Science*, 17(1), 21–28.
- Reef Check Malaysia. (2025). Status of Coral Reefs in Malaysia, 2024. <https://reefcheck.org.my/wp-content/uploads/2025/07/2024AnnualSurveyReport.pdf>
- Reijnders, L., & Huijbregts, M. A. J. (2008). Palm oil and the emission of carbon-based greenhouse gases. *Journal of Cleaner Production*, 16(4), 477–482.
- Rentier, E. S., & Cammeraat, L. H. (2022). The environmental impacts of river sand mining. *Science of the Total Environment*, 838, 155877.
- Saint-Gobain. (2022). *Water in Construction: Insights and Solutions*. Paris: Saint-Gobain Research and Innovation.
- Sarkar, M. S. K., Begum, R. A., & Pereira, J. J. (2020). Impacts of climate change on oil palm production in Malaysia. *Environmental Science and Pollution Research*, 27, 9760–9770.
- Securities Commission Malaysia. (2023). Guidelines on Sustainable and Responsible Investment Funds. <https://www.sc.com.my/api/documentms/download.ashx?id=1863d35d-9a34-4ccc-bf61-9f942b520b44>
- Securities Commission Malaysia. (2024). National Sustainability Reporting Framework. <https://www.sc.com.my/api/documentms/download.ashx?id=e98c3900-7b35-4cf5-a07d-fd17acf8734e>
- Seto, K. C., Sánchez-Rodríguez, R., & Fragkias, M. (2010). The new geography of contemporary urbanization and the environment. *Annual Review of Environment and Resources*, 35, 167–194.

- Seto, K. C., Güneralp, B., & Hutyra, L. R. (2012). Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools. *Proceedings of the National Academy of Sciences*, 109(40), 16083–16088.
- Simkin, R. D. Seto, K. C. McDonald, R. I. & Jetz, W. (2022). Biodiversity impacts and conservation implications of urban land expansion projected to 2050. *Proceedings of the National Academy of Sciences*, 119(12), e2117297119. <https://doi.org/10.1073/pnas.2117297119>
- SteelWatch. (2025). The State of Steel: Decarbonisation Pathways for the Global Steel Industry. SteelWatch.
- Tardieu, L., Hamel, P., & Viguié, V. (2025). Light pollution from real estate: A neglected nature-related impact. *Urban Sustainability*, 5, 12.
- Teo, T. M. (2015). Effectiveness of the oil palm pollinating weevil, *Elaeodobius kamerunicus*, in Malaysia. *Utar Agriculture Science Journal*, 1(4), 40–43.
- TNFD. (2023a). Guidance on the identification and assessment of nature-related issues—The TNFD LEAP approach v1—September 2023. <https://tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/?#publication-content>
- TNFD. (2023b). Recommendations of the Taskforce on Nature-related Financial Disclosures.
- TNFD. (2025a). Discussion paper on nature-related opportunities. <https://tnfd.global/publication/discussion-paper-on-nature-related-opportunities/#publication-content>
- TNFD. (2025b). Evidence review on the financial effects of nature-related risks. <https://tnfd.global/publication/evidence-financial-effects-of-nature-related-risks/>
- TNFD. (2025c). TNFD 2025 Status Report. September 2025. Taskforce on Nature-related Financial Disclosures (TNFD). https://tnfd.global/wp-content/uploads/2025/09/250918_TNFD-Status-Report_DIGITAL.pdf
- Tobias, M. M., Kremen, C., & Williams, N. M. (2018). Effects of urbanization on bee communities depend on dominance status. *Urban Ecosystems*, 21(1), 47–58.
- Tonks, A. J., Aplin, P., Beriro, D. J., Cooper, H., Evers, S., Vane, C. H., & Sjögersten, S. (2017). Impacts of conversion of tropical peat swamp forest to oil palm plantation on peat organic chemistry, physical properties and carbon stocks. *Geoderma*, 289, 36–45.
- UNDP BIOFIN Malaysia. (2018). Biodiversity Expenditure Review (BER) of Malaysia: Final report. https://www.biofin.org/sites/default/files/content/knowledge_products/Malaysia%20BER%20Report_21%20August%202018.pdf
- UNDP BIOFIN Malaysia. (2025). Corporate Survey on Malaysia's TNFD Readiness. UNDP Biodiversity Finance Initiative, Kuala Lumpur.
- UNDP BIOFIN Malaysia. (2026, forthcoming). Biodiversity Expenditure Review (BER) of Malaysia, 2nd edition. UNDP Biodiversity Finance Initiative, Kuala Lumpur.
- UNEP-WCMC and IUCN. (2025). Protected Planet: The World Database on Protected Areas (WDPA). <https://www.protectedplanet.net>
- USDA. (2016). Indonesia and Malaysia palm oil production: Adverse weather impacts. USDA Foreign Agricultural Service Commodity Intelligence Report, June 2016.
- USDA Foreign Agricultural Service. (2025). Oilseeds: World Markets and Trade (PS&D Online).
- United States Department of Agriculture (USDA) Foreign Agricultural Service. (2025). Palm Oil Production by Country (PS&D Online).
- Uwingabire, Z. & Gallai, N. (2024). Impacts of degraded pollination ecosystem services on global food security and nutrition. *Ecological Economics*, 217, 108068. <https://doi.org/10.1016/j.ecolecon.2023.108068>
- Wan, T. S. M. (2000). Use of barn owls (*Tyto alba*) for biological control of rodents in oil palm plantations. *Planter*, 76(894), 449–470.
- World Bank & Securities Commission Malaysia. (2024). Disclosure Assessment of Malaysia's Listed Companies and Recommendations for Policy Development. World Bank. <https://www.sc.com.my/api/documentms/download.ashx?id=f10ad514-1e79-4690-89d7-5683e441c907>
- World Economic Forum (WEF). (2024). Net-Zero Industry Tracker 2024 Edition: Cement Industry. World Economic Forum, Geneva.
- WWF-Malaysia. (2022). Status of Malayan Tigers. https://www.wwf.org.my/tiger_facts/status_of_malayan_tigers/



Annexes



Annex 1:

Report methodology

Three types of methods were involved that provided the results of this report: an ENCORE analysis of Malaysian banks' lending, surveys among financial institutions and firms on their nature-related risk and opportunities assessment and disclosure practices and LEAP pilot experiments. This section details each of them in sequence.

A. ENCORE assessment of Malaysian banks' lending

The analysis is based on Malaysian banks' commercial loan portfolios as of end-2024, using data provided by BNM. These loans total RM816 billion (approximately USD 183 billion) and are classified by lending sector according to the Malaysian Standard Industrial Classification (MSIC). Using this sectoral classification, the ENCORE database can then be applied to assess whether the loans are directed to sectors with high or very high dependencies on ecosystem services, or that exert high pressures on nature.

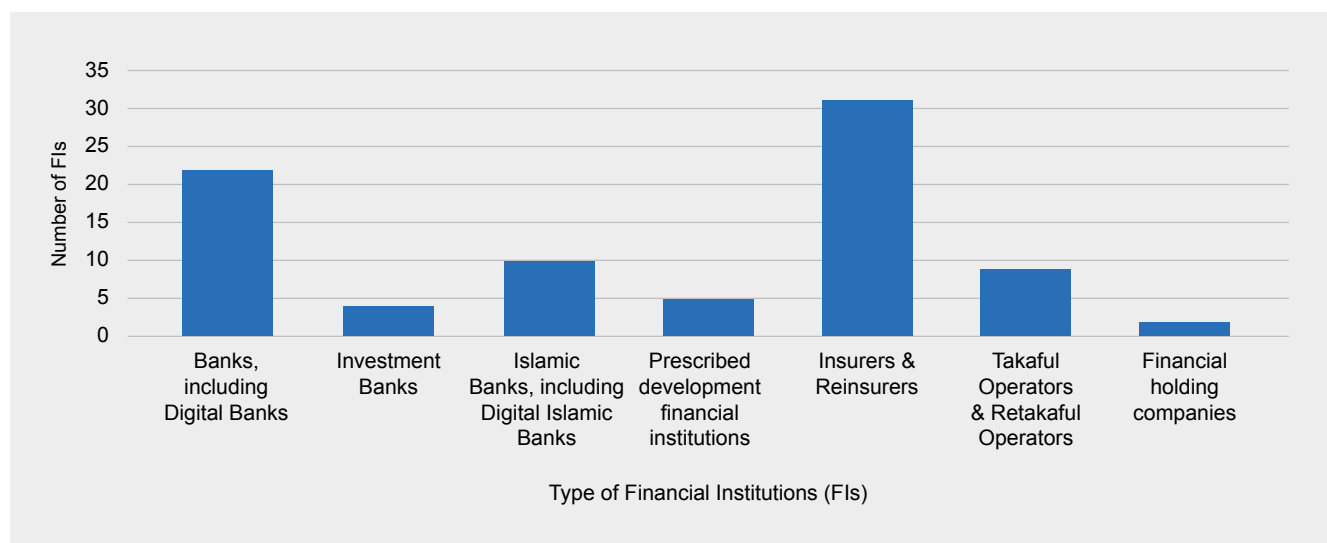
The ENCORE database (Exploring Natural Capital Opportunities, Risks and Exposure) is an open-access dataset that maps how a wide range of economic activities depend on and place pressures on nature through ecosystem services. It was developed by the Natural Capital Finance Alliance, a partnership led by Global Canopy, the UN Environment Program Finance Initiative (UNEP FI), and the UN Environment Program World Conservation Monitoring Centre (UNEP-WCMC). It was initially launched in 2018 and has been subject to updates since then. The platform supports sustainability practitioners, financial institutions, corporates and regulators in screening nature-related dependencies and pressures by linking hundreds of economic activities (now 271 distinct economic activities classified under the International Standard Industrial Classification (ISIC – very close to MSIC) in the latest version) to ecosystem services and environmental pressures.

For each economic activity, ENCORE records materiality scores that indicate the strength of potential dependencies on ecosystem services (such as water supply, pollination, climate regulation and cultural services) and pressures exerted on nature (such as land use change, pollution or resource extraction). The ecosystem services in the updated database align with the UN System of Environmental-Economic Accounting-Ecosystem Accounting (SEEA-EA) and comprise roughly 25 ecosystem services, expanding beyond earlier versions that used 21 services. ENCORE also documents a range of pressures reflecting key ways economic activities impact natural systems. These materiality ratings – ranging from Very Low to Very High – provide a standardised, high-level basis for comparing how different sectors interact with natural capital, enabling top-down identification of potential nature-related risks and informing deeper, contextual risk assessments and disclosures.

B. Financial institution and firm surveys

1. Financial institution survey

The financial institution survey was conducted among 83 financial institutions to understand their current approach to nature-related risks and the challenges they face in managing and disclosing these risks. The survey targeted institutions regulated by BNM and was open from 20 June to 18 July 2025. Responses were received from 41 banks, 40 insurance and takaful operators (ITOs), and 2 financial holding companies (Figure A1.1).

Figure A1.1**Composition of financial institutions survey respondents**

Source: Authors. Note, $n = 83$

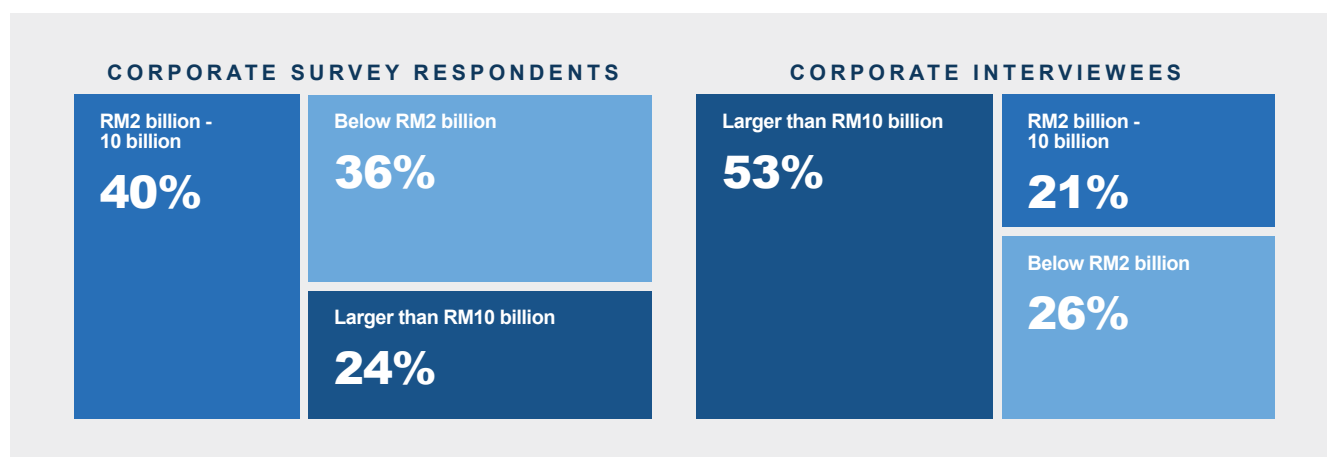
The survey comprised four sections, on (A) Consideration of nature-related impacts, dependencies, risks and opportunities, (B) Consideration of nature-related risks for customers, (C) Impediments or challenges faced, and (D) Additional views.

2. Firm survey

The corporate survey spanned over Malaysian listed issuers, sampled across sectors and profiles to capture breadth. Responses from 45 organisations were received, spanning 12 Bursa Malaysia sectors, with variation in size (from under 250 to over 5,000 employees), revenue (from under RM2 billion to over RM10 billion), market orientation (domestic, regional, global), and operating locations to

observe geographic patterns (Figure A1.2). The instrument covered awareness, governance, assessment practices, data/tools, disclosure, and capacity needs.

To complement survey findings, semi-structured interviews were conducted with 19 senior leaders and sustainability practitioners across multiple industries. These discussions, conducted in August–October 2025 under the Chatham House Rule, provided practical context on internal decision-making, key drivers and barriers, data and capacity gaps, and preferences for supervisory guidance—adding depth and nuance to the patterns observed in the surveys.

Figure A1.2**Composition of Corporate survey respondents and Interviewees**

Note: In the corporate survey, $n = 45$. In the interviews, $n = 19$.

All insights in this report are anonymised and presented in aggregate. While the sample is not a full census and may lean toward more engaged firms, potential bias was mitigated through triangulation and cautious interpretation of findings.

C. LEAP pilot assessments

1. Pilot financial institutions

Three financial institutions, CIMB, UOB and financial institution A, participated in this TNFD LEAP pilot. In conducting these LEAP assessments, the financial institutions were asked to scope the assessment to the palm oil and construction sectors due to their relevance both to nature risk and to the Malaysian economy.

Financial institutions were each provided with an optional template developed from TNFD LEAP guiding questions and tailored for financial institutions to structure their assessment. Where financial institutions had a pre-existing LEAP assessment, the analysis was conducted based on the existing material. Intensive engagements were conducted with the financial institutions over a period of 2 to 3 months (August-October 2025) to guide them through the LEAP process, and develop understanding of existing data and capacity, and challenges in conducting the assessment.

The LEAP assessments and engagements with the financial institutions gave us detailed insights into the experience and challenges in assessing nature-related impacts, dependencies, risks and opportunities to financial institutions arising from financed portfolios. It also provided information on the available methods and tools that financial institutions could use to begin assessing their nature-considerations.

2. Pilot firms

Two listed companies, Company A – operating in the palm oil value chain - and Gamuda – operating in the construction and property value chain – participated to this TNFD LEAP pilot. As explained in Chapter 2, this pilot study focused on the palm oil and construction value chains because of their significant contributions to the national economy and key export markets (for oil palm particularly), their substantial exposure within the financial sector, and their important interactions with nature. The companies (henceforth referred to as ‘pilot companies’) were identified based on existing awareness, capacity and risk management strategies of their nature-related risks.

The studies were conducted in an iterative process with each pilot firm identifying their dependencies, impacts, risks and opportunities (DIROs) using a template developed based on the LEAP approach. This process, which was more in-depth than for the pilot financial institutions, took place between October 2024 and September 2025. Finally, the results of the LEAP pilots were analysed by drawing from the ‘TNFD Pilots – Australian Case Study Report’ by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) of Australia, with criteria recontextualised to a Malaysian context.

Annex 2:

Dependencies and pressures of the Palm oil and Construction sectors

A. Literature review

1. Palm oil sector

Table A2.1

The palm oil sector's pressures on nature in the literature

Pressure	Description of palm oil's pressure
Land use change	The establishment of plantations often begins with clearing land , sometimes involving the use of fire and the drainage of peatlands . The conversion of natural forests, particularly species-rich rainforests in areas like Malaysian Borneo, makes oil palm a major driver of deforestation , accounting for 47% of deforestation in Malaysia between 1972 and 2015, and 57-60% in Malaysian Borneo during the same period (Meijaard et al., 2018).
Climate change, Emissions of GHG Emissions of non-GHG air pollutants	CO2 is released in large quantities from clearing forests, land-clearing fires (Fargione et al. 2008), peat drainage, and the decomposition of drained peat (Tonks et al. 2017; Cook 2018). Nitrous oxide (N2O) emissions are increased, mainly from nitrogen fertiliser use (Dislich et al. 2017), and methane (CH4) is generated from anaerobic decomposition in oil palm mill effluent (POME) ponds and certain land conditions (Harsono et al. 2014; Reijnders and Huijbregts, 2008; Intergovernmental Panel on Climate Change (IPCC), 2013; Dislich et al. 2017). These changes, along with increased emissions of volatile organic compounds (VOCs) like isoprene, also impact local air quality and create hotter, drier microclimates within plantations compared to forests (Fowler et al. 2011).
Emission of soil and water pollutants Emission of solid waste	Oil palm can decrease water storage and baseflow , with irrigation contributing to the depletion of aquifers (Famiglietti, 2014). It also increases annual water yield (the total amount of water flowing out) and surface run-off (caused by the decreased ground cover), hence affecting the quality of water via sediment pollution (Dislich et al. 2017). The use of fertilisers, pesticides, and herbicides contaminates water bodies, contributing to eutrophication and negatively affecting aquatic organisms (Gharibreza et al. 2013). Soil health is also degraded; soil erosion can be 50 times greater than in natural forests, and intensive agriculture can lead to a near-complete loss of native earthworm populations and reduced soil fertility (Darmawan et al. 2017). Oil palm also production generates large amounts of organic waste , including empty fruit bunches and oil palm mill effluent (POME). POME is generally minimised as much as possible in modern mills but poses a significant pollution threat for water bodies if not properly treated (Ahmad et al., 2003).
Introduction of invasive species	Oil palm plantation can be associated with the introduction of invasive species (Meijaard et al., 2018). For example, Barn Owls (<i>Tyto alba</i>) do not naturally occur on Borneo but are often introduced into plantations there to control rodent pests (Wan, 2000).

Source: Authors, based on a literature review.

Table A2.2**The palm oil sector's dependencies on nature in the literature**

Ecosystem service	Dependence on the ecosystem service
Local and global climate regulation Rainfall pattern regulation Water supply	Oil palm is a tropical plant requiring high rainfall, adequate solar radiation, and high humidity to maximise its photosynthetic capacity and yield. While rain-fed, the crop is sensitive to water storage dynamics. Periods of elevated temperature and reduced rainfall, along with climatic cycles, like El Niño and La Niña, cause stress and negatively impact oil yield (Murphy et al. 2021; Rahutomo, 2016; USDA, 2016). Some projections indicate a potential 10 to 41% decrease in Malaysian production with a 1 to 4 °C increase in average annual temperature (Sarkar et al. 2020), and high levels of oil palm mortality for Peninsular Malaysia in the future from unsuitable climate (Paterson, 2020).
Flood mitigation	Oil palms are intolerant to inundation, and reduced water infiltration in plantations can increase drought and flood risks (Mantel et al., 2007; Abram et al. 2014).
Pollination	Oil palm relies notably on pollination by the African oil palm weevil (<i>Elaeidobius kamerunicus</i>) whose introduction to Southeast Asia dramatically increased yields by up to 53%, and without which yields could be dramatically lower (Teo, 2015; Greathead, 1983). While wind also plays a role (Dhileepan, 1994; Klein et al. 2007), the industry's heavy reliance on this single pollinator species can be considered risky (Dislich et al. 2017).
Biological control	The crop depends on biological control to manage pests and diseases; for instance, the rhinoceros beetle is effectively controlled by specific natural pathogens, and diseases like Basal Stem Rot can severely reduce yields if not managed (Murphy et al. 2021). Monoculture plantations, which are common for oil palm, are more susceptible to pest outbreaks due to reduced biodiversity of natural predators and parasitoids like insectivorous birds and bats, highlighting a dependency on maintaining natural pest regulation services. Future climatic changes, along with the rapid expansion of high intensity commercial plantations in new regions such as West Africa and South/Central America are also likely to result in the emergence of new pests and pathogens (Murphy et al. 2021).
Soil quality regulation	Soil fertility and properties are essential, with healthy soil and the activity of soil fauna (e.g. earthworms) contributing to nutrient cycling and overall productivity (Murphy et al. 2021).

Source: Authors, based on a literature review.

2. Construction sector

Malaysia – particularly the urban area of Kuala Lumpur – is among the global hotspots where future urban expansion is most likely to impact biodiversity (Simkin et al. 2022). This trend is part of a broader global pattern: urban land is expanding faster than the human population (Seto et al. 2010) and is projected to grow rapidly before the

2040s. Most of this future urban expansion is expected to occur over croplands and forests (Chen et al. 2020). Such land conversion will have direct consequences not only for food production and food security, but also for biodiversity, carbon storage, and the provision of ecosystem services (Chen et al. 2020; Seto et al. 2012; Simkin et al. 2022).

Table A2.3

The construction sector's direct and indirect pressures on nature in the literature

Pressures	Pressures from the Construction sector and value chain
Land use change	<u>Construction works</u>: Making space for construction involves land clearance and the destruction of natural habitats. The soil, a crucially important ecosystem (FAO et al. 2020), undergoes physical modifications via compaction and by the creation of sealed surfaces (application of hard surfacing to land, such as for roads or parking), which cut off fauna populations (Green Building Council Australia, 2024; Tobias et al. 2018; Montanarella, 2007). Buildings and linear infrastructure (highways, bridges, dams), also fragment ecosystems (de Jonge et al, 2022) which can for example prevent the migration of species and affect their genetic pool. <u>Real estate management (downstream value chain)</u>: Ongoing management can drive land use change if some habitats were created along the construction process are not well managed and degrade because of the disruptions caused by being next to the building (TNFD, 2025b). <u>Building demolition (downstream value chain)</u>: The demolition of buildings changes the land use and structure of the land and can lead to the loss of habitats that have developed over time around the infrastructure (TNFD, 2025b).
Resource use	<u>Construction material (upstream value chain)</u>: The extraction of biomass (timber, fibres, etc.) and other natural resources (iron ores, sand, stone, etc.) used for construction impacts ecosystems. For example (Green Building Council Australia, 2024; TNFD, 2025a): - Concrete: material extraction, quarrying and dredging for material (limestone, aggregate, gypsum), along with the production of cement, cause habitat loss, intensive water use, land-use change, air pollution and GHG emissions (cement manufacturing was responsible for about 8% of the world's total CO₂ emissions in 2021 (WEF, 2024). - Sand is also very often used in construction, such as into bricks and concrete. It is notably extracted from riverbeds, with detrimental impacts for ecosystems (Rentier and Cammeraat, 2022) - Steel: material extraction through open-pit mining and extraction of coking coal, limestone and iron ore – cause habitat loss, removal of fertile topsoil, land use change and air/land/water pollution, GHG emissions (11% of total global CO₂ emissions per year (SteelWatch, 2025)). - Timber can cause soil erosion and compaction, habitat fragmentation and degradation, disruption of water cycle and water pollution, land use change (Adhikari and Ozarska, 2018) <u>Construction works</u> can also include significant water use (Rahman et al. 2019), for example for producing concrete on-site (Saint Gobain, 2022) <u>Real estate management (downstream value chain)</u>: Users of real estate (tenants) consume water (TNFD, 2025b).
Climate change	<u>Construction works</u> entail GHG emissions due to on-site material production of electricity use, although most emissions from construction are indirect (due to downstream and upstream value chain) (Hong et al. 2015). Construction also affects the local climate through heat island effects, to which sealed surfaces contribute (Peng et al. 2012).

(continued)

Ecosystem service	Pressures from the Construction sector and value chain
Pollution	<u>Construction works</u>: Chemical spills during construction can pollute waterways and the soil, and construction machinery drives pollution such as disturbances (e.g. noise), disrupting animal communication and reproduction (TNFD, 2025b). <u>Real estate management (downstream value chain)</u>: Users of real estate produce pollutants to water, soil and air (e.g. sewage, particulate matter from heating and transport), solid waste (e.g. packaging, food waste) (TNFD, 2025b) and disturbances (e.g. light) (Tardieu et al. 2025). <u>Demolition (downstream value chain)</u> can release water and soil pollutants and solid waste in case of failure to manage demolition waste. Buildings can contain toxic or other hazardous waste (TNFD, 2025b).
Invasive alien species	<u>Construction works and Real estate management</u>: The introduction of invasive alien species and the spreading of plant pathogens can be facilitated by the traffic of construction vehicles, and linear infrastructure such as roads, railways and canals. Planting non-native species on landscaped areas can result in issues with invasive species if these plants – or animals that have travelled with them – spread beyond the site. (TNFD, 2025b; Green Building Council Australia, 2024).

Source: Authors, based on a literature review.

Table A2.4**The construction sector's dependencies on nature in the literature**

Ecosystem service	Dependence on the ecosystem service
Biomass provisioning and other provisioning services	<u>Construction processes</u> consume extracted natural resources like soil, sand and timber.
Water flow regulation Water supply Water purification	<u>Construction processes</u> depend on the maintenance of water cycles and a reliable supply of water, including surface water and precipitation (Saint Gobain, 2022). <u>Real estate management</u> : ecosystems surrounding buildings – such as wetlands – can help maintain water supply and quality by naturally filtering water, benefiting both tenants and property owners.
Flood mitigation Storm mitigation Erosion control	<u>Construction processes & Real estate management</u> : Healthy soils, vegetation and coastal ecosystems like mangroves and dunes mitigate risks of natural hazards – including floods and storms – and protect against landslides or soil erosion (Green Building Council Australia, 2024; Dominati et al. 2010).
Local climate regulation	<u>Real estate management</u> : Urban green spaces and ecosystems help mitigate urban heat island effect (Priya and Senthil, 2025).
Cultural services	<u>Real estate management</u> : The value of real estate is influenced by environmental amenities surrounding a building– such as green spaces or water bodies– which contribute to the well-being of its occupants (Hassett et al. 2025).

Source: Authors, based on a literature review.

B. Assessment by LEAP pilot firms

1. Palm oil firm (Company A)

Table A2.5

Materiality ratings of palm oil value chain's dependencies and pressures established by Company A

Ecosystem Service	Materiality Rating based on ENCORE		
	Growing of Perennial Crops	Plant Propagation	Support Activities for Crop Production
Dependencies			
Biomass provisioning services	VH	VH	M
Global climate regulation services	VH	H	L
Rainfall pattern regulations services (at sub-continental scale)	VH	VH	M
Local (micro and meso) climate regulation services	VH	VH	M
Soil quality regulation services	VH	H	L
Soil and sediment retention services	VH	VH	M
Water purification services	VH	VH	VH
Surface water and water flow regulation services	H	VH	M
Flood mitigation services	H	H	L
Genetic material services	VH	VH	M
Biological control services	H	H	L
Education, scientific and research services	N/A	VH	M (VH)
Water supply services	H	VH	H
Storm mitigation services	H	H	L
Pollination services	VH	H	VL
Pressures			
Emission of GHG	M	M	H
Area of land use	H	H	H
Area of freshwater use	H	H	N/A
Volume of water use	H	VH	VH
Emission of nutrient pollutants to water and soil	H	H	VH
Emission of toxic pollutants to water and soilw	H	H	M
Generation and release of solid waste	H	H	H
Introduction of invasive species	L	L	L

Note: VH – Very High, H – High, M – Medium, L – Low, VL – Very Low, N/A – Not Applicable.

 Very high	 High	 Medium	() ENCORE rating, when different from Company A's rating
 Low	 Very low	 Not applicable	N/A Not available

Source: Authors' based on Company A's assessment, drawing from ENCORE with minor adjustments.

2. Construction firm (Gamuda)

See Chapter 5.

Annex 3:

Nature-related risk assessments and disclosure within current regulations in Malaysia

This annex details the findings of Table 1 and examines the various sustainability frameworks that apply to financial institutions and corporates, with a particular focus on how these frameworks currently integrate nature-related dimensions.

Policy, disclosure framework	Issuer*	Applies to	Mandatory?	How nature is integrated
Financial Institution				
<u>Climate Change & Principle-based Taxonomy (CCPT)</u>	BNM (with JC3 support)	Financial institutions; indirect implications for borrowers	Supervisory / enabling	Explicit nature objective: includes 'protection of healthy ecosystems and biodiversity' as an environmental objective; supported by JC3 implementation prompts (incl. sensitive areas / biodiversity impacts).
<u>Climate Change and Principle-based Taxonomy (CCPT) and implementation materials</u>	JC3	Banks / insurers and their clients	Guidance	Makes biodiversity more 'operational' by embedding prompts in routine due diligence (e.g. proximity to sensitive areas; biodiversity impacts).
<u>Climate Risk Management and Scenario Analysis (CRMSA)</u>	BNM	Banks / insurers (supervisory expectations)	Supervisory	Nature enters indirectly via related classification/due-diligence tools (e.g. CCPT objective on biodiversity; sector prompts used in due diligence).
<u>Guidance Note on Managing ESG Risks for Fund Management Companies</u>	SC	Fund management companies	Regulatory guidance	Nature/biodiversity considerations are based on materiality and within stewardship/engagement expectations.
<u>Sustainable and Responsible Investment Guide for Private Markets</u>	SC	Venture capital / private equity / private market operators	Guidance	Provides sustainability integration guidance; Consideration on biodiversity/nature is typically manager-discretion unless material.
<u>Value-based Intermediation Financing & Investment Impact Assessment Framework (VBIAF)</u>	BNM (with JC3 support)	Islamic Financial Institutions	Voluntary guidance	Sectoral guides explicitly flag high-impact issues (e.g. land conversion, deforestation, biodiversity/ecosystem impacts) as part of impact-based risk assessment expectations in relevant sectors.

(continued)

Policy, disclosure framework	Issuer*	Applies to	Mandatory?	How nature is integrated?
Guidelines on Sustainable & Responsible Investment (SRI) Funds	SC	Fund managers offering SRI-labelled funds	Regulatory (for SRI-labelled funds)	Expects managers to disclose biodiversity-related risks where material (nature not prescribed as standalone baseline).
Corporate				
ASEAN Green / Sustainability / Sustainability-Linked Bond Standards	ASEAN Capital Markets Forum (ACMF)	Bond/sukuk issuers (regional reference)	Voluntary (regional reference)	Project categories and Key Performance Indicator (KPI) structures can cover ecosystem co-benefits and nature-linked outcomes, depending on use-of-proceeds / KPI design and materiality.
National Sustainability Reporting Framework (NSRF) adopting ISSB Financial Reporting Standard (FRS) S1/S2	SC / Bursa	Listed issuers (phased) + large non-listed	Mandatory (phased)	Biodiversity/ecosystem impacts are disclosed when assessed financially material (supported by Bursa guidance). Reporting architecture aligns with TCFD/ TNFD pillars.
Principles-based SRI Taxonomy	SC	Capital market participants / issuers using taxonomy for labelling/ financing	Voluntary guidance	Explicit ecosystem objectives that cover protection of ecosystems/ biodiversity within activity classification.
Simplified ESG Disclosure Guide for SMEs	JC3 ecosystem (Malaysia)	SMEs (esp. in supply chains)	Voluntary	Provides simplified ESG datapoints that include resource use/land/ waste proxies, preparing SMEs to support larger companies' ISSB-aligned reporting.
SRI Sukuk Framework (use-of-proceeds)	SC	Corporate bond/sukuk issuers	Voluntary (market-led)	Allows financing for biodiversity conservation / sustainable land use (nature-eligible categories).
SRI-Linked Sukuk Framework (performance-linked)	SC	Corporate issuers	Voluntary (market-led)	Enables nature-linked performance indicators (e.g. restoration outcomes such as hectares restored).
Sustainability Reporting Guide (3rd ed.)	Bursa	Listed issuers (guidance for Sustainability Statement)	Guidance	Clarifies that biodiversity/ ecosystem impacts should be disclosed when material; prompts governance, policies, due diligence, and indicators to structure disclosures.

(continued)

Policy, disclosure framework	Issuer*	Applies to	Mandatory?	How nature is integrated?
Financial Institution and Corporate				
<u>Sustainability Statement in annual reports</u>	Bursa	Listed issuers (Main & ACE)	Mandatory	Materiality-based: biodiversity/ ecosystem impacts disclosed when material; requires governance, materiality process, how matters are managed, and indicator data (where available).
<u>ASEAN Taxonomy for Sustainable Finance (V4)</u>	ASEAN Taxonomy Board	Regional reference used by ASEAN capital markets	Voluntary (regional reference)	Includes objectives on protection of healthy ecosystems/biodiversity and is referenced as a regional harmonisation tool across ASEAN.
<u>CDP (climate / water / forests / biodiversity questionnaires)</u>	CDP (International framework)	Any entity (corporates and financial institutions)	Voluntary	Provides forests/biodiversity/water disclosure channels (deforestation, water management, supply chain impacts), improving comparability for investors.
<u>GRI Standards</u>	GRI (International framework)	Voluntary sustainability reporting for any entity	Voluntary	Widely used; Bursa guidance encourages use; Cover biodiversity topics via topic standards.
<u>TNFD recommendations (LEAP) – adopters’ practice</u>	TNFD (International framework)	Any entity (corporates and financial institutions)	Voluntary	Drives structured disclosure of dependencies/impacts/risks/ opportunities.

Source: Authors, based on a literature review.

Annex 4:

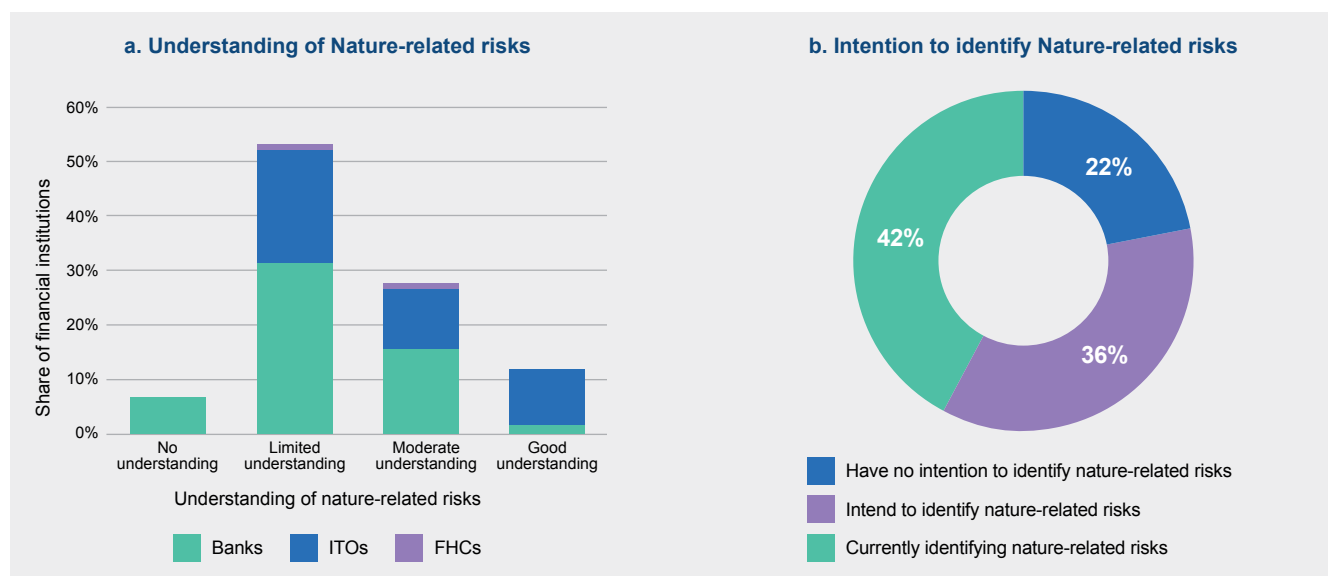
Additional survey results

A. Additional financial institution survey results

Figure A4.1

A majority of financial institutions has a limited or no understanding of nature-related risks, but a majority also started or plans to identify these risks

Financial institutions' understanding and intention to identify nature-related risks

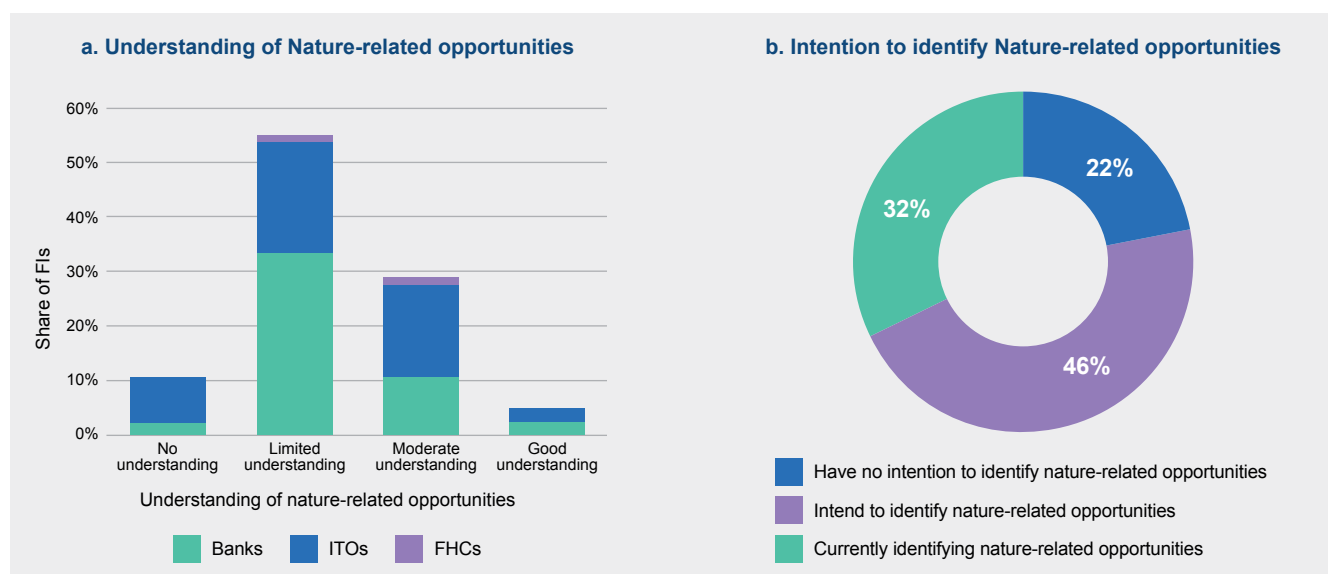


Source: Authors, based on financial institution Survey (n = 83).

Figure A4.2

Understanding and identification of nature-related opportunities is less common than for risks

Financial institutions' understanding and intention to identify nature-related opportunities

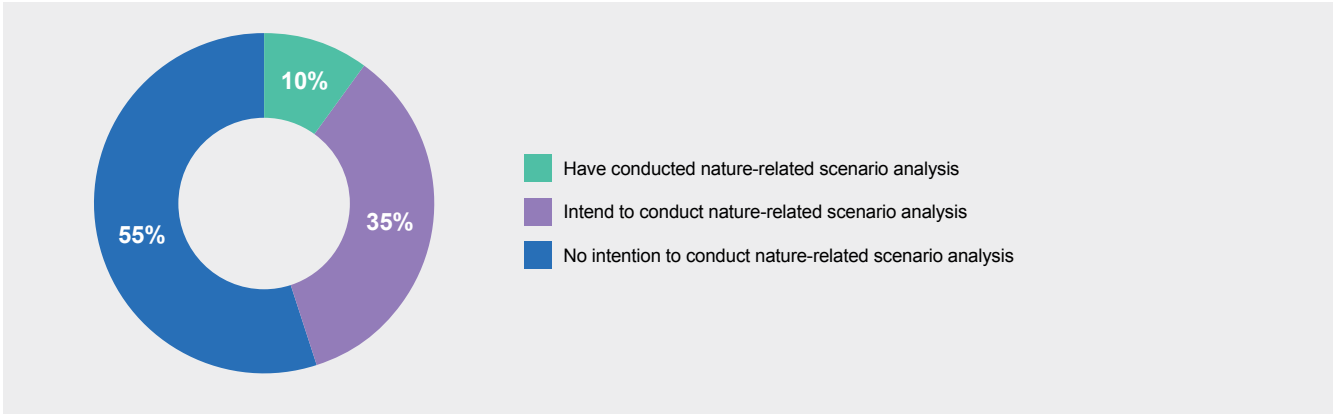


Source: Authors, based on financial institution Survey (n = 83).

Figure A4.3

A majority of financial institutions does not intend to conduct nature-related risk scenario analysis

Financial institutions’ plan to conduct nature-related risk scenario analysis

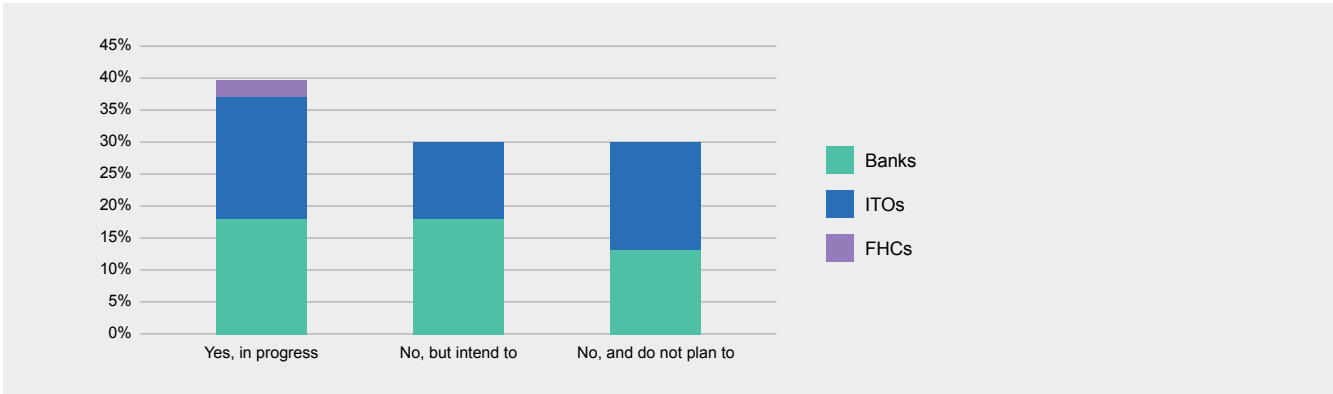


Source: Authors, based on financial institution Survey (n = 83).

Figure A4.4

A majority of financial institutions are in progress or intend to incorporate nature-related risks and opportunities in their business decisions

Financial institutions’ incorporation of nature-related Risk and opportunities in business decisions

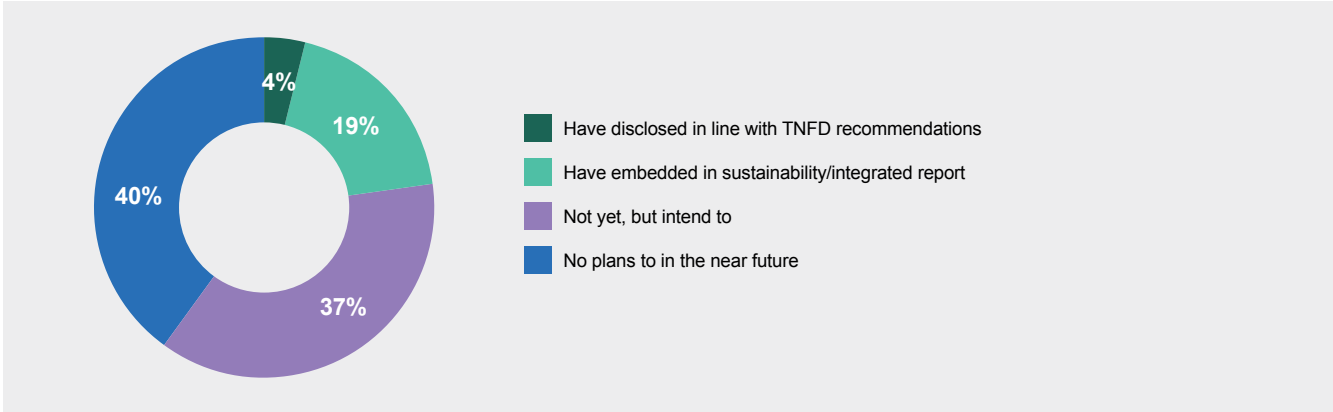


Source: Authors, based on financial institution Survey (n = 83).

Figure A4.5

A majority of financial institution have disclosed or intend to disclose on nature-related aspects

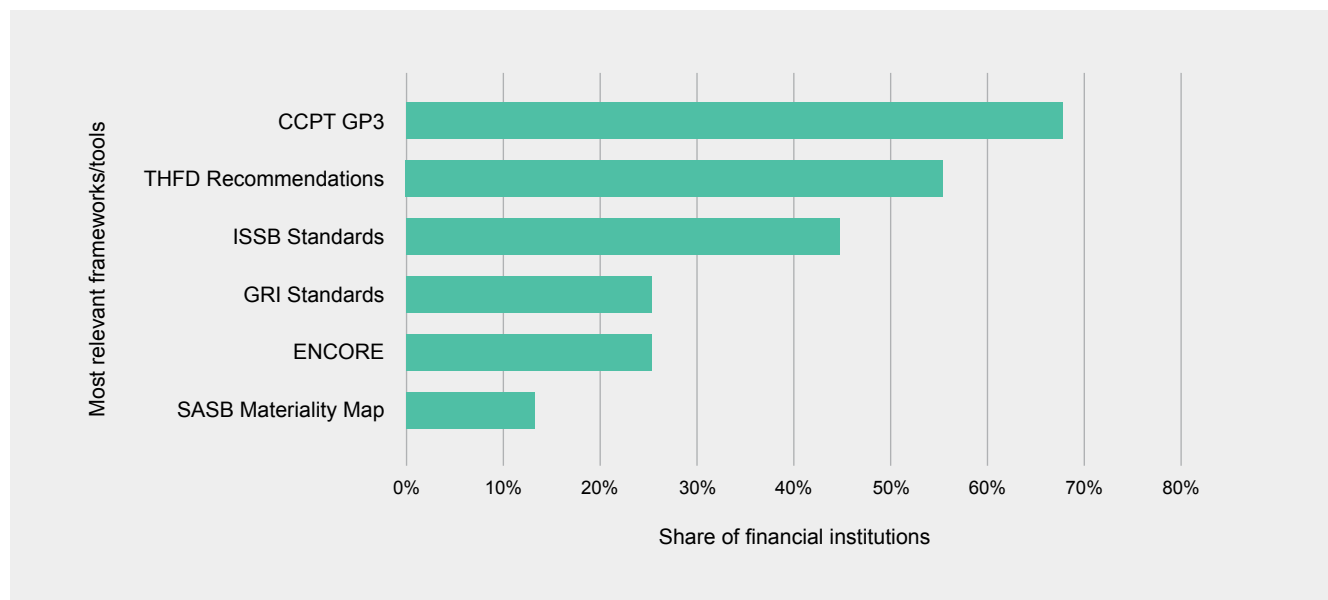
Financial institutions’ plans to disclose on nature-related risks and opportunities



Source: Authors, based on financial institution Survey (n = 83).

Figure A4.6**CCPT GP3 and TNFD Recommendations are perceived by financial institutions as the most relevant frameworks for assessing and disclosing on nature**

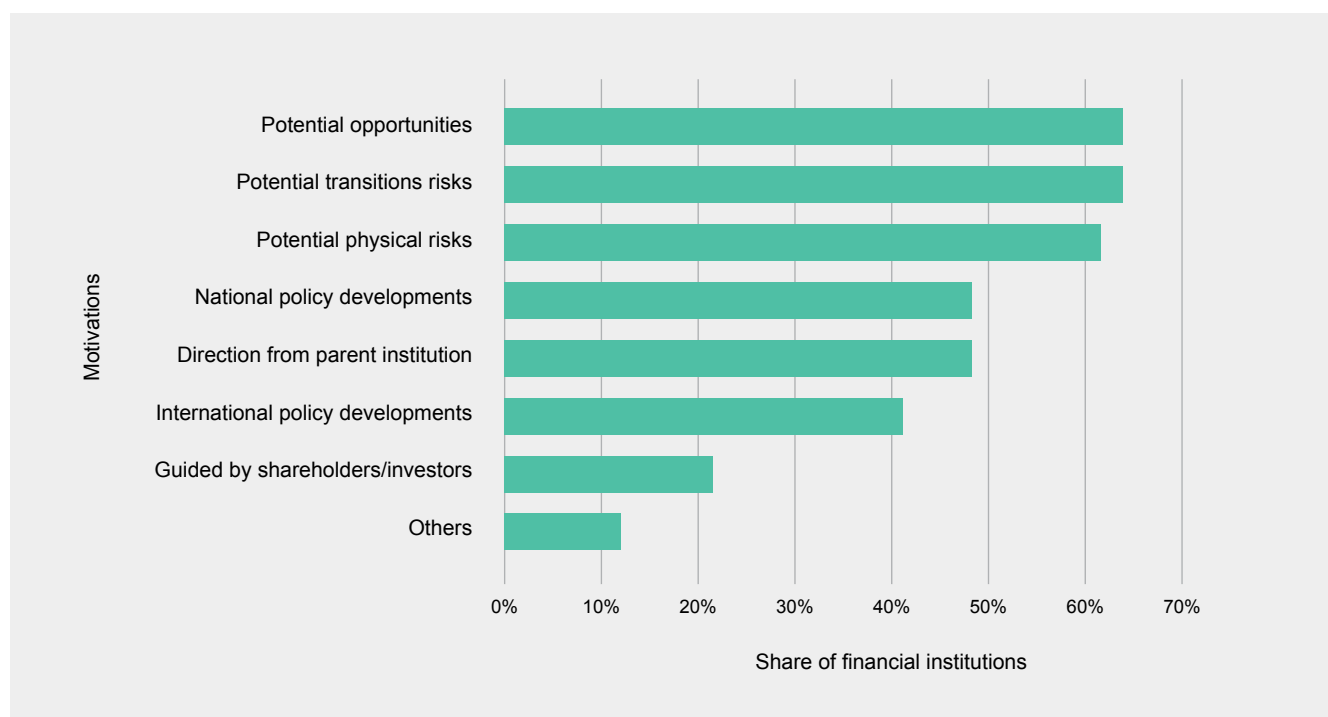
Financial institutions' perceived relevance of frameworks and tools for nature-related assessment and disclosure



Source: Authors, based on financial institution Survey ($n = 83$).

Figure A4.7**Finding opportunities and mitigating risks are the main motivations behind financial institutions nature-related assessment and disclosure**

Financial institutions' motivations for nature-related assessment and disclosure

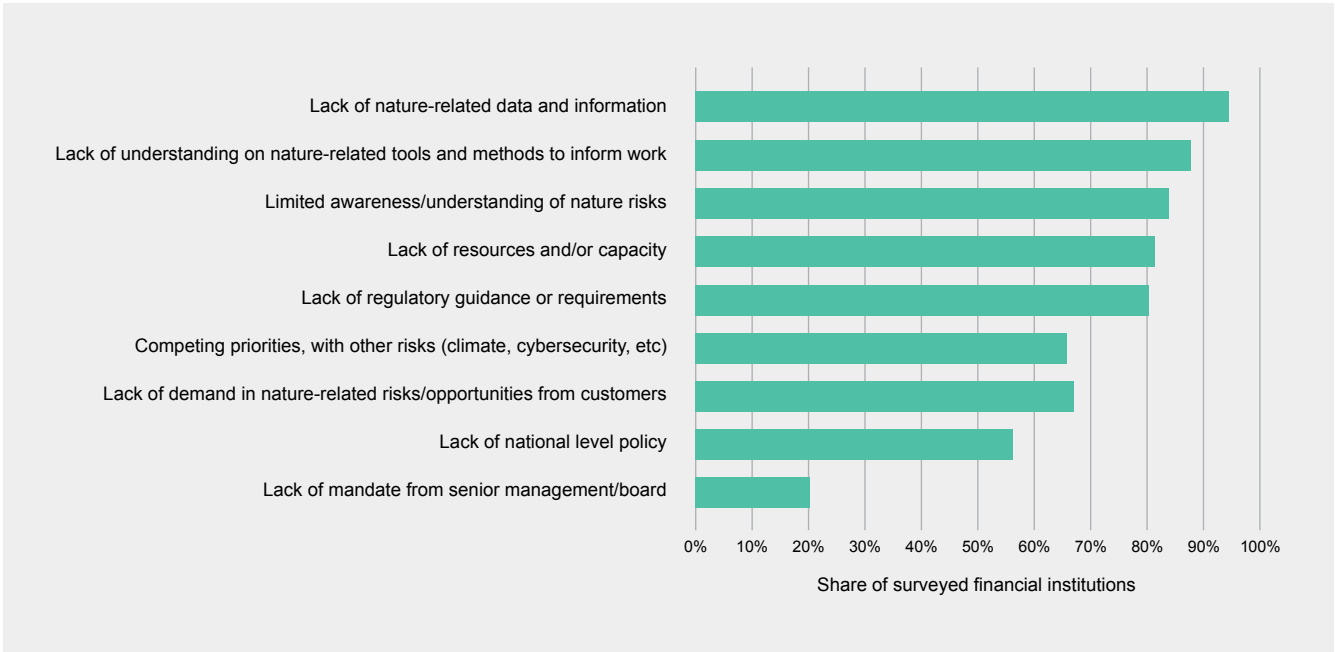


Source: Authors, based on financial institution Survey ($n = 83$).

Figure A4.8

Lack of nature-related data and limited understanding of risks and methodologies are financial institutions most cited obstacles to conducting nature related risks and opportunities assessments

Obstacles to conducting assessing nature-related risk and opportunities



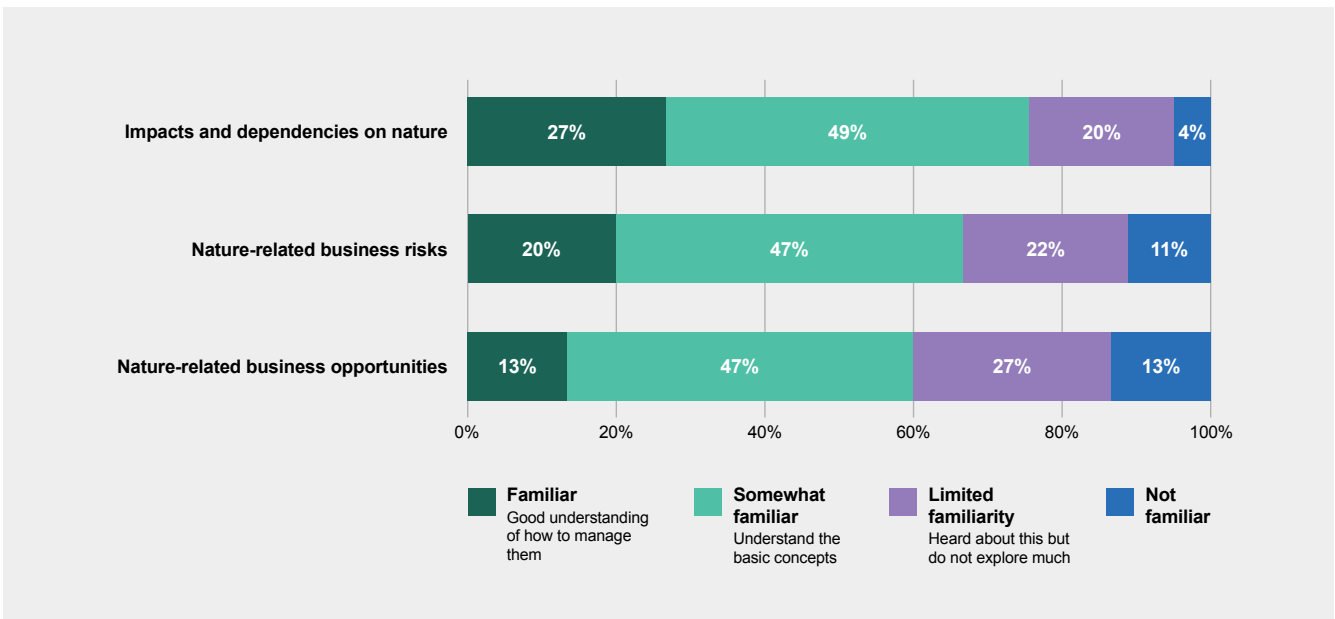
Source: Authors, based on financial institution Survey (n = 83).

B. Additional corporate survey results

Figure A4.9

A majority of firms are familiar or somewhat familiar with nature-related risks, familiarity with nature-related opportunities is slightly lower

Familiarity with nature-related concepts among Malaysian firms

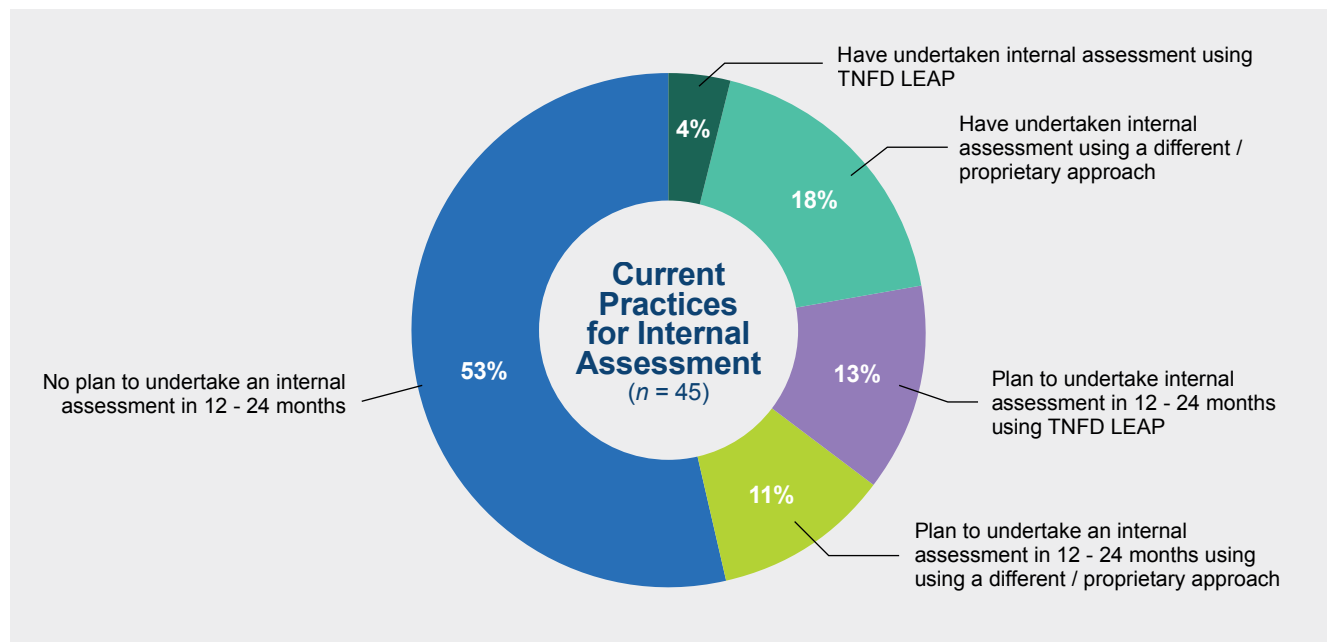


Source: Authors, based on Corporate Survey on Malaysia's TNFD Readiness, UNDP BIOFIN 2025. (n = 45).

Figure A4.10

Almost 50% of firms have undertaken or plan to undertake an internal assessment of nature-related risks and opportunities

Current practices or plans for assessing nature-related issues

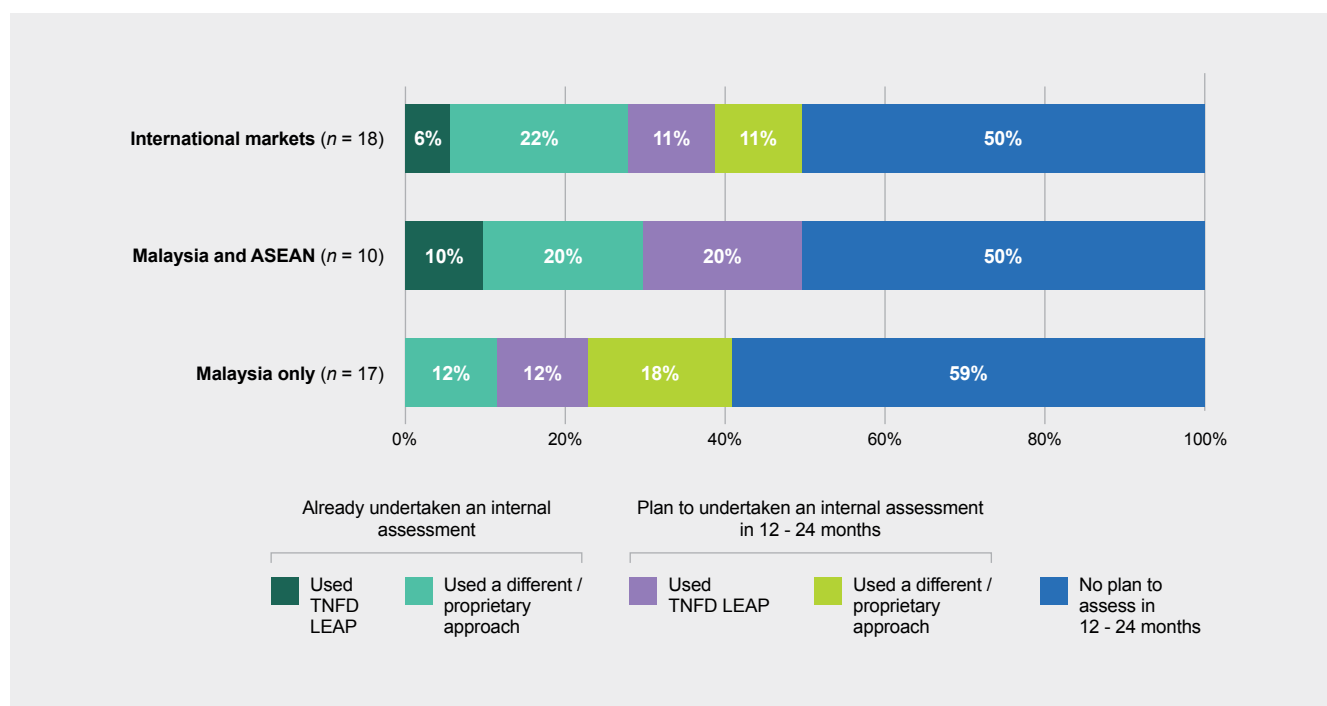


Source: Authors, based on Corporate Survey on Malaysia's TNFD Readiness, UNDP BIOFIN 2025. (n = 45).

Figure A4.11

Firms active on International or ASEAN markets tend to be more willing to assess nature-related risk and opportunities

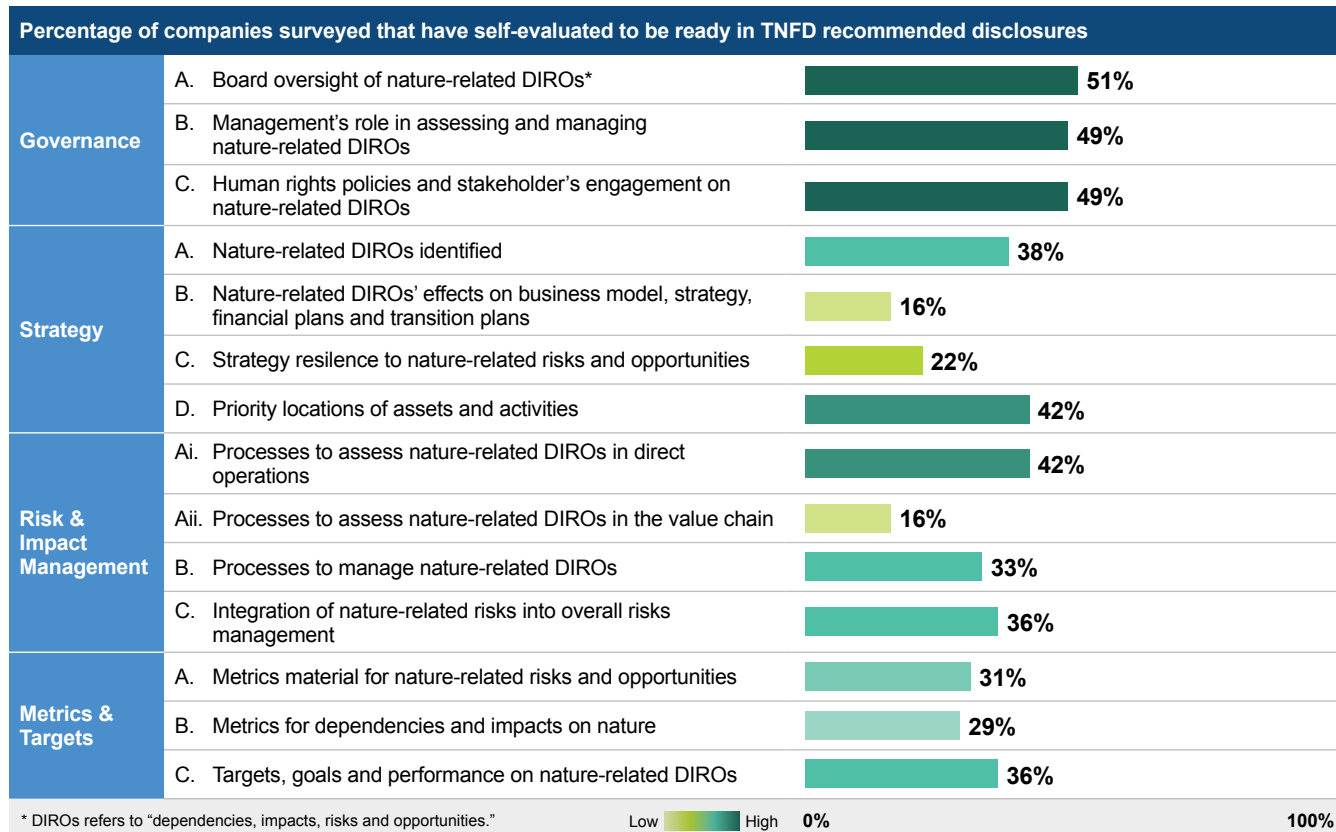
Current practices or plans for assessing nature-related issues – by market



Source: Authors, based on Corporate Survey on Malaysia's TNFD Readiness, UNDP BIOFIN 2025. (n = 45).

Figure A4.12**Malaysian firms are most ready to follow the Governance Pillar of TNFD Recommended disclosure**

Self-evaluated readiness based on TNFD recommended disclosures



Source: Authors, based on Corporate Survey on Malaysia's TNFD Readiness, UNDP BIOFIN 2025. (n = 45).

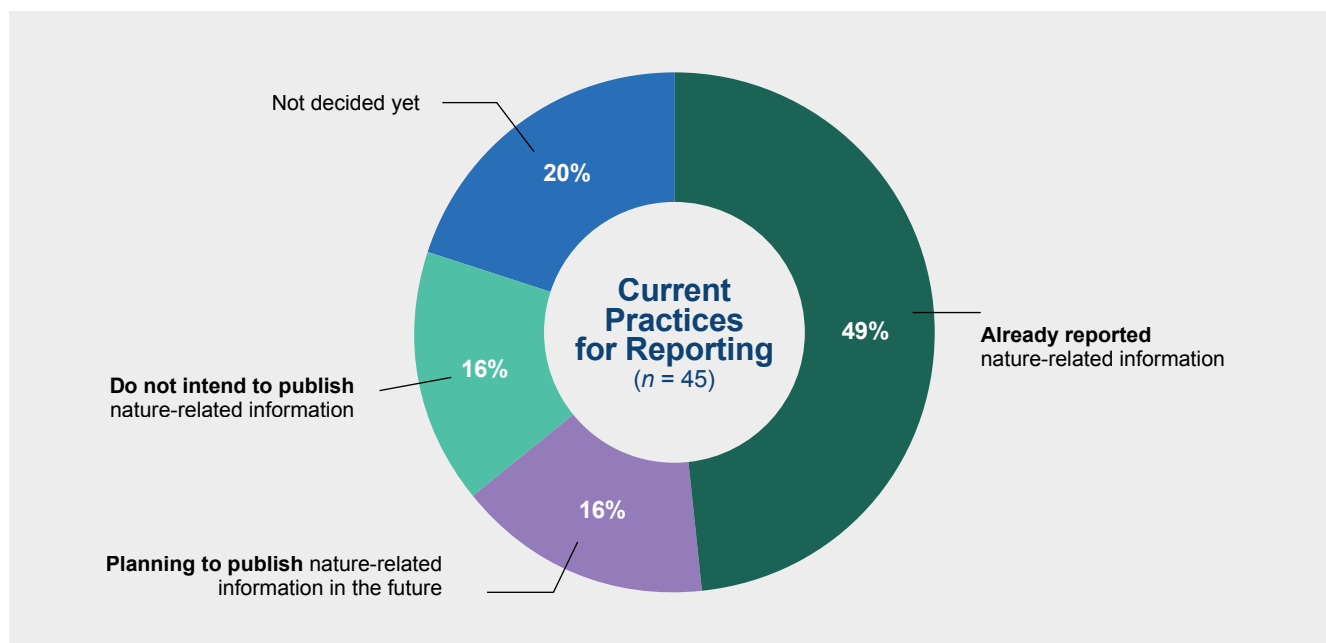
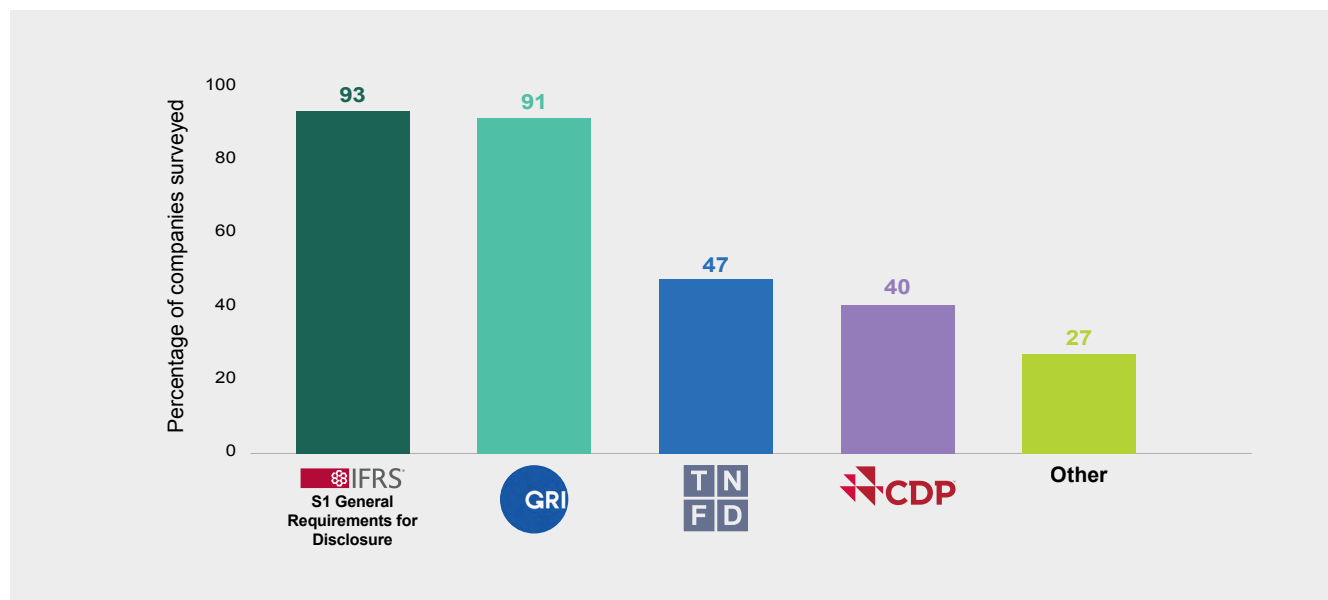
Figure A4.13**A majority of firms are already reporting or plan to report on nature-related information**

Figure A4.14

IFRS and GRI Standards are known to almost all Malaysian firms, while the TNFD framework is known by about half of firms in the sample

Awareness of sustainability and nature-related standards and frameworks

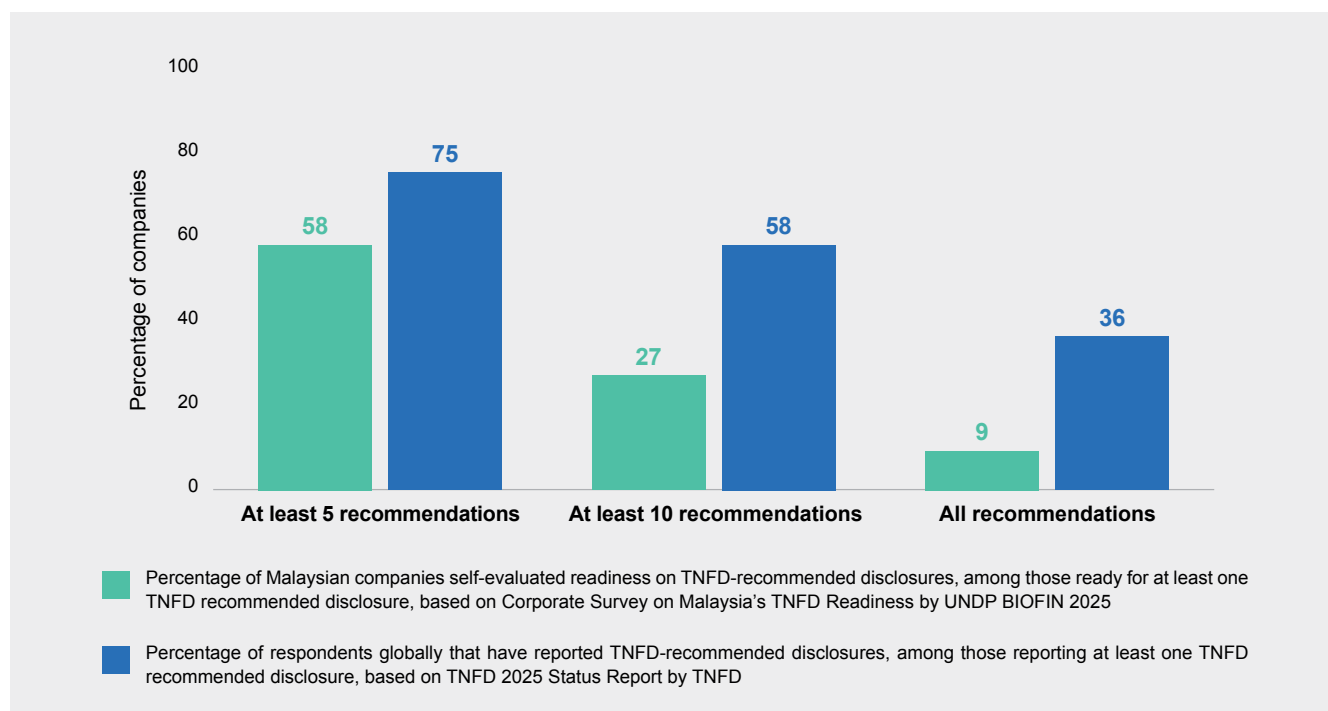


Source: Authors, based on Corporate Survey on Malaysia's TNFD Readiness, UNDP BIOFIN 2025. (n = 45).

Figure A4.15

Malaysian firms tend to be less ready to follow TNFD Recommendations than their global peers, but a majority is already ready for following at least five TNFD recommendations

Self-evaluated readiness based on TNFD recommended disclosures

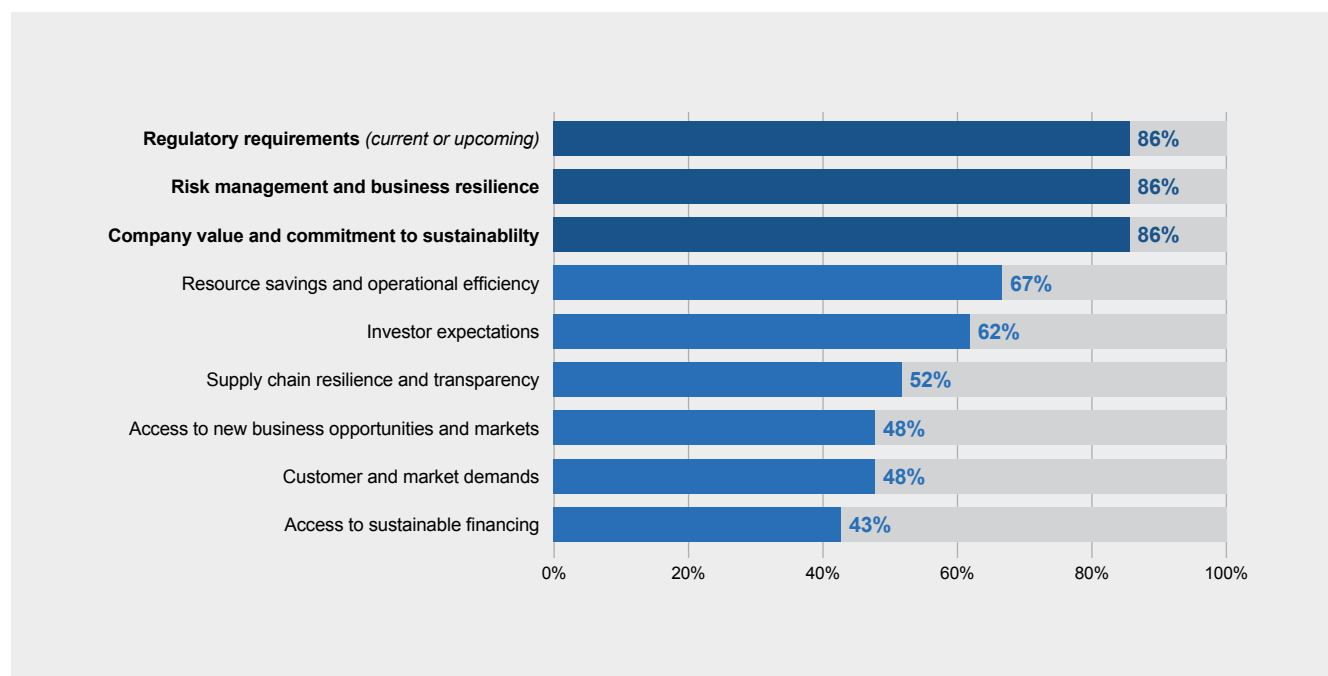


Source: Authors, based on Corporate Survey on Malaysia's TNFD Readiness, UNDP BIOFIN 2025 (n = 33); and TNFD 2025 Status Report, TNFD 2025 (n = 182).

Figure A4.16

Firms' main motivations for conducting nature-related assessment and disclosure are regulatory requirement, risk management and firm values

Motivations for nature-related assessment & reporting

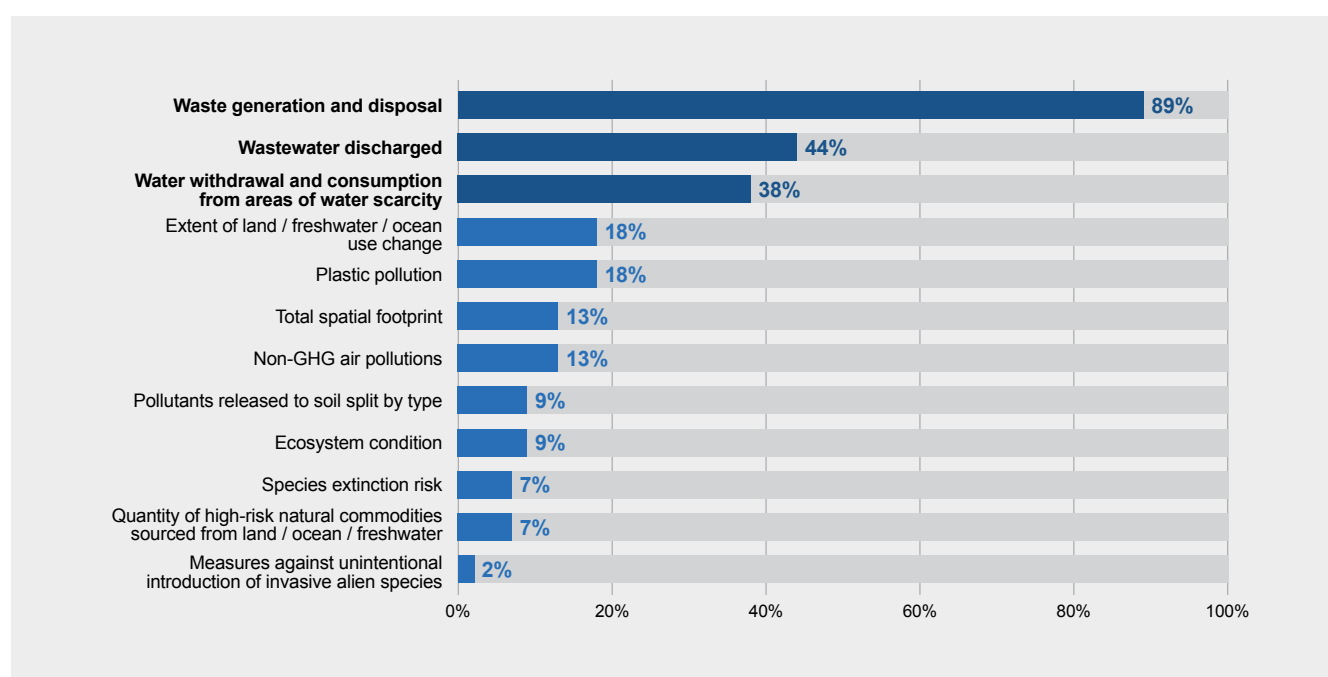


Source: Authors, based on Corporate Survey on Malaysia's TNFD Readiness, UNDP BIOFIN 2025. (n = 21).

Figure A4.17

Corporates find it easier to measure and report waste, wastewater, and water use than land use, pollution, or ecosystem impacts

Feasibility to measure and report on nature-related metrics



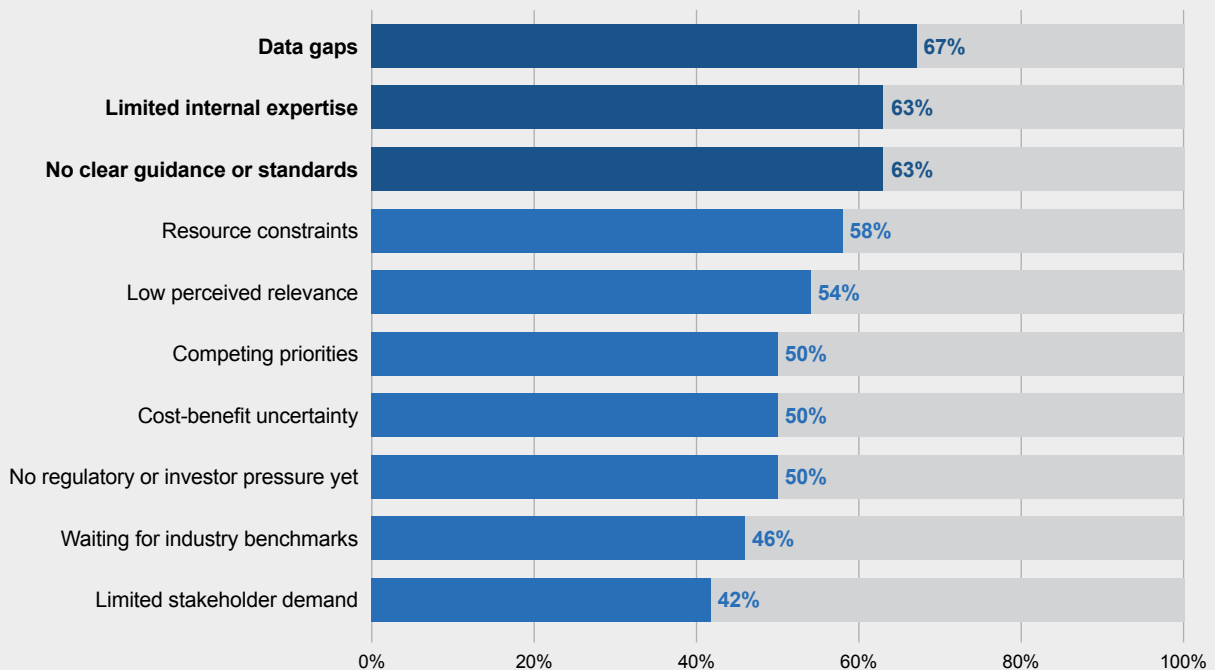
Source: Authors, based on Corporate Survey on Malaysia's TNFD Readiness, UNDP BIOFIN 2025. (n = 45).

Figure A4.18**Access to data and limited expertise are firms' most cited obstacles to conducting nature-related risk and opportunities assessments**

Obstacles to conducting assessing nature-related risk and opportunities

(a) Among firms having conducted or planning to conduct an assessment in 12-24 months

		Companies that have assessed (n = 10)	Companies that planned to assess (n = 11)
Internal Capacity	Limited internal expertise	80%	91%
	Resource constraints	80%	73%
Access to Data	Data availability and quality	90%	82%
	Technology limitations	70%	55%
Guidance & Regulations	Lack of clear guidance	70%	82%
	Regulatory uncertainty	60%	82%
Internal Alignment	Integration with existing processes	70%	73%
	Stakeholder engagement & leadership buy-in	30%	36%
	Cross-departmental coordination	30%	36%
No Significant Challenge		0%	0%

Low  High**(b) Among firms with no plan to conduct an assessment in 12-24 months**





BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA



WORLD BANK GROUP

