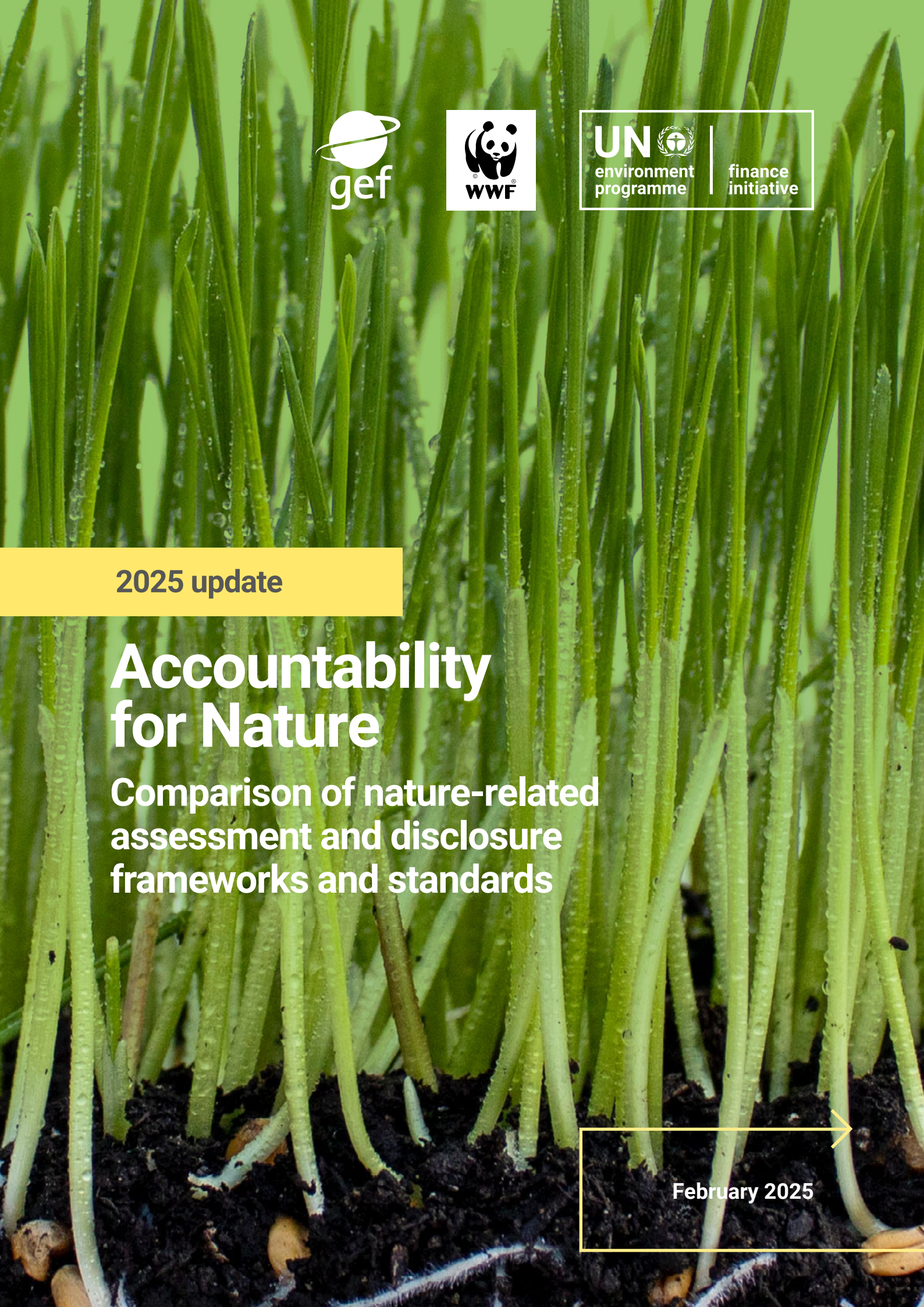

2025 update

Accountability for Nature

Comparison of nature-related assessment and disclosure frameworks and standards

February 2025

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The first version of the report "Accountability for Nature: Comparison of Nature-Related Assessment and Disclosure Frameworks and Standards" was published in January 2024. This January 2025 re-publication of the report includes updates to specific factual information to reflect latest changes in the reviewed approaches, a new key finding (2.10) on disclosures on pollution, and an addendum on pollution.

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Contents

Acronyms and abbreviations

AASB	Australian Accounting Standards Board
AI	Artificial intelligence
BEES	Biodiversity, Ecosystems and Ecosystems Services
CBD	Convention on Biological Diversity
CC	Capitals Coalition
CDSB	Climate Disclosure Standards Board
COP	Conference of Parties
CSBI	Cross Sector Biodiversity Initiative
CSRD	Corporate Sustainability Reporting Directive
DCF	Deforestation and conversion-free
EFRAG SR TEG	European Financial Reporting Advisory Group Sustainability Reporting Technical Expert Group
ESRS	European Sustainability Reporting Standards
EU	European Union
FLAG	Forest, Land and Agriculture
GBF	Kunming-Montreal Global Biodiversity Framework
GFC	The Global Framework on Chemicals
GHG	Greenhouse gas
GRI	Global Reporting Initiative
GSSB	Global Sustainability Standards Board
IFRS	International Financial Reporting Standards Foundation
IOSCO	International Organization of Securities Commissions
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPLC	Indigenous Peoples and Local Communities
ISSB	International Sustainability Standards Board
JEDI	Justice, Equity, Diversity and Inclusion
LEAP	TNFD's LEAP Approach (Locate, Evaluate, Assess, Prepare)
NBSAPs	National Biodiversity Strategy and Action Plans
NDPE	No Deforestation, no Peat and no Exploitation
NFRD	Non-Financial Reporting Directive
NGFS	Network for Greening the Financial System
OECD	Organization for Economic Co-operation and Development
OHCHR	Office of the United Nations High Commissioner for Human Rights
PFAS	Per- and Polyfluoroalkyl Substances

PRI	Principles for Responsible Investment
SASB	Sustainability Accounting Standards Board
SBTs	Science-Based Targets
SBTi	Science-Based Targets Initiative
SBTi FLAG	SBTi's Forest, Land and Agriculture guidance
SBTN	Science Based Targets Network
SDGs	Sustainable Development Goals
SEC	Securities and Exchange Commission of the United States
SFDR	Sustainable Finance Disclosure Regulation
TCFD	Task Force on Climate-Related Financial Disclosures
TNFD	Taskforce on Nature-related Financial Disclosures
UNCCD	United Nations Conference to Combat Desertification
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP FI	United Nations Environment Programme Finance Initiative
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
VBA	Value Balancing Alliance
WBCSD	World Business Council for Sustainable Development
WEF	World Economic Forum
WHO	World Health Organization

Executive summary

This report provides an overview of the key trends in methods proposed by the leading frameworks and standards for private sector assessment and disclosure on nature-related issues. Co-authored by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) and the United Nations Environment Programme Finance Initiative (UNEP FI), this report presents findings from comparative research on seven leading standards, frameworks and systems for assessment and disclosure (referred to as "nature-related assessment and disclosure approaches", see Box 1). It focuses on trends related to methodologies and definitions of environmental concepts, and the implications for disclosure.

Box 1: Nature-related assessment and disclosure approaches reviewed in this report

- CDP system
- European Sustainability Reporting Standards (ESRS)
- Global Reporting Initiative (GRI) Standards
- International Sustainability Standards Board (ISSB) Standards[ii]
- Natural Capital Protocol
- Science Based Targets Network (SBTN) target-setting guidance
- Taskforce on Nature related Financial Disclosure (TNFD) framework

The report is aimed at both implementers and developers of the approaches. It will be useful for financial institutions and businesses preparing to implement the approaches that are reviewed here in their organizations. It is also intended to support further development of frameworks and standards by enabling developers to take stock of the evolving assessment and disclosure landscape. The first version of the report was published in January 2024 based upon research conducted between April and November 2023. This 2025 update of the report includes minor content updates reflecting iterations in the covered approaches up to August 2024 and an additional finding for disclosures on pollution, including an addendum. This new additional content provides more information on the interconnectedness between nature and pollution as reflected on the approaches reviewed in this study.

The study generated 12 key findings summarized in Table 1 below. Overall, it revealed that the reviewed approaches are increasingly aligned with one another in their definitions of key concepts and recommended methodologies. Examples include:

- Cross-referencing of materiality definitions. For example, TNFD recommends alignment with ISSB Standards and TCFD guidelines for assessing financial materiality. For impact materiality, TNFD highlights the definitions proposed by GRI and ESRS, and recommended that companies align with the GRI definition if they are looking to apply an impact materiality process without any regulatory requirements or guidance;
- Most approaches recommending similar processes and criteria for prioritizing locations that are most material or significant;
- Most approaches recognizing that impact measurement includes assessment of impact drivers, changes to the state of nature, changes in the flow of ecosystem services and stock of ecosystem assets; and
- All approaches expect companies to set nature targets and report performance against these.

Alignment and interoperability between the approaches is expected to continue to improve. Important factors contributing to this are that:

- Several organizations developing assessment and disclosure approaches have formed bilateral collaborations with one another. This includes, but is not limited to, collaboration between TNFD and CDP, TNFD and EFRAG, TNFD and GRI, the IFRS Foundation and CDP and the IFRS Foundation and GRI.[1]
- Some developers of approaches have also collaborated on official interoperability mappings of data points, disclosure requirements and disclosure metrics. For example, interoperability/correspondence mapping has been developed between the GRI Standards and TNFD's recommended disclosures and metrics, ESRS and TNFD's recommended disclosures and metrics, as well as ESRS and the ISSB Standards. More interoperability mappings, including the one between the GRI Standards and ISSB Standards, are currently being developed.[2]
- The ISSB has started a research project exploring information about sustainability-related risks and opportunities associated with Biodiversity, Ecosystems and Ecosystem Services (BEES). The project builds on existing materials such as the SASB Standards, CDSB Framework Application Guidance and TNFD recommendations, and aims to enhance the interoperability between the ISSB Standards and other widely used approaches such as the GRI Standards and ESRS.
- The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Business and Biodiversity Assessment, expected to be completed in 2025, will clarify concepts and solidify methodologies for assessment of nature-related issues faced by business.

There remain some aspects of the approaches that need to be strengthened further. Examples include:

- Where the approaches offer guidance on state of nature measurement, value chain assessment and assessment of opportunities, this is relatively high level. Insights from existing scientific research could help inform more detailed guidance on these issues.
- Many approaches are realm-agnostic and provide only limited guidance on how the methodologies can be adapted to different types of ecosystems. For example, challenges with measurement and attribution of impacts in oceans are not always addressed.
- Most approaches recognize that ecological systemic risks can arise. Since there is limited research that explores and models these types of risks, the approaches currently provide limited guidance on how to monitor and manage these.

Alongside further development, there is increasing focus on implementation. This is supported by:

- Regional and national regulation establishing mandatory sustainability reporting. For example, the EU Corporate Sustainability Reporting Directive (CSRD) requires the first companies to report according to the ESRS for the 2024 financial year (in reports published in 2025), with more companies being obligated to report in future years.
- Organizations developing approaches promoting voluntary implementation and providing capacity building opportunities. For example, TNFD is encouraging companies to register as Early Adopters or Adopters and developing training materials and training in collaboration with partners.
- Increasing awareness of nature and biodiversity issues and international policy objectives, such as the Kunming-Montreal Global Biodiversity Framework (GBF). A growing number of companies are seeking to demonstrate how they are contributing towards these.
- Growing recognition of the interconnections between climate and nature, as well as between environmental and social issues. As these interconnections rise in prominence at international policy conventions (e.g. United Nations Framework Convention on Climate Change (UNFCCC) COP29, Convention on Biological Diversity (CBD) COP16 or United Nations Convention to Combat Desertification (UNCCD) COP16), companies are recognizing that their sustainability reporting and action need to extend beyond climate.

The landscape of private sector assessment and disclosure on nature will continue to evolve. As all approaches have plans for future updates, specific recommendations or requirements of the different approaches may change. The transition from voluntary to mandatory disclosure requirements is likely to continue and be observed in an increasing number of countries. Future research comparing the approaches will help assess progress on the highlighted trends and identify challenges ahead.

Table 1: Summary of the 12 key findings from the comparative study of the nature-related assessment and disclosure approaches

No	Focus	Key finding
1	**Definition of materiality**	The definition of materiality differs across the approaches reviewed. Some prescribe financial materiality or environmental and social materiality, while others are flexible in their requirements and guidance. There are also differences in the guidance provided on how companies should identify nature-related issues that are material to assess or disclose.
2	**Coverage of realms**	While most approaches aim to cover all realms, their disclosure requirements and assessment guidance are often developed primarily with consideration of the land and freshwater realms, with less consideration of the ocean realm. Additional methodologies and guidance on measuring and disclosing nature-related issues in oceans are being developed and have the potential to address some of the applicability challenges.
3	**Coverage of sectors**	All approaches aim to be applicable to all sectors. They vary in the expected level of tailoring to the sector context. Many approaches provide additional guidance for sectors generally recognized as associated with high nature-related dependencies and impacts (e.g. agriculture, extractives) and the finance industry.
4	**Coverage of value chains**	Most approaches require the assessment and disclosure of the company's nature-related issues within their direct operations as well as upstream and downstream value chains. However, there is variation in the expected level of detail of upstream and downstream disclosures as well as the scope of value chain links expected to be covered.
5	**Location information requirements**	All approaches reflect the importance of location-specific nature-related assessment and disclosure. Several approaches recommend that companies provide spatial data to capture these locations precisely.
6	**Nature-related impacts**	Assessment of impacts is central to all of the approaches. Most approaches recognize that a comprehensive analysis of business impacts on nature requires looking beyond the impact drivers/pressures resulting from business activities. They recommend or require that companies measure the state of nature and understand how the impact drivers/pressures resulting from their business activities lead to changes in the flow of ecosystem services and stock of ecosystem assets.
7	**Nature-related dependencies**	Most approaches cover business dependencies on nature. The connections between a company's dependencies and its impacts as well as considerations of the state of nature and external drivers of change in the location, are increasingly considered to be a part of the measurement of business dependencies on nature.
8	**Nature-related risks and opportunities**	Approaches use similar definitions and categorizations of nature-related risks and opportunities. While companies are typically expected to disclose the risks and opportunities associated with the most material effects on their financial performance and strategy, some approaches recognize that all risks and opportunities associated with significant impacts on nature or society are or will likely prove financially material over time.

9	**Disclosure metrics**	All approaches encourage companies to disclose not only a description of their nature-related issues but also metrics and their performance against the metrics. There is variation in the level of prescriptiveness on the choice of metrics.
10	**Disclosures on pollution** Additional content 2025	Pollution is covered by all approaches reviewed in this report. While some approaches provide pollution-specific disclosure recommendations, requirements and metrics, others cover pollution in broader disclosures. Differences between the approaches can also be found in the types of pollution addressed.
11	**Targets**	Most approaches require or recommend companies to set targets for strengthening their performance and action on nature-related issues and regularly report on their progress towards these targets. An increasing number of approaches is expecting companies to set targets on specific dependencies, impacts, risks or opportunities at locations.
12	**Engagement with rights-holders and relevant stakeholders**	Companies are encouraged to engage with rights-holders and relevant stakeholders at operation locations and beyond when assessing and disclosing their nature-related issues. Detailed guidance on stakeholder engagement is emerging.

Table 2: Overview of the key characteristics of the nature-related assessment and disclosure approaches reviewed

Characteristic	Nature-related assessment and disclosure approaches						
	CDP disclosure system	**European Sustainability Reporting Standards (ESRS)**	**Global Reporting Initiative (GRI) Standards**	**International Sustainability Standards Board (ISSB) Standards[3]**	**Natural Capital Protocol**	**Science Based Targets Network (SBTN) target-setting guidance**	**Taskforce on Nature-related Financial Disclosure (TNFD) framework**
Type of approach	Climate and nature reporting platform	Sustainability reporting standards	Sustainability reporting standards	Standards for sustainability-related financial disclosures	Measurement and valuation framework	Guidance on target setting	Risk management and disclosure framework
Voluntary or mandatory	Voluntary	Mandatory[4]	Mandatory and voluntary, varies by jurisdiction[5]	Mandatory and voluntary, varies by jurisdiction[6]	Voluntary	Voluntary	Voluntary
Coverage of nature	Covers climate change, forests, water security, plastics, and biodiversity through different environmental modules within the questionnaire	Cover nature and other sustainability issues, include dedicated environmental standards	Cover nature and other sustainability issues, include topic standards on specific environmental issues	Cover nature and other sustainability issues, include dedicated climate standards	Overarching nature coverage	Overarching nature coverage	Overarching nature coverage

Characteristic	Nature-related assessment and disclosure approaches						
	CDP disclosure system	**European Sustainability Reporting Standards (ESRS)**	**Global Reporting Initiative (GRI) Standards**	**International Sustainability Standards Board (ISSB) Standards**[3]	**Natural Capital Protocol**	**Science Based Targets Network (SBTN) target-setting guidance**	**Taskforce on Nature-related Financial Disclosure (TNFD) framework**
Status	The 2024 questionnaire follows an updated structure, more closely aligned with the TNFD. Expecting minor changes in the 2025 version.	The Corporate Sustainability Reporting Directive (CSRD) requires the first set of companies to report according to ESRS for the first time in the 2024 financial year, in reports published in 2025. Additional standards (e.g. for SMEs or specific sectors) are being developed.	The revised GRI 101: Biodiversity 2024 was published in January 2024. Other nature-related standards are available, such as GRI 301: Materials 2016, GRI 303: Water and effluents 2018, GRI 306: Waste 2020.	ISSB Standards (IFRS S1 and IFRS S2) issued in June 2023. The CDSB Framework Application Guidance for Biodiversity-related Disclosures and Water-related Disclosures were published in 2021. The SASB Standards were last revised in December 2023.[7]	The current version was released in 2016. A new Capitals Protocol (replacing Natural Capital Protocol and Social and Human Capital Protocol) is expected to be released in 2025.	The first release of SBTs for nature in May 2023, version 1.1 released in July 2024. Next updates planned for 2025.	TNFD Framework v1.0 was released in September 2023. Additional guidance is being developed.
Target report preparers	Businesses and financial institutions[8]	Businesses and financial institutions as specified in the EU CSRD	Businesses, financial institutions and other organizations	Businesses and financial institutions	Businesses and financial institutions	Businesses	Businesses and financial institutions

Characteristic	Nature-related assessment and disclosure approaches						
	CDP disclosure system	**European Sustainability Reporting Standards (ESRS)**	**Global Reporting Initiative (GRI) Standards**	**International Sustainability Standards Board (ISSB) Standards[3]**	**Natural Capital Protocol**	**Science Based Targets Network (SBTN) target-setting guidance**	**Taskforce on Nature-related Financial Disclosure (TNFD) framework**
Target report users[9]	Financial institutions/ investors, public/ civil society	Financial institutions/ investors, businesses, governments, civil society, EU institutions[10]	Financial institutions/ investors, businesses, governments and regulators, civil society, and any other interested party	Investors, lenders and other creditors	Businesses and financial institutions[11]	Businesses and financial institutions	Financial institutions/ investors, businesses, regulators, financial service providers, public/civil society[12]
Definition of materiality	Environmental, social and financial materiality	Environmental, social and financial materiality	Environmental and social materiality[13]	Financial materiality[14]	Flexible[15]	Environmental and social materiality[16]	Flexible[17]
Availability of realm- or biome-specific guidance	Yes	Yes[18]	No	No	No	Yes	Yes
Scope of sector-specific guidance	Sector-specific disclosure requirements for selected sectors	Sector-specific disclosure requirements for selected sectors[19]	Sector-specific disclosure requirements and guidance for selected sectors[20]	Sector-specific guidance for all sectors[21]	Sector-specific guidance for selected sectors	Selected sector-specific guidance[22]	Sector-specific guidance and disclosure requirements for selected sectors

Characteristic	Nature-related assessment and disclosure approaches						
	CDP disclosure system	**European Sustainability Reporting Standards (ESRS)**	**Global Reporting Initiative (GRI) Standards**	**International Sustainability Standards Board (ISSB) Standards[3]**	**Natural Capital Protocol**	**Science Based Targets Network (SBTN) target-setting guidance**	**Taskforce on Nature-related Financial Disclosure (TNFD) framework**
Coverage of value chain	Direct operations, upstream and downstream	Direct operations, upstream and downstream	Direct operations and upstream and downstream (downstream is optional in the GRI Biodiversity Standard)	Direct operations, upstream and downstream	Direct operations, upstream and downstream	Direct operations and upstream (downstream may be covered in future releases)	Direct operations, upstream and downstream
Use of location information in the assessment	Yes	Yes	Yes	Yes	Flexible—tailored to the choice of the business	Yes	Yes
Assessment of business dependencies and impacts on nature	Both dependencies and impacts	Both dependencies and impacts	Impacts, limited assessment of dependencies	Both dependencies and impacts	Both dependencies and impacts	Impacts, limited assessment of dependencies	Both dependencies and impacts
Disclosure on business dependencies and impacts on nature	Both dependencies and impacts	Both dependencies and impacts	Impacts[23]	Both dependencies and impacts (subject to financial materiality)	Disclosure optional	Impacts (dependencies may be covered in the future)	Both dependencies and impacts

Characteristic	Nature-related assessment and disclosure approaches						
	CDP disclosure system	**European Sustainability Reporting Standards (ESRS)**	**Global Reporting Initiative (GRI) Standards**	**International Sustainability Standards Board (ISSB) Standards[3]**	**Natural Capital Protocol**	**Science Based Targets Network (SBTN) target-setting guidance**	**Taskforce on Nature-related Financial Disclosure (TNFD) framework**
Assessment of nature-related risks and opportunities	Both risks and opportunities	Both risks and opportunities	Not covered	Both risks and opportunities	Both risks and opportunities	Not covered	Both risks and opportunities
Disclosure on nature-related risks and opportunities	Both risks and opportunities	Both risks and opportunities	Not covered	Both risks and opportunities	Disclosure optional	Not covered	Both risks and opportunities
Disclosure of nature-related targets	Yes	Yes	Yes	Yes	Disclosure optional	Yes	Yes
Engagement with rights-holders and relevant stakeholders required/ recommended	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. Introduction

1.1 About this report

This report, co-authored by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) and the United Nations Environment Programme Finance Initiative (UNEP FI), aims to provide an overview of the key methodological and conceptual trends among the nature-related assessment and disclosure approaches.

The term "nature-related assessment and disclosure approaches" is used in this report to refer to standards, frameworks and systems for assessment and disclosure on nature-related issues by private sector companies. Frameworks "can be thought of as a set of principles providing guidance and shaping people's thoughts on how to think about a certain topic" (GRI 2022). Standards represent the agreed level of requirements, which are viewed as acceptable for reporting entities to meet (GRI 2022). Frameworks "are normally put into practice in the absence of well-defined standards"; however, they can also provide recommendations on what should be reported, which might inform the development of standards and other regulations in the future (GRI 2022). Reporting platforms or other disclosure systems enable companies to report data on their sustainability performance and impacts. They can support companies' alignment with voluntary and mandatory disclosure frameworks and standards, other regulatory requirements or market best practice. The list of the approaches covered in this report can be found in Table 3 below.

Table 3: Brief Introduction of the seven nature-related assessment and disclosure approaches covered in this report

Approach	Type of approach	Background information
CDP disclosure system	Climate and nature reporting platform	**CDP** is a global disclosure system. By providing a voluntary disclosure platform which integrates climate change, forests, water security along with other environmental issues, CDP helps companies, investors and cities to disclose and manage their impact on the environment, with the data being used by banks, investors, governments and other companies. This study focuses on the CDP questionnaires for companies.
European Sustainability Reporting Standards (ESRS)	Sustainability reporting standards	In July 2023, the European Commission adopted the **European Sustainability Reporting Standards (ESRS)** for use by all companies subject to the EU Corporate Sustainability Reporting Directive (CSRD). The subjected companies will have to report environmental, social and governance sustainability related information according to the ESRS. Reporting will be mandatory for the first group of companies in financial year 2024.[24] The ESRS comprise the General requirements (ESRS 1), General disclosures (ESRS E2), as well as topical standards focusing on environmental (ESRS E1–E5), social (ESRS S1–S4), and governance (ESRS G1) related disclosures. This study focuses on the environmental topical standards (ESRS E1–E5), with particular focus on ESRS E4 on biodiversity and ecosystems.
Global Reporting Initiative (GRI) Standards	Sustainability reporting standards	The **Global Reporting Initiative (GRI)** is an independent, international organization that helps businesses and other organizations in reporting impacts. The GRI Standards are a modular system of interconnected standards comprising: the GRI Universal Standards (GRI 1–3), the GRI Sector Standards (GRI 11–14), and the GRI Topic Standards (GRI 101, 201–207, 301–308, 401–418). While the Universal Standards are applicable to all companies, the Sector Standards and the Topic Standards apply to companies in specific sectors and when the topics cover the most significant impacts of the organization. This study focuses on the nature-related Topic Standards (GRI 101: Biodiversity 2024, GRI 305: Emissions 2016, GRI 306: Waste 2020), with particular focus on the GRI Biodiversity Standard (GRI 101: Biodiversity 2024). The study recognizes that the Topic Standards are part of the modular system of standards—relevant information on the Universal and Sector Standards is also captured in the report.

Approach	Type of approach	Background information
International Sustainability Standards Board (ISSB) Standards	Standards for sustainability-related financial disclosures	The **International Sustainability Standards Board (ISSB)** was formed in November 2021 by the International Financial Reporting Standards (IFRS) Foundation to develop global accounting and sustainability disclosure standards. The IFRS Foundation consolidated the Sustainability Accounting Standards Board (SASB) and Climate Disclosure Standards Board (CDSB) in 2022. In June 2023, The ISSB issued two sustainability standards based on the exposure drafts, consultation and public feedback: IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures. Currently, IFRS S1 and S2 are voluntary, but they are expected to be mandated in different jurisdictions over time. This study describes characteristics of ISSB Standards based on the IFRS S1 and S2 Standards, as well as the SASB Standards and the CDSB Framework Application Guidance, which are referred to within the ISSB Standards for additional guidance.
Natural Capital Protocol	Measurement and valuation framework	Developed by the Capitals Coalition, the **Natural Capital Protocol** is a voluntary framework for decision-making and/or reporting that enables organizations to identify, measure and value their direct and indirect impacts and dependencies on natural capital. Applicable within any business sector to organizations of all sizes and in all operational geographies, the Protocol provides guidance to companies on how to measure, value and integrate natural capital impacts and dependencies into existing business processes such as risk mitigation, sourcing, supply chain management and product design.
Science Based Targets Network (SBTN) target-setting guidance	Guidance on target setting	The **Science Based Targets Network (SBTN)** is a collaborative effort to assist companies and cities in establishing targets and addressing their impacts on the environment. Building on the Initial Guidance that introduced companies the process of setting voluntary science-based targets (SBTs) for nature in 2020, SBTN has further developed technical guidance to provide companies the methodological detail to set targets. Its initial release in May 2023 was primarily focused on the first three steps of target setting. This included the version 1 method for Step 1: Assess and Step 2: Prioritize, as well as the version 1 method for Step 3: Freshwater and the beta version 0.3 for Step 3: Land.

Approach	Type of approach	Background information
Taskforce on Nature-related Financial Disclosure (TNFD) framework	Risk management and disclosure framework	Established in 2021, the **Taskforce on Nature-related Financial Disclosures (TNFD)** is a global, market-led initiative with the mission to develop and deliver a risk management and disclosure framework that can be used by organizations of all sizes in all jurisdictions to identify, assess, manage and disclose nature-related dependencies, impacts, risks and opportunities, and with the ultimate aim of supporting a shift in global financial flows away from nature-negative outcomes and toward nature-positive ones. As a voluntary framework, TNFD seeks to provide recommendations and guidance of relevance to a wide range of market participants including financial institutions, corporates and various types of business organizations. In September 2023, TNFD released Version 1.0 of the framework for market adoption. This was accompanied by the Guidance on the Identification and Assessment of Nature-related Issues: the LEAP Approach. This study considered the TNFD v1.0 framework, the LEAP approach guidance as well as other guidance documents developed by the TNFD.

The report focuses on trends related to the definitions and coverage of environmental management concepts, and the implications of these for disclosure. The report covers private sector nature-related assessment and disclosure approaches that are globally recognized as important reference points for shaping market best practice. These include both voluntary and mandatory approaches that are already available or are currently in development.

The first version of the report, published in January 2024, was built upon comparative research that was conducted between April and November 2023. Key characteristics of the approaches and their conceptualization of nature were analyzed and the observations on common trends and differences were synthesized into the key findings. The list of characteristics reviewed in this study can be found in Table 4 below. Experts from organizations developing the approaches were consulted for clarification on the latest content of their frameworks and standards in late October to early November 2023.

This updated version of the report includes updates to specific factual information to reflect changes in the covered approaches since the report's initial publication in January 2024. Experts from organizations developing the approaches were consulted on the latest updates to their frameworks and standards in early August to early September 2024.

A key finding and Addendum on pollution were added based on desk research conducted by UNEP FI between November and December 2024. Experts from organizations developing the approaches were invited to review these additions in late December 2024 to early January 2025.

A description of the methodology followed in this research can be found in Annex 1 to this report.

Table 4: Characteristics of the nature-related assessment and disclosure approaches selected to be the focus of this study

Characteristics	
Definition of materiality	Nature-related dependencies
Coverage of realms	Nature-related risks and opportunities
Coverage of sectors	Disclosure metrics
Coverage of value chains	Disclosures on pollution
Location information requirements	Targets
Nature-related impacts	Engagement with rights-holders and relevant stakeholders

The report, produced in response to requests from UNEP FI members, will be useful for financial institutions and businesses preparing to implement nature-related assessment and disclosure approaches in their organizations. It offers insights into common requirements across the approaches, which could help organizations identify synergies across multiple approaches and prioritize areas for strengthening organizational systems, processes and internal capacity. The report will also be useful for developers of disclosure frameworks and standards to understand the methodological and conceptual trends in the evolving landscape of assessment and disclosure approaches, helping to inform further iterations.

The report reflects key trends among these approaches based on the latest versions of the documents outlining their recommendations and requirements available at the time of finalizing this report, in September 2024. These include draft versions that were made publicly available or that were made available to the research team for the purposes of this study. A detailed list of these can be found in the reference list.

As the landscape of nature-related assessment and disclosure approaches continues to evolve, specific contents of the different approaches may change after final or updated versions of these frameworks and standards are released. The report primarily focuses on trends that have been observed across the multiple approaches reviewed and are unlikely to change in the near future. Where information indicated in this report is likely to evolve based on an updated version of a framework, the authors have tried to specify this.

1.2 Evolving regulatory landscape of private sector disclosure on nature

With the regulatory landscape on climate disclosure having matured rapidly in the past decade, there is now a growing realization that climate risks are not isolated from, but oftentimes coupled with, risks related to nature and the wider environment. Since the publication of the Taskforce on Climate-related Financial Disclosures (TCFD) disclosure recommendations in 2017, reporting on climate-related risks and opportunities has become more widely recognized as best practice and the number of companies reporting in line with the TCFD is gradually increasing (TCFD 2023). Many countries have also introduced climate-related disclosure requirements for businesses and financial institutions. The growing voluntary and mandatory implementation of climate disclosures not only facilitated improved availability of data to inform climate-positive investment and decision-making but also amplified the interest in further environmental disclosure considerations. In 2019, the Network for Greening the Financial System (NGFS), which brings together 114 central banks and financial supervisors, acknowledged that risks associated with nature, alongside climate, are significant, growing and in demand of immediate mitigation action (NGFS 2023).

Building on the growing interest in environmental disclosure beyond climate, multiple nature-related disclosure frameworks and standards have emerged in recent years. The Taskforce on Nature-related Financial Disclosures (TNFD), which was announced in 2020, published its disclosure recommendations and additional guidance in September 2023 (TNFD 2023a; TNFD 2023b). The Science Based Targets Network (SBTN), which aims to mirror the work by the Science Based Targets Initiative (SBTi) on climate, released the first set of guidance documents on setting nature targets in May 2023, updated in 2024 (SBTN 2024a). Existing reporting and disclosure systems, frameworks and standards, including CDP and the Global Reporting Initiative (GRI) Standards, have also been driving broader environmental disclosure (GRI 2021; CDP 2024a; CDP 2024b; CDP 2024c). In developing new and updated disclosure recommendations, these initiatives can build on lessons from a growing body of research and guidance on assessment of nature-related issues including the Natural Capital Protocol (CC 2016a), the Align project (UNEP-WCMC *et al.* 2022), the Transparent project (VBA, CC and WBCSD 2023) and the assessments conducted by IPBES (IPBES 2019).

Voluntary frameworks such as the TNFD are expected to inform national, regional and international standards on nature-related disclosure for business and finance. At the 2021 United Nations Climate Change Conference (COP26), the IFRS Foundation announced the establishment of the International Sustainability Standards Board (ISSB) (IFRS 2021). ISSB released the first batch of standards for sustainability disclosures to meet the needs of investors in June 2023, including IFRS S1 General Sustainability-related Disclosures and IFRS S2 Climate-related Disclosures (IFRS 2023c; IFRS 2023d). Over time, the ISSB Standards are expected to be adopted and enforced in different jurisdictions, especially after the endorsement from the International Organization of Securities Commissions (IOSCO) (IOSCO 2023). As of October 2023, numerous countries including Australia, Brazil, Canada, Mexico, Nigeria, United Kingdom and Zimbabwe have announced their intent to adopt the ISSB Standards (AASB 2023; IFRS 2023a; IFRS 2023c 2024b). Further, as of May 2024, more than 20 jurisdictions, which account for over half of global GDP, have already decided to use or are taking steps to introduce ISSB Standards in their legal or regulatory frameworks (IFRS 2024b). The ISSB has expressed its intention to expand its coverage of environmental issues and started a research project on sustainability related risks and opportunities associated with biodiversity, ecosystems and ecosystem services (IFRS 2023b, IFRS 2024a).

Alongside the global ISSB Standards, critical advancements have been made in the development and adoption of national and regional disclosure standards for climate and nature-related issues. In the EU, the Sustainable Finance Disclosure Regulation (SFDR) has been introduced in 2019 with the first financial institutions required to disclose their sustainability performance in 2021 (European Commission 2023a). In January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force and the first set of companies are expected to disclose against the ESRS in 2025 for the reporting year of 2024 (European Commission 2023b). In the United States, the Securities and Exchange Commission (SEC) adopted enhanced rules on climate-related disclosures by public companies and companies in public offerings in March 2024 (US SEC 2024). The implementation of the SEC climate disclosure rules is currently on pause due to several lawsuits (Columbia School of Professional Studies 2024). A recent review

of sustainability reporting regulation by the United Nations Conference on Trade and Development (UNCTAD) has mapped case studies of existing or planned sustainability reporting regulation in several countries, including China, Colombia, India and the Russian Federation (TD/B/C.II/ISAR/105). Another study by the CDP found relevant regulations in Indonesia and Brazil (CDP 2023a). GRI's 2023 Carrots and Sticks report found that the GRI Standards were referenced in 512 policies in 92 countries (Chalmers et. al 2023).

As focus starts to shift from development to implementation, standard developers and regulators are recognizing that nature-related disclosure approaches need to be aligned and interoperable to effectively drive action. In the coming years, the number of companies required to report against the ESRS will increase (European Commission 2024a). Discussions around the European Commission Omnibus proposal[25] in late 2024 / early 2025 have also highlighted the importance of interoperability of disclosure regulation with other types of regulations relating to for example taxonomies and corporate due diligence. In parallel, regulation introducing mandatory sustainability reporting is being considered in other jurisdictions (see e.g. United Kingdom Government 2024; Hong Kong Institute of Certified Public Accountants 2024). Developers of voluntary standards and frameworks are also promoting implementation and providing capacity building opportunities. For example, TNFD is encouraging companies to register as Early Adopters or Adopters and developing training materials and trainings in collaboration with partners (TNFD 2024). Several organizations developing voluntary and regulatory disclosure frameworks and standards have signed bilateral collaboration agreements with one another. This includes, but is not limited to, collaboration between TNFD and CDP, TNFD and ERFAG, TNFD and GRI, the IFRS Foundation and CDP and the IFRS Foundation and GRI.[26] Some developers of approaches have also collaborated on official interoperability mappings of data points, disclosure requirements and disclosure metrics. For example, interoperability/correspondence mapping was done between the GRI Standards and TNFD's recommended disclosure and metrics, ESRS and TNFD's recommended disclosure and metrics, as well as ESRS and the ISSB Standards. More interoperability mappings, including the one between the GRI Standards and the ISSB Standards, are currently being developed.[27]

An important driver of national regulation on business and finance disclosure on nature is the Kunming-Montreal Global Biodiversity Framework (GBF) adopted at the 2022 UN Biodiversity Conference COP15. The GBF provides a framework of action to halt and reverse the loss of biodiversity by 2030, and the 196 countries that are parties to the CBD will be responsible for achieving the GBF goals and targets and monitoring progress (CBD 2022). This includes Target 15 through which the countries that are parties to the CBD commit to "take legal, administrative or policy measures to encourage and enable businesses, and in particular to ensure that large and transnational companies and financial institutions […] regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity" (CBD 2022). As countries continue refining and start implementing their National Biodiversity Strategies and Action Plans (NBSAPs), national regulations requiring or supporting business and finance disclosure on biodiversity and nature are likely to be introduced around the world. In the meantime, some businesses and financial institutions are also voluntarily showing their support towards the implementation of GBF goals and targets (see e.g. Business for Nature 2024; UNEP FI 2024).

There is a growing recognition that climate, nature and social issues are inherently interconnected. Future regulatory measures are likely to reflect this. Scientific research continues to underscore that action on nature, climate, people's well-being and human rights need to go hand in hand (e.g. IPBES 2022; Potsdam Institute for Climate Impact Research 2024; Pritchard & Richardson 2022). International policy conventions (e.g. United Nations Framework Convention on Climate Change (UNFCCC) COP29, CBD COP16 or UNCCD COP16) highlight the importance of addressing the interconnections between these issues. Corporate sustainability disclosure approaches, including those reviewed in this report, are encouraging companies to integrate their measurement and reporting on climate, nature and social issues. The importance of interoperability between sustainability reporting on different thematic areas is likely to be reflected in policies and regulations.

2. Key findings

2.1 Key finding 1: Definition of materiality

Key finding 1: The definition of materiality differs across the approaches reviewed. Some prescribe financial materiality or environmental and social materiality, while others are flexible in their requirements and guidance. There are also differences in the guidance provided on how companies should identify nature-related issues that are material to assess or disclose.

Among the nature-related assessment and disclosure approaches reviewed, some approaches prescribe a specific definition of materiality, while others leave companies the flexibility to choose their preferred materiality approach. GRI Standards and the SBTN target-setting methods reflect an environmental and social materiality approach. According to the GRI Standards, "a topic is material when it represents the company's most significant impacts on the economy, environment, and people, including impacts on human rights" (GSSB 2021). According to the SBTN methods, the concept of materiality is commonly used to describe the environmental, social, or financial significance of companies' business activities. The SBTN methods emphasize environmental materiality from a societal perspective, henceforth referred to in the methods as "environmental materiality." This is a measure of the impact of a company's operations and value chain on nature, including people." (SBTN 2024b). While SBTN methods are primarily guided by environmental and social materiality considerations, they allow the introduction of information on financial materiality when making the decision about where to begin target-setting in Step 2c of v1.1 of the methods. More detailed definitions of materiality used by the different approaches can be found in Table 5 below.

ISSB Standards, on the other hand, use financial materiality, requiring companies to disclose information that could be relevant for investors and other target report users. In the ISSB Standards, companies are required to disclose all sustainability-related risks and opportunities "that could reasonably be expected to affect an entity's prospects" (IFRS 2023c). However, companies are also required to disclose all material information about these sustainability-related risks and opportunities. The material information could include not only qualitative and quantitative data on the sustainability risks and opportunities that a company is facing, but potentially also data on the dependencies and impacts that give rise to these risks and opportunities. What specifically should be reported on the sustainability-related risks and opportunities is determined by "whether omitting, misstating or obscuring that information could reasonably be expected to influence the decisions made by primary users of general-purpose financial reports" (IFRS 2023c).

Both ESRS and CDP use definitions of materiality that span both financial and environmental and social considerations. ESRS requires use of double materiality. A sustainability matter is material if it meets the criteria for impact materiality or financial materiality or both. Impact materiality is determined based on whether the sustainability matter is related to a company's impacts (actual or potential) on people and the environment. Financial materiality uses the same definition as the ISSB—a matter is considered to be material if omitting, misstating or obscuring information about it could reasonably be expected to influence decisions made by primary users of general-purpose financial reports. Aligning with ESRS and other disclosure approaches, the CDP questionnaires were developed to capture information necessary for understanding the company's impacts ("inside-out") on the environment, as well as information essential for understanding the company's position, performance, and development regarding climate change and environmental degradation ("outside-in").

Both TNFD and the Natural Capital Protocol use a flexible materiality approach—allowing companies to assess and disclose information based on their own materiality preferences or requirements in their jurisdictions. Whether an issue is material will depend on the company's choice of materiality approach, which the TNFD and Natural Capital Protocol recommend companies set out prior to their assessment. The TNFD disclosure recommendations also outline that companies should clearly state within their reports the materiality approach applied and be consistent across all of their disclosures. TNFD recommends that companies apply the ISSB's definition of materiality as a baseline. Report preparers who want or need to report to a different materiality approach may apply an impact materiality approach to identify information in addition. The TNFD recommends the impact materiality definition from GRI for report preparers who want or need to apply an impact materiality process in the absence of any regulatory guidance that may be relevant to the organization. The Natural Capital Protocol was designed as a framework to guide assessments for different purposes. It focuses on the importance of identifying what is material in relation to the assessment's objectives and applications. Which information is material to assess and/or disclose therefore depends on the purpose for which an assessment guided by the Natural Capital Protocol is conducted.

There is differing guidance on the process companies should follow to identify nature-related issues that are material. TNFD provides guidance on materiality assessment in the LEAP approach. While it does not prescribe a particular set of materiality criteria or thresholds, it offers guidance for both impact materiality assessment (LEAP approach component E4) and risk and opportunity materiality assessment (component A4) and recommends companies base the criteria for what they consider to be material on the definition of materiality that they choose to apply. Where relevant, TNFD encourages companies to refer to the ISSB Standards for their definition of financial materiality, to GRI for criteria on impact materiality, and recognizes companies may be under jurisdictions that favour the ESRS definition. The ISSB Standards allow companies to choose their own criteria and thresholds to determine whether a matter is material or not. They refer companies to the SASB Standards and the CDSB Framework Application Guidance for guidance on assessing magnitude and nature of sustainability-related risks and opportunities to understand their materiality. Both ESRS and the GRI Standards outline specific aspects of impacts that should be measured to determine the materiality of

impacts.[28] For actual negative impacts, the severity of the impact should be considered, determined by (1) scale, (2) scope and (3) irremediable character of the impact. For potential negative impacts, both severity and likelihood should be considered. When assessing positive impacts, materiality is determined by (1) the scale and scope for actual impacts; and (2) the scale, scope, and likelihood for potential impacts. The ESRS, which also covers risks and opportunities, also specifies that the materiality of these should be assessed based on their likelihood of occurrence and the potential magnitude of their financial effects.

An initial materiality screening to prioritize areas where more detailed assessment should be carried out is often required or recommended. According to the GRI Standards, for example, before proceeding with disclosures under individual topic standards, companies are required to conduct a materiality assessment to determine which topic standards (including biodiversity, water and other nature-related standards) they should be disclosing against. To report against specific topic standards, companies need to assess in more detail which impacts are the most significant. In the TNFD's LEAP approach, an initial scoping and prioritization is complemented by an assessment of dependency and impact materiality at the last stage of the evaluation phase (E4), after measuring the dependencies and impact. The materiality of risks and opportunities is also assessed in the final stage of the Assess phase of LEAP (A4), while the decision on what information should be disclosed is made during the Prepare phase. SBTN also expects companies to conduct an initial materiality screening in Step 1 and justify how pressures were or were not deemed material. The Natural Capital Protocol currently uses the term "materiality assessment" to refer to the process at the start of the assessment of dependencies and impacts.[29] The prepared new version of the Protocol, the Capitals Protocol, will update its guidance on when and how a materiality assessment should be conducted to be interoperable with TNFD.

Table 5: Definition of materiality and conceptualization of the materiality assessment used in the nature-related assessment and disclosure approaches

Approach	Materiality applied	Description of the materiality used	At what stage in the assessment process should companies conduct a materiality assessment?	What are the criteria defining whether an issue is material or not?
CDP	Environmental, social and financial materiality	CDP states that their questionnaires reflect a double materiality perspective. They define this as including the information necessary for understanding impacts of the company ("inside-out") on the environment and information necessary for understanding position, performance and development of the company regarding climate change and environmental degradation ("outside-in").	N/A	N/A
ESRS	Environmental, social and financial materiality	According to ESRS, companies are required to report on sustainability matters based on the double materiality principle, which prescribes that an issue is material if it is relevant from either financial materiality or impact materiality perspective. ESRS outline the following definition of financial materiality: "The financial materiality assessment corresponds to the identification of information that is considered material for primary users of general-purpose financial reports in making decisions relating to providing resources to the entity. Information is considered material for primary users of general-purpose financial reports if omitting, misstating or obscuring that information could reasonably be expected to influence decisions that they make based on the undertaking's sustainability statement" (European Commission 2023b). ESRS outline the following definition of impact materiality: "A sustainability matter is material from an impact perspective when it pertains to the undertaking's material actual or potential, positive, or negative impacts on people or the environment over the short-, medium- and long-term time horizons" (European Commission 2023b).	Initial materiality screening + More detailed assessment of the materiality of dependencies, impacts, risks and opportunities after they are measured to determine what should be disclosed	Impact Materiality: ▪ Actual negative impacts: ▫ Severity of the impact (Severity is based on (1) the scale; (2) scope; (3) irremediable character of the impact) ▪ Potential negative impacts: ▫ Severity and likelihood of the impact. ▪ Actual positive impacts: ▫ Scale and scope of the impact ▪ Potential positive impacts: ▫ Scale, scope and likelihood of the impact Financial Materiality: ▪ Likelihood of occurrence ▪ Potential magnitude of the financial effects.

Approach	Materiality applied	Description of the materiality used	At what stage in the assessment process should companies conduct a materiality assessment?	What are the criteria defining whether an issue is material or not?
GRI	Environmental and social materiality[30]	The GRI Standards' materiality approach focuses on impacts, enabling companies to report on their most significant impacts on the environment, economy, and the people. Material topics are defined by the GRI as topics that represent the company's most significant impacts on the economy, environment, and people, including impacts on their human rights.	Initial screening of material topics + More detailed assessment of most significant impacts after they are measured to determine what should be disclosed	Criteria for determining the significance of the impacts: ▪ Actual negative impacts: ▫ Severity of the impact (Severity is based on (1) the scale; (2) scope; (3) irremediable character of the impact) ▪ Potential negative impacts: ▫ Severity and likelihood of the impact. ▪ Actual positive impacts: ▪ Scale and scope of the impact Potential positive impacts: ▫ Scale, scope and likeli-hood of the impact
ISSB	Financial materiality	The process for determining what is material for each company is focused on the company's risks and opportunities. "Information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that primary users of general-purpose financial reports make on the basis of those reports, which include financial statements and sustainability-related financial disclosures" (IFRS 2023c).	Initial materiality screening + More detailed assessment of material risks and opportunities after they are measured to determine what should be disclosed.[31]	The IFRS S1 states that materiality judgements are specific to an entity. The ISSB Standards do not specify any thresholds for materiality or predetermine what would be material in a particular situation.

Approach	Materiality applied	Description of the materiality used	At what stage in the assessment process should companies conduct a materiality assessment?	What are the criteria defining whether an issue is material or not?
Natural Capital Protocol	Flexible[32]	The Natural Capital Protocol is designed to provide assessment guidance for a wide range of purposes and therefore it allows companies to choose their own materiality approach. Within the Protocol, an impact or dependency on natural capital is 'material' if consideration of its value, as part of the set of information used for decision making, has the potential to alter that decision.	"Materiality assessment" is conducted at the scoping stage when determining which dependencies and/or impacts are most relevant for inclusion in the natural capital assessment. This can be revisited following a valuation of impacts and dependencies.	Flexible. Companies can choose their own criteria.
SBTN	Environmental and social materiality[33]	According to SBTN, "the concept of materiality is commonly used to describe the environmental, social, or financial significance of companies' business activities. The SBTN methods emphasize environmental materiality from a societal perspective, henceforth referred to in the methods as "environmental materiality". This is a measure of the impact of a company's operations and value chain on nature, including people" (SBTN 2024b). "This perspective differs from, but complements, the financial perspective of materiality typically used by companies, which emphasizes how environmental impacts affect the company" (SBTN 2024b). However, companies can also apply a financial materiality or risk-based perspective in Step 2c to consider risks that could lead to financial losses or missed opportunities in their target-setting strategies.	Initial materiality screening in Step 1 + More detailed assessment of materiality of pressures through the later steps of the target-setting methodology	The use of materiality screening tools from either the prescriptive or the flexible approach in determining the materiality results. The five criteria for determining when an issue is material are:[34] ▪ Magnitude ▪ Irreversibility ▪ Frequency of impact ▪ Likelihood of impact ▪ Timing of impact

Approach	Materiality applied	Description of the materiality used	At what stage in the assessment process should companies conduct a materiality assessment?	What are the criteria defining whether an issue is material or not?
TNFD	Flexible[35]	TNFD uses a flexible materiality approach, which supports the reporting needs of all report preparers and report users globally, including their preferences and regulatory requirements regarding materiality. Companies should set out their approach to materiality—aligning to external standards or regulatory requirements where appropriate—to help report users understand the context of the information being presented by the report preparer.	Initial materiality screening in the L2 component of the LEAP approach + More detailed assessment of material dependencies and impacts in E4, of risks and opportunities in A4 and of all nature-related issues when preparing the disclosures in P3 to determine what should be disclosed.	When assessing financial materiality, TNFD recommends consistency with the ISSB Standards and TCFD by assessing which risks and opportunities are of the most significant financial effect by estimating magnitude, likelihood, vulnerability, speed of onset and additional criteria of the severity of impacts on nature and impacts to society. If assessing impact materiality, TNFD recommends companies align with the criteria set out by GRI.

2.2 Key finding 2: Coverage of realms

Key finding 2: While most approaches aim to cover all realms, their disclosure requirements and assessment guidance are often developed primarily with consideration of the land and freshwater realms, with less consideration of the ocean realm. Additional methodologies and guidance on measuring and disclosing nature-related issues in oceans are being developed and have the potential to address some of the applicability challenges.

Most nature-related assessment and disclosure approaches reviewed in this report aim to provide frameworks and methodologies that are applicable to all realms of nature. TNFD, GRI and ESRS explicitly state that their disclosure recommendations and assessment guidance are designed to be relevant to land, freshwater and ocean realms. The Natural Capital Protocol and ISSB Standards do not explicitly specify which realms they cover, but they are intended to be relevant for all companies, regardless of the locations of their operation sites. An overview of the realm coverage by the different approaches can be found in Table 6 below.

Guidance is emerging to address the specific challenges associated with assessment and disclosure of nature-related issues in the ocean realm. In the ocean realm, more often than in land or freshwater realms, companies' impact drivers can result in impacts thousands of kilometers away.[36] Compared to most land and freshwater ecosystems, the ecological characteristics of oceans also tend to be more variable over time and seasons of the year.[37] Locating, attributing and measuring impacts in the ocean realm can therefore be more challenging, which could result in underestimating the scope of nature-related issues. Some of the reviewed approaches are beginning to address these challenges by developing guidance for the ocean realm or specific marine biomes. For example, SBTN will be releasing initial target-setting guidance for the ocean realm in 2024. ESRS include among their environmental standards ESRS E3 on water and marine resources, which outlines disclosure requirements on water discharges in the oceans and extraction and use of marine resources. The TNFD, as another example, has released a biome-specific guidance for the marine shelf biome, which addresses some aspects of the challenges outlined above.[38] The guidance differentiates between localized and diffused dependencies and impacts a company might have in interactions with a marine ecosystem. It also provides a list of metrics relevant for the marine shelf biome. In June 2024, the TNFD also launched its first set of additional sector guidance, which includes aquaculture and fishing sectors, and may develop further biome guidance for ocean biomes in the future.[39] This provides companies with further insights on measuring and disclosing their nature-related issues in the ocean.

Some approaches also include provisions helping companies overcome constraints in data availability for the ocean realm. When assessing nature-related issues in the ocean, companies may struggle to find certain types of secondary data in the necessary quality. For some metrics, baseline data are also not available. While new metrics and datasets are being developed and access to existing ocean data is being improved,[40] closing the gap on the data available for the ocean realm will require technological advances, signif-

icant resources and time. Some nature-related assessment and disclosure approaches include provisions allowing companies to overcome these data constraints. For example, GRI Standards allow companies to report estimates where precise measurements are not feasible, provided the methodology for obtaining the estimates is also disclosed.

Table 6: Coverage of realms by the nature-related assessment and disclosure approaches

Approach	Intended coverage of realms	Realm or biome-specific guidance available?
CDP	Land Freshwater Atmosphere	Guidance related to specific environmental themes—climate change, forests, water security, plastics and biodiversity—across the land, freshwater and atmosphere realms is provided within the questionnaire.
ESRS	All realms	ESRS E3 Water and marine resources
GRI	All realms	No
ISSB	All realms	No
Natural Capital Protocol	All realms	No
SBTN	All realms	Land Freshwater Ocean (in development)
TNFD	All realms	Currently there is biome-specific guidance available for the following biomes: tropical and sub-tropical forests, savannas and grasslands, river and streams, marine shelf, and intensive land use systems. TNFD may develop specific guidance for other biomes depending on feedback from market participants.

2.3 Key finding 3: Coverage of sectors

Key finding 3: All approaches aim to be applicable to all sectors. They vary in the expected level of tailoring to the sector context. Many approaches provide additional guidance for sectors generally recognized as associated with high nature-related dependencies and impacts (e.g. agriculture, extractives) and the finance industry.

All the reviewed nature-related assessment and disclosure approaches can be applied to all sectors with varying flexibility for adaptation to the sectoral context. A core, sector-agnostic methodology facilitates implementation of the approach and contributes to greater comparability of disclosures across sectors, which is particularly important for investors, regulators and civil society. However, in certain sectors, these sector-agnostic methodologies can be challenging to implement or open scope for differences in implementation. While many disclosure approaches have developed or are expected to develop sector-specific guidance, the guidance varies in scope, sectoral coverage and classification of the sectors. Table 7 below summarizes the sectoral coverage and scope of the sector-specific guidance provided by different approaches.

Where sector-specific guidance is available, priority is given to additional guidance on sectors widely recognized as associated with high nature-related dependencies and impacts and additional guidance for the finance industry. The TNFD, for example, has released sector-specific LEAP approach guidance for the oil and gas, metals and mining, forestry and paper, food and agriculture, electric utilities and power generators, chemicals, biotechnology and pharmaceuticals, aquaculture and additional guidance for financial institutions.[41] Additionally, the TNFD has released draft versions of additional guidance for the fishing, engineering, construction and real estate, construction materials, beverage and apparel, accessories and footwear sectors. These guidance documents offer recommendations on implementing the cross-sector TNFD LEAP approach as well as tools and data that are particularly relevant for the sector in question. The TNFD guidance also includes sector disclosure metrics, which are part of the TNFD's measurement architecture. GRI, as another example, has released sector-specific standards for oil and gas, coal, mining, as well as agriculture, aquaculture and fishing sectors. GRI Standards for textiles and apparel and financial services are currently under development, and standards for other sectors with significant sustainability impacts will be added gradually.

Some approaches provide sector-specific guidance for all sectors. The ISSB Standards invite companies to refer to the SASB Standards as well as broader best practice in each sector. In relation to the IFRS S2 Standard on Climate-related Disclosures, the ISSB provides industry-based guidance for all SASB Standards' sectors that outlines which disclosure topics and metric are likely to be relevant for a company in the given sector. The ESRS are also expected to eventually provide sector-specific standards for all sectors of the economy, but these will be published gradually, with the first set (including, Mining, Quarrying and Coal, Oil and Gas and Road Transport) released for public consultation in the second half of 2024.

There are notable differences in the level of prescriptiveness of the sector-specific guidance. The ISSB invites companies to consider the SASB Standards, the Industry-based Guidance on Implementing IFRS S2 and best practice within their sector but leaves scope for the company to decide why the mentioned sustainability issues may not be relevant. GRI's sector-specific standards, on the other hand, outline the likely material topics and disclosures for each sector. Companies are expected to report against these on a comply or explain basis—they may determine which topics are not relevant for them to report but they need to provide an explanation for this. The ESRS sector-specific standards will outline the disclosures that all companies in a given sector will be required to report against, subject to the materiality assessment. Although companies will be able to justify why they are not providing information against a specific disclosure, this more prescriptive approach is designed to enable a high level of comparability within a given sector. Within the CDP questionnaire, there are specific modules and questions for sectors such as Agricultural commodities, Oil and gas, Coal and Metals and mining alongside general questions that all CDP reporting companies are presented with.

TNFD provides both sector-specific guidance, which offers recommendations but leaves room for flexibility, and sector-specific disclosure metrics, which include both required ("core") and optional ("additional") metrics. The TNFD sector-specific guidance offers additional guidance and tools for companies from a given sector on how to conduct a LEAP assessment, which prepares companies for the disclosure but is not required to follow for TNFD-aligned disclosure. The TNFD additional guidance for financial institutions also provides guidance for financial institutions to apply the TNFD recommended disclosures. The TNFD also provides core sector disclosure metrics, which are sector-specific disclosure metrics that are required for all companies in a given sector on a comply or explain basis. TNFD has also proposed additional sector disclosure metrics, which are optional but cover issues that are relevant to many companies in a given sector. However, the lists of sector-specific disclosure metrics developed by the TNFD are not intended to be exhaustive—companies are expected to disclose on all material nature-related issues.

SBTN currently provides sector-specific guidance only for Step 3 of the methods, which focuses on setting of the targets. Separate guidance for the finance sector is in development. All companies are encouraged to apply the SBTN Technical Guidance that has been released to date, spanning the assessment of material pressures (Step 1), prioritization of locations and business components for target-setting (Step 2) and setting of the targets (Step 3). The Step 3 Technical Guidance on freshwater, land and ocean targets is, however, more relevant to companies in some sectors rather than others (e.g. the land targets guidance is relevant especially to the Forestry, Land and Agriculture sectors as it builds on the SBTi FLAG guidance). Step 3 Technical Guidance on land targets includes sector-specific requirements on which companies should be setting no conversion targets, land footprint reduction targets and landscape engagement targets.[42] Guidance on how SBTN methods can be relevant to the finance sector is currently being developed.

Table 7: Sectoral coverage and scope of the sector-specific guidance of the reviewed nature-related assessment and disclosure approaches

Approach	Scope of sector-specific guidance	Sectoral coverage of the sector-specific guidance
CDP	The CDP questionnaire includes some additional sector-specific questions for certain sectors. There is also a sector-specific module for the financial sector. Guidance on how to respond to these sector-specific questions and module is provided alongside the questions.	The following sectors are covered by specific questions and modules in the CDP corporate questionnaire: ▪ Agricultural commodities ▪ Food, beverage & tobacco ▪ Paper & forestry ▪ Electric utilities ▪ Oil & gas ▪ Chemicals ▪ Coal ▪ Metals & mining ▪ Capital goods ▪ Financial services ▪ Cement ▪ Construction ▪ Transport services ▪ Transport OEMs ▪ Steel ▪ Real estate
ESRS	ESRS are currently in the process of developing sector-specific standards, which will be applicable to all companies within a sector. They will address impacts, risks and opportunities not covered, or not sufficiently covered, by the sector-agnostic standards.	The first set of sector-specific standards (including, Mining, Quarrying and Coal, Oil and Gas and Road Transport) is expected to be released for public consultation during the second half of 2024. In the coming years, ESRS are expected to provide sector-specific standards for all sectors of the economy, divided into 35 sectors, as detailed in [draft] ESRS SEC 1.
GRI	While the GRI Universal Standards and Topic Standards can be used by an organization of any size, type, sector or geographic location, the GRI has also developed Sector Standards applicable to companies in specific sectors. They describe the sustainability context for a sector, outline organizations' likely material topics based on the sector's most significant impacts, and list disclosures that are relevant for the sector to report on.	The GRI has already released the following Sector Standards: ▪ Oil and gas (GRI 11) ▪ Coal (GRI 12) ▪ Agriculture, aquaculture, and fishing sectors (GRI 13) ▪ Mining (GRI 14) Development of the following Sector Standards is currently under way: ▪ Textiles and Apparel ▪ Financial Services GRI has plans to develop standards for 40 sectors, with priority given to those that have the highest impact on the economy, environment and society.

Approach	Scope of sector-specific guidance	Sectoral coverage of the sector-specific guidance
ISSB	The ISSB recommends companies refer to the SASB Standards as well as broader best practice in each sector. The SASB Standards include industry-specific guidance and disclosure topics that are likely to be material for companies in the given sector, as well as disclosure requirements and relevant metrics. They also include guidance on how to compile disclosure-relevant data. In addition to this, the IFRS S2 on Climate-related Disclosures includes an annex on Industry-based Guidance on implementing Climate-related Disclosures. The annex details what climate-related metrics should be reported and how they can be measured for 68 industries.	The SASB Standards, which the ISSB encourages companies to refer to for sector-specific guidance on material sustainability issues, along with the industry-specific guidance for IFRS S2 on climate-related disclosures, cover all sectors of the economy, divided into the following 11 categories: ▪ Consumer goods ▪ Extractives & Minerals processing ▪ Financials ▪ Food & Beverage ▪ Health Care ▪ Infrastructure ▪ Renewable Resources & Alternative Energy ▪ Resource Transformation ▪ Services ▪ Technology & Communications ▪ Transportation
Natural Capital Protocol	The Natural Capital Protocol is designed to be a broad and flexible framework that is applicable to any business sector, operating in any geography, at any organizational level. Four sector guides are available to accompany the Protocol and provide more specific but voluntary guidance.	▪ Forest Products ▪ Apparel ▪ Food and Beverage ▪ Finance
SBTN	SBTN currently provides sector-specific guidance only for Step 3 of the methods, which focuses on setting of the targets. SBTN validation criteria also include some exceptions or adaptations for application of the methods companies in certain sectors. All companies, except consultancies and financial institutions, are encouraged to apply the methods developed by SBTN to assess material pressures (Step 1) and prioritize locations and business components for target-setting (Step 2). Some aspects of the freshwater, land and ocean target-setting methodologies (Step 3) are more relevant to companies in some sectors rather than others (e.g. the land targets guidance is relevant especially to the Forestry, Land and Agriculture sectors).	SBTN Step 3 methods include selected sector-specific guidance. Finance sector guidance in development.

Approach	Scope of sector-specific guidance	Sectoral coverage of the sector-specific guidance
TNFD	In addition to cross-sector recommendations and guidance, the TNFD has provided both sector-specific guidance and sector-specific disclosure metrics. The sector-specific guidance provides recommendations and tools for applying the TNFD LEAP approach. The use of the sector guidance and the LEAP approach are not required for TNFD-aligned reporting, but the guidance could significantly shape how companies in the given sector apply the TNFD recommendations. The additional guidance for financial institutions is unique in that it covers how financial institutions should apply the TNFD disclosure recommendations. The sector-specific disclosure metrics include core sector disclosure metrics, which are required for TNFD aligned disclosures for all companies in a given sector on a comply or explain basis and additional sector disclosure metrics, which are recommended for disclosure, where relevant. The list of additional sector-specific disclosure metrics is not intended to be exhaustive; companies can report metrics for any other nature-related issues that they determine to be relevant and material.	As of August 2024, sector-specific guidance has been published for the following sectors: ▪ Financial institutions ▪ Oil and gas ▪ Metals and mining ▪ Forestry and paper ▪ Food and agriculture ▪ Electric utilities and power generators ▪ Chemicals ▪ Biotechnology and pharmaceuticals ▪ Aquaculture Draft sector guidance and disclosure metrics are available for consultation for the following sectors: ▪ Fishing ▪ Engineering, Construction, and Real Estate ▪ Construction Materials ▪ Beverages ▪ Apparel, Accessories, and Footwear

2.4 Key finding 4: Coverage of value chain

Key finding 4: Most approaches require the assessment and disclosure of the company's nature-related issues within their direct operations as well as upstream and downstream value chains. However, there is variation in the expected level of detail of upstream and downstream disclosures as well as the scope of value chain links expected to be covered.

Most approaches require assessment and disclosure of the company's direct operations as well as upstream and downstream value chains. TNFD, ESRS, CDP, ISSB Standards, GRI and the Natural Capital Protocol all set expectations for companies to assess and (if material) disclose not only the nature-related issues in their direct operations but also in their entire value chain. SBTN currently covers direct operations and upstream, but it is expected to extend its coverage to downstream in the future. An overview of which parts of the value chain are covered by the different approaches can be found in Table 8 below.

The scope of which upstream and downstream activities should be assessed and disclosed is significantly shaped by the materiality perspective. According to the ISSB Standards, which use financial materiality, the decision on what upstream and downstream nature-related issues are relevant to disclose should be based on the needs of investors. Companies should disclose all upstream and downstream risks and opportunities that "could reasonably be expected to affect the entity's prospect" and the dependencies and impacts that give rise to them (IFRS 2023c). According to the ESRS, which prescribe double materiality, a company could be required to disclose on the negative impacts on nature associated with the sourcing of commodities, even where these negative impacts do not translate into material business risks for the company. TNFD, which does not require a specific materiality definition, highlights the implications of the decision on the materiality definition for the value chains assessment and disclosure in their guidance.

SBTN prescribes specific criteria for scoping out the value chains that should be included in the target-setting process. Companies implementing SBTN guidance are expected to compile a list of all direct operations and upstream activities that feed into the companies' direct operations**.** Assessment and subsequent target-setting is required for all material pressures in direct operations. In upstream, it should focus only on pressures associated with sourcing of "production inputs".[43] Companies are required to cover at least 67% of their overall sourcing (in volume), except the commodities that appear on the SBTN High Impact Commodity List (for which at least 90% coverage is required) and commodities listed in the EU Deforestation Regulation (for which 100% coverage is required).

TNFD provides broad guidance on how companies should prioritize their assessment of value chains to capture all nature-related issues that are relevant to disclose. Although TNFD recommends that companies disclose all material nature-related issues in their direct operations and value chains, it recognizes that some companies may need to take a "deep and narrow" or "broad and shallow" approach in the early years of their reporting. The value chain coverage should then be expanded over time.[44] The TNFD

LEAP approach also recommends that during the Locate phase companies narrow down their value chain focus on parts that are most likely to be associated with nature-related issues using sector, geography and supply chain filters, including the SBTN High Impact Commodity List. TNFD, however, does not specify a cut-off for the proportion of value chain links that can be deprioritized from later stages of the assessment.

Some approaches allow for a less detailed reporting on parts of the value chain. This includes enabling a lower level of coverage and the use of proxy data. For example, GRI Biodiversity Standard specifies several disclosures as recommended (and not required) for downstream activities. For both ESRS and TNFD, if companies are not able to collect the necessary information about their upstream and downstream value chain after making a reasonable effort to do so, they can instead estimate it, including using sector-average data and other proxies. ESRS in addition to this set out a transitional phase for the first three years of a company's sustainability reporting. Companies are allowed to omit value chain information during the transitional phase if it is not available, provided they explain why the information is not available, the efforts made to obtain it and plans to obtain it in the future. When disclosing information on policies, actions and targets, companies may limit the information on their upstream and downstream value chain to information available in-house and publicly available information. SBTN, as another example, allows companies to use less precise, more uncertain and less spatially resolved information to determine target boundaries (referred to as "target boundary B"), in the cases where companies lack national or subnational location data for a portion of their commodities and upstream activities. Companies are required to improve data availability on their upstream suppliers over time and gradually reduce the proportion of activities that fall within 'target boundary B'.

Table 8: Overview of the current value chains coverage by the different nature-related assessment and disclosure approaches

Approach	Value chains coverage	Extent of value chains disclosure
CDP	Direct operations, upstream and downstream	CDP's cross-sector modules ask companies to describe their processes for assessing dependencies, impacts, risks and opportunities across the entire value chain, and disclose risks and opportunities that have been identified as material in direct operations, upstream or downstream. Within the environmental issue-specific modules, direct operations are better covered than upstream and downstream, but specific questions ask companies to provide information on their value chains. For example, in the Climate module, companies are asked to report their Scope 3 emissions and in the Forest module, companies are asked to disclose information on whether their commodity sourcing is associated with deforestation and conversion of natural ecosystems. CDP also have a supplier engagement programme, where the purchasing companies are encouraged to invite their suppliers to report through CDP. The value chain data collected through the supplier engagement programme complements the information on nature-related issues associated with companies' direct operations.
ESRS	Direct operations, upstream and downstream	In general, the ESRS cross-cutting standards state that in sustainability statements, companies are required to include information on the material impacts, risks and opportunities (and dependencies[45]) associated with their direct operations as well as their business relationships in the upstream and/or downstream value chains. However, companies will only need to include value chain information that is material, and information required by any specific requirements set in the topical standards. If companies are unable to collect the required value chain information, they can estimate the information using all reasonable and supportable information, such as sector-average data and other proxies. When companies disclose their policies, actions, and targets addressing nature-related issues, they should also include value chain information to the extent that these policies, actions, and targets involve actors in the value chain. Recognizing the data challenges on value chain reporting, the ESRS have set out a transitional phase for the first three years of sustainability reporting. Companies are allowed to omit unavailable value chain information in the condition that they have demonstrated their efforts, provided explanation and the future action plans. They can also limit the information on their upstream and downstream value chain partners to information available in-house and publicly available information when disclosing information on policies, actions and targets.
GRI	Direct operations, upstream and downstream	In the GRI Standards, the entire value chain should be considered in the assessment of a company's impacts. GRI 3 (see requirement 3–3–b) enables organizations to report on all material topics, whether a company is involved with the negative impacts through its activities or as a result of its business relationships (including business relationship upstream and downstream the value chain). Specific GRI Topic Standards may require or recommend information for an organization's upstream and downstream value chain. Examples include Scope 3 emissions in GRI 305: Emissions 2016 or GRI 306: Waste 2020 on waste along the value chain. GRI 101: Biodiversity 2024 on biodiversity requires reporting on direct operations and upstream only—information on the downstream is recommended.

Approach	Value chains coverage	Extent of value chains disclosure
ISSB	Direct operations, upstream and downstream	According to the ISSB Standards, companies should disclose sustainability-related risks and opportunities related to the full range of activities, resources and relationship used and relied on from conception to end-of-life of the companies' products or services. In other words, covering not only direct operations but also all upstream and downstream value chain stages.
Natural Capital Protocol	Direct operations, upstream and downstream	The Natural Capital Protocol allows companies to determine the scope of value chain covered by their assessment, i.e., the upstream, direct operations and downstream, depending on the purpose of their assessment. It provides guiding questions to companies on what aspects to assess along the value chain.
SBTN	Direct operations and upstream (downstream may be covered in future releases)	SBTN v1.1 methods require companies to assess the pressures arising from activities associated with their directly owned or operated sites and facilities or other assets, and the state of nature in the locations where those activities occur. For upstream, SBTN requires companies to assess the pressures and state of nature for any production inputs. Once companies have completed a high-level screening of these direct operations and upstream activities (Step 1a of the SBTN methods), they go on to estimate pressure and state of nature values for 100% of their direct operations and at least 67% of their production input sourcing (in volume). Commodities that appear on the SBTN High Impact Commodity List are an exception and should be covered at least 90%. Another exception is commodities listed in the EU Deforestation Regulation, which should be covered 100%. Targets set in Step 3 should eventually cover all activities within companies' direct operations and upstream that are known or expected to have a material impact on nature (based on their Step 1 assessments). However, companies are expected to set targets first on the locations where action is needed most urgently and for activities which have the highest contribution to the pressure categories. While SBTN guidance does not include methods for companies to set targets on the downstream parts of their value chain, companies are encouraged to seek solutions for assessing, tracking and managing their downstream impacts. Downstream guidance may be developed in the future.
TNFD	Direct operations, upstream and downstream	The TNFD recommends that companies disclose on the full set of material nature-related dependencies, impacts, risks and opportunities, including climate, of their operations and across their value chains. This includes a consideration of the upstream and downstream value chains. For financial institutions, this includes financed, facilitated, investment and insured activities and assets. The TNFD also published additional Guidance on value chains, which provides more detailed cross-sectoral recommendations for how companies can tackle the analysis of their upstream and downstream value chains. The TNFD expects that organizations will need to take a deep and narrow approach at first, investigating a small number of highly material issues in detail in the early years of disclosure, before expanding their investigations over time to obtain a fuller picture. The coverage should expand over time.

2.5 Key finding 5: Location information requirements

Key finding 5: All approaches reflect the importance of location-specific nature-related assessment and disclosure. Several approaches recommend that companies provide spatial data to capture these locations precisely.

The need for location information is paramount in all approaches. All nature-related assessment and disclosure approaches recognize that nature-related dependencies, impacts, risks and opportunities are location specific. The need for information on all locations where a company or its value chain partners have activities is emphasized across the different approaches. For example, TNFD's general disclosure requirements state that the consideration of the geographic location of the company's interface with nature should be integral to the assessment of nature-related issues and their disclosure if they are material. The LEAP approach guidance recommends companies start their assessment by compiling a list of locations including their direct operations and value chain activities in order to locate their interface with nature. SBTN, as another example, recognizes that impacts are location specific and therefore setting effective science-based targets in managing nature-related impacts across different locations will require the use of location and spatial information. In Step 1, companies are asked to provide location information for all their directly owned or operated sites as well as the known or expected sourcing locations for their production inputs. In Step 2, companies then use the information on all parts of the value chain and pressures identified as material to determine which locations and economic activities to include within their "boundaries" for each target, and where to act first. An overview of the location information requirements across the nature-related assessment and disclosure approaches can be found in Table 9 below.

Location specific disclosure is increasingly required. Some approaches require spatially explicit disclosure with varying degrees of precision for direct operations and upstream and downstream activities. For example, when companies disclose their nature-related dependencies and impacts as part of the TNFD Strategy A disclosure, they must include a description of the material dependencies and impacts on nature. This description should encompass the location of the dependency/impact with reference to the location(s) identified in Strategy D and specify whether the dependency/impact is related to the company's direct operations or to its upstream or downstream value chains.[46] TNFD encourages companies to disclose spatial data as part of Strategy D disclosures, if possible, but this is not required. According to the ESRS, companies should break the information down by site and describe where the sites are located, when material impacts, risks and opportunities are highly dependent on a specific location. Further information also needs to be disclosed on companies' negative impacts on biodiversity sensitive areas. Another example is the GRI 101: Biodiversity 2024 Standard, which requires companies to disclose the location of their most significant impacts on biodiversity. This disclosure should include the location and size in hectares of their sites, along with information related to the ecologically sensitive areas that are in or near these

sites. The GRI 101: Biodiversity 2024 Standard also asks companies to report the products in their supply chains that have the most significant impacts on biodiversity and indicate the countries or jurisdictions where they are developed. The standard strongly encourages disclosure of spatial data—recommending companies report on the locations of their direct operation sites using polygon outlines or maps where possible. For the supply chain, the standard acknowledges that spatial data may not be possible to report and specifies companies only need to report the country or jurisdiction. They can report more precise information where the spatial data are available.

Prioritization of locations is often recommended and there is increasing convergence on the criteria used to determine the ecological significance of areas. Recognizing companies can have multiple sites but do not necessarily have material nature-related issues in all of them, most approaches recommend a degree of prioritization between locations. Several approaches are aligned or in the process of aligning more closely with the location prioritization criteria recommended by TNFD. As part of component L3 of the LEAP approach, TNFD asks companies to identify where the value chain activities and direct operations with potentially moderate and high dependencies are located, along with the biomes and specific ecosystems that they interface with. In L4, companies identify where these are in ecologically sensitive locations, based on criteria such as ecosystem integrity, biodiversity importance, water risks and importance for communities (for more information, see Box 2 below). Aligned with TNFD, the GRI Biodiversity Standard puts forward a similar process that companies can follow to identify the locations with the most significant impacts on biodiversity. It recommends companies consider the direct drivers of biodiversity loss, the proximity to ecologically sensitive areas, and the state of biodiversity. The ESRS E4 similarly recommends that companies identify sites that are most likely to be material in the early stages of their assessments. It encourages the use of the LEAP approach and prioritizing sites based on integrity and importance of biodiversity and ecosystems. Some of the criteria defining biodiversity-sensitive areas are similar to the criteria for sensitive locations specified by TNFD but some differences remain.

Box 2: TNFD's definition of sensitive locations

According to the TNFD v1.0, "sensitive locations are locations where the assets and/or activities in its direct operations—and, where possible, upstream and downstream value chain(s)—interface with nature in:

- Areas important for biodiversity; 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."

(TNFD 2023b)

Detailed description of the sensitive location criteria and recommended data sources can be found in the TNFD disclosure recommendation Strategy D and in TNFD's guidance on the Locate stage of LEAP.[47,48]

SBTN also uses information on ecological significance to prioritize locations for initial target-setting efforts. SBTN's Step 2 method provides a prescriptive approach for companies to interpret the environmental significance of their impacts in different locations, using information on the state of nature in these locations. This includes using indicators on ecosystem integrity, species threats, water availability, water pollution and others. The process allows companies to determine which locations should be prioritized for target setting from an environmental perspective. Companies can complement this with location-specific considerations on social and human rights priorities, business dependencies on nature, and feasibility or strategic priorities. It is expected that companies expand their target coverage over time. SBTN methods have helped inform the Locate phase of the TNFD LEAP approach, and there are plans for further alignment between the two approaches on the ecological significance criteria used for prioritization.

There is a divergence among approaches on the need to disclose locations with biodiversity significance that are not expected to be associated with material impacts or dependencies. TNFD disclosure recommendation Strategy D asks companies to disclose all priority locations in direct operations, upstream and downstream. This includes not only the locations where the company has identified material nature-related issues but also all locations where the company interfaces with ecologically sensitive areas.[49] The GRI Biodiversity Standard, on the other hand, requires companies to disclose only the sites with the most significant impacts on biodiversity and ecologically sensitive areas that are in or near these sites. The ESRS E4 on biodiversity and ecosystems also requires companies to disclose only direct operation sites with material impacts and dependencies and provide information on the ecological status of the areas where they are located. In addition to this, companies are required to disclose any biodiversity-sensitive areas in these sites that are negatively impacted by the company's activities.

Table 9: Overview of the location information requirements across the nature-related assessment and disclosure approaches

Approach	Is assessment of nature-related issues location-specific?	Is disclosure of nature-related issues location-specific?	Is spatial data required/ recommended to be disclosed?	Is prioritization based on location allowed/recommended?	Do companies need to disclose where they interface with nature in areas of biodiversity significance?
CDP	Yes	Yes	Spatial data is not required, but recommended for certain topics (e.g. list of names and locations for production and processing sites in commodity supply chains)	Currently no, but intend to include in the near future.	Yes, the climate change questionnaire requires companies to report whether they have activities located in or near 'biodiversity-sensitive areas' and if they fall within the operational site's area of influence.
ESRS	Yes	Yes	No	Yes, companies are recommended to identify the relevant sites where they are likely to have material dependencies and impacts in the list of locations based on the approach outlined in the ESRS Application Requirements.[50]	Yes, under ESRS E4, companies are required to disclose whether they have sites located in or near biodiversity-sensitive areas and where activities related to these sites negatively impact these areas. If these sites are material, companies are further required to provide the list of material sites and disclose the locations by specifying the biodiversity-sensitive areas impacted.
GRI	Yes	Yes	Spatial data (e.g. polygon outlines or maps) is required for direct operations and recommended for value chain.	Yes, companies should prioritize locations based on an assessment of their biodiversity and ecosystem service importance.	Yes, the GRI Biodiversity Standard requires disclosure of locations with the most significant (material) impacts that are in areas of biodiversity significance.

Approach	Is assessment of nature-related issues location-specific?	Is disclosure of nature-related issues location-specific?	Is spatial data required/ recommended to be disclosed?	Is prioritization based on location allowed/recommended?	Do companies need to disclose where they interface with nature in areas of biodiversity significance?
ISSB	Yes	Not required but recommended.[51]	No	Not required, but prioritization of locations is recommended in the CDSB Framework Application Guidance.	Not a distinct disclosure requirement, but companies may include this information in their description of risks and opportunities if it is material.
Natural Capital Protocol	Yes	N/A	N/A	Yes, using location information is recommended to scope and prioritize the assessment.	N/A
SBTN	Yes	Yes, targets and reporting on progress should be location specific.	N/A	Yes, companies are required to identify, interpret and prioritize the most material sites to measure, set and disclose targets with the use of location information in Steps 1 and 2 of the SBTN guidance.	No, according to the current guidance companies do not need to publicly disclose this information. However, companies will need to provide data to SBTN specifying which of their locations are of highest significance for biodiversity and other environmental concerns.
TNFD	Yes	Yes	Spatial data is not required but is recommended.	Yes, companies are recommended to prioritize locations in the Locate phase of the LEAP approach.	Yes. Under the disclosure recommendation Strategy D, companies are required to disclose all locations where the company's direct operations, and upstream and/or downstream and/or financed assets and activities, where relevant, are in ecologically sensitive areas. Criteria for ecologically sensitive areas are provided and include areas of biodiversity importance. The ecologically sensitive locations are expected to be disclosed regardless of the materiality of the company's impacts in these locations.

2.6 Key finding 6: Nature-related impacts

Key finding 6: Assessment of impacts is central to all of the approaches. Most approaches recognize that a comprehensive analysis of business impacts on nature requires looking beyond the impact drivers/pressures resulting from business activities. They recommend or require that companies measure the state of nature and understand how the impact drivers/pressures resulting from their business activities lead to changes in the flow of ecosystem services and stock of ecosystem assets.

Assessment of business impacts on nature is crucial in all of the reviewed approaches but plays a different role depending on the type of the approach. It can inform reporting on impacts as part of disclosure or target setting, or support risk and opportunity assessments. The GRI Standards are specifically designed to enable organizations to report their most significant impacts on the economy, nature and people. SBTN methods are developed to help companies set targets that will assist management of business impacts on nature. CDP, ESRS, Natural Capital Protocol and TNFD support companies in assessment and/or disclosure of their nature-related impacts alongside other issues, the understanding of which should also be informed by impact measurement. The ISSB Standards, which are designed to support the information needs of investors, lenders and other creditors, require companies to disclose impacts on nature only if these give rise to material risks and opportunities S2).[52] Companies reporting against the ISSB Standards are required to refer to and consider the applicability of the SASB Standards to identify material risks and opportunities and what information may be material to investors to report on these, which may include information on companies' impacts. The ISSB Standards also give companies the option to refer to the CDSB Framework Application Guidance, ESRS or GRI Standards to identify impact-focused metrics and other information that may be material to report. An overview of which approaches recommend or require assessment and disclosure of business impacts on nature can be found in Table 10 below.

Disclosure of nature-related impacts involves disclosure of quantitative metrics. For example, TNFD asks companies to disclose their impacts, the metrics used by the company to measure these impacts and their values under recommended disclosures Strategy A and Metrics & Targets B. The ESRS similarly specify that companies need to report their material impacts on nature, impact metrics and performance against these to meet the Disclosure Requirements within the environmental standards. The GRI Biodiversity Standard, as another example, requires quantitative information to be disclosed on the impact drivers/pressures and their state of nature context associated with the most significant impacts.

Some approaches provide comprehensive step-by-step guidance on how impacts should be measured. For example, TNFD's LEAP approach provides detailed guidance to companies on how to identify and measure their nature-related impacts, and on how this information should feed into the risk and opportunity assessment as well as the disclosure reports. The ISSB Standards refer to the CDSB Framework Application Guidance. SBTN's target-setting guidance outlines the required approach for measuring business impacts on nature within the Step 1–3 guidance documents released to date, with further details to be added in the future. Meanwhile, the Natural Capital Protocol was developed as a standardized framework to identify, measure and value business impacts and dependencies on nature through providing a nine-step guidance divided into four stages.

Other approaches provide guidance only on the aspects of business impact measurement that are required for all disclosing companies in the interest of ensuring comparability of disclosure reports. The ESRS, for example, does not include detailed step-by-step guidance on how companies should structure their measurement of impacts on nature. But specific paragraphs under the topical standards' application requirements provide recommendations on the components that the business impact measurement should include. For example, the application requirements under ESRS E4 on biodiversity and ecosystems specify the types of direct drivers of biodiversity loss that should be assessed. Similarly, GRI Standards provide guidance on how different disclosure requirements should be approached within the topic standards. For example, GRI 303: Water and Effluents 2018 includes guidance on how areas with water stress can be assessed, publicly available and credible tools that companies can use for that assessment, and instructions on how to report the impacts.

Looking more closely at what the measurement of business impacts on nature is expected to cover, nearly all of the approaches cover all IPBES direct drivers of biodiversity loss and ecosystem change. The IPBES direct drivers of biodiversity loss and ecosystem change include natural resource use and exploitation, land- and sea-use change, pollution, climate change and introduction of invasive species (IPBES 2019). TNFD, ESRS and GRI cover all of them.[53] The CDP company questionnaire covers most of the direct drivers. The ISSB Standards do not directly refer to the IPBES direct drivers of biodiversity loss and ecosystem change but they permit the use of the CDSB Framework Application Guidance that covers all IPBES drivers. SBTN technical guidance currently focuses primarily on land use and land use change, soil pollution, freshwater use, and freshwater pollution, with further details on other types of impact drivers/pressures expected to be included in future guidance documents released. This will build on the indicator framework proposing different types of pressure and state of nature indicators that companies are expected to use during Step 1 to assess their direct operations and value chain.[54]

State of nature assessment is also recognized by most approaches as a necessary part of impact measurement that is expected to include both species- and ecosystem-level assessments. ESRS, GRI, Natural Capital Protocol, SBTN and TNFD all specify that measurement of impact drivers/pressures should be accompanied by an assessment of the state of nature and an assessment of the changes to the ecosystem assets or services to which the impact drivers/pressures have led or are likely to lead.[55,56,57] The questions in the CDP questionnaire primarily focus on capturing the companies' impact drivers/

pressures and policies and procedures that the company uses to manage them, but some questions ask for additional context on the state of nature. For example, companies are asked to indicate the proportion of their water withdrawn from areas of water stress. ESRS, GRI, SBTN and TNFD also all explicitly state that companies should be assessing species abundance and species risks as part of the measurement of the state of nature.[58] This provides complementary information to changes in ecosystem condition and extent, and it captures impacts on species diversity and specific focal species. The ISSB Standards do not require assessment of the state of nature, but the CDSB Framework Application Guidance, an optional source of guidance mentioned in the ISSB Standards, does recommend assessment of the state of nature. While the importance of assessing the state of nature to understand impacts is reflected in most of the reviewed approaches, they provide limited guidance on how companies should conduct the baseline measurements of the state of nature, how frequently the full method should be repeated and what methods could be appropriate for tracking changes within these intervals.

Table 10: Overview of the requirements and recommendations on assessment and disclosure of business impacts on nature by the nature-related assessment and disclosure approaches

Approach	Are impacts recommended or required to be assessed?	Are impacts required to be disclosed?	What guidance on measurement of business impacts on nature is provided?	What components are included in the measurement of impacts?			Types of impact-related metrics required or recommended for disclosure
				Impact drivers/ Pressures	Changes to the state of nature	Changes in the flow of ecosystem services and stock of ecosystem assets	
CDP	Yes	Yes	Limited guidance—Clarifications in the questionnaires	Yes, impact drivers/ pressures related to climate change, water security, forests, plastics and biodiversity	Included for specific questions only	Not Included	▪ Specific impact driver/pressure metrics ▪ Selected state of nature metrics, e.g. water accounting and intensity metrics
ESRS	Yes	Yes	Limited guidance—ESRS E1—5 Application Requirements	Yes, covering all IPBES direct drivers	Yes, including ecosystem extent, condition and species risks	Yes	▪ Impact driver/ pressure metrics ▪ State of species metrics ▪ Ecosystem extent and condition metrics
GRI	Yes	Yes	Limited guidance—Guidance under disclosure requirements for environmental topic standards	Yes, covering all IPBES direct drivers	Yes, including ecosystem extent, condition and species risks	Yes	▪ Impact driver/ pressure metrics

Approach	Are impacts recommended or required to be assessed?	Are impacts required to be disclosed?	What guidance on measurement of business impacts on nature is provided?	What components are included in the measurement of impacts?			Types of impact-related metrics required or recommended for disclosure
				Impact drivers/ Pressures	Changes to the state of nature	Changes in the flow of ecosystem services and stock of ecosystem assets	
ISSB	Yes, indirectly[59]	Yes, if giving rise to material risks or opportunities and information on impacts is material to investors	Full guidance—SASB Standards and CDSB Framework Application Guidance	Yes, covering all IPBES direct drivers, but indirectly[60]	Yes, indirectly. CDSB Framework Application Guidance recommends measurements of ecosystem extent, condition, integrity and species risks	Yes, indirectly. CDSB Framework Application Guidance recommends measurement of changes in the flow of ecosystem services.	None
Natural Capital Protocol	Yes	N/A[61]	Full guidance—Natural Capital Protocol Measure and Value Steps 5—6	Yes, covering all IPBES direct drivers	Yes, including all changes in state of natural capital	Yes	N/A
SBTN	Yes	Yes (as part of disclosing progress against targets)	Full guidance—SBTN Technical Guidance on Steps 1—3. This includes an indicator framework in helping companies to map the pressures to states.	Yes, covering land use and land use change, soil pollution, freshwater use, and freshwater pollution primarily, with further guidance on other types of impact drivers/ pressures expected in the near future	Yes, including ecosystem extent, integrity and connectivity, and species risks[62]	Yes	▪ Impact driver/ pressure metrics ▪ Pressure-sensitive state of nature metrics (SoN_p) ▪ Biodiversity significance state of nature metrics (SoN_B)

Approach	Are impacts recommended or required to be assessed?	Are impacts required to be disclosed?	What guidance on measurement of business impacts on nature is provided?	What components are included in the measurement of impacts?			Types of impact-related metrics required or recommended for disclosure
				Impact drivers/ Pressures	Changes to the state of nature	Changes in the flow of ecosystem services and stock of ecosystem assets	
TNFD	Yes	Yes	Full guidance—LEAP approach guidance on the Evaluate phase and accompanying Annex 2 on how to measure changes in the state of nature	Yes, covering all IPBES direct drivers	Yes, including ecosystem extent, condition and species risks	Yes	▪ Impact driver/ pressure metrics ▪ State of nature metrics ▪ Ecosystem services metrics

2.7 Key finding 7: Nature-related dependencies

Key finding 7: Most approaches cover business dependencies on nature. The connections between a company's dependencies and its impacts as well as considerations of the state of nature and external drivers of change in the location, are increasingly considered to be a part of the measurement of business dependencies on nature.

Reflecting the recognition that business dependencies on nature are associated with significant risks and opportunities, all approaches that consider nature-related risks to companies cover business dependencies on nature. TNFD and ESRS both specify that companies should assess their dependencies on nature and disclose the most material ones. CDP covers specific types of business dependencies on nature through its questionnaire. The ISSB Standards require companies to disclose the dependencies that result in material risks and opportunities. The ISSB Standards also refer to the CDSB Framework Application Guidance, which recommends that companies assess all potentially significant dependencies on nature. An overview of the requirements and recommendations on the assessment and disclosure of business dependencies on nature by the approaches can be found in Table 11 below.

The GRI Biodiversity Standard and SBTN are primarily focused on business impacts on nature and society, but they encourage companies to consider dependencies on nature in connection with the impacts. The GRI Biodiversity Standard asks companies to report how the ecosystem services upon which the companies and other stakeholders depend could be affected, but it does not provide a detailed guidance on how companies should measure the size of their dependencies on nature. In the case of SBTN, while dependencies are not currently included in the guidance on assessment (Step 1) and target-setting (Step 3), companies are able to introduce information on dependencies when choosing priority locations for target setting and action (Step 2).

There is recognition that businesses depend upon nature not only for provisioning ecosystem services but also for regulating and maintenance and cultural ecosystem services. TNFD, ESRS, GRI, Natural Capital Protocol as well as the ISSB's CDSB Framework Application Guidance all recommend that companies identify their dependencies on all ecosystem services, including provisioning services, regulation and maintenance services and cultural services. CDP's company questionnaire covers only specific ecosystem services, but these include all three types of ecosystem services.

There is increasing recognition that assessing business dependencies requires measuring companies' reliance on the ecosystem service as well as understanding how the ecosystem service and the state of nature supporting it might change. Measurement of business dependencies on nature can include different components: (1) measurement of the business's reliance on the ecosystem service, (2) measurement of impact drivers resulting from the business's own activities (3) measurement of external drivers of change, (4) assessment of the state of nature supporting the ecosystem service and (5) assessment of the availability and quality of the ecosystem service

(UNEP 2023a). TNFD, Natural Capital Protocol and the ISSB's CDSB Framework Application Guidance explicitly list all five components in their recommendations on how business dependencies should be measured. The ESRS specifies that companies should consider how they are affected by their dependencies on natural capital and how their impact drivers could be affecting the ecosystem services upon which they depend. The guidance within the environmental ESRS standards does not explicitly specify external drivers of change and state of nature as part of dependency measurement. Companies are, however, expected to disclose whether the ecosystem services they depend upon are likely to be disrupted. They are also encouraged to draw on climate and nature scenarios, as part of which the impacts caused by other stakeholders in the landscape and expected changes in the state of nature would be considered.

Table 11: Overview of the requirements and recommendations on assessment and disclosure of business dependencies on nature by the nature-related assessment and disclosure approaches

Approach	Are dependencies recommended or required to be assessed?	Are dependencies required to be disclosed?	What guidance on measurement of business dependencies on nature is provided?	What components are included in the measurement of dependencies?				
				Reliance on the ecosystem service	External drivers of change	Impact drivers	Changes to the state of nature	Ecosystem services
CDP	Yes	Yes	Limited guidance—Clarifications as part of question-naires	Yes	Not included	No	Not included	Not included
ESRS	Yes	Yes	Limited guid-ance—ESRS E1–5 Application Requirements	Yes	Not explic-itly part of dependency measurement, considered through nature scenarios	Yes, covering all IPBES direct drivers	Not explic-itly part of dependency measurement, considered through nature scenarios	Yes
GRI	Yes (limited)	Only as part of the reporting on impacts	Limited guidance—Guidance under disclosure require-ments for envi-ronmental topic standards	Yes (as part of the reporting on impacts)	No	Yes, covering all IPBES direct drivers (as part of the reporting on impacts)	No	Yes (as part of the reporting on impacts)

Approach	Are dependencies recommended or required to be assessed?	Are dependencies required to be disclosed?	What guidance on measurement of business dependencies on nature is provided?	What components are included in the measurement of dependencies?				
				Reliance on the ecosystem service	External drivers of change	Impact drivers	Changes to the state of nature	Ecosystem services
ISSB	Yes	Yes, if giving rise to material risks and opportunities	Full guidance—CDSB Framework Application Guidance and SASB Standards	Yes	Yes	Yes, covering all IPBES direct drivers	Yes, CDSB Framework Application Guidance includes ecosystem extent, condition, integrity and species risks	Yes, included in the CDSB Framework Application Guidance
Natural Capital Protocol	Yes	N/A[63]	Full guidance—Natural Capital Protocol Measure and Value Steps 5–6	Yes	Yes	Yes, covering all IPBES direct drivers	Yes, including all changes in the state of natural capital	Yes
SBTN	Yes (Limited)[64]	No	N/A	N/A	N/A	N/A	N/A	N/A
TNFD	Yes	Yes	Full guidance—LEAP approach guidance on the Evaluate phase and accompanying Annex 2 on how to measure changes in the state of nature	Yes	Yes	Yes, covering all IPBES direct drivers	Yes, including ecosystem extent, condition and species risks	Yes

2.8 Key finding 8: Nature-related risks and opportunities

Key finding 8: Approaches use similar definitions and categorizations of nature-related risks and opportunities. While companies are typically expected to disclose the risks and opportunities associated with the most material effects on their financial performance and strategy, some approaches recognize that all risks and opportunities associated with significant impacts on nature or society are or will likely prove financially material over time.

Nature-related risks and opportunities for business and finance are a fundamental part of approaches that consider financial materiality, and they all adopt similar definitions. While nature-related impacts and dependencies have effects on nature and people, nature-related risks and opportunities relate to the assessed company only. Other stakeholders in the landscape may face their own sets of nature-related risks and opportunities, and several of the approaches encourage companies to consider these as part of estimating potential indirect or systemic risks and in their engagement with vulnerable communities. However, when estimating the value of nature-related risks and opportunities faced by a given company, companies are expected to capture how the risks and opportunities relate to them and their performance. An overview of the risk and opportunity coverage by the different approaches can be found in Table 12 below.

There are also similar categorizations of risks and opportunities. CDP, ESRS, ISSB Standards and TNFD all differentiate between acute physical and chronic physical risks. In addition to this, most approaches recognize different types of transition risks, including policy and legal risks, technology risks, market risks and reputation risks. The third category recognized by most approaches are systemic risks.[65,66] For opportunities, the names of the categories tend to vary but resource efficiency, products and services, market, as well as financial incentives are commonly included in the categorizations (see Table 12 below). ESRS and TNFD also highlight opportunities that benefit nature through companies improving their sustainability performance, such as ecosystem protection, restoration and regeneration and sustainable use of natural resources.

While companies are typically expected to disclose the risks and opportunities associated with the most material effects on their financial performance and strategy, some approaches recognize that all risks and opportunities associated with significant impacts on nature or society are material or will likely prove financially material to the company over time. ESRS, ISSB Standards and TNFD all outline that companies should assess the likelihood and magnitude of nature-related risks as well as their type. These factors should feed into the estimation of the severity of the risks and opportunities and their current and anticipated financial effects. Although these three approaches allow companies to determine the exact methodology and criteria for identifying material risks and opportunities, they require the companies to (1) align it with the definition of materiality and (2) document the methodology followed as part of their disclosure reports. TNFD, which does not prescribe a specific definition of materiality, recommends that all companies (including those using a financial materiality approach) prioritize risks

and opportunities not only based on their likelihood and magnitude but also based on additional criteria, including the severity of impacts on nature and of implications for society. These additional prioritization criteria will capture the risks and opportunities that may not appear material based on the currently estimated likelihood and magnitude, but which could significantly affect a company's financial position or strategy over short-, medium- or long-term.

The approaches currently provide limited guidance on assessing and managing compound and systemic nature-related risks. All of the reviewed approaches acknowledge that nature-related risks can compound into disproportionately larger or new risks. However, they provide limited guidance on how company-level assessments should consider these to effectively and efficiently capture the full scope of nature-related risks that companies may face. The ISSB standards and TNFD expect companies to assess each risk separately and report those that are material. They do not prescribe specific methods for how companies should consider interlinkages between different risks. None of the reviewed approaches require or recommend specific metrics for assessment and disclosure of nature-related systemic risks.[67] Companies can choose their preferred methodologies for measuring these.

Table 12: Overview of the requirements and recommendations on assessment and disclosure of nature-related risks and opportunities

Approach	Risks and opportunities recommended/ required to be assessed?	Are risks and opportunities required to be disclosed?	What guidance on measurement of risks and opportunities is provided?	Types of risks	Types of opportunities	What information is expected to be disclosed about risks and opportunities?
CDP	Yes	Yes	Limited guidance—Clarifications as part of questionnaires	Physical risks, including: ▪ Acute physical risks ▪ Chronic physical risks Regulatory risks Transition risks, including: ▪ Policy ▪ Market ▪ Reputation ▪ Technology ▪ Liability	Resource efficiency ▪ Energy source ▪ Capital flow and financing ▪ Products and services ▪ Markets Reputational capital and/or resilience	Different questions in the questionnaire cover elements of: ▪ Description of each risk and opportunity identified and whether they are likely to materialize in short-, medium- or long-term ▪ Anticipated financial effects of specific risks and opportunities in the short-, medium- and long-term ▪ Effects on the company's business model and value chain from specific risks and opportunities ▪ Effects on the company's strategy and decision-making from specific risks and opportunities, including cost of responses to risks

Approach	Risks and opportunities recommended/ required to be assessed?	Are risks and opportunities required to be disclosed?	What guidance on measurement of risks and opportunities is provided?	Types of risks	Types of opportunities	What information is expected to be disclosed about risks and opportunities?
ESRS	Yes	Yes	Limited guidance—ESRS E1–5 Application Requirements	Physical risks, including: ▪ Acute physical risks ▪ Chronic physical risks Transition risks, including: ▪ Policy and Legal ▪ Technology ▪ Market ▪ Reputation Systemic risks, including: ▪ Ecosystem collapse risks ▪ Aggregated risk ▪ Contagion risks	Business performance opportunities, including: ▪ Resource efficiency ▪ Products and services ▪ Markets ▪ Capital flow and financing ▪ Reputational capital Sustainability performance opportunities, including: ▪ Ecosystem protection, restoration and regeneration ▪ Sustainable use of natural resources	For material risks and opportunities: ▪ Anticipated financial effects (For opportunities does not need to be quantified.) ▪ Whether they are likely to materialize in the short-, medium- and long-term. ▪ Which impacts and dependencies the risks relate to. ▪ Critical assumptions are used to estimate the financial effects, and the level of uncertainty.
GRI	No	No	N/A	N/A	N/A	N/A

Approach	Risks and opportunities recommended/ required to be assessed?	Are risks and opportunities required to be disclosed?	What guidance on measurement of risks and opportunities is provided?	Types of risks	Types of opportunities	What information is expected to be disclosed about risks and opportunities?
ISSB	Yes	Yes	Full guidance—Within the ISSB Standards as well as in the SASB Standards and the CDSB Framework Application Guidance	Physical risks, including: ▪ Acute physical risks ▪ Chronic physical risks Policy & Legal Market Technology Reputational[68]	Resource efficiency Products, services and market Financial incentives Reputational & relationship with stakeholders[69]	For material risks and opportunities: ▪ Effects on financial position and cash flows (Quantitative information can be omitted if the effects cannot be separated, the uncertainty is high, or the company does not have the capacity to provide quantitative information.) ▪ Effects on the company's business model and value chain ▪ Effects on strategy and decision-making ▪ Whether they are likely to materialize in the short-, medium- and long-term.
Natural Capital Protocol	Yes	N/A[70]	Limited guidance provided on how assessments of impacts and dependencies can inform identification of risks and opportunities, as well examples provided on risks and opportunities.	Operational Legal and regulatory Financing Reputational and Marketing Societal	Operational Legal and regulatory Financing Reputational and Marketing Societal	N/A
SBTN[71]	No	No	N/A.	N/A	N/A	N/A

Approach	Risks and opportunities recommended/ required to be assessed?	Are risks and opportunities required to be disclosed?	What guidance on measurement of risks and opportunities is provided?	Types of risks	Types of opportunities	What information is expected to be disclosed about risks and opportunities?
TNFD	Yes	Yes	Full guidance—The disclosure recommendations and the LEAP approach	Physical risks, including: ▪ Acute physical risks ▪ Chronic physical risks Transition risks, including: ▪ Policy ▪ Market ▪ Reputation ▪ Technology ▪ Liability Systemic risks, including: ▪ Ecosystem stability ▪ Financial stability	Business performance opportunities, including: ▪ Resource efficiency ▪ Products & services ▪ Markets ▪ Capital flows and financing ▪ Reputational capital Sustainability performance, including: ▪ Ecosystem protection, restoration and regeneration ▪ Sustainable use of natural resources	For material risks and opportunities: ▪ Description of each nature-related risk and opportunity identified Whether they are likely to materialize in short-, medium- and long-term ▪ How they arise from the company's dependencies and impacts on nature ▪ The TNFD risk and opportunity category to which the risk or opportunity belongs ▪ Effects on the company's business model, value chain and strategy ▪ Effects on financial position ▪ Quantitative information covering all core global and core sector risk and opportunity metrics on a comply or explain basis, as well as any other relevant metrics ▪ Related targets and transition plans, if applicable.

2.9 Key finding 9: Disclosure metrics

Key finding 9: All approaches encourage companies to disclose not only a description of their nature-related issues but also metrics and their performance against the metrics. There is variation in the level of prescriptiveness on the choice of metrics.

While the inclusion of metrics is core to assessment and disclosure, there are varying levels of flexibility in the choice of metrics that are required or recommended to disclose across the approaches. Both GRI and TNFD prescribe some specific metrics that companies need to disclose but expect companies to go beyond these and disclose metrics on all nature-related issues that are material to the reporting company. The GRI Standards explicitly require disclosure of several metrics if the given nature-related issues are material for the reporting company**.** For instance, if the company identifies it contributes to exploitation of natural resources, examples of the required metrics include the volume of water withdrawal and consumption in megaliters, or type and quantity of wild species used and their species extinction risk in locations. TNFD sets out the core disclosure metrics, which are to be disclosed on a comply or explain bases for all companies looking to report in line with the TNFD recommendations. The 14 core disclosure metrics at the global level are complemented with core disclosure metrics for specific sectors and biomes. The TNFD also provides an extensive list of additional disclosure metrics that organizations should disclose, where relevant, to best represent their material nature-related issues, based on their specific circumstances, and a list of assessment metrics in the LEAP approach guidance. An overview of how prescriptive the disclosure metrics requirements and recommendations are across the different approaches can be found in Table 13 below.

ESRS prescribe some metrics but, in many cases, give companies the flexibility to select their own so long as they align with the necessary characteristics. ESRS specifies certain metrics that all companies reporting against a particular ESRS environmental standard must disclose. For instance, companies reporting against ESRS E2 on pollution are required to disclose the amounts of pollutants emitted and those reporting against ESRS E3 on water, need to disclose their total water consumption in m^3. ESRS E4 on biodiversity and ecosystems specify two metrics that all companies reporting against that standard need to disclose: number and area size (in hectares) of sites owned, leased or managed in or near biodiversity-sensitive areas that the company is negatively affecting. Except for these metrics and others that a specific company may be required to report, ESRS E4 gives companies the flexibility to choose their own metrics. It provides specific recommendations regarding the elements that the metrics should cover. For example, if companies directly contribute to the impact drivers of land-use change, freshwater-use change, and/or sea-use change, they are encouraged to report on metrics measuring changes in ecosystem structural connectivity and changes to the spatial configuration of the landscape.

The ISSB Standards also give companies the flexibility to select their disclosure metrics as long as they are in line with recommended guidance or established best practice. The ISSB prescribes some specific disclosure metrics on greenhouse gas emissions in the IFRS S2 on Climate-related Disclosures. For other environmental sustainability issues, the ISSB does not currently provide separate standards and companies are asked to refer to the general guidance within the IFRS S1 General Sustainability-related Disclosures standard. This specifies companies should base their choice of disclosure metrics on guidance in the SASB Standards. They may also refer to the CDSB Framework Application Guidance and best practice within the sector or geographical region in which the company is operating. For information on best practice, the ISSB recommends reviewing recommendations of other standard-setting bodies and sustainability reports of other companies in the same industry or region.

Table 13: Overview of the flexibility in choosing the disclosure metrics across the nature-related assessment and disclosure approaches

Approach	Flexibility in choosing which metrics are disclosed
CDP	Limited flexibility. CDP expect companies to have full disclosure of the required metrics (i.e. completing all the data points they are presented with) as minimum in their questionnaire. All disclosers are presented with datapoints on climate change, plastics and biodiversity. Datapoints on forests and water security are presented if a discloser has been requested or has opted in to report on these. Examples of some of the metrics include: ▪ Percentage of commodity volumes verified as DCF (deforestation-and conversion-free) (Forests) ▪ Percentage of processing facilities in supply chain with DCF/ NDPE (no deforestation, no peat and no exploitation) commitments; % of processing facilities in supply chain with deforestation/conversion monitoring systems in place to measure the performance of several actors in the supply chains (Forests) ▪ Engagement and investment in landscape/jurisdictional initiatives; percentage of commodity volumes produced/sourced from landscape/jurisdictional initiatives (Forests) ▪ Respondents reporting that sufficient amounts of good quality freshwater available for use is 'vital' or 'important' for their direct operations (Water security) ▪ Percentage of water risks reported that are physical (Water security) ▪ Percentage of water opportunities relating to efficiency (Water security)

Approach	Flexibility in choosing which metrics are disclosed
ESRS	The five ESRS environmental standards include disclosure requirements on metrics and targets. In some of the environmental standards, ESRS specify some metrics that all companies reporting against these standards should disclose. Examples include Scope 1–3 GHG emission in the ESRS E1 standard on climate change, amounts of pollutants emitted by the company in the ESRS E2 on pollution, total water consumption in m^3 in the ESRS E3 on water or total weight of products used in the production in the ESRS E5 on circular economy. In the ESRS E4 on biodiversity and ecosystems, the disclosure requirements on metrics and targets prescribe only two specific metrics that all companies reporting against that standard need to disclose (the undertaking may be required to disclose additional nature-related metrics, following ESRS provisions, even if those are not specified in the ESRS): number and area size (in hectares) of sites owned, leased or managed in or near biodiversity-sensitive areas that the company is negatively affecting. For reporting on other nature-related issues, ESRS E4 leave companies the flexibility to choose their metrics but outlines specific recommendations on what elements these metrics should cover. For example, companies that find they have material impacts on ecosystems are recommended to disclose metrics on ecosystem extent and condition.
GRI	GRI Standards include several required metrics to capture the company's contribution to direct drivers of biodiversity loss. Examples include: ▪ Area size in hectares of a company's sites with the most significant impacts on biodiversity ▪ Volume of water withdrawal and consumption ▪ Species extinction risk of wild species used ▪ Ecosystem extent in hectares For other aspects of the company's impacts on nature, GRI Standards leave companies the flexibility to choose the metrics but outline what the metrics should cover or provide some recommendations for metrics. For example, for measurement of ecosystem condition the GRI Biodiversity Standard recommends reporting condition-adjusted hectares.
ISSB	The ISSB Standards prescribe some specific disclosure metrics on greenhouse gas emissions in the IFRS S2 Climate-related Disclosures. For other environmental sustainability issues, the ISSB does not currently have separate standards. The IFRS S1 requires companies to consider the SASB Standards when identifying disclosure metrics that capture their sustainability risks and opportunities, and recommends companies refer to: ▪ The CDSB Framework Application Guidance ▪ The most recent pronouncements of other standard-setting bodies whose requirements are designed to meet the information needs of users of general-purpose financial reports ▪ The sustainability-related risks and opportunities identified by entities that operate in the same industry(s) or geographical region(s).
Natural Capital Protocol	The Natural Capital Protocol offers a flexible approach on metrics used in assessment and leaves flexibility to companies in determining whether they report on the results of their assessment—ranging from qualitative, quantitative and monetary approaches and their related metrics, based on the purpose of their assessment. It provides guidance on factors to consider when selecting assessment and disclosure metrics, along with some illustrative examples.

Approach	Flexibility in choosing which metrics are disclosed
SBTN	The SBTN methods released to date cover Steps 1–3. They focus on the information required to be submitted for validation. Guidance on external disclosures from companies (Step 5) is still under development. SBTN provides guidance for the choice of metrics in different steps of the target-setting process (from Steps 1–3). The degree of certainty companies must have about their measurements for these metrics and the spatial resolution of the data associated with these increases as companies move through the methods. For instance, in Step 1, companies may have a general estimate for the ecosystem conversion they have contributed to over the last five years at national level, but as they move to Step 3 and setting targets, they must measure hectares of deforestation or conversion since a given cut-off date within a sourcing area or smaller spatial unit. In general, SBTN methods aim to use indicators that reflect (1) appropriateness and ability to describe the company's activity, (2) controllability and the company's ability to affect the metric directly, and (3) comprehensiveness in their ability to capture the full picture, including pressures generated by the company and the associated changes in the state of nature (as well as changes in impacts/benefits from this). This means that companies may need to use multiple indicators and metrics together in order capture the full extent of their impacts (negative and positive) on nature.
TNFD	TNFD differentiates between disclosure metrics and assessment metrics. For disclosure metrics, it differentiates between core disclosure metrics and additional disclosure metrics. ▪ Core disclosure metrics are recommended to be disclosed on a comply or explain basis by all companies looking to align with TNFD recommendations. They are intended to support comparability within and across sectors on areas of high priority. The state of nature core disclosure metrics are currently listed as placeholders. ▪ Additional disclosure metrics that do not need to be disclosed by all companies but are recommended for disclosure, where relevant, to best represent an organization's material nature-related issues, based on their specific circumstances. In addition to a set of 14 core disclosure metrics and more than 25 additional disclosure metrics at the global level, TNFD also provides core and additional disclosure metrics for selected sectors and biomes with the aim to cover more sectors and biomes over time. TNFD disclosure recommendations explain that companies and financial institutions are expected to go beyond the lists of core and additional disclosure metrics and disclose all metrics that are relevant and material to their organization.

2.10 Key finding 10: Disclosures on pollution

Key finding 10: Pollution is covered by all approaches reviewed in this report. While some approaches provide pollution-specific disclosure recommendations, requirements and metrics, others cover pollution in broader disclosures. Differences between the approaches can also be found in the types of pollution addressed.

Pollution is covered by all the seven nature-related assessment and disclosure approaches reviewed in this report. While all approaches encourage companies to go beyond narrative descriptions of their disclosures, the approaches differ in the level of specificity in guidance and metrics on pollution.

Each disclosure approach has a unique origin that shapes its focus and methodology for addressing pollution. These diverse origins lead to variations in the environmental media included (air, soil, water), the types of pollution defined (e.g., GHGs, non-GHGs, plastics, waste, chemicals), and the emphasis placed on environmental impact, consideration of impacts and dependencies or how those impacts and dependencies translate into financial risk and opportunities.

CDP, ESRS, GRI, Natural Capital Protocol, SBTN and TNFD include guidance and metrics on pollution that can be considered for corporate disclosures but differ in the level of specificity in guidance and metrics. Within ISSB Standards, IFRS S1, which covers all sustainability issues including pollution, does not include pollution-specific requirements, while IFRS S2, which covers climate change, includes climate-related pollution requirements. Among the approaches that include dedicated guidance and/or metrics on pollution, the integration of pollution-related topics varies across the approaches examined in this report.

CDP includes dedicated modules covering pollution in environmental performance disclosures, including climate change, water security, plastics and biodiversity. Pollution is also included in various other modules from CDP on dependencies, impacts, risks and opportunities, as well as on governance and business strategy. ESRS includes a dedicated topical standard–ESRS E2: Pollution–along with other topical standards that incorporate pollution-related disclosure requirements, such as on climate change, water and marine resources, biodiversity and ecosystems, resource use and circular economy and affected communities. GRI includes pollution-related disclosures across several of the GRI Topic Standards, complementing those in GRI 3 which serves as the starting point to report on all material topics. GRI is currently reviewing some of the pollution-related disclosures and as part of updating these may more explicitly cover plastic pollution (drafts are expected for public comments in 2026). The Natural Capital Protocol guides organisations to identify, measure, and value their impacts and dependencies on natural capital, including those related to pollution. SBTN considers freshwater and soil pollution among the key pressure categories that companies are encouraged to assess and address when setting science-based targets for nature. Water pollution reduction is covered in SBTN Step 3 Freshwater methods as part of the freshwater quality target. Soil pollution reduction is one of the potential focus areas for a landscape engagement target outlined in the SBTN Step 3 Land methods. As for TNFD, pollution is embedded throughout the TNFD Recommendations and Additional Guidance as one of the drivers of nature change, with

organisations recommended to disclose their dependencies, impacts, risks and opportunities on nature, including those related to pollution, and the associated metrics. ISSB Standards require disclosures of information on sustainability-related risks and opportunities that can be reasonably expected to affect the entity's prospects, which could encompass GHG emissions (and thereby air pollution) and other form(s) of pollution if such information is material to users of general purpose financial reports, such as investors, in making decisions relating to providing resources to the entity.

The environmental endpoints (air, soil, water) and types of pollution and level of specificity of disclosure metrics prescribed also differ across approaches. While some approaches are general, covering all sustainability issues, including pollution (i.e. all types of pollution), other approaches provide specific requirements on certain types of pollution. Specific requirements or recommendations on air pollution are provided by Noting that SBTN covers non-GHG air pollution only in Steps 1 and 2, and are currently[72] Specific recommendations or requirements on water pollution are provided CDP, ESRS, GRI, Natural Capital Protocol, SBTN, and TNFD. Water pollution-specific metrics recommended by these approaches include, for instance, pollutant loads discharged into water systems, wastewater discharge volumes, and water quality indicators. Specific recommendations or requirements soil pollution are provided by, as well as by GRI for instance in sectoral standards such as GRI 14 for the mining sector. Metrics for soil pollution recommended by these approaches include, for example, nutrient pollution levels in soil, pollutant concentrations, and soil quality indicators.[73] Specific recommendations or requirements on pare CDP, ESRS, Natural Capital Protocol, and TNFD. Example metrics for plastic pollution recommended by these approaches include plastic waste volumes generated, plastic recycling efforts, and the percentage of plastics that are reusable, technically recyclable, and recyclable in practice and at scale. Hazardous and non-hazardous waste are specifically covered in ESRS, GRI, SBTN, Natural Capital Protocol, and TNFDMetrics related to waste pollution recommended by the approaches include, for example, total weight of hazardous and non-hazardous waste by type, waste diverted from landfill, and waste treatment and disposal methods. Other forms of pollution, including noise and light pollution, are included in some approaches which are general and thus cover pollutionin , such as TNFD, ISSB and the Natural Capital Protocol.

Table 14 below provides a high-level overview of pollution disclosures and metrics in the seven nature-related assessment and disclosure approaches covered in this report. In several jurisdictions, companies have already been reporting on certain types of pollution in response to regulatory requirements or voluntary standards (e.g. the European Union's National Emission Reduction Commitments Directive or ISO 14001). More information on how corporate assessment and disclosure approaches fit into the broader pollution standards and regulatory landscape can be found in the Addendum on Pollution at the end of this report.

The Addendum provides: (i) a high-level analysis of pollution's multifaceted effects on people, ecosystems, and economies, (ii) an overview of key international and regional agreements addressing pollution, and (iii) insights into the potential challenges and opportunities for enhancing global efforts to address pollution.

Table 14: Overview of requirements and recommendations on pollution and examples of pollution-specific metrics in nature-related assessment and disclosure approaches

Approach	Does the approach cover pollution?	Does the approach provide dedicated standard / module /guidance / metrics on pollution?	Sub-standard(s)/ module(s)/ guidance/ metric(s) within the approach that address(es) pollution	Examples of pollution metrics
CDP	Yes	Yes	**Identification, assessment, and management of dependencies, impacts, risks, and opportunities (Module 2)** includes disclosures of identification and classification of potential water pollutants and related impact; **Disclosure of risks and opportunities (Module 3)** includes disclosure of water and plastic pollution risk(s) and water pollution-related regulatory violations; **Governance (Module 4)** includes disclosures of how pollution is embedded in the governance structure and mechanisms; **Business Strategy (Module 5)** includes disclosures of how pollution affects business strategy; **Environmental Performance—Climate Change (Module 7)** includes disclosures on GHG emissions, which can include air pollutants, and whether reduction of short-lived climate pollutants is part of climate-related targets; **Environmental Performance—Water Security (Module 9)** focuses on water pollution, requiring disclosures on pollutant loads, use of hazardous substances, and wastewater treatment; **Environmental Performance—Plastics (Module 10)** focuses on plastic pollution through tracking plastic volumes produced, used or sold, plastic waste generation, plastic recycling efforts, and plastic end of life management; and **Environmental Performance—Biodiversity (Module 11)** includes disclosures of measures adopted to mitigate or avoid adverse impacts on biodiversity from pollution activities	Metrics include, for example: Pollutant loads discharged into water systems; plastic waste volumes generated; progress on pollution reduction targets

Approach	Does the approach cover pollution?	Does the approach provide dedicated standard / module /guidance / metrics on pollution?	Sub-standard(s)/ module(s)/ guidance/ metric(s) within the approach that address(es) pollution	Examples of pollution metrics
ESRS	Yes	Yes	**ESRS E1: Climate Change** addresses impacts from seven greenhouse gases connected to air pollution (CO_2, CH_4, N_2O, HFCs, PFCs, SF6 and NF3); **ESRS E2: Pollution** explicitly addresses metrics on emissions to air, water and soil, including through microplastics, as well as on the generation and release of substances of concern and substances of very high concern, and on the anticipated financial effects from material pollution-related risks and opportunities. The standard requires companies to identify material impacts, risks and opportunities connected to pollution, and to disclose pollution-related policies, actions and targets, including sources of these pollutants, their mitigation actions, and their residual impacts on ecosystems and human health; **ESRS E3: Water and Marine Resources** addresses the prevention and abatement of pollution in marine and freshwater ecosystems, requiring, among others, information on water discharges and targets for improving water quality; **ESRS E4: Biodiversity and Ecosystems** addresses, among others, impacts on biodiversity-sensitive areas, impacts related to the state of species, and impacts related to the extent and condition of ecosystems, which may be caused by pollution; **ESRS E5: Resource use and circular economy** addresses, in particular, the transition away from extraction of non-renewable resources and the implementation of practices that prevent waste generation, including pollution generated by waste (e.g., reduction of plastic waste); and **ESRS S3: Affected communities** addresses material negative impacts on affected communities from pollution-related impacts attributable to the undertaking, as the undertaking's pollution -related impacts may affect people and communities.	Metrics include, for example: volumes of pollutants emitted/ discharged; microplastics generated or used; total amounts of substances of concern that are generated or used, and that are emitted; share of net revenue made with products and services that are or that contain substances of very high concern

Approach	Does the approach cover pollution?	Does the approach provide dedicated standard / module /guidance / metrics on pollution?	Sub-standard(s)/ module(s)/ guidance/ metric(s) within the approach that address(es) pollution	Examples of pollution metrics
GRI	Yes	Yes	**GRI 3: Material Topics 2021** includes disclosures on the list and management of material topics; **GRI 11: Oil and Gas Sector 2021** focuses on emissions to air, soil, and water, including management strategies for emissions and responses to critical incidents; **GRI 12: Coal Sector 2022** addresses sector-specific pollution issues, emphasising the management of emissions and environmental impacts inherent to coal operations; **GRI 13: Agriculture Aquaculture and Fishing Sectors 2022** covers pollution aspects related to these sectors, including the management of effluents and waste, and their impacts on local ecosystems; **GRI 14: Mining Sector 2024** includes pollution disclosures concerning mining activities, such as emissions to air, pollutants released to soil, and water, and strategies for managing the associated environmental impacts **GRI 101: Biodiversity 2024** includes disclosures of biodiversity-related impacts, including those resulting from pollution, and measures adopted to mitigate adverse effects; **GRI 301: Materials 2016** includes disclosures on renewables and non-renewable materials used, recycled input materials and reclaimed products; **GRI 303: Water and Effluents** includes disclosures on water withdrawal, discharge, and consumption, including the identification and classification of potential water pollutants and related impacts; **GRI 302: Energy 2016** includes disclosures concerning waste generated in operations;	Metrics include, for example: Total water withdrawal by source; GHG emissions (Scope 1, 2, and 3); Significant spills of hazardous substances, including volume, and impact of significant spills; total weight of waste by type and disposal method

Approach	Does the approach cover pollution?	Does the approach provide dedicated standard / module /guidance / metrics on pollution?	Sub-standard(s)/ module(s)/ guidance/ metric(s) within the approach that address(es) pollution	Examples of pollution metrics
			GRI 305: Emissions 2016 includes GHG emissions disclosures, and whether the reduction of short-lived climate pollutants is part of climate-related targets, apart from disclosures of emissions stemming from chemicals and waste processing; **GRI 306: Waste 2020** addresses waste generation and management, including tracking waste generation, recycling efforts, and reduction strategies to mitigate pollution; and **GRI 306: Effluents and Waste 2016** includes a disclosure on significant spills; and **GRI 413: Local Communities 2016** includes disclosures on how pollution affects local communities and the measures taken to manage these impacts In addition, the Global Sustainability Standards Board (GSSB) approved a Pollution Working Group that will work on the revision of some of the pollution related disclosures and on the development of pollution-related disclosures which may also address plastics pollution (GSSB 2024a); the drafts are expected to be ready for public comment in Q1 2026 (GSSB 2024b).	

Approach	Does the approach cover pollution?	Does the approach provide dedicated standard / module /guidance / metrics on pollution?	Sub-standard(s)/ module(s)/ guidance/ metric(s) within the approach that address(es) pollution	Examples of pollution metrics
IFRS S1 & S2	Yes	IFRS S1 & S2 cover sustainability- and climate-related risks and opportunities, including disclosures on GHG emissions	IFRS S1 covers all sustainability issues, including pollution, and IFRS S2 covers climate change. IFRS S1 does not include pollution-specific requirements, while IFRS S2 includes requirements on climate-related pollution. Both standards require disclosures of information on sustainability-related risks and opportunities that can be reasonably expected to affect the entity's prospects, which could encompass GHG emissions (and thereby air pollution) and other form(s) of pollution if such information is material to users of general purpose financial reports, such as investors, in making decisions relating to providing resources to the entity. According to the Standards, and entity shall refer to and consider the applicability of the SASB Standards when identifying sustainability-related risks and opportunities and identifying applicable disclosure requirements. These Standards include additional sector-specific pollution requirements.	Metrics include, for example: CO_2 equivalents for GHGs
Natural Capital Protocol	Yes	Yes	Natural Capital Protocol is a framework which guides organizations to identify, measure, and value their direct and indirect impacts and dependencies on natural capital, including aspects related to pollution. It promotes identifying pollutant flows, how they create pressures on natural habitats and the resulting economic implications. This helps to enhance sustainability-related decision-making through identifying risks and opportunities.	Metrics include, for example: Impacts on natural capital including those due to pollution (such as GHGs emissions, non-GHG air pollutants, groundwater discharge, waste, etc.)

Approach	Does the approach cover pollution?	Does the approach provide dedicated standard / module /guidance / metrics on pollution?	Sub-standard(s)/ module(s)/ guidance/ metric(s) within the approach that address(es) pollution	Examples of pollution metrics
SBTN	Yes	Yes	Pollution is embedded in the SBTN guidance. For example, freshwater and soil pollutants are 2 of the 8 pressure categories that companies are required to assess and address throughout the process of setting science-based targets for nature. Companies are required to (i) screen their activities for materiality on freshwater and soil pollution, (ii) assess the environmental pressures of their value chain activities and associated state of nature in their value chain locations, such as pollutant loading to soil and freshwater and soil and water quality (e.g., pollution levels), and (iii) set targets to reduce their nutrient pollutant loading to freshwater in accordance to the local needs of nature and to improve terrestrial ecological conditions, which may focus on soil pollution, in key value chain landscapes.	Metrics include, for example: Pollutant concentrations; Nutrient pollution levels in soil or other soil pollution indicator (if nutrients are not relevant); Nutrient pollution levels in freshwater (instream nitrogen or phosphorus concentration)

Approach	Does the approach cover pollution?	Does the approach provide dedicated standard / module /guidance / metrics on pollution?	Sub-standard(s)/ module(s)/ guidance/ metric(s) within the approach that address(es) pollution	Examples of pollution metrics
TNFD	Yes	Yes	Pollution is embedded throughout the TNFD Recommendations and Additional Guidance as one of the drivers of nature change (details are listed below). They are considered through dependency and impact pathways framing, where organizations are recommended to measure impact drivers and the associated changes to the state of nature and ecosystem services. This then feeds into risk and opportunity assessments, as well as mitigation and transition planning. Organizations are recommended to disclose their dependencies, impacts, risks and opportunities on nature, including those related to pollution, and the associated metrics. The TNFD disclosure metrics include indicators and metrics that address pollution and pollution removal as a driver of nature change, including five core global disclosure indicators on pollutants that are recommended to be disclosed on comply or explain basis. Additionally, the TNFD provides sector-specific guidance for industries including Chemicals, and Biotechnology and Pharmaceuticals amongst others. These guidelines include recommended disclosure metrics related to pollution and pollution removal, assisting organizations in assessing and reporting their environmental impacts.	Indicators include, for example: Volume of pollutants released to soil by type in tonnes; volume of wastewater discharged; weight of hazardous and non-hazardous waste by type; waste diverted from landfill; plastic footprint; percentage of plastics that is reusable, technically recyclable and recyclable in practice and at scale; non-GHG air pollutants by type

2.11 Key finding 11: Targets

Key finding 11: Most approaches require or recommend companies to set targets for strengthening their performance and action on nature-related issues and regularly report on their progress towards these targets. An increasing number of approaches is expecting companies to set targets on specific dependencies, impacts, risks or opportunities at locations.

Most of the nature-related assessment and disclosure approaches reviewed expect companies to set targets for nature and biodiversity action. SBTN's core purpose is to build on SBTi climate target-setting guidance and develop additional methods, guidance and tools to support companies in setting science-based targets on nature. CDP, ESRS, GRI, ISSB Standards and TNFD all encourage, or require, companies to set nature-related targets with a specific timeframe and clear geographical and value chain scope. Companies are recommended to set targets that are aligned with international and regional goals and policies. For instance, SBTN, TNFD, ESRS, CDP and GRI all specify that companies should disclose their short-, medium-, and long-term targets, and demonstrate how these targets align with global policy goals such as the Paris Agreement, GBF and Sustainable Development Goals (SDGs). In addition to this, SBTN, ESRS and the GRI Biodiversity Standard also ask companies to describe how their targets or their implementation align with the mitigation hierarchy.[74] An overview of what different approaches require companies to disclose about their nature-related targets can be found in Table 15 below.*

Companies are expected to set not only targets at a corporate level but also location specific ones. For example, SBTN requires companies to set targets at site level based on the land and freshwater technical guidance documents for Step 3.[75] TNFD specifies that companies may aim to set three types of targets: business model targets, operational targets, and nature interface targets. The nature interface targets include targets on final impact drivers, state of nature and size and quality of an ecosystem service. The GRI Biodiversity Standard, as another example, requires companies to explain how their targets are related to their most significant impacts at location and how these targets are identified with the use of scientific evidence that is relevant to appropriate local sustainability contexts.

SBTN, as the approach specifically focused on target setting, provides a structured and detailed approach to the target-setting process. The SBTN target-setting guidance aims to support companies in determining what types of targets they should be setting, how they should be setting them and how they can achieve progress towards them. This includes assessing the materiality and estimating pressures in the value chain (Step 1),

* Additional guidance on nature target setting for financial institutions can be found in the Principles for Responsible Banking (PRB) Nature Target-Setting Guidance authored by UNEP FI with support from PRB signatories, which can be accessed here (unepfi.org/industries/banking/nature-target-setting-guidance/). Finance for Biodiversity Foundation has also released the Nature Target-Setting Framework for Asset Owners and Asset Managers, which can be accessed here (financeforbiodiversity.org/ffb-foundation-launched-the-nature-target-setting-framework-for-asset-managers-and-asset-owners/).

interpreting and prioritizing locations based on pressure and state data (Step 2), measuring, setting and disclosing targets (Step 3), taking action (Step 4) and tracking progress (Step 5). SBTN's Step 3 guidance also outlines how companies should determine appropriate levels of ambition for targets set for selected locations. SBTN will allow companies to validate their targets as being in line with the SBTN methods.

The approaches designed to support disclosure are less prescriptive on how companies should set their nature-related targets, and recommend companies follow SBTN or other target-setting guidance. The GRI Biodiversity Standard, for example, allows companies to follow any approach to target setting that draws on methods supported by scientific evidence. It requires companies to describe the methods they have chosen to identify the targets as well as the metrics they have chosen to set those targets. Although TNFD does not require a specific target-setting methodology to be followed in its disclosure recommendations, organizations are required to provide a description of the targets and associated metrics, and the methodology used to set the target and baseline. TNFD's LEAP approach guidance, however, strongly recommends companies refer to the SBTN methods. TNFD and SBTN have also jointly co-authored the Guidance for corporates on science-based targets for nature. The ESRS, as another example, does not require a specific target-setting methodology either. Companies are, among other characteristics, required to describe whether they have used ecological thresholds and allocations of impact when determining their targets, and whether these thresholds and allocations are based on scientific evidence. ESRS E2, E3 and E5 also reference SBTN as useful guidance.

While regular reporting on progress toward targets is required, the specific information to be provided as evidence of the progress varies among the approaches. ESRS, GRI, ISSB Standards, and TNFD require companies to report the indicators and metrics used to evaluate their progress in achieving the targets as well as baseline data alongside their annual performance data to facilitate easier comparison. The ISSB, and TNFD also ask companies to report any revisions or adjustments to nature-related targets and the justifications for these. Both TNFD and GRI expect companies to provide an explanation of any instances where the company exceeds or falls short of the target trajectory. As an approach specifically focusing on targets, SBTN covers the above requirements and recommendations and specifies that companies should outline any adaptive management actions they have taken to address underperformance on targets. SBTN has not yet released its Step 5 guidance on tracking progress, which is expected to provide additional clarifications and details on how companies should be reporting on their progress towards targets.

Table 15: Overview of disclosure requirements and recommendations on targets across the nature-related assessment and disclosure approaches

Approach	What is recommended or required to disclose on targets?				
	Alignment with international goals/ policies	**Target specifications**	**Target setting process**	**Target scope and horizon**	**Monitoring of progress**
CDP	▪ Target alignment with frameworks	▪ Quantitative targets and qualitative goals that have been set ▪ Purpose of the target ▪ Links to the business strategy	▪ Approach in setting the targets ▪ Explanation if targets are not set, and if there are any future plans in setting the targets[76]	▪ Timeline for achieving the targets	▪ The baseline value and base year from which progress is measured ▪ The performance against the disclosed targets ▪ Metrics used to evaluate performance and effectiveness
ESRS[77]	▪ Whether the targets are informed by, and/ or aligned with the GBF, the Planetary Boundaries, relevant aspects of the EU Biodiversity Strategy for 2030 and other biodiversity and ecosystem-related national policies and legislation	▪ How the target is addressing the identified dependencies, impacts, risks and opportunities ▪ Target applicability to the mitigation hierarchy ▪ A description of the relationship of the target to the policy objectives ▪ The defined target level to be achieved ▪ Milestones or interim targets	▪ Application of ecological thresholds and allocations of impacts ▪ Involvement of biodiversity offsets ▪ The methodologies and significant assumptions used to define targets ▪ Whether the targets are science based[78] ▪ Whether and how stakeholders have been involved in target setting ▪ Any changes in targets and measurement methodologies within the defined time horizon	▪ Geographical scope of the targets ▪ Operations and value chain coverage of the target ▪ The period to which the target applies	▪ The baseline value and base year from which progress is ▪ measured ▪ The performance against the disclosed targets ▪ Metrics used to evaluate performance and effectiveness

Approach	What is recommended or required to disclose on targets?				
	Alignment with international goals/ policies	**Target specifications**	**Target setting process**	**Target scope and horizon**	**Monitoring of progress**
GRI[79]	▪ How the targets are informed by the 2050 Goals and 2030 Targets in the GBF or other authoritative intergovernmental instruments ▪ Whether the targets are based on legislation or voluntary	▪ Linkage of the targets to the most significant impacts ▪ How targets are informed by scientific evidence ▪ Whether and how the targets take into account the sustainability context of the impacts ▪ Value of the target ▪ Base year of the targets	▪ Methods used to identify targets ▪ Metrics used in setting the targets ▪ The monitoring, reporting and reviewing process that has been adopted	▪ Activities and business relationships to which the goals and targets apply ▪ Target timeline and milestones	▪ Progress made in achieving the targets and goals during the reporting year ▪ Indicators used to evaluate progress ▪ Methods used to measure performance against targets
ISSB	▪ In IFRS S2 only: Whether the entity used a climate-related scenario aligned with the latest international agreement on climate change	▪ The specific quantitative or qualitative target the entity has set ▪ Milestones and interim targets	▪ The metric used in setting the target	▪ The period for which the target applies ▪ The base period from which progress is measured	▪ Metrics to be used in monitoring the progress ▪ Performance against each target and analysis of trends or changes in the company's performance ▪ Revisions to the target and an explanation for those revisions
Natural Capital Protocol[80]	N/A	N/A	N/A	N/A	N/A

Approach	What is recommended or required to disclose on targets?				
	Alignment with international goals/ policies	**Target specifications**	**Target setting process**	**Target scope and horizon**	**Monitoring of progress**
SBTN[81]	▪ Alignment with these goals and policies is built into the methodologies; companies do not need to provide separate disclosures on this topic	▪ SBTs for nature will correspond to the pressures/ impact drivers they seek to manage, and the locations where this management will occur ▪ Once validated by SBTN, companies will use approved target language to communicate about their targets ▪ Companies will prepare action plans to inform how they to meet the target[82] ▪ Companies will also specify when they anticipate updating their targets (e.g. every five years)	▪ Organizational scope included in initial assessment (financial vs. operational control, business units, acquired or sold businesses) ▪ Baseline (e.g. year or period) included ▪ Baseline value for each pressure managed through targets (i.e. estimations for each pressure in the baseline year or period) ▪ Methods used (for Step 1, 2 and 3), specifying version and year ▪ Suite of indicators and metrics used to set the target ▪ Models used to set the target ▪ Indication of whether stakeholder consultations took place to inform targets	▪ Geographical scope of the target ▪ Timeframe for achieving the target, including interim milestones and anticipated checkpoints for recalculation	For each target: ▪ Progress from baseline and on track assessment ▪ Adaptive management actions if targets are not on track ▪ Explanation to any changes to targets, indicators and monitoring plans At corporate level: ▪ Progress toward coverage of all business units if business unit approach used ▪ Progress within each target boundary (i.e. progress toward coverage of all activities and locations material for each pressure) ▪ Progress toward coverage of all material upstream activities, if some included in Target Boundary B in the first year[83]

Approach	What is recommended or required to disclose on targets?				
	Alignment with international goals/ policies	**Target specifications**	**Target setting process**	**Target scope and horizon**	**Monitoring of progress**
TNFD	▪ Whether and how the target aligns with or supports the targets and goals of the GBF, the Paris Agreement on climate change, the SDGs, Planetary Boundaries and other global reference environmental treaties, policy goals and system-wide initiatives	▪ The strategy or risk management objective the target seeks to address ▪ The targeted value of the metric ▪ Short- and medium-term interim targets or target trajectory for the metric ▪ Targets in scope that covers changes to impact drivers, improve or maintain the flow of ecosystem services, changes to business activities and processes correlated with dependencies and impacts, halt and reverse nature loss and improve or maintain the state of nature ▪ Proportion of targets that address short term, medium term and long term risks and opportunities	▪ The baseline year and level of the metric ▪ The methodology used to set the target and baseline	▪ The timeframe for achieving the target ▪ Proportion of targets that are time-bound and quantifiable ▪ Proportion of geographical sites/priority locations that are covered by targets	▪ The metric used to quantify the target and monitor performance ▪ Performance against the target relative to the baseline or reference condition on a historical and current year basis ▪ If the organization exceeded or fell short of the target trajectory or is projected to do so, an explanation of the reasons and disclosure of any resulting adjustment or resetting of targets from the prior period

2.12 Key finding 12: Engagement with rights-holders and relevant stakeholders

Key finding 12: Companies are encouraged to engage with rights-holders and relevant stakeholders at operation locations and beyond when assessing and disclosing their nature-related issues. Detailed guidance on stakeholder engagement is emerging.

Engagement with rights-holders and relevant stakeholders is highlighted as important for understanding the full scope of nature-related issues in all the reviewed approaches. TNFD, for example, recommends companies engage with Indigenous Peoples, Local Communities, affected and other stakeholders. It defines stakeholders as persons or groups who are directly or indirectly affected by a company's activities, as well as those who may have interests and/or the ability to influence its activities. Affected stakeholders include marginalized groups such as migrant workers, women, elders, children or youth, Indigenous Peoples and people with disabilities. Engagement is described by TNFD as an interactive process that should be characterized by two-way communication and good faith on both sides to be effective. It can include meetings, hearings or consultation proceedings. SBTN defines stakeholders as people who can affect a company's projects or activities or those who may be positively or negatively affected in connection with a company's environmental impacts. It similarly places a particular emphasis on engagement with local stakeholders who are at greater risk of being adversely impacted by any potentially negative environmental outcomes that are caused by the companies' activities. These stakeholders may include Indigenous Peoples, frontline and fence line communities, women, smallholders and other vulnerable workers within the company value chain. SBTN emphasizes that effective stakeholder engagement requires communication, listening, learning, collaboration, reciprocity and trust-building. It should follow a set of core principles including respect for human rights and core tenets of justice, equity, diversity and inclusion (JEDI), recognition of underlying inequities and power structures, and be embedded in an understanding of the place. An overview of the requirements and recommendations for engaging with rights-holders and other relevant stakeholders across the approaches can be found in Table 16 below.

The ESRS specifically differentiates between two main groups of stakeholders with which a company needs to engage. The first group are the affected stakeholders, which includes communities, Indigenous Peoples and other rights-holders. The second are users of sustainability statements and other user groups such as business partners, civil society and governments. According to the ESRS, companies' decisions on which issues are material to assess and disclose should be primarily informed by engagement with affected stakeholders. Both affected stakeholders and users of sustainability statements should be consulted at a later stage of the assessment, to provide input or feedback on its findings.

Some of the reviewed approaches provide more detailed guidance on how companies should engage with rights holders and relevant stakeholders throughout the entire assessment and disclosure process. For instance, TNFD's Guidance on Engagement with Indigenous Peoples, Local Communities, and Affected Stakeholders provides detailed advice on how companies should engage with Indigenous Peoples, Local Communities and affected stakeholders in every phase of the LEAP approach and when preparing their disclosure reports.[84] It outlines best practice for identifying relevant stakeholders, preparing for engagement, designing and conducting the engagement and involving stakeholders in the monitoring and evaluation process. SBTN, as another example, published a version 0.1 Stakeholder Engagement Guidance, which is aligned with the guidance from the TNFD. It provides step-by-step recommendations on how companies can achieve JEDI objectives and work with stakeholders as they set science-based targets for nature.[85] This guidance can be expected to evolve further in future releases. GRI Standards, on the other hand, provide definitions of concepts related to stakeholder engagement and additional information in GRI 1: Foundation. Additional guidance is also provided in the descriptions of different disclosures in universal and topic standards.

Specific disclosure requirements on engagement outcomes and processes are also starting to emerge. TNFD, for example, expects companies to draw on engagement processes in preparing reporting against all disclosure recommendations and also includes specific provisions in two disclosure recommendations: Governance C and Strategy D. Governance C disclosure recommendation asks companies to disclose their human rights polices and engagement activities with respect to Indigenous Peoples, Local Communities, affected and other stakeholders, in the assessment of, and response to, nature-related issues. Strategy D disclosure recommendation asks companies to disclose the locations of their assets and activities that meet the criteria for priority locations, which include areas of importance for ecosystem service provision that bring benefits to Indigenous Peoples, Local Communities and stakeholders. Another example is the CDP questionnaire. It includes specific questions on how companies take into consideration different types of stakeholders when identifying and assessing their impacts, risks and opportunities. The GRI Standards cover stakeholder engagement through different disclosures in their modular system of interconnected standards. The GRI Universal Standards, which apply to all companies, require companies to describe their approach to stakeholder engagement and specify the stakeholders and experts whose views have informed the process of determining material topic standards. This is complemented with additional disclosures in each topic standard. The GRI Biodiversity Standard, for example, asks companies to report their access and benefit sharing measures, which are the measures the companies use to access genetic resources and the associated traditional knowledge that is held by Indigenous Peoples and local communities. Companies are also asked to describe any measures taken to minimize negative impacts on stakeholders resulting from their impacts on biodiversity for all sites with the most significant biodiversity impacts. In addition to this, the GRI Biodiversity Standard expects companies to indicate whether their sites with the most significant biodiversity impacts are in areas important for the delivery of ecosystem service benefits to stakeholders and to describe how different beneficiaries in the landscape could be affected by the company's impacts on ecosystem services.

Recommendations and requirements are beginning to emerge on how considerations of impacts on and risks to affected stakeholders and rights-holders should be mainstreamed into all nature-related disclosures. There is an increasing recognition that nature-related, social and human rights issues cannot be fully understood when they are assessed or reported on in silos. For example, pollution-related impacts could span across environmental, social, and economic dimensions, with significant effects on human health and social well-being. For a succinct overview of the multi-faceted negative impacts on the people, planet and economy, please refer to the Addendum on Pollution. To highlight a few examples of the negative impacts from pollution on health and social:

- The World Health Organization (WHO) reports that 99% of the global population is exposed to air pollution levels surpassing WHO guidelines, increasing the likelihood of disease (2024);
- According to the Office of the United Nations High Commissioner for Human Rights (OHCHR), freshwater pollution could undermine human rights through restricting access to clean drinking water (OHCHR 2023);
- The consumption of contaminated seafood due to ocean pollution could further exemplify the intersection of nature-related and social-health dimensions, as it jeopardizes both short-term and long-term public health outcomes.
- Soil pollution could exacerbate human health risks by (i) directly exposing populations to harmful substances such as chemicals and heavy metals, potentially leading to severe illnesses (Münzel *et al.* 2023); and (ii) indirectly through contaminating crops (Food and Agricultural Organization of the United Nations 2020).

Through the stakeholder engagement guidance documents and other updates, approaches are starting to recommend and require that when companies disclose nature-related issues, they also specify how these issues connect to social and human rights issues. An important milestone in relation to this is going to be the publication of the Capitals Protocol in 2025, which will replace the Natural Capital Protocol and Social and Human Capital Protocol.[86] Practical considerations supporting alignment between environmental and social reporting, such as clarity on how locations should be labelled or impact information aggregated, are also improving the usability of disclosure information for cross-cutting analysis of environmental, social and human rights issues.

Table 16: Overview of the requirements, recommendations and guidance on engagement with rights-holders and other relevant stakeholders across the approaches

Approach	Is engagement with rights-holders and other relevant stakeholders encouraged?	Is engagement guidance provided?
CDP	Yes. Descriptions of the type, details, and rationale for stakeholder engagement (including details of prioritization process) are requested within the questionnaire's cross-sector modules. Specific to climate, forests, and water topics, CDP asks companies to disclose their engagement across materially impactful value chains. If companies are engaged in landscape and/or jurisdictional methods to sustainable land use, they are asked to disclose how their actions support the method through multi-stakeholder alignment and community capacity building. Companies are also expected to disclose the stakeholders they have considered and the relevant issues while identifying and assessing issues. Companies are also asked to report their policies and commitments to respecting internationally recognized human rights, including the rights of Indigenous Peoples, local communities, workers, and others who may be affected by company activities.	Not provided.
ESRS	Yes. Under ESRS, engagement with affected stakeholders is central to the company's identification and assessment of actual and potential negative impacts, and the determination of their materiality. When companies report the process to identify and assess material impacts, dependencies, risks and opportunities, the materiality assessment should include engagement with relevant stakeholders. The engagement process is also required to be disclosed under the Strategy Disclosure Requirements. For instance, ESRS E4 require companies to include details on the involvement of stakeholders, including holders of indigenous and local knowledge, when describing the resilience of their strategy and business model in relation to biodiversity and ecosystems.	Limited. ESRS primarily outline several disclosure requirements related to engagement in various reporting areas and topical standards. However, they provide limited guidance on how companies should conduct the stakeholder engagement activities.

Approach	Is engagement with rights-holders and other relevant stakeholders encouraged?	Is engagement guidance provided?
GRI	Yes, GRI Standards include several disclosures that require knowledge of and engagement with rights-holders and other stakeholders in the landscape. In the GRI Biodiversity Standard, for example, companies are asked to report their access and benefit sharing measures, which would be used by the company to access genetic resources and the associated traditional knowledge that is held by indigenous and local communities. Companies are also asked to describe any measures taken to minimize negative impacts on stakeholders resulting from the company's impacts on biodiversity. For all sites with the most significant biodiversity impacts, GRI Biodiversity Standard expects companies to indicate whether these sites are in areas important for the delivery of ecosystem service benefits to stakeholders and to describe different beneficiaries in the landscape could be affected by impacts on ecosystem services.	Yes. Guidance and examples on how companies should engage with affected rights-holders and stakeholders are provided in different standards under specific disclosures related to engagement.
ISSB	Yes, within the CDSB Framework Application Guidance (which is referenced in IFRS S1). The guidance outlines engagement and collaboration as a key characteristic to be considered when preparing information for the mainstream report. The guidance highlights that stakeholders may have specific dependencies on biodiversity, including women, local and indigenous communities. Participation in collaborative actions is fundamental for effective biodiversity management.	Yes. While no specific guidance on engagement is provided within IFRS S1 and S2, in the CDSB Framework Application Guidance that the ISSB Sustainability Standards refer to, there is guidance on stakeholder engagement and cooperation.
Natural Capital Protocol	Yes. Stakeholder engagement is an integral element throughout the whole Natural Capital Protocol. Natural capital assessment should consider all potential natural capital impacts and/or dependencies that may be important or material to the business and its stakeholders. Under the Scoping stage, companies are required to identify the stakeholders and their level of engagement in the assessment. These stakeholders can range from the ones directly related to the business, including shareholders, and suppliers, and rights-holders that are affected by the natural capital impacts and/or dependencies such as indigenous and local communities.	Yes. Relevant sections in the Natural Capital Protocol offer explanations and guidance on the involvement, consideration, and engagement of stakeholders and right-holders at each stage of the process.

Approach	Is engagement with rights-holders and other relevant stakeholders encouraged?	Is engagement guidance provided?
SBTN	Yes. Stakeholder engagement plays a crucial role in the process of establishing science-based targets for nature. SBTN strongly recommends that companies use its Stakeholder Engagement Guidance as they use the technical guidance on target setting (Steps 1–3) in order to ensure that their targets benefit nature and people. As an example, companies are strongly recommended to factor in the needs of local stakeholders and rights-holders, including Indigenous Peoples, local communities and other affected and often marginalized groups (such as women, youth, elderly, migrant workers), during their evaluation of feasibility and strategic interest of different locations (Step 2d) ahead of forming a target setting strategy and applying methods in Step 3. When setting targets in Step 3, companies are required to consult stakeholders to select an appropriate modelling approach (freshwater method), and to consider the objectives of multiple local stakeholders when setting landscape engagement targets (land method).	Yes. SBTN released the Stakeholder Engagement Guidance v0.1 (beta) in May 2023. This document offers companies a comprehensive, step-by-step guidance on stakeholder engagement, covering areas including the significance of engagement in setting science-based targets, the identification of critical stakeholders, the timing and methodology for engaging with various stakeholders, as well as their involvement in the monitoring and evaluation process. The final version of the Guidance is expected in 2024.
TNFD	Yes. Engagement with Indigenous Peoples, Local Communities, affected and other stakeholders is an integral part in the TNFD Framework. The TNFD general requirement 6 has listed the engagement with Indigenous Peoples and Local Communities (IPLCs) and affected stakeholders a crucial element for any robust identification, assessment, and management of nature-related issues. TNFD recommended disclosure Governance C requires companies to describe the activities to engage with the IPLCs, affected and other stakeholder groups when assessing and responding to nature-related dependencies, impacts, risks and opportunities. Engagement is also integrated throughout the entire LEAP approach. For instance, when evaluating nature-related dependencies and impacts, companies should factor in the environmental assets and ecosystem services that different stakeholder and rights-holder groups depend on and how business activities impact their dependencies on nature and access to ecosystem services.	Yes, TNFD released the 'Guidance on Engagement with Indigenous Peoples, Local Communities, and Affected Stakeholders' as part of version 1.0 in September 2023. This document offers detailed guidance to companies on the engagement process, covering multiple areas including the identification of relevant stakeholders and rights-holders, background information on international standards related to engagement, the preparation of appropriate policies, processes, systems, and strategies for engagement, methodologies for designing and conducting engagement, as well as the involvement of Indigenous Peoples, Local Communities, and affected stakeholders during monitoring and evaluation.

Addendum on Pollution

This addendum provides a foundation for understanding the impacts of pollution, which is one of the five direct drivers of biodiversity loss identified by IPBES (2019). Beside the nature-related dependencies, impacts, risks and opportunities that are the focus of the Accountability for Nature report, this addendum also highlights the nature-pollution axis by exploring pollution's multifaceted effects on people, ecosystems, and economies, while providing an overview of some of the key policy frameworks and agreements aiming to address pollution. The Addendum also explores challenges and opportunities to strengthen action on pollution.

Introduction to pollution and its global significance

The world is increasingly threatened by a triple planetary crisis, consisting of climate change, biodiversity loss, and pollution (United Nations Secretary-General 2020). These interconnected challenges collectively threaten ecosystems, societies, and businesses, with profound implications for economic, environmental, and social stability.

Pollution represents a pervasive global challenge affecting every aspect of life on Earth. The United Nations defines pollution as (i) the presence of substances and heat in environmental media (air, water, land) whose nature, location, or quantity produces undesirable environmental effects; and (ii) activity that generates pollutants—substances present in concentrations that may harm organisms (humans, plants and animals) or exceed an environmental quality standard (United Nations Statistics Division 1997). Sectors, including chemicals, manufacturing, extractives and power generation, waste management, transportation, and agriculture can be particularly exposed to the risks driven by pollution, due to their business activities that involve the extraction and processing of materials and generation of waste in the form of pollutants

The Kunming-Montreal Global Biodiversity Framework (GBF) highlights the need for actions towards reducing the overall risk from excess nutrients, pesticides and highly hazardous chemicals, and eliminating plastic pollution (Convention on Biological Diversity 2023). The Global Framework on Chemicals (GFC) asks stakeholders to take effective measures to prevent and minimise the adverse effects of chemicals and waste, with *inter alia* Target A7 aiming for the phase out of highly hazardous pesticides (UNEP 2023c). In March 2022, at the UN Environment Assembly (UNEA-5.2), UN member states decided to negotiate an international legally binding instrument to end plastic pollution, including in the marine environment. Table 17 provides an overview of selected examples illustrating the negative impacts associated with pollution on the economic, social, and environmental dimensions (synthesized from multiple sources).

For businesses and financial institutions, addressing pollution transcends a corporate social and environmental responsibility, becoming a strategic necessity. The World Economic Forum (WEF) Global Risks Report 2025 ranks pollution as the fifth highest environmental risk. Pollution is also perceived as a leading risk in the short term. Its sixth-place ranking in the short term reflects a growing recognition of the serious health and ecosystem impacts of a wide range of pollutants across air, water and land. Pollution is a critical source of environmental risks that drive economic and financial risks affecting not only individual companies but also entire financial systems. Without comprehensive management of these impacts and risks, it could lead to excessive allocation of financial resources to polluting sectors, which not only exacerbates pollution, but could also threaten financial institutions balance sheets and financial stability (Svartzman *et al.* 2020; NGFS 2023; European Commission 2024b). Pollution impacts from business activities and environmental incidents have impacts on nature and people (impact materiality), that in turn represent physical and transition risks to business (financial materiality). For instance, illegal dumping of substances and waste contaminates soil, crops, water, land and marine ecosystems, thereby damaging habitats and disrupting the food chain (European Parliament 2021). However, addressing pollution could pave potential pathways to long-term resilience and innovation.

Table 17 provides a high-level overview of the widespread negative impacts of pollution on people, planet and the economy. While some of the issues highlighted below may be associated with more than one form of pollution, highlighting the examples of negative impacts across the health and social, environmental and economic dimensions helps contextualize pollution as a pervasive global challenge.

Table 17: Overview of selected examples illustrating the negative impacts associated with pollution on the economic, social, and environmental dimensions (synthesized from multiple sources)

	Examples of Negative Impacts on Different Dimensions:		
Pollution Domain	**Health & Social Dimension**	**Environmental Dimension**	**Economic Dimension**
Air Pollution	**Health Impacts**: The World Health Organization (WHO) estimates that 99% of the global population is exposed to air pollution levels that exceed WHO guidelines, heightening the risk of diseases (2024)	**Biodiversity Loss**: Decline in species diversity and harm to flora and fauna from toxic air substances (European Environment Agency 2022a)	**Public Health Costs**: Increased spending due to pollution-related illnesses (World Bank 2021)
	Quality of Life: Diminished well-being alongside potential impact on social mobility due to air pollution exposure (Lee *et al.* 2024)	**Climate Change**: Contribution to global warming through GHG emissions (IPCC 2021; UNEP 2024b)	**Productivity Loss**: Air pollution reduces workforce's productivity (Dechezleprêtre *et al.* 2019)
Freshwater Pollution	**Health Impacts**: Unsafe water raises health risks, including through waterborne diseases (WHO 2024a)	**Biodiversity Loss**: Eutrophication leads to algae overgrowth, causing changes in species composition (Gold & Sims 2009);	**Water Treatment Costs**: Increased expenses to purify contaminated freshwaters (Dechezleprêtre *et al.* 2019).
	Threatened Access to Clean Water: Pollution undermines human rights through limiting access to clean drinking water (OHCHR 2023)	Habitat loss and death of organisms due to toxins, leading to alteration of food chains and thereby food security (Dechezleprêtre *et al.* 2019)	**Fish Population Decline**: Pollution contributes to the drastic decreases of the proportion of fish stocks within biologically sustainable levels in freshwater and oceans (United Nations 2024), leading to economic losses, including through decline in fisheries and related industries (Deinet *et al.* 2024; Mittempergher *et al.* 2023)
Ocean Pollution	**Health Impacts**: Health hazards due to consumption of contaminated seafood (Zaynab *et al.* 2022) and longer-term health risks associated with exposures to pollutants (Böke & Arıman 2023) and exposome (Baccarelli 2024)		
	Loss of Coastal Protection: The destruction of coral reefs due to pollutants and rising temperatures threaten coastal protection of millions of people (Resource Watch 2020), creating relocation needs (Burke & Wood 2021)	**Coral Reef Destruction**: Damage of coral reefs from pollutants and rising temperatures (Resource Watch 2020), leading to the potential collapse of marine ecosystems (WWF 2024)	**Cleanup Costs**: Significant expenses related to cleaning up oil spills (Zapata 2021; Dzirutwe 2023)

	Examples of Negative Impacts on Different Dimensions:		
Pollution Domain	**Health & Social Dimension**	**Environmental Dimension**	**Economic Dimension**
Soil Pollution	**Health Impacts**: Exposure to harmful chemicals and heavy metals in soil expose humans to diseases while exacerbating water pollution (Münzel *et al.* 2023)	**Biodiversity Loss**: Pollution contributes to the loss of soil organisms essential for ecosystem functions(European Environment Agency 2022b); 'overfertilization' changes forest health (Münzel *et al.* 2023)	**Decreased Crop Yield**: Pollution reduces crop yields and soil fertility (Ellerbeck 2023)
	Food Safety Concerns: Pollution creates contaminated crops which can threaten food safety (Food and Agricultural Organization of the United Nations 2020)	**Water pollution**: Harmful chemicals and heavy metals in soil contributes to water pollution as pollutants leach into rivers (Münzel *et al.* 2023) and groundwater (Dechezleprêtre *et al.* 2019)	**Land Devaluation**: Decreased property values in contaminated areas (Meissner & Musshoff 2022)

Global efforts to address pollution

This section gives an overview of some of the key international agreements aiming to address pollution, which highlight the critical importance of coordinated action and shared accountability by governments, policy makers and businesses in addressing pollution.

The Kunming-Montreal Global Biodiversity Framework (KMGBF)

Adopted in December 2022, the KMGBF sets targets to halt and reverse biodiversity loss by 2030 (Convention on Biological Diversity 2023). Target 7 outlines the parties' commitment to a significant reduction of pollution risks and the negative impacts of pollution from all sources to levels not harmful to biodiversity and ecosystems. This includes:

- Reducing excess nutrients lost to the environment by at least half;
- Reducing the overall risk from pesticides and highly hazardous chemicals by at least half; and
- Preventing, reducing, and working towards eliminating plastic pollution.

Target 7 is complemented and supported by other targets, in line with the KMGBF all-of-society approach to transformative action. These include, for example, Target 10 on enhancing biodiversity and sustainability in agriculture, aquaculture, fisheries and forestry, Target 11 on restoring, maintaining and enhancing nature's contributions to people, Target 15 on business assessment, disclosure and reduction of biodiversity-related risks and negative impacts, Target 17 on biosafety and distributing the benefits of biotechnology, Target 18 on reducing incentives and subsidies harmful to biodiversity.

The Global Framework on Chemicals (GFC)

- Adopted in 2023, the GFC has the vision of a planet free of harm from chemicals and waste for a safe, healthy and sustainable future (UNEP 2023c). It outlines five strategic objectives and 28 targets to help countries and stakeholders manage the entire lifecycle of chemicals.

Industries such as agriculture, pharmaceuticals, and construction amongst others are urged to develop and implement sustainable chemical and waste management strategies, to improve transparency and to reduce chemicals input along the value chain and chemicals impact (Target D6). Financial institutions are also encouraged to incorporate by 2030 the sound management of chemicals and waste in their finance approaches and models (Target D3).

Disclosure is at the heart of the GFC, and Strategic Objective B is particularly relevant to disclosure efforts. To achieve this objective, the GFC has defined a set of seven targets (B1 to B7) aimed at ensuring transparency, accessibility, and the effective use of knowledge and data in mitigating chemical risks. Thus, Target B2 requires stakeholders to provide reliable information on chemicals in materials and products across value chains.

Disclosure enhancing is also present in other targets such a Target D3 that requires the private sector, including the finance sector, to adopt internationally recognized reporting standards for managing chemicals and waste by 2030. **A more comprehensive review of the implications of the GFC for financial institutions is provided in the** *Navigating pollution. A Blueprint for the Banking Sector* **publication by UNEP FI** (UNEP FI 2024b).

These targets highlight the GFC's focus on enabling comprehensive disclosures, fostering awareness, and ensuring accountability in chemical and waste management.

The International Legally Binding Instrument to End Plastic Pollution (currently being negotiated)

Plastic pollution is increasingly harming ecosystems and threatening biodiversity. The OECD estimates that, without intervention, plastic leakage into the environment could double to 44 million tonnes annually by 2060 (OECD 2022). In response, the United Nations Environment Assembly adopted a landmark resolution in March 2022, tasking the United Nations Environment Programme (UNEP) to establish an Intergovernmental Negotiating Committee (INC) to create a legally binding instrument addressing plastic pollution across its entire lifecycle.

During the fifth session of the INC (INC-5), held from 25 November to 1 December 2024, discussions advanced on the instrument structure and key elements. While significant progress was made in clarifying positions and identifying shared challenges, critical differences remain, necessitating additional time for resolution. An important outcome of INC-5 was the adoption of a 'Chair's Text,' which will serve as the basis for negotiations at the resumed session in 2025 (UNEP 2024a).

Other global and regional agreements

In addition to the previously mentioned instruments, several other key global and regional agreements play vital roles in addressing pollution at various levels, including the following:

- Convention on Long-Range Transboundary Air Pollution (1979): Aims to limit, gradually reduce and prevent air pollution, including long-range transboundary air pollution;
- Montreal Protocol on Substances that Deplete the Ozone Layer (1987): Aims to phase out the production and consumption of ozone-depleting substances;
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989): Seeks to minimize the generation and movement of hazardous wastes between nations, particularly from developed to less developed countries;
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998): Promotes shared responsibilities among parties in the international trade of hazardous chemicals;
- Stockholm Convention on Persistent Organic Pollutants (2001): Targets elimination or restriction of persistent organic pollutants harmful to health and the environment; and
- Minamata Convention on Mercury (2013): Strives to protect human health and the environment from the adverse effects of mercury.

Potential challenges and opportunities for further strengthening actions against pollution

The transition towards effective pollution management and reduction presents to businesses and policy makers both significant challenges and substantial opportunities for innovation, collaboration, and leadership.

Data gaps in pollution exposure, related risks and impacts

The rapid production and introduction of new chemicals into the environment could outpace the ability to fully research and assess their long-term impacts. A study by the Stockholm Resilience Centre (Persson *et al.* 2022) highlights that the production of new chemicals is on a trajectory that exceeds the capacity for thorough analysis and regulation, contributing to the challenge of pollution mitigation.

The fact that pollution's economic costs could transmit into a substantial burden on global economies calls for the need to integrate pollution-related externalities into financial risk assessments. The OECD (2016) estimates that pollution-related externalities could cost economies USD2.6 trillion annually. The welfare economic costs of air pollution is estimated to over USD 6 trillion annually, while the loss of ecosystem services is expected to range between USD 6.3 and 10.7 trillion annually for soil ecosystem services lost because of soil degradation (Economics of Land Degradation Initiative [ELD] 2015), and from USD 0.5 to 2.5 trillion annually for ecosystem services from the marine environment lost because of plastic pollution (Beaumont *et al.* 2019). By incorporating these costs into financial models, businesses can better understand the long-term economic implications of pollution and be incentivized to invest in cleaner technologies and more sustainable practices.

However, a key challenge in tackling pollution is the lack of comprehensive data connecting pollution exposure to health, ecosystems, and economic outcomes. Current gaps in data, such as the relationships between pollution exposure and health impacts (Vilcassim & Thurston 2023), and the socio-economic consequences of such exposures (Hasenkopf *et al.* 2023), need to be closed to ensure a better understanding of the relationship between exposure and impacts. Such data gaps could hinder the adoption of effective risk assessment and mitigation strategies for businesses.

Opportunity for harmonising standards, enhanced guidance and capacity building

One way to bridge the data gaps is through enhancing the disclosure of nature and pollution-related information by businesses and financial institutions. For example, more than 5,000 companies disclosed their plastic-related activities, impacts, risks and opportunities through CDP in 2024— (CDP 2024f). This highlights the dedication of businesses in addressing pollution-related impacts, risks and opportunities. However, the progress of financial institutions in addressing and disclosing nature- and pollution-related issues remains slow (CDP 2023c). This could be explained by barriers such as low board-level understanding about the importance of nature and pollution (CDP 2023c), and skills gap in understanding, analysing, and integrating environmental, social, and governance factors into investment and business decision-making processes (CFA Institute 2024). **For more information on best practices and on how to inform board members about**

the need to assess and act on nature-related issues, see the *Nature in the Boardroom* publication from UNEP FI (UNEP FI 2024c).

Key finding 10 in this report, which shows a high-level comparison of the seven approaches to nature-related assessment and disclosure, highlights the diverse guidance on disclosure requirements, recommendations and metrics on pollution. While all approaches cover pollution and encourage companies to go beyond narrative descriptions of their disclosures, the integration of pollution-related topics differs. While some approaches provide pollution-specific disclosure recommendations, requirements and metrics, others cover pollution in broader disclosures. Differences between the approaches can also be found in the types of pollution addressed. Deepening collaboration to enable interoperable standards and frameworks, co-developing guidance and capacity building initiatives that address challenges from report preparers, could pave the way for boosting the uptake of effective sustainability reporting and improving data comparability and quality.

Research required to enable comprehensive understanding of long-term effects of pollution

The long-term impacts of pollution on health, ecosystems, and economic productivity are often underestimated in financial risk models. A study concluded that about 5.13 million deaths per year globally are attributable to ambient air pollution from fossil fuel use, highlighting the significant yet underappreciated economic and health risks (Lelieveld *et al.* 2023). Nevertheless, the broader economic and health risks of pollution are still not adequately recognized (Hughes 2024) and more efforts to effectively integrate pollution into business and financial risk assessments and relevant decision-making are needed. The Global Risks Report 2025 from the WEF (World Economic Forum 2025) identifies research and development as one of the main levers to drive action on risk reduction and preparedness regarding pollution over the next 10 years (World Economic Forum 2025).

Leverage opportunities from technological advancements

Technological advancements, such as satellite monitoring, artificial intelligence (AI) powered analytics, and Internet of Things sensors (Ullo & Sinha 2020), offer significant opportunities for pollution data collection and related analyses. These technologies enable businesses to track pollution levels with greater accuracy and responsiveness. Two notable examples include: (i) NASA's Tropospheric Emissions, which monitors pollution through using satellite for high-resolution air quality data, allowing for precise monitoring of pollutants like nitrogen dioxide and ozone (United States Environmental Protection Agency 2020); (ii) the United States Department of State developed an AI-powered application that provides data on air pollution (Tran 2024).

In addition to improving data collection, technological advancements could also hold legal implications, particularly in cases where pollution can be measured and attributed to specific sources. For instance, certain per- and polyfluoroalkyl substances (PFAS) found in the environment can be chemically 'fingerprinted' back to their sources (Joseph *et al.* 2023; The Water Research Foundation 2024). This could help strengthen accountability as well as enable enforcement of environmental laws and regulations.

Annex 1: Methodology

This section outlines the research methodology used in this study. The study relied on a qualitative review of selected leading approaches to private sector assessment and disclosure on nature-related issues. The data collection for Chapter 1, and Key findings 1–9; 11–12 in Chapter 2 was led by UNEP-WCMC while the analysis of the findings and their synthesis into the report was completed by UNEP-WCMC and UNEP FI. As for Key finding 10 in Chapter 2 and the addendum on pollution, UNEP FI led the data collection and completed the synthesis of findings.

Approaches covered and characteristics reviewed

During the inception phase, scoping research and initial consultations with selected assessment and disclosure approaches were conducted to determine which approaches should be covered in this report and which characteristics should be analyzed.

The list of the nature-related assessment and disclosure approaches covered in this study can be found in Table 3. The key criteria for selection of the approaches were (1) coverage of biodiversity and nature issues, (2) relevance at global level or across multiple regions and (3) time relevance.

The characteristics of the nature-related assessment and disclosure approaches that were selected to be the focus of this study are listed in Table 18 below. They include biodiversity and nature concepts, methodological issues for understanding the relationship between companies and nature as well as more general characteristics that shape the scope of what is assessed and disclosed.

Table 18: Characteristics of the nature-related assessment and disclosure approaches selected to be the focus of this study

Characteristics	
Definition of materiality	Nature-related dependencies
Coverage of realms	Nature-related risks and opportunities
Coverage of sectors	Disclosure metrics
Coverage of value chains	Disclosures on pollution
Location information requirements	Targets
Nature-related impacts	Engagement with rights-holders and relevant stakeholders

Data collection

The data collection was conducted in several rounds, with initial desk research and interviews completed between May and July 2023 and further desk research completed between August and November 2023 to address updates released by the reviewed approaches. For this updated version of the report, desk research and additional interviews were conducted between June and August 2024 to update specific factual information within the report originally published in January 2024.

Desk review

The key sources of information included official published documents covering the disclosure approaches and their methodologies, any further guidance provided by the approaches and draft versions documents released online or made available to the research team. Detailed lists of the versions of the documents considered in drafting of this report can be found in the reference list. The documents outlining the approaches were complemented by review of existing research and guidance documents comparing the different approaches as well as other secondary sources (e.g. news pieces, information materials, websites) available online and shared by the representatives of different organizations developing the approaches. The information collected through the desk review was synthesized into a summary of each characteristic for each approach, to facilitate a comparison of the characteristics across the different approaches.

Interviews

Semi-structured interviews were conducted with representatives of the organizations who developed or are developing nature-related assessment and disclosure approaches. The purpose of these interviews was to triangulate the information identified through the desk research and enable inclusion of upcoming revisions that were not public at the time of writing. Interviews were conducted virtually between May to July 2023. For this updated version of the report, additional interviews were conducted virtually in July 2024. The full list of the experts interviewed can be found in Annex 2.

The questions shown in Annex 3 were used as guidance during the interviews. The context of a specific organization, in addition to the gaps in information reviewed during the desk research, were used to tailor the questions.

Data analysis

The data collected through the desk research on the agreed characteristics was qualitatively analyzed and the key findings were drawn as a result. The findings of the research process were discussed within the research team. Draft versions of the report were shared for review with the interviewees and other relevant representatives of the organizations developing the nature-related assessment and disclosure approaches in late October to early November 2023. For this updated version of the report, review by the relevant representatives of the organizations was conducted in August–December 2024.

Limitations

Some limitations exist in this research, which include but are not limited to:

Inherent differences: Approaches reviewed in this report differ in type and the purposes they are designed to serve. ESRS, GRI and ISSB Standards are disclosure standards, TNFD is a risk management and disclosure framework, and Natural Capital Protocol is a measurement and valuation framework. SBTN is a target-setting guidance while CDP is a disclosure system. Each of these approaches plays an important role in the corporate disclosure landscape. When comparing the seven approaches against the selected characteristics in this research, our analysis took into consideration the specific context and function of these approaches. Nevertheless, some of the differences outlined in this report are inherent to the type and purpose of the approaches covered.

Ongoing iteration and development: Several approaches are currently undergoing the process of further development or iteration which means that in some cases researchers had to rely on the latest available draft of the given approach. Certain details of the approaches may change during the publication or shortly after the publication of this report. The report primarily focuses on trends that have been observed across the multiple approaches reviewed and are unlikely to change in the near future. Where information indicated in this report is likely to evolve based on an updated version of the approach, the authors have made an effort to specify this.

Information sharing constraints: Due to ongoing updates and sensitive nature of information, some interview respondents were not able to share the full details of the approaches' planned future contents or strategy. Researchers had to rely on the information that was publicly available at the time of conducting the study or that the representatives of the different disclosure approaches were willing to make available for the purpose of the study.

Annex 2: Full list of experts interviewed

CDP	Barbro Doevre, Mabel Smith
EFRAG and EGRAG SR TEG	Pedro Faria, Philippe Diaz, Rita Marinhas
GRI	Elodie Chene, Matthew Dunn, Sharon Hagen
IFRS Foundation	Francesca Recanati, Greg Waters
Capitals Coalition	Tom McKenna, Marta Santamaria
SBTN	Samantha McCraine
TNFD	Alessandra Melis, Emily McKenzie

Annex 3: Interview questions

The below are examples of the questions that were asked. The questions were tailored to the approach based on initial findings from the desk research.

- To get an understanding of your approach, we reviewed the following documents [name documents reviewed]. Are there any other materials you would recommend us to review?
- Your approach has defined Materiality as "……", why?
- Based on [name document reviewed], you recommend disclosures on business impacts and dependencies as follows "……". Would you be able to elaborate more on this?
- You propose companies use [methodology name] as the methodology for measurement/assessment. What are the major justifications behind?
- Your approach has currently covered A,B, and C sectors. Any plans to further expand into other sectors such as D,E, and F?

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Endnotes

1 Collaboration agreements between TNFD and CDP: tnfd.global/tnfd-marks-continued-global-momentum-and-new-capability-building-initiatives-one-year-after-release-of-disclosure-recommendations/; TNFD and EFRAG: efrag.org/en/news-and-calendar/news/efrag-and-tnfd-sign-a-cooperation-agreement-to-further-advance-naturerelated-reporting; TNFD and GRI: tnfd.global/strengthened-collaboration-between-gri-and-tnfd/; IFRS Foundation and CDP: ifrs.org/news-and-events/news/2024/06/issb-delivers-further-harmonisation-of-the-sustainability-disclosure-landscape-new-work-plan/; IFRS Foundation and GRI: ifrs.org/news-and-events/news/2022/03/ifrs-foundation-signs-agreement-with-gri/#:~:text=The%20IFRS%20Foundation%20and%20Global%20Reporting%20Initiative%20%28GRI%29,to%20coordinate%20their%20work%20programmes%20and%20standard-setting%20activities..

2 Interoperability/correspondence mapping between the GRI standards and TNFD's recommended disclosure and metrics: tnfd.global/publication/interoperability-mapping-between-the-gri-standards-and-the-tnfd-recommended-disclosures-and-metrics/; ESRS and TNFD's recommended disclosure and metrics: tnfd.global/tnfd-and-efrag-publish-correspondence-mapping/; ESRS and the ISSB Standards: ifrs.org/content/dam/ifrs/supporting-implementation/issb-standards/esrs-issb-standards-interoperability-guidance.pdf. Mapping currently being developed by GRI and IFRS Foundation: globalreporting.org/news/news-center/gri-and-ifrs-foundation-collaboration-to-deliver-full-interoperability-that-enables-seamless-sustainability-reporting/.

3 The characteristics of ISSB Standards in this table are based on the IFRS S1 and S2 Standards, as well as the SASB Standards and the CDSB Framework Application Guidance that the ISSB Standards refer to for additional guidance.

4 ESRS will be mandatory for companies subject to the EU Corporate Sustainability Reporting Directive (CSRD). Other companies may choose to voluntarily report against ESRS. EFRAG will also produce a standard forSMEs, which will be voluntary.

5 GRI Standards are made mandatory in some jurisdictions. As of 2023, the GRI Standards are referenced or required in 259 policies in 85 countries around the world.

6 ISSB Standards are expected to be mandated in different jurisdictions, similarly to the IFRS Accounting Standards.

7 As part of the 2024–2026 work plan, the International Sustainability Standards Board (ISSB) will research risks and opportunities associated with sustainability topics beyond climate for entities to meet the information needs of investors. This includes exploring information about sustainability-related risks and opportunities associated with BEES.

8 CDP also has questionnaires for cities and states and regions. These are not covered in this research.

9 Target report users refer to individuals or groups who are expected to use the reports created by report preparers.

10 More information on the primary users of ESRS-aligned reporting can be found in ESRS 1 General requirements.

11 The Natural Capital Protocol provides additional guidance for the financial institutions.

12 More information on the target users of TNFD-aligned reports can be found on page 16 of the TNFD v1.0 recommendations.

13 GRI Standards refer to "the most significant impacts on the economy, environment and people".

14 ISSB S1 states that "In the context of sustainability-related financial disclosures, information is material if omitting, misstating or obscuring that information could reasonably be expected to influence decisions that primary

users of general purpose financial reports make on the basis of those reports, which include financial statements and sustainability-related financial disclosures and which provide information about a specific reporting entity" (IFRS 2023c).

15 Natural Capital Protocol recommends the approach to materiality should be tailored to the circumstance of the business and purpose of the assessment.

16 While SBTN has a major impact/environmental/social materiality focus, it allows the introduction of information on financial materiality when making the decision about where to begin target-setting in Step 2d.

17 TNFD does not prescribe a specific approach to materiality. They recommend the ISSB definition of financial materiality as a baseline but acknowledge that companies may choose a different approach, including but not limited to the GRI impact materiality approach or ESRS double materiality approach.

18 ESRS E3 focus on water and marine resources.

19 ESRS are planning to develop sector-specific standards for all sectors in the near future.

20 Over time, GRI aims to develop standards for all 40 sectors.

21 ISSB Standards make reference to the SASB Standards (SICS classification across 77 industries) for sector-specific guidance.

22 SBTN provides selected sector-specific guidance within the Step 3 methods. SBTN's finance sector guidance is in development.

23 Includes impacts on ecosystem services on which the company or other stakeholders in the landscape depend.

24 Companies previously subject to the EU Non-Financial Reporting Directive (NFRD) and large non-EU listed companies with more than 500 employees will have to start reporting under ESRS in financial year 2024. The standard will be applicable to large non-listed companies in 2025, with other types of companies becoming subject to the CSRD over the following years.

25 The European Commission Omnibus proposal is part of a larger initiative called the Competitiveness Compass, an initiative providing a strategic framework to steer the Commission's work. As of January 2025 and within its scope, the Omnibus proposal "will simplify sustainability reporting, due diligence, and taxonomy" according to the European Commission (European Commission, 2025).

26 Collaboration agreements between TNFD and CDP: tnfd.global/tnfd-marks-continued-global-momentum-and-new-capability-building-initiatives-one-year-after-release-of-disclosure-recommendations/; TNFD and EFRAG: efrag.org/en/news-and-calendar/news/efrag-and-tnfd-sign-a-cooperation-agreement-to-further-advance-naturerelated-reporting; TNFD and GRI: tnfd.global/strengthened-collaboration-between-gri-and-tnfd/; IFRS Foundation and CDP: ifrs.org/news-and-events/news/2024/06/issb-delivers-further-harmonisation-of-the-sustainability-disclosure-landscape-new-work-plan/; IFRS Foundation and GRI: ifrs.org/news-and-events/news/2022/03/ifrs-foundation-signs-agreement-with-gri/#:~:text=The%20IFRS%20Foundation%20and%20Global%20Reporting%20Initiative%20%28GRI%29,to%20coordinate%20their%20work%20programmes%20and%20standard-setting%20activities.

27 Interoperability/correspondence mapping between the GRI standards and TNFD's recommended disclosure and metrics: tnfd.global/publication/interoperability-mapping-between-the-gri-standards-and-the-tnfd-recommended-disclosures-and-metrics/; ESRS and TNFD's recommended disclosure and metrics: tnfd.global/tnfd-and-efrag-publish-correspondence-mapping/; ESRS and the ISSB Standards: ifrs.org/content/dam/ifrs/supporting-implementation/issb-standards/esrs-issb-standards-interoperability-guidance.pdf. Mapping currently being developed by GRI and IFRS Foundation: globalreporting.org/news/news-center/gri-and-ifrs-foundation-collaboration-to-deliver-full-interoperability-that-enables-seamless-sustainability-reporting/.

28 GRI refers to materiality as the significance of the negative and positive impacts.

29 The materiality assessment will be conducted at a different stage in the future integrated Capitals Protocol.

30 GRI Standards refer to "the most significant impacts on the economy, environment and people".

31 Initial materiality screening is recommended in the CDSB Framework Application Guidance to which ISSB Standards refer for additional guidance.

32 Natural Capital Protocol recommends the approach to materiality should be tailored to the circumstance of the business and purpose of the assessment.

33 While SBTN has a major impact/environmental/social materiality focus, it allows the introduction of information on financial materiality when making the decision about where to begin target-setting in Step 2d.

34 The SBTN glossary states that "Parameters used to understand significance (e.g. time frame, geographic distribution, potential severity) should correspond to societal preferences and the views and knowledge of those who live and are connected to place." (SBTN 2023)

35 TNFD does not prescribe a specific approach to materiality. They recommend the ISSB definition of financial materiality as a baseline but acknowledge that companies may choose a different approach, including but not limited to the GRI impact materiality approach or ESRS double materiality approach.

36 For example, ocean currents can transport plastic waste across the globe (Erik van Sebille et al 2020) or diffuse oil released from offshore drilling to a large area (Murray 2018).

37 For example, the spatiotemporal variability of methane in shallow near-shore habitats ranges globally from 6 to 460 nM throughout the year (Roth et al 2022). Another example is that many oceanic species have non-linear migration and dispersal ranges that can exceed thousands of miles and follow variable patterns (Putnam, 2018).

38 For further information: tnfd.global/publication/guidance-by-biome/#publication-content

39 The TNFD sector guidance for fishing was published as draft for consultation with market participants and other interested stakeholders until September 2024, and will be finalised based on feedback received following the consultation period.

40 For example, IBAT is in the process of integrating a data layer on of marine STAR, UNEP-WCMC is continually updating the Ocean+ platform and UNEP-WCMC and ORRAA are working on updating the Coastal Risk Index.

41 The LEAP approach is TNFD's recommended approach to identification and assessment of nature-related issues. Companies do not need to follow the LEAP approach to prepare their TNFD disclosure reports, it is a voluntary additional guidance.

42 More information can be found in Table 4 in the SBTN Step 3 Target Setting Guidance: Land v1.0. Accessible here: sciencebasedtargetsnetwork.org/wp-content/uploads/2024/09/Technical-Guidance-2024-Step3-Land-v1.pdf

43 SBTN defined production inputs as "goods that the company acquires to process, transform, or integrate into new products, including those that are consumed in the process and become waste or byproducts, as well as packaging materials". For more information, see SBTN v1.1 Step 1 guidance. sciencebasedtargetsnetwork.org/wp-content/uploads/2024/07/Technical-Guidance-2024-Step1-Assess-v1-1.pdf

44 For more information, see TNFD Guidance on value chains. tnfd.global/wp-content/uploads/2024/06/24-26270-TNFD-Discussion-Paper-%E2%80%93-Approach-to-Value-Chain-DIGITAL.pdf?v=1719522658

45 In ESRS E4 Biodiversity and Ecosystems, companies are required to describe their process to identify and assess material biodiversity- and ecosystem-related impacts and dependencies across the value chain and the associated risks and opportunities.

46 Strategy D defines priority locations "as locations that are material (i.e., where an organization has identified material nature- related issues) and sensitive (i.e., where the assets and/or activities in its direct operations–and, where possible upstream and downstream value chain(s)–interface with nature in: areas important for biodiversity; and/or areas of high ecosystem integrity; and/or areas of rapid decline in ecosystem integrity; and/or areas of high physical water scarcity risks; and/or areas of importance for ecosystem service provision, including benefits to Indigenous Peoples, Local Communities and stakeholders)"(TNFD 2023b).

47 TNFD v1.0 Recommendations can be accessed here: tnfd.global/publication/recommendations-of-the-task-force-on-nature-related-financial-disclosures/#publication-content

48 TNFD Guidance on the identification and assessment of nature-related issues: the LEAP approach can be accessed here: tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/#publication-content

49 For TNFD's definition of ecologically sensitive locations, see Box 2. TNFD disclosure recommendation Strategy D expects companies to disclose all ecologically sensitive locations identified in their direct operations. Disclosure of ecologically sensitive locations for the upstream and downstream parts of the value chain is recommended where possible.

50 The detailed guidance can be found in Application Requirement 7 in ESRS E4 Biodiversity and Ecosystems

51 While ISSB does not require the disclosure of nature related issues to be location-specific, the CDSB Framework Application guidance for biodiversity-related disclosures recommends that organizations disclose the geographical specificity of their biodiversity dependencies, impacts, risks and opportunities.

52 For more information on ISSB's definition of materiality, see Table 5 under key finding 1 in this report.

53 TNFD and ESRS also include freshwater use change.

54 SBTN's Indicator Framework V1 can be found in the annex to the 2023 Step 1 methods. These can be accessed here: sciencebasedtargetsnetwork.org/wp-content/uploads/2023/05/Technical-Guidance-2023-Step1-Assess-v1.pdf

55 Adopted from the System of Environmental-Economic Accounting—Ecosystem Accounting (SEEA EA), TNFD defines state of nature "as the condition and extent of ecosystems, and species population size and extinction risk, including positive or negative changes" (TNFD 2023b).

56 ISSB Standards refer to the CDSB Framework Application Guidance, which recommends assessment of the state of nature as part of impact measurement.

57 SBTN's definition of the state of nature covers both biotic and abiotic components of ecosystems.

58 ISSB Standards refer to the CDSB Framework Application Guidance, which recommends this.

59 The ISSB Standards, which are designed to support the information needs of investors, lenders and other creditors, require companies to disclose impacts on nature only if these give rise to risks and opportunities that could reasonably affect the entity's prospects (with the exception of Scope 1–3 greenhouse gas emissions required in IFRS S2). To identify sustainability-related risks and opportunities, as well as material information related to those risks and opportunities, the ISSB Standards require report preparers to refer to and consider the applicability of the SASB Standards. Report preparers are permitted, but not required, to use the CDSB Framework Application Guidance for water and biodiversity for the same purpose. They are also permitted to refer to the ESRS and GRI Standards to identify material information related to pre-identified risks or opportunities. In other words, the ISSB Standards allow preparers to use impact-focused metrics found in the above disclosure standards and frameworks when that information is material to investors.

60 ISSB Standards do not directly refer to the IPBES direct drivers of biodiversity loss and ecosystem change but they permit the use of the CDSB Framework Application Guidance that covers all IPBES drivers. Natural Capital Protocol provides a flexible voluntary guidance, and impact reporting is only one of the potential uses.

61 Natural Capital Protocol provides a flexible voluntary guidance, and impact reporting is only one of the potential uses.

62 SBTN uses the term "state of nature" differently from how it is used in this report. SBTN's definition of state of nature includes both biotic and abiotic components. The abiotic state of nature measurements would cover assessments of water availability, water pollution/eutrophication etc.

63 Natural Capital Protocol provides a flexible voluntary guidance, and dependencies reporting is only one of the potential uses.

64 Since SBTN focuses on targets supporting management of business impacts on nature, it does not currently include dependencies in its guidance on assessment (Step 1) and target-setting (Step 3). However, it does allow for companies to introduce information on dependencies when choosing priority locations for target setting and action (Step 2).

65 Nature-related systemic risks are "risks arising from the breakdown of the entire system, rather than the failure of individual parts. Nature-related systemic risks are characterised by modest tipping points combining indirectly to produce large failures and cascading interactions of physical and transition risks. One loss triggers a chain of others and stops systems from recovering their equilibrium after a shock. Nature-related systemic risk covers more than only risk to a financial system (i.e. financial stability risk). It also covers the risks from the breakdown of natural systems (i.e. ecosystems)" (TNFD 2023b).

66 ISSB Standards define these risk types in IFRS S2 on climate-related disclosures. The different risk categories are also described in the CDSB Framework Application Guidance, to which the ISSB Standards refer.

67 For definition of systemic risks, see endnote 65.

68 ISSB Standards define these different risks in IFRS S2 on climate-related disclosures. The different risk categories are also described in the CDSB Framework Application Guidance, to which the ISSB Standards refer.

69 ISSB Standards define these risk types in IFRS S2 on climate-related disclosures. The different risk categories are also described in the CDSB Framework Application Guidance, to which the ISSB Standards refer.

70 Natural Capital Protocol provides a flexible voluntary guidance, and risk and opportunity reporting is only one possible use.

71 SBTN covers non-GHG air pollution in Steps 1 and 2 but non-GHG air pollutants are not covered by the currently available Step 3 methods. GHG air pollutants are covered by SBTi, which SBTN complements.

72 Many of nature-related risks caused by plastic pollution are also linked to the unsafe and unsustainable management of chemicals throughout their life cycle.

73 Since SBTN focuses on targets supporting management of business impacts on nature, it does not provide guidance on assessment of risks and opportunities, but it does allow for companies to introduce information on risks and opportunities when choosing priority locations for target setting and action (Step 2).

74 As defined by the Cross Sector Biodiversity Initiative (CBSI), the mitigation hierarchy is: 'the sequence of actions to anticipate and avoid impacts on biodiversity and ecosystem services; and where avoidance is not possible, minimize; and, when impacts occur, rehabilitate or restore; and where significant residual impacts remain, offset (Cross Sector Biodiversity Initiative 2015).

75 Oceans Step 3 Technical Guidance is currently being developed by SBTN.

76 Under module F6 of the deforestation questionnaire, when applicable, CDP asks companies to explain why they do not have target(s) in place for decreasing production and/or consumption for disclosed commodity(ies), alongside any plans to set targets in the future.

77 The ESRS requirements and recommendations in this table are based on ESRS E4 and the ESRS 2 Minimum Disclosure Requirement.

78 Determined by (1) whether ecological thresholds / allocations have been used in setting the target and (2) whether the ecological thresholds/allocations used are based on scientific evidence.

79 The GRI requirements and recommendations in this table are based on the GRI 101: Biodiversity Standard 2024 and the GRI 3 Disclosure 3–3 that is relevant for all nature-related topics.

80 Natural Capital Protocol provides a flexible voluntary guidance, and target setting is only one of the potential uses.

81 The SBTN requirements are primarily focused on the information required to be submitted for validation; guidance on external disclosures from companies (Step 5) is still under development. Content included here is based on SBTN 2023 technical guidance and plans for the SBTN target dashboard.

82 Action plans are currently only required to be disclosed to the SBTN Validation Team.

83 In SBTN, Target Boundary B refers to activities where more precise locations for target-setting are needed, and therefore where companies need to plan for increasing traceability.

84 TNFD Guidance on Engagement with Indigenous Peoples, Local Communities and Affected Stakeholders can be accessed here: tnfd.global/publication/guidance-on-engagement-with-indigenous-peoples-local-communi-

ties-and-affected-stakeholders/#publication-content

85 SBTN Stakeholder Engagement Guidance can be accessed here: sciencebasedtargetsnetwork.org/wp-content/uploads/2023/05/Technical-Guidance-2023-Stakeholder-Engagement-Guidance-beta.pdf

86 For more information, see capitalscoalition.org/capitals-approach/

UN environment programme

finance initiative

UNEP Finance Initiative brings together a large network of banks, insurers and investors that collectively catalyses action across the financial system to deliver more sustainable global economies. For more than 30 years the initiative has been connecting the UN with financial institutions from around the world to shape the sustainable finance agenda. It has established the world's foremost sustainability frameworks that help the finance industry address global environmental, social and governance (ESG) challenges. Convened by a Geneva, Switzerland-based secretariat, more than 500 banks and insurers with assets exceeding US$100 trillion work together to facilitate the implementation of UNEP FI's Principles for Responsible Banking and Principles for Sustainable Insurance. Financial institutions work with UNEP FI on a voluntary basis and the initiative helps them to apply the industry frameworks and develop practical guidance and tools to position their businesses for the transition to a sustainable and inclusive economy. .

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