
Date **November 2024**
Project **Biodiversity, Ecosystems, and Ecosystem Services (BEES)**
Topic **Literature review on the evidence of investor interest**
Contacts **Jeff Stehm (jstehm@ifrs.org)**

This paper has been prepared for discussion at a public meeting of the International Sustainability Standards Board (ISSB). This paper does not represent the views of the ISSB or any individual ISSB member. Any comments in the paper do not purport to set out what would be an acceptable or unacceptable application of IFRS[®] Sustainability Disclosure Standards. The ISSB's technical decisions are made in public and are reported in the ISSB Update.

Purpose

1. The purpose of this paper is to summarize the results of a literature review of investor interest in information on biodiversity, ecosystem and ecosystem services (BEES)-related risks and opportunities.¹ The paper contributes to the research question: ‘What are the information needs of investors and how is current disclosure practice meeting or failing to meet these needs?’.²
2. To help answer this research question, the literature review assesses four relevant and related topics:
 - (a) the level and drivers of investor interest in BEES-related risks and opportunities
 - (b) the type and sources of information that investors use to assess such risks and opportunities
 - (c) how investors use such information in their investment decision-making processes
 - (d) the information challenges, barriers or gaps faced by investors
3. This literature review is part of a broader research effort to gather evidence of investor interest in information on BEES-related risks and opportunities. The July staff paper on “Biodiversity, ecosystems and ecosystem services and human capital research projects - research design and

¹ The ISSB research project uses the term biodiversity, ecosystems and ecosystem services (BEES) for the full set of nature- and environmental-related risks and opportunities.

² Throughout this paper, the term investor has the meaning of ‘primary user’ as defined by the IFRS Foundation. In this paper, the investment value chain refers to entities other than investors, such as third-party data providers, rating agencies, and index constructors that provide services to investors.

approach” outlined the overall approach and activities for the ‘investor interest’ research area along with other areas of research of the ISSB’s research project on BEES.³

4. This paper does not seek any decisions from the ISSB. The paper only presents preliminary findings of the research; more information will be shared on this research area in future meetings of the ISSB.

Structure of the paper

5. The paper is structured as follows:
 - (a) Approach to and limitations of the literature review (paragraphs 6-7)
 - (b) Summary of findings (paragraphs 8-18)
 - (c) Analysis (paragraph 19-59)
 - (i) Investor interest and its drivers for BEES-related risks and opportunities (paragraphs 20-29)
 - (ii) Types and sources of information (paragraphs 30-43)
 - (iii) How information is used by investors in investment decisions (paragraphs 44-53)
 - (iv) Information challenges, barriers and gaps (paragraphs 54-59)

Approach to and limitations of the literature review

6. Staff conducted a literature review covering a diverse set of over 100 sources. These sources were drawn from consultancy and data provider reports (23%), academic papers and publications (19%), investment industry organizations (15%), international organizations and government reports (15%), trade publications (13%), investor research (6%), standard setters (5%) and NGO reports (4%).⁴ Staff assessed the credibility of this literature based on a combination of factors such as sample size, study design, credibility of author(s), relevancy and recency of the report.

³ [AP2B “Biodiversity, ecosystems and ecosystem services and human capital research projects - Research design and approach”](#), July 2024

⁴ For academic studies, most appeared in interdisciplinary journals rather than mainstream accounting or finance journals.

The review used a variety of tools to identify relevant literature including desk research on reputable publications, investor and third-party recommendations and ISSB member recommendations.

7. Staff notes that sources dealing exclusively with BEES topics and the investment process were relatively limited. Most sources discussed biodiversity and nature-related risks either in the context of the ‘E’ pillar of Environmental, Social, and Governance (ESG) factors or in terms of broader sustainability considerations such as the UN Sustainable Development Goals (SDGs). This literature review strived to focus on sources specific to nature and biodiversity-related risks and opportunities in the investment process. However, it does draw on the wider ESG- and sustainability-related literature to the extent that the insights are relevant to investor interest in BEES-related risks and opportunities.

Summary of findings

8. The literature review highlighted the growing interest in BEES-related investment considerations, the diverse sources and types of information used, the numerous ways this information is applied in investment decisions, and the significant challenges and barriers that exist. This section summarizes five findings from the literature review that are explored in more detail in the analysis section.

Finding #1: Investors are aware of BEES-related risks and opportunities but are at an early stage incorporating them in investment decisions.

9. While many investors express an interest in and recognize that BEES-related risks and opportunities may be potential considerations in their decisions, other investors lack interest at the present time. Of those investors with an awareness of and interest in BEES-related risks and opportunities, many are still at an early stage of incorporating BEES-related risks and opportunities into investment decisions. Many investors are trying to understand the risk and

opportunity measures and factors most significant for their investment decisions and how best to incorporate them into their investment process and models.

Finding #2: Investor interest in BEES is driven by several factors.

10. Investor interest is driven by factors such as risk mitigation, improved financial returns, client demand, regulatory requirements and societal pressures (Boffo & Patalano, 2020). The weight of these drivers differs among investors depending in part on assessment of significance of BEES-related risks and opportunities and investors' investment strategies and approaches (PwC, 2022) (Capital Group, 2022) (WWF and Oliver Wyman, 2024) (CFA Institute, 2020) (CFA Institute, 2022b). The most predominant drivers are risk, return and client demand.

Finding #3: Investors use multiple sources and diverse types of information.

11. Investors rely on multiple sources of BEES-related information, both direct and indirect. Direct sources include company reports, engagements, company regulatory filings and indirect sources include public reports, public and private databases, third-party data providers and ESG raters, NGO reports, academic studies, and public media.
12. Many investors are primarily using qualitative information such as a company's nature-related policies and commitments or news of nature-related company controversies. Investors also find qualitative information in the form of narratives in company reports useful to understand a company's nature-related priorities and context when analysing company data from third-party providers (Financial Reporting Council, 2023).
13. But there is a strong investor demand for more quantitative data, especially location-specific and financially relevant data around BEES-related risks and opportunities (UN EP, 2022) (University of Cambridge Institute for Sustainability Leadership, 2021).
14. Investors also source and use information on subtopics within nature, such as deforestation, water, pollution, land use, etc. It appears they do so because the subtopics are tied more directly with company and industry dependencies. Such information also tends to be relatively more available than more comprehensive information on a company's overall BEES-related risks and opportunities. The literature, for example, points out the high dependency of the agricultural,

food and extractive industries on water use and land use and associated risks related to water use, water contamination, habitat loss and biodiversity decline.

Finding #4: Investors use information in numerous ways in investment decisions.

15. The literature discusses (and calls with investors confirm) that they use several different investment approaches, either separately or in combination, in applying BEES-related information to investment decisions. These approaches include integration, screening, identifying thematic trends and/or stewardship activities. Most investors appear to start with either stewardship or screening approaches and proceed to integration or thematic approaches.

Finding #5: Investors often mention information challenges to accurately assessing and managing BEES-related risks and opportunities.

16. Information challenges around BEES-related risks and opportunities cited by the literature include the complexity and localized nature of BEES-related risks and opportunities; lack of standardized and comparable quantitative data; need for more decision-useful methodologies in generating and using data; confusing and non-standard terms; and the need for the adoption of more comprehensive and comparable reporting frameworks.
17. The lack of standardized, high-quality biodiversity data from companies makes it particularly challenging for investors to accurately assess and manage BEES-related risks and opportunities, potentially leading to suboptimal investment decisions. Specific data gaps include company location data (both activity and asset locations), supply chain data, and information on certain biomes such as ocean and marine ecosystems.
18. What information is available presently is often focused on disclosure of impacts and dependencies with progressively less information disclosed by companies on the resulting components of risk and opportunity, namely threats, exposures, vulnerabilities, and consequences (Mair, et al., 2024).

Questions for the ISSB

1. Does the ISSB have any questions on the **investor interest** or the **drivers of investor interest** in BEES-related risks and opportunities?
2. Does the ISSB have any questions on the **sources of information used by investors** in the context of BEES-related risks and opportunities?
3. Does the ISSB have any questions about **how investors are using the information** available to them in making investment decisions that take account of BEES-related risks and opportunities?
4. Does the ISSB have any questions regarding the **information challenges** faced by investors and **investors' information desires**?

Analysis

19. This section details the results from the literature review as follows:
- (a) Investors' interest and drivers of interest in BEES-related risks and opportunities.
 - (b) Sources of information that investors use.
 - (c) How investors use such information in their investment decisions.
 - (d) Information challenges, barriers, and gaps faced by investors.

Investor interest in BEES-related risks and opportunities

20. While many investors express an interest in and recognize that BEES-related risks and opportunities may be a potential consideration in their decisions, other investors seem to lack interest at the present time. For instance, a 2021 global survey by Credit Suisse of 327 asset owners and asset managers from 35 countries indicated that 84% of respondents were very concerned about biodiversity loss. But in 2023, PwC reported that only 10% of 345 surveyed investors from 30 countries thought that nature and biodiversity risks were important to consider when evaluating the companies they invest in or cover (PwC, 2023, p. 2). Another indicator of interest is a 2020 analysis by PRI that found that biodiversity was mentioned in only 9% of the reports of the 2,356 PRI signatories, natural capital was mentioned in only 1% of reports and ecosystem services were mentioned in only 0.5% of the reports (PRI, 2020, p. 16).
21. Another finding that emerges from the literature is the investors, even if interested, remain at an early stage of incorporating information on BEES-related risks and opportunities in their investment decisions and processes. This nascent level of incorporation of BEES-related risks and opportunities into investment decisions stems from several factors – a focus on the risks and opportunities of climate change, data challenges with BEES-related risks and opportunities, methodological challenges for measuring risks and opportunities, difficulties valuing financial effects and incorporating them into investment models and processes, and a lack of in-house expertise.
22. The Credit Suisse survey also pointed out that of the 84% of investors concerned with biodiversity loss, 91% did not have measurable targets, 72% had not assessed their portfolio

- regarding biodiversity risks, and 27% are not addressing biodiversity themes to any extent (Credit Suisse, 2021). A 2024 GARP survey of 48 financial institutions found that almost 70% scored a low level in GARP's risk management maturity model for nature (GARP, 2024).⁵
23. Similarly, in 2022, CDP found that only 20% of 556 surveyed financial institutions in 52 countries were assessing their exposures to any nature-related risks or opportunities and only 10% and 13%, respectively, for forest or water-related risks (CDP, 2023a). CDP also reported that financial institutions' disclosure of metrics about BEES-related risks in their portfolios remains nascent in the absence of clear guidance on tools and methodologies to use.
24. However, investor interest in BEES-related risks and opportunities is steadily increasing. Between 2016 and 2019, PRI signatory reports mentioning biodiversity and water rose by 111% and 78%, respectively (PRI, 2020, p. 16). This parallels the finding that 52% of the 500 asset owners in a 2023 Morningstar survey found that environmental factors (e.g., sustainable food / agriculture, water and wastewater management, waste and hazardous materials management) became more significant or much more significant in the past year.

Drivers of investor interest in BEES-related risks and opportunities

25. The predominant drivers of investor interest in BEES-related risks and opportunities in the literature appear to be risk management, return enhancement, and client demand (PwC, 2022) (Capital Group, 2022, p. 16) (WWF and Oliver Wyman, 2024). The CFA Institute found that the top two drivers of over 7,000 surveyed investors were risk management and investor preferences (CFA Institute, 2020). A BNP Paribas (2019, p. 13) survey of 347 asset owners and asset managers found improved returns followed by reduced risk and client demand as the main

⁵ Participating firms were scored on each of the risk dimensions – governance, strategy, risk management, metrics/targets/limits, scenario analysis and disclosure - which not only provides a measure of their level of achievement but also indicates how each firm stands relative to its peers.

drivers of interest. A Merrill Lynch Wealth Management survey found the predominant driver was client demand (Boffo & Patalano, 2020, p. 17).

26. Other reasons cited in the literature driving consideration of BEES-related risks and opportunities in investment decisions include fiduciary duty, reputational benefits, and regulatory requirements (CFA Institute, 2020) (GARP, 2023, p. 15).
27. As more countries institute mandatory reporting on BEES-related risks and opportunities, regulations become an increasing driver of investor interest. Much of this regulation is in response to Target 15(a) of the Kunming-Montreal Global Biodiversity Framework, which calls on countries to encourage companies to “regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity.” National regulatory reporting requirements are often identified as a key driver of investor interest in BEES-related risks and opportunities as more company-level information becomes available (Ecolx, 2024) (ERM Sustainability Institute, 2024) (Whitehorn, et al., 2019) (GRESB, 2023). Investors are also driven to consider BEES-related risks and opportunities by their own regulatory disclosure requirements such as the EU’s Sustainable Finance Disclosure Regulation (SFDR). Finally, investors take an interest in a company’s compliance risk with emerging nature-related and biodiversity regulations.
28. Voluntary reporting frameworks, such as the Task Force on Nature-related Financial Disclosures (TNFD) and the Global Reporting Initiative (GRI), are another driver of investor interest in BEES-related risks and opportunities as better information becomes available to incorporate into investment decisions (WWF and Oliver Wyman, 2024, p. 19) (GARP, 2024, p. 22).
29. The rise of impact investing and sustainable finance has further accelerated the demand for integrating natural capital and biodiversity considerations as investors seek investment opportunities that generate positive environmental outcomes alongside financial returns.

Types and sources of information

Types of information of interest to investors

30. Investors are interested in both qualitative and quantitative information across the full range of BEES-related risks and opportunities that allows them to understand if a company is operating in high-risk sectors, high-risk locations, or sourcing high-risk materials through its supply chain (Bloomberg Professional Services, 2024).
31. However, most investors focus on a specific and limited set of BEES-related risks and opportunities, such as those associated with land use, forests, water, and pollution (WWF and Oliver Wyman, 2024). GARP has found in small surveys of investors in 2022 and 2024 that investors tended to look at BEES-related risks and opportunities on biodiversity loss (44-62%), water scarcity and pollution (40-51%), deforestation (50%), resource exploitation (40%) and land use change/land pollution (31-50%) (GARP, 2023) (GARP, 2024). Investors find a more focused information approach is more easily tied to the known dependencies or impacts of a particular company, industry or sector (Financial Reporting Council, 2023).
32. Investors tend to begin with qualitative information such as BEES-related company policies or commitments and commodity certifications (CFA Institute, 2020) along with information on controversies such as breaches of regulations, fines, and adverse reputational news.
33. Quantitative information used by investors currently consists of metrics such as water withdrawals, water consumption, water use from stressed areas, amount and type of land use conversion near sensitive areas, etc. Only 10-15% of investors in a 2024 GARP survey of 48 firms cite use of metrics for nature areas such as land/ocean/freshwater use change, resource exploitation, and pollution as compared to 33% for climate change (GARP, 2024, p. 21).
34. Quantitative indicators and methodologies of overall biodiversity health and integrity, however, are beginning to emerge. The Ecosystem Condition Protocol was recently launched at COP16⁶ (Cox, 2024) (Ecosystem Condition Protocol, 2024).⁷ Other metrics include various forms of an

⁶ COP16 is the sixteenth meeting of the Conference of the Parties to the Convention on Biological Diversity that took place from 21 October–1 November 2024 in Cali, Colombia.

⁷ The Ecosystem Condition Protocol seeks to standardise the measurement of ecosystem conditions across corporate reporting using a similar format to the Greenhouse Gas (GHG) Protocol.

Ecosystem Integrity Index (Hill, et al., 2022) and the Biodiversity Intactness Index (Natural History Museum (London), 2024).⁸

Sources of Information

35. Investors obtain BEES-related information either from direct or indirect sources or both (Financial Reporting Council, 2023). Most investors do not rely on a single source of information, either direct or indirect, but obtain information from multiple sources. Morningstar reported that asset owners rely on internal (45%), external (30%), or a mix of internal/external (25%) information sources (Morningstar, 2023, p. 7).
36. Direct information is data and information investors collect from materials published by companies (reports, financial statements, announcements), from interactions between investors and companies (engagements, earnings calls) or from company regulatory filings.
37. Indirect information is data and information that investors obtain from third party data providers including ESG ratings and biodiversity indices, or public sources such as official and NGO reports, and public databases. While third parties may derive this information from company reporting or from other sources such as the media, they typically offer value-added data aggregation and quality checks for investors. Some data providers also may estimate or model data where gaps exist. Third-party service providers also may use this data to market information products such as ESG or biodiversity scores or ratings, portfolio benchmarks or indices based on biodiversity considerations.
38. Some third parties, especially niche and boutique firms, may provide enriched information offerings by combining company information with information such as geolocation of biodiversity hotspots, watershed data, protected areas, biomes, deforestation zones, eDNA, etc. to obtain a more information-rich and granular contextual understanding of a company's biodiversity context (RSMetrics, 2023) (PRI, 2023a) (NatureMetrics, 2023) (MSCI, 2024a) (Colombo, 2024a) (Colombo, 2024b). Investors may also access such information using tools

⁸ The Museum's Biodiversity Intactness Index (BII) data will be available to investors through a third-party data provider. The BII measures how biodiversity in terrestrial ecosystems worldwide is affected by human activities, particularly those related to land use change and intensification. It estimates how much of an ecosystem's natural biodiversity still remains despite human impacts.

such as ENCORE or IBAT or various biodiversity footprinting methodologies (IBAT, 2020) (Natural Capital Finance Alliance, 2018) (Iceberg Data Lab, 2023) (PRé Sustainability, 2023) (Netherlands Enterprise Agency, 2021) (TNFD, 2023a).^{9 10}

Use of ESG scores for BEES-related assessments

39. Given the current lack of comprehensive company-level information on BEES-related risks and opportunities, many investors turn to ESG scores/ratings or ESG/Biodiversity indexes as a proxy.
40. Institutional investors and asset managers use the components of the ‘E’ pillar of ESG in their investment strategies (Bergman, Curran, Deckelbaum, & Karp, 2021) (PRI 2020) (Morningstar 2023) (Bergman, et al. 2021) (ShareAction 2020) (ERM Sustainability Institute, 2023). In a 2020 survey of 2,800 CFA Institute members, a total of 70% said they take the E factors of ESG into consideration in their investing (CFA Institute, 2020, p. 13).
41. The ‘E’ pillar of ESG scores can help investors to assess the performance of a company’s environmental strategy, its environmental performance over time and its standing against market and industry peers (CFA, 2024) (Larcker, Pomorski, Tayan, & Watts, 2022) (Clarity AI, 2023) (Farnham, 2023) (Pagano, Sinclair, & Yang, 2018). Many investors either use the sub-score for the E pillar or further disaggregate this sub-score into its constituent components to obtain more granular information (Pimco, 2023, p. 29).
42. The information content of the ‘E’ pillar, however, can vary among rating providers due to differences in methodologies, criteria, priorities, and interpretations (Hayes, 2023). For example, the E pillar might contain any number of selected BEES-related informational elements including such elements as land use and deforestation policies, water management and conservation efforts,

⁹ Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE) is a tool that uses geospatial datasets on natural capital assets and drivers of environmental change, and qualitative impact/ dependency ratings to link ecosystem services to production processes. ENCORE is used by many investors to understand ecosystem impacts and dependencies of various industries. It has been developed by the UNEP-WCMC; Natural Capital Finance Alliance; UNEP Finance initiative; and Global Canopy.

¹⁰ Integrated Biodiversity Assessment Tool (IBAT) uses geospatial data to identify where operations/supplier/investment locations sit in areas important for biodiversity including Key Biodiversity Areas, protected areas and areas containing threatened species. It has been developed by Birdlife International; Conservation International; IUCN; and the UNEP-WCMC.

biodiversity conservation efforts, pollution prevention and waste management, resource management practices, circular economy initiatives, environmental compliance with regulations, and environmental certifications and standards adherence.

43. Another indirect information source for investors is ESG or biodiversity indices, which “provide a comprehensive framework for evaluating and identifying companies based on the sustainability of their business practices” (GRESB, 2024).¹¹ Biodiversity-specific indices are new but like ESG indices they provide a proxy for evaluating and identifying companies based on their biodiversity risks and opportunities. These products provide investors with a convenient and cost-effective way to identify companies managing BEES-related topics well, without having to conduct extensive research about individual companies.

How information is used by investors in investment decisions

44. Investors are heterogeneous and have different and at times multiple aims when making BEES-related investment decisions. Differing investment aims have implications for what information investors use and how they use it in the investment process. For example, information on BEES-related risks and opportunities may inform an investor’s **investment strategy** including objectives and policies and overall asset class allocations. BEES-related risks and opportunities also will inform an investor’s **investment analysis and selection** including specific information about sector, industry, and company-level BEES-related risks and opportunities and the effects on their prospects. Finally, investors will need relevant information to **manage their portfolio** such as monitoring ongoing BEES-related portfolio risks and performance, adjusting asset allocations, client reporting and informing an investor’s stewardship activities such company engagements or proxy voting. Investors and their fiduciaries often use BEES-related information

¹¹ An index is a hypothetical portfolio of investments that tracks the performance of a group of stocks, bonds, or other investments. Some indexes use market-cap weighting, revenue weighting, float weighting, and fundamental weighting to adjust the individual impact of items in an index. Investors cannot invest directly in an index, but an index can be used as a benchmark for assessing investment performance or for developing Exchange-Traded Funds (ETFs) or other funds based on the index. Biodiversity indices typically exclude companies that harm biodiversity and select companies that have a less negative impact on ecosystems. Some indices also track companies that have high scores for biodiversity- and climate-related SDGs.

to plan, structure, and execute stewardship strategies, including the monitoring, engagement and voting components of stewardship (PRI, 2021). Engagement not only occurs between investors/asset managers and investee companies, but also between investors and their asset managers.

Investment analysis and selection

45. In this phase of the investment process, investors use information on BEES-related risks and opportunities to select investments with potentially better risk-return prospects or that match client objectives. Depending on an investor's investment strategy, asset class allocations, and time horizons, consideration of BEES-related information may be only one of several factors considered or it may be a primary determinant in investment selection.
46. What emerges from the literature are three common approaches to incorporating BEES-related information into investment decision making – screening investments, integrating BEES-related information into an investor's current investment analysis process, and analysing long-term BEES-related trends (thematic investing) (PRI, 2023a). Investors may use these methods in isolation or in combination.

Use of screening techniques

47. Different BEES-related screens may use different thresholds based on such factors as corporate activity (e.g. proportion of a company's revenue, either directly or indirectly, derived from a screened activity), sector activity (e.g. what sector the company is categorised in) or related to other metrics or indicators (e.g. controversies, risk factors, etc.).¹² This information might be applied using absolute or relative measures.
48. Negative screening is the predominant type used by investors, with positive and norms-based screening a close second (ShareAction, 2020) (Duuren, Plantinga, & Scholtens, 2016) (PRI, 2020a).

¹² Investment screening applies filters to lists of potential investments to rule companies in (positive screening) or out (negative screening) of contention for investment, typically based on an investor's preferences, values or ethics.

-
49. Investors may use both negative and positive screening in combination – negative screening to initially remove obvious companies with high BEES-related risks and then positive screening to further reduce the investment pool to companies with low BEES-related risks, BEES-related opportunities, or a positive improvement trend along some BEES-related dimension.

Use of an integration approach

50. An integration approach involves systematically incorporating information on BEES-related risks and opportunities into the investor’s traditional financial analysis and investment decision-making processes with the aim to improve risk-adjusted returns or achieve other investment objectives (PRI, 2023) (University of Cambridge Institute for Sustainability Leadership, 2021) (University of Cambridge Institute for Sustainability Leadership, 2022a) (University of Cambridge Institute for Sustainability Leadership, 2022b) (Boffo & Patalano, 2020).
51. Integration is based on the belief that BEES-related risks and opportunities are one of many factors that can affect the risk and return of investments and that these factors are not fully reflected in asset prices. Integration involves seeking out BEES-related information, assessing the materiality of that information, and integrating information deemed to be material into investment analysis and decisions. (PRI, 2023). In addition to quantitative information, it also uses qualitative information such as management quality, strategy and governance (Duuren, Plantinga, & Scholtens, 2016) (CFA Institute and PRI, 2018) (CFA Institute, 2022a) (CFA Institute, 2022b).
52. Investors use biodiversity indices in investment decisions in diverse ways. First, financial institutions can design and manage investment products, such as ETFs that track the index. Second, investors may design and manage their own portfolio around a biodiversity index, either an externally developed index or an internally developed index.

Use of thematic approaches

53. BEES-related thematic investing aims to capture better returns over the longer term by identifying future trends or structural changes to the economy.¹³ In the area of BEES, investors are using information to identify longer-term trends such as structural shifts in supply and demand for natural resources; alternative products, services and technologies which better preserve and support ecosystems and processes for sustainability in ecosystem services; and new biodiversity-focused business models. This could be in areas such as precision or regenerative agriculture, plant-based foods, sustainable packaging, water treatment and new sustainable production and consumption models. (AXA, 2023)

Information challenges, barriers and gaps

54. Investors are seeking high-quality, investment-useful BEES information at the sector, entity, and site levels for both a company' direct operations and supply chain but face several general and specific challenges including: (Bloomberg Professional Services, 2024)
- (a) **Data availability.** A CFA survey of over 7,000 asset owners and asset managers found lack of ESG information/data as a barrier to assessing risks and opportunities for 26% of investors while in a Credit Suisse survey 70% of 327 asset owners and asset managers surveyed saw availability of nature-related data similarly (Credit Suisse, 2021) (CFA Institute, 2020).
 - (b) **Dataset integration.** Work by various NGOs and industry groups is aimed at improving the interoperability of available datasets. For example, TNFD's Nature-related Data Catalyst Initiative has found that not all datasets are set up in a way where they can be integrated easily (i.e., different datasets covering different types of information), and thus it can be difficult to combine datasets as well as aggregate data up to the entity level (TNFD, 2023).

¹³ Structural changes and trends are driven by such things as innovation, long-term shifts in supply and demand, technology advancements, regulatory changes and new business models among other things.

-
- (c) **Estimated or modelled data.** The available data sets covering nature-related issues can be sparsely populated. Investors and third-party data providers often rely on models to estimate biodiversity risks related to a company’s direct operations, supply chain or downstream activities. Modelling biodiversity-related financial risks, however, is often difficult as data is often scarce or inaccurate for model parameter estimation and calibration. “For instance, to assess a portfolio’s dependency on ecosystem services, investors should, in theory, determine the price of each ecosystem service a company relies on for every region it operates in, whether for animal pollination, fertile soil or raw material supply. Such an assessment requires advanced models and granular data as well as precisely geocoded data because biodiversity loss drivers and impacts are local. In addition, several nature-related risks could have reverberating effects, which makes assessing financial risks from nature loss even more difficult. Furthermore, some key data points are rarely disclosed and may be inaccurate when they are. Collecting data for supply chains is an even greater challenge. However, none of these hurdles are insurmountable.” (MSCI, 2024a).
- (d) **Data coverage.** Investor portfolios may span value chain segments, geographies, and ecosystems, and there may be information coverage gaps for certain geographies, operations, or ecosystems (WWF and Oliver Wyman, 2024). Some nature-related themes are more lacking in data than others. For example, investors typically find major data gaps in understanding risks and opportunities associated with ocean-related sectors. (BNP Paribas Assest Management, 2024)
- (e) **Location data.** Location data is essential for evaluating entity-level BEES-related risks and opportunities but is seriously lacking. Geospatial data on the location of company operations, including types of assets and activities at each location, is required for biodiversity impact and dependency analysis at the entity-level (MSCI, 2024a). Investors also need asset level locations and ownership data to reflect the ultimate owner (BNP Paribas Assest Management, 2024).
- (f) **Supply chain data.** Assessment of BEES-related risks and opportunities in a company’s supply chain is a significant challenge for most investors. Many investors base their

investment decisions on information concerning a company's direct operations due to the lack of supply chain transparency (WWF and Oliver Wyman, 2024).

- (g) **Quantitative and financially relevant data.** Investors also desire information that is more quantitative, location specific to a company, and financially relevant, which is currently lacking. For example, information such as the costs associated with a company's BEES-related commitments and the effects on its prospects and business model. A 2022 global survey by PwC of 227 investment professionals indicated that 73% of investors wanted to see the cost to meet a company's commitments (PwC, 2022).
- (h) **Ability to use data.** Finally, investors cited challenges in their ability to use data. These challenges stem from such factors as insufficient knowledge or expertise within an investor's organization (32-33%),¹⁴ lack of accepted ways to value natural capital (49%)¹⁵ and difficulties determining the most effective information for quantitative investment models (21%)¹⁶ (CFA Institute, 2022b) (Credit Suisse, 2021) (WWF and Oliver Wyman, 2024, p. 21).

Challenges to the generation and collection of information

55. Investors cannot find and use relevant information unless preparers have the means to generate the information in the first place. Preparers, however, face several challenges in measuring complex nature-related impacts, dependencies, and the resulting risks and opportunities, including:
- (a) **Measurement challenges:** Measuring aspects of BEES such as ecosystem condition, ecosystem function, ecosystem services, species diversity, and other environmental factors including valuation of those factors faces a lack of consensus around measurement methods, difficulty in measuring at different scales, high cost of measurement, or lack of standardized measures and metrics. While numerous measurement methods and tools exist, there is a **lack of consensus** about the key metrics to focus on. Often methods are

¹⁴ Based on CFA survey of 7,000 asset owners and asset managers and Oliver Wyman survey of 51 investors.

¹⁵ Based on Credit Suisse survey of 222 asset owners and asset managers.

¹⁶ Based on CFA survey of 7,000 asset owners and asset managers.

designed for one scale (e.g., a local site) but cannot be used on a **different scale** (e.g., watershed or landscape). Many biodiversity impact assessments can be **costly**, requiring on-site physical assessments, specialized expertise, geospatial overlays, and ongoing monitoring. In a study, McKinsey found that due to a **lack of standardized metrics** for natural capital and ecosystem services many companies have limited understanding of how to structurally and responsibly engage on the topic of nature, which prevents many from making quantified commitments or taking targeted action (McKinsey, 2022).

Valuation of natural capital and ecosystem services, which 49% of 222 investors surveyed by Credit Suisse see as a barrier (2021), has no widely agreed and accepted valuation methodologies among investors, despite the existence of standard economic valuation approaches (Hudson, 2024) (Guer, Mueller, & Schiereck, 2024) (Roland Berger, 2023) (OECD, 2002).

- (b) **Complexity.** Another challenge is that biodiversity, in contrast to climate change, is far more complex, localized and multi-dimensional. Determining BEES-related risks and opportunities involves some aspects of the following at the local level of a company's assets and activities:
- (i) Measurement/monitoring the state of nature/flow of ecosystem services
 - (ii) Determining changes in nature and services from company impacts
 - (iii) Determining dependencies on specific natural assets or ecosystem services
 - (iv) Assessing risks and opportunities deriving from impacts and dependencies
 - (v) Determining the likelihood and financial significance of risk exposures
- (c) **Entity-level aggregation.** Complicating matters further, BEES-related risks and opportunities are likely to be different in different locations and across different sectors/industries and may be measured in different ways, which makes it harder to create an overall entity-level or portfolio measure of BEES-related risk and opportunity exposure.
56. These challenges add up to practical considerations for preparers and investors, including defining actionable BEES-related goals, identifying efficacious metrics to judge performance,

distilling disclosures to a core set of material information, and producing information in a form that is verifiable and can be assured.

Disclosure challenges

57. **Need for standardized reporting frameworks/requirements.** Investors have noted a need for reporting to be more standardized to facilitate comparability and transparency in company disclosures (CFA Institute, 2022b). It also can be a challenge for investors to verify information or seek assurance as to its veracity (Hudson, 2024, p. 4).
58. **Need for standardized terminology and metrics.** Investors also have noted a need for standardized terminology, definitions, and metrics to facilitate comparability and transparency (CFA Institute, 2022b) (BNP Paribas Asset Management, 2024). According to a survey of 500 asset owners conducted by Morningstar, 29% of investors indicated that unreliable/out-of-date/unstandardized data is a challenge (Morningstar, 2023, pp. 6-7). For example, companies define and apply ‘biodiversity’ in different ways and there are no agreed upon metrics for measuring various BEES-related risks and opportunities.
59. **Potential reporting burdens.** While investors generally appreciate more rather than less information from investee companies, they are concerned about reporting burdens obscuring relevant and material information. Given the multiple dimensions of nature and biodiversity (e.g., pollution, waste, water, land, species, biome, habitat) and the location-specific aspects of risks and opportunities arising from impacts and dependencies within these dimensions, the potential reporting on BEES-related risks and opportunities could be significant. The challenge is determining the metrics and qualitative information that efficaciously conveys material information for investors.

References

- AXA. (2023, April 11). *Biodiversity Q&A: Understanding a powerful new investment theme*. Retrieved from <https://www.axa-im.com/investment-institute/sustainability/biodiversity-qa-understanding-powerful-new-investment-theme>
- Bergman, M. S., Curran, D., Deckelbaum, A. J., & Karp, B. S. (2021, May/June). ESG Ratings and Data: How to Make Sense of Disagreement. *The Corporate Governance Advisor*, 29(3).
- Bloomberg Professional Services. (2024, July 16). *The complexities of nature-related: Responsible Investor Interview with Christian O'Dwyer*. Retrieved from Bloomberg: <https://www.bloomberg.com/professional/insights/sustainable-finance/the-complexities-of-nature-related-data-capture/>
- BNP Paribas. (2019). *The ESG Global Survey 2019*.
- BNP Paribas Asset Management. (2024). *Statement from the private financial sector to ESG data providers: The urgent need for better ocean-related data to make informed investment decisions*. Retrieved from BNP Paribas Asset Management: <https://www.bnpparibas-am.com/en/sustainability/statement-from-the-private-financial-sector-to-esg-data-providers/>
- Boffo, R., & Patalano, R. (2020). *ESG Investing: Practices, Progress and Challenges*. OECD. Retrieved from www.oecd.org/finance/ESG-Investing-Practices-Progress-and-Challenges.pdf
- Bracking, S. (2012). How do Investors Value Environmental Harm/Care? *Development and Change*, 43(1), 271-293. doi:10.01111/j.1467-7660.2011.01756.x
- Brandon, R. G., Krueger, P., & Schmidt, P. S. (2021). ESG Rating Disagreement and Stock Returns. *Financial Analysts Journal*, 77(4), 104-127. doi:10.1080/0015198X.2021.1963186
- Capital Group. (2022). *Global ESG Survey*. Retrieved from <https://www.capitalgroup.com/advisor/pdf/shareholder/ITGEOT-028-658081.pdf>
- CDP. (2023, October 11). *Catching up with climate – where next for nature disclosure?* Retrieved from CDP: <https://www.cdp.net/en/articles/forests/catching-up-with-climate-where-next-for-nature-disclosure>
- CDP. (2023). *CDP 2023 disclosure data factsheet*. Retrieved from CDP: <https://www.cdp.net/en/companies/cdp-2023-disclosure-data-factsheet>
- CDP. (2023a). *Nature in Green Finance: Bridging the gap in environmental reporting*.
- CFA. (2024, May 7). Retrieved from The Role and Rise of ESG Ratings: <https://www.cfainstitute.org/en/professional-insights-stories/the-role-and-rise-of-esg-ratings-1/>
- CFA Institute. (2020). *Future of Sustainability in Investment Management: From Ideas to Reality*.
- CFA Institute. (2022a). *Guidance for Integrating ESG Information into Equity Analysis and Research Reports*.
- CFA Institute. (2022b). *Integrating Natural Capital and Biodiversity in the Investment Process*.
- CFA Institute and PRI. (2018). *Guidance and Case Studies for ESG Integration: Equities and Fixed Income*.
- Christensen, D. M., Serafeim, G., & Sikochi, A. (2022, January). Why is Corporate Virtue in the Eye of the Beholder? The Case of ESG Ratings. *The Accounting Review*, 97(1), 147-175. doi:10.2308/TAR-2019-0506
- Clarity AI. (2023, August 25). *ESG Scores vs ESG Ratings: How Are They Different?* Retrieved from Clarity AI: [https://clarity.ai/research-and-insights/esg-risk/esg-scores-vs-esg-ratings-how-are-they-different/#:~:text=A%20recent%20survey%20indicates%20that,%20material%20issues%20\(75%25\).](https://clarity.ai/research-and-insights/esg-risk/esg-scores-vs-esg-ratings-how-are-they-different/#:~:text=A%20recent%20survey%20indicates%20that,%20material%20issues%20(75%25).)
- Colombo, S. (2024a, July 3). *Environmental intelligence firm raises \$10 mln to mainstream nature risk reporting*. Retrieved from Carbon Pulse: <https://carbon-pulse.com/300673/>
- Colombo, S. (2024b, July 4). *French nature tech startup to develop ESA-funded biodiversity monitoring tool*. Retrieved from Carbon Pulse: <https://carbon-pulse.com/301219/>
- Corporate Reporting Dialogue et al. (2016). *Statement of Common Principles of Materiality of the Corporate Reporting Dialogue*.
- Cox, T. (2024, May 7). *Ecosystem Condition Protocol to launch draft at COP16*. Retrieved from Carbon Pulse: https://carbon-pulse.com/284560/?utm_source=Biodiversity+Pulse&utm_campaign=d77a457229-Biodiversity+Pulse%3A+07052024&utm_medium=e%E2%80%A6
- Credit Suisse. (2021). *Unearthing Investor Action on Biodiversity*.
- Deloitte. (2022). *ESG Ratings: do they add value? How to get prepared?* Retrieved from <https://www2.deloitte.com/ce/en/pages/about-deloitte/articles/esg-ratings-do-they-add-value.html>

- Duuren, E. v., Plantinga, A., & Scholtens, B. (2016). ESG Integration and the Investment Management Process: Fundamental Investing Reinvented. *Journal of Business Ethics*, 138, 525-533. doi:10.1007/s10551-015-2610-8
- Ecolex. (2024). *The gateway to environmental law*. Retrieved from Ecolex: <https://www.ecolex.org/>
- Ecosystem Condition Protocol. (2024). *Ecosystem Condition Protocol - Preparation Phase: First mapping of needs and resources*.
- Environmental Finance Data. (2024). *Another strong year for biodiversity bonds*. Retrieved from www.efdata.org
- ERM Sustainability Institute. (2023). *Rate the Raters 2023: ESG Ratings at a Cross-Roads*.
- ERM Sustainability Institute. (2024). *The Global Regulations Radar*.
- European Leveraged Finance Association. (2021). *ESG Data Collection: Current deficits and how these can be addressed*.
- European Leveraged Finance Association. (2023). *Why do Regional Discrepancies and Cross-Border Regulatory Differences affect the ESG Landscape?*
- Farnham, K. (2023, November 28). *ESG scores and ratings: what are they, why they matter*. Retrieved from Diligent: <https://www.diligent.com/resources/blog/esg-risk-scores>
- FERI Cognitive Finance Institute. (2024). *The Biodiversity Advantage: Business Solutions and Investment Opportunities for Nature*. Retrieved from <https://www.feri-institut.de/en/content-center/2406041728>
- Finance Strategists. (2024, May 3). Retrieved from Finance Strategists: <https://www.financestrategists.com/wealth-management/fundamental-vs-technical-analysis/the-methods-of-investment-analysis/>
- Financial Reporting Council. (2023). *ESG data distribution and consumption: optimising the flow of ESG data from companies to investors*. Retrieved from <https://www.frc.org.uk/library/digital-reporting/esg/phase-2-esg-data-distribution-and-consumption/>
- Freiberg, D., Rogers, J., & Serafeim, G. (2020). How ESG issues become financially material to corporations and their investors. *Harvard Business School Working Paper 20-056*.
- Galilee Asset Management. (2022). *The 7 Golden Rules of Thematic Investing*.
- Garel, A., Romec, A., Sautner, Z., & Wagner, A. (2024). Do investors care about biodiversity? *Review of Finance*, 1-36. doi:10.1093/rof/rfae010
- GARP. (2022). *Fourth Annual Global Survey of Climate Risk Management at Financial Firms*. Retrieved from https://www.garp.org/hubfs/Website/SCR/PDF/GRI_22ClimateRiskSurveyReport.pdf
- GARP. (2023). *Biodiversity Loss: An introduction for risk professions*.
- GARP. (2024). *Global Survey of Nature Risk Management at Financial Firms 2024: A Discipline in its Infancy*.
- Giglio, S., Kuchler, T., Stroebel, J., & Zeng, X. (2023). Biodiversity Risk. *NBER WORKING PAPER 31137*. doi:10.3386/w31137
- GIIN. (2022). *Institutional Asset Owners: Strategies for Engaging with Asset Managers for Impact*.
- Gosrani, S., Saklatvala, K., & Verhaar, F. (2023). ESG Assessment Challenges in Investment Manager Due Diligence. *CFA Journal*, 153, 26-32.
- GRESB. (2023, October 5). *The rise of biodiversity regulations*. Retrieved from GRESB: <https://www.gresb.com/nl-en/the-rise-of-biodiversity-regulations/>
- GRESB. (2024). *ESG Indices*. Retrieved from GRESB: <https://www.gresb.com/nl-en/esg-indices/>
- Guer, Y., Mueller, L., & Schiereck, D. (2024). Biodiversity: A Bibliometric Analysis of Accounting, Economics, and Finance Journals. *Journal of Alternative Finance*, 1(2), 194-210. doi:10.1177/27533743241236802
- Hayes, A. (2023, July 27). *How to Tell if a Company Has High ESG Scores*. Retrieved from Investopedia: [https://www.investopedia.com/company-esg-score-7480372#:~:text=Environmental%2C%20social%2C%20and%20governance%20\(,more%20than%2070%20considered%20good.](https://www.investopedia.com/company-esg-score-7480372#:~:text=Environmental%2C%20social%2C%20and%20governance%20(,more%20than%2070%20considered%20good.)
- Hill, S. L., Fajardo, J., Maney, C., Harfoot, M., Harrison, M., Guaras, D., . . . Burgess, N. D. (2022). The Ecosystem Integrity Index: a novel measure of terrestrial ecosystem integrity with global coverage. *BioRxiv preprint*. doi:<https://doi.org/10.1101/2022.08.21.504707> ;
- Hudson, R. (2024, July 18). Biodiversity and risk in the financial sector. *Journal of Sustainable Finance and Accounting*, 2, 100009. doi:10.1016/j.josfa.2024.100009
- IBAT. (2020). *Screening for biodiversity risk in finance sector*. Retrieved from <https://www.ibat-alliance.org/pdf/briefing-notes-financial-sector.pdf>

- Iceberg Data Lab. (2023). *Corporate Biodiversity Footprint - Methodological Guides*.
- Ingebretsen, E. (2023). ESG as a key pillar of investment strategy. *Journal of Securities Operations & Custody*, 16(1), 57–69.
- International Corporate Governance Network - ICGN. (2023). *ICGN Biodiversity Action Toolkit*.
- Investopedia. (2024, April 12). *Using Quantitative Investment Strategies*. Retrieved from Investopedia: <https://www.investopedia.com/articles/trading/09/quant-strategies.asp>
- IPBES. (2016). *Assessment Report on Pollinators, Pollination and Food Production*.
- IPBES. (Forthcoming). *DRAFT - Methodological assessment of the impact and dependence of business on biodiversity and nature's contributions to people - summary for policymakers*. IPBES.
- Larcker, D. F., Pomorski, L., Tayan, B., & Watts, E. M. (2022). *ESG Ratings: A compass without direction*. Stanford Closer Look series.
- Mair, L., Elnahass, M., Xiang, E., Hawkins, F., Siikamaki, J., Hillis, L., . . . McGowan, P. (2024). Corporate disclosures need a biodiversity outcome focus and regulatory backing to deliver global conservation goals. *Conservation Letters*, e13024. doi:10.1111/conl.13024
- McKinsey. (2022, September 13). *Where the world's largest companies stand on nature*. Retrieved from McKinsey: <https://www.mckinsey.com/capabilities/sustainability/our-insights/where-the-worlds-largest-companies-stand-on-nature#/>
- Morningstar. (2023). *Voice of the Asset Owner Survey 2023: Quantitative Analysis*.
- MSCI. (2023, September 20). *Biodiversity Funds: Welcome to the Jungle*. Retrieved from MSCI: <https://www.msci.com/www/blog-posts/biodiversity-funds-br-welcome/04075535373>
- MSCI. (2024). *Nature and Biodiversity: Identify and measure portfolio impacts*. Retrieved July 27, 2024, from <https://www.msci.com/our-solutions/climate-investing/nature-and-biodiversity>
- MSCI. (2024). *Thematic Investing*. Retrieved from MSCI: <https://www.msci.com/our-solutions/indexes/thematic-investing>
- MSCI. (2024a). *An Investors Guide to Nature and Biodiversity Risks and Impacts*.
- MSCI. (2024a). *MSCI GeoSpatial Intelligence*.
- Natural Capital Finance Alliance. (2018). *Integrating Natural Capital in Risk Assessments: A step-by-step guide for banks*. Retrieved from <https://www.encorenature.org/resources/integrating-natural-capital-in-risk-assessments>
- Natural History Museum (London). (2024). *Biodiversity Intactness Index*. Retrieved from <https://www.nhm.ac.uk/our-science/services/data/biodiversity-intactness-index.html>
- NatureMetrics. (2023). *Making nature your competitive advantage: Using nature intelligence to transform how the extractives industry approaches, measures, and reports on biodiversity*. Retrieved from <https://www.naturemetrics.com/whitepapers-guides>
- Netherlands Enterprise Agency. (2021). *Biodiversity Footprinting for Financial Institutions: exploring biodiversity assessment*.
- OECD. (2002). *Handbook of Biodiversity Valuation*.
- OECD. (2019). *Biodiversity: Finance and the Economic and Business Case for Action*.
- Pagano, M. S., Sinclair, G., & Yang, T. (2018). Understanding ESG ratings and ESG indexes. In S. Boubaker, D. Cumming, & D. K. Nguyen, *Research Handbook of Finance and Sustainability*. Edward Elgar.
- Paisley, J., & Nelson, M. (2024). *Global Survey of Nature Risk Management at Financial Firms: A discipline in its infancy (GARP)*. GARP Risk Institute.
- Pimco. (2023). *Sustainable Investing Report 2023*.
- PRé Sustainability. (2023). *Methodology Guide: Biodiversity Footprinting for Financial Institutions*.
- PRI. (2018). *Asset Owner Strategy Guide: How to Craft an Investment Strategy*. Retrieved from <https://www.unpri.org/asset-owner-resources/asset-owner-strategy-guide-how-to-craft-an-investment-strategy/402.article>
- PRI. (2020). *Investor Action on Biodiversity: Discussion Paper*.
- PRI. (2020a). *An introduction to responsible investing: screening*. Retrieved from <https://www.unpri.org/introductory-guides-to-responsible-investment/an-introduction-to-responsible-investment-screening/5834.article>

- PRI. (2021). *An introduction to responsible investing: stewardship*. Retrieved from <https://www.unpri.org/introductory-guides-to-responsible-investment/an-introduction-to-responsible-investment-stewardship/7228.article>
- PRI. (2023, November 1). *Definitions for responsible investment approaches*. Retrieved from PRI: <https://www.unpri.org/investment-tools/definitions-for-responsible-investment-approaches/11874.article#:~:text=ESG%20integration%20refers%20to%20the,and%20on%20appropriate%20research%20sources.>
- PRI. (2023a). *An Introduction to Responsible Investing*. PRI.
- PRI. (2023b). *ESG Integration in Listed Equity: A Technical Guide*.
- PwC. (2022). *Global Investor Survey 2022*.
- PwC. (2023). *Global Investor Survey 2023*.
- Roland Berger. (2023). *Biodiversity Valuation*. Retrieved from <https://www.rolandberger.com/en/Insights/Publications/Biodiversity-Valuation.html>
- RSMetrics. (2023). *TNFD LEAP Aligned Natural Capital & Biodiversity Assessment with RS Metrics' ESG Signals*.
- Serafeim, G. (2022). *Purpose + Profit: How Business Can Lift Up the World*. Harper Collins.
- SGA Analytics. (2023, May 29). *Top ESG Data Sources & Providers for 2024*. Retrieved from SGA Analytics: <https://us.sganalytics.com/blog/top-ESG-data-sources-2023/>
- ShareAction. (2020). *Point of No Returns: Part IV-Biodiversity - An assessment of asset managers' approaches to biodiversity*.
- State Street Global Advisors. (2022). *State Street Global Advisors' Approach to ESG Screening*. State Street. Retrieved from <https://www.ssga.com/library-content/pdfs/insights/esg-screening-piece.pdf>
- Tayan, B. (2022, August 22). *ESG Ratings: A Compass without Direction*. Retrieved from Harvard Law School Forum on Corporate Governance: <https://corpgov.law.harvard.edu/2022/08/24/esg-ratings-a-compass-without-direction/#:~:text=A%202020%20survey%20by%20SustainAbility,into%20ESG%20labeled%20investment%20products.>
- The Investor Forum. (2019). *Defining Stewardship and Engagement*.
- The Reporting Exchange. (2018). *Sustainability reporting landscape in India*.
- TNFD. (2023). *Findings of a high-level scoping study exploring the case for a global nature-related public data facility*. Retrieved from <https://tnfd.global/publication/findings-of-a-high-level-scoping-study-exploring-the-case-for-a-global-nature-related-public-data-facility/#publication-content>
- TNFD. (2023a). *Discussion Paper on Biodiversity Footprinting Approaches for Financial Institutions*.
- TNFD. (2023b). *Guidance on the identification and assessment of nature-related issues: the LEAP approach*.
- TNFD. (2024, August 14). *Examples of TNFD Reporting*. Retrieved from TNFD: <https://tnfd.global/knowledge-hub/example-tnfd-reporting/>
- TNFD. (2024, August 14). *Tools Catalog*. Retrieved from TNFD: <https://tnfd.global/guidance/tools-catalogue/>
- TNFD. (2024a). *Discussion Paper on Conducting Advanced Scenario Analysis*.
- TNFD. (2024b). *Guidance on Scenario Analysis*.
- TNFD. (2024c). *Guidance on Value Chains*.
- UN EP. (2022). *Nature Risk Profile: A methodology for profiling nature-related dependencies and impacts*.
- University of Cambridge Institute for Sustainability Leadership. (2021). *Handbook for Nature-related Financial Risks: Key Concepts and a Framework for Identification*.
- University of Cambridge Institute for Sustainability Leadership. (2022a). *Integrating Nature: The case for action on nature-related financial risks*.
- University of Cambridge Institute for Sustainability Leadership. (2022b). *Nature-related financial risk use case: Mapping exposure to nature-related risks across financial indices*.
- Whitehorn, P. R., Navarro, L., Schroter, M., Fernandez, M., Rotllan-Puig, X., & Marques, A. (2019). *Mainstreaming biodiversity: A review of national strategies*. *Journal of Biological Conservation*, 235, 157-163. doi:10.1016/j.biocon.2019.04.016: 10.1016/j.biocon.2019.04.016
- World Benchmarking Alliance. (2024, August). *Nature Benchmark 2022-2024*. Retrieved from World Benchmarking Alliance: <https://www.worldbenchmarkingalliance.org/publication/nature/>
- WWF and Oliver Wyman. (2024). *Biodiversity and Infrastructure Investing*.