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Staff paper

Agenda reference: 3D

Biodiversity, ecosystems, and ecosystem services (BEES)- Preliminary assessment of evidence of effects on an entity's prospects

Date	**November 2024**
Project	**Biodiversity, ecosystems and ecosystem services**
Topic	**Preliminary assessment of evidence of effects on an entity's prospects**
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Discussion agenda

- Research objectives and approach
  - Research objectives
  - Approach to market outreach
  - Approach to literature review
- Preliminary findings
  - Effects on an entity's prospects
  - Key sectors exposed to risks
  - Key topics and themes
- Case studies
- Takeaways and next steps
  - Key takeaways
  - Next steps
  - Question for the ISSB
- References

Research objectives and approach

Research objectives

The overarching research question that this presentation aims to address is:

Whether, how and to what extent do BEES-related risks and opportunities affect an entity's cash flows, its access to finance or cost of capital over the short, medium or long term?

The findings outlined in this paper are preliminary in scope and intended to update the ISSB on progress on the research. They build on extensive market outreach and preliminary desk research, the scope of which will be expanded upon when the staff brings final findings to the Board in a future session

The ISSB is not asked to make any decisions in this presentation

Note: The term **'an entity's prospects'** will be used throughout the paper to refer to *cash flows, access to finance or cost of capital over the short, medium or long term*

As outlined in Agenda Paper 2B *Biodiversity, ecosystems and ecosystem services and human capital research projects — Research design and approach* (July 2024), this research area focuses on evidence of effects on an entity's prospects.

Key activities* for this area of research will include:

(a) a review of existing research on how BEES-related risks and opportunities could affect an entity's prospects, to improve understanding of BEES-related subtopics and industry-specificity affecting such prospects;

(b) engagement with investors and preparers in order to identify examples of effects on an entity's prospects that have materialised or are being considered in decision-making;

(c) exploring the use of artificial intelligence (AI) tools to analyse discussion of effects on an entity's prospects from BEES-related risks and opportunities in entities' public reporting; and

(d) analysis of previous research that the ISSB or its predecessor organisations conducted to build evidence of effects on an entity's prospects

* This paper does not cover activities (c) and (d)

Approach to market outreach

Bilateral Engagements

- Outreach conducted in conjunction with the investor interest research staff, with targeted questions on effects on entity prospects*
- Met with individuals from 38 entities: investors, asset owners, data providers, RFI respondents to the 2023 *Request for Information: Consultation on Agenda Priorities* and a limited set of preparers

Roundtables

- Held five investor roundtables and one for preparers from Mining industry
- Additional roundtables scheduled including academic roundtable

Next steps

- Target investors from Latin America, the Caribbean, Middle East, and African countries for more regional diversity
- Engage more sell-side analysts given valuable insights gleaned

Sample questions for market outreach:

- What correlations have you observed between BEES-related topics (such as, land-use, water-use, resource exploitation, pollution) and an entity's financial performance? Have they involved specific industries, geographies or specific aspects of financial performance?
- What are the key drivers or sources of financial implications from BEES-related risks and opportunities, such as regulations, shifting consumer demand, litigation, input prices/volatility, physical disruptions?
- What is your approach to assessing the financial implications from these sources for investees or potential investees over the short, medium or long term?

* For more details on bilateral engagements and roundtables (excluding three preparers, and the mining and academic roundtables), see ISSB Agenda Reference 3B: *Biodiversity, ecosystems, and ecosystem services (BEES)- Preliminary assessment of evidence of investor interest* (November 2024).

Approach to literature review

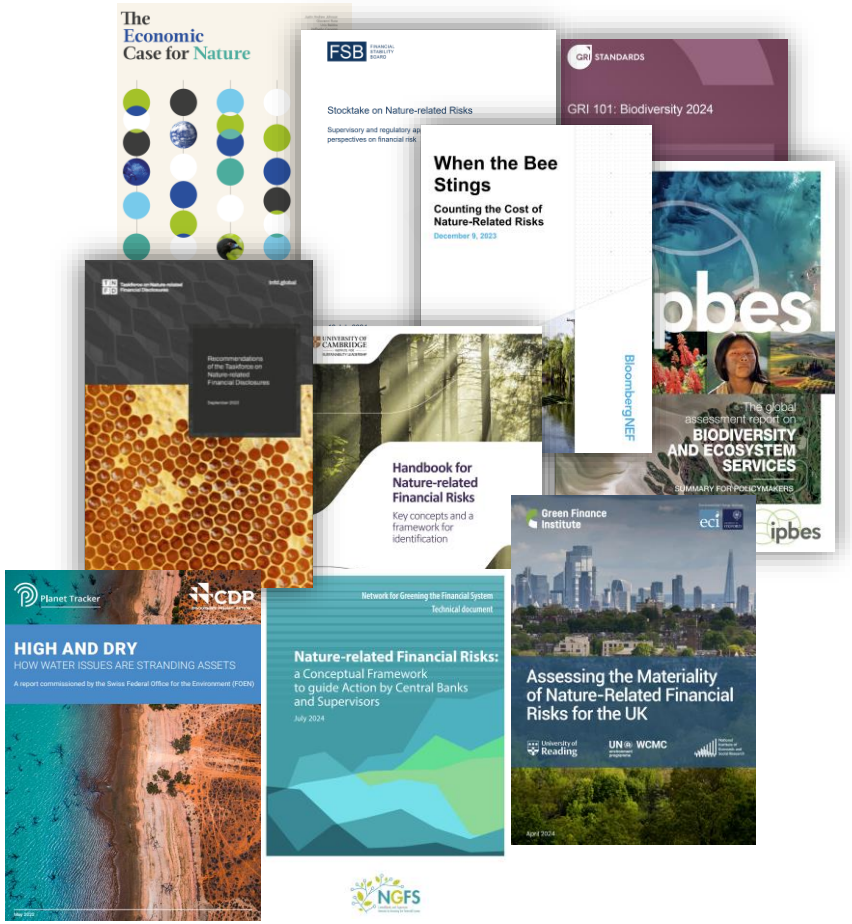
The staff collated and commenced analysis of research publications addressing the implications of BEES-related risks and opportunities for investment decisions, seeking evidence of whether and how they are likely to affect an entity's prospects

A variety of tools was used to identify relevant literature, including desk research on reputable publications, investor and third-party recommendations and ISSB member recommendations*

Such publications include:

- Reports from organisations that have developed related standards and frameworks (TNFD, NGFS)
- Publications by ratings and data providers
- Papers from academics and think-tanks
- Reports from institutional investors and sell-side research

Examples of literature reviewed



* This literature was assessed based on a combination of factors such as sample size, study design, credibility of report author(s) and recency of the report

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Preliminary findings

Effects on an entity's prospects

- The effects of BEES-related **transition risks** on an entity's prospects depends on the strength of its financial position and diversification of assets. Effects on entity prospects tend to be somewhat marginal for larger entities, yet may be meaningful for smaller companies
- Chronic **physical risks** arising from dependencies on fragile ecosystems and assets may increase or accumulate over time, degrading an entity's ability to access finance unless effectively mitigated
- In many cases, BEES-related risks create ripple effects on an entity's prospects, including foregone sales, penalties, remediation, share price declines, and reputational damage
- Investment in adaptation and compliance, including substitution, relocation and remediation can present considerable costs, whether proactively or reactively driven

Note: There are various frameworks for classifying nature-related risks and effects on an entity's prospects. Common features include distinctions between physical and transition risks linked to impacts and dependencies, with variation in subcategories and the way effects on entity prospects are categorised

Nature-related risks and effects on entity prospects[1]

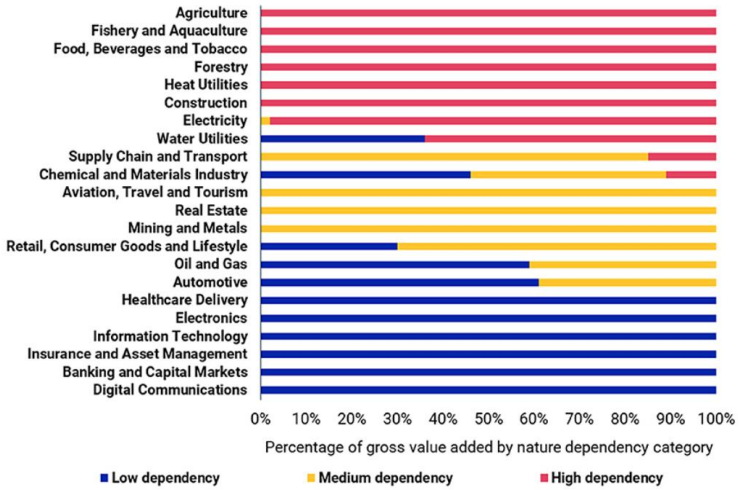
	Type of Risk	Event	Potential effects on an entity's prospects
Transition risks	Physical risk (impact)	Infrastructure failure (dam collapse)	Legal costs, foregone sales due to stalled production, remediation costs, share price
	Physical risk (dependency)	Drought triggers suspension or closure of operations	Forgone sales due to stalled production, investment in adaptation, asset impairment, access to finance (chronic)
	Regulatory/ Legal risk (impact)	Liability for environmental contamination	Legal costs, fines/penalties, compliance costs, remediation, increased cost of capital
	Regulatory/ Legal risk (dependency)	New regulation on natural resource extraction limits	Input costs rise, investment in substitution/relocation
	Reputation risk (impact/ dependency)	Project opposition due to adverse natural impacts/ dependencies	Forgone sales due to operational impacts, security costs, share price, asset impairment (chronic)
	Market risk/ opportunity (impact)	Change in consumer preferences toward low-impact goods	Decreased sales for failure to meet consumer preferences; vs increased sales for those that do

Key sectors exposed to risks

- BEES-related risks and opportunities are **industry and location specific** with variable **dependencies and impacts** across industries through both **direct operations and the broader value chain**
- Risks and opportunities linked to **BEES-related impacts** materialise in a range of industries, including food products, oil, gas and consumable fuels, chemicals, consumer staples, and metals and mining[3]
- **Chronic BEES-related dependencies** are categorised from low- to medium- to high-dependency industries
  - **The agricultural sector,** broadly defined, faces the highest dependencies and impacts on natural capital and is heavily exposed to transition risks and opportunities. Food and agricultural production accounts for 70% of water withdrawals globally[2] and 90% of global deforestation[4]
  - **Forestry and utilities industries** also have high dependencies on natural capital, via both direct operations and the broader value chain

Sectors cited in market outreach*:
Food and agriculture
Consumer goods (apparel, textiles)
Forestry
Extractives and mining

Dependencies of industries on natural capital[5]



* For key sectors cited via market outreach it was not always clear if this was directly linked to effects on an entity's prospects
Note: The first phase of SASB Standards enhancements currently underway covers SASB Standards within the Food and Beverage, Extractives and Infrastructure sectors with high impacts and dependencies on natural capital, aligned with some of the findings above

Key topics and themes

Water: the most widely cited topic in the literature and market outreach with effects on an entity's prospects

- Evidence of **asset impairment** driven by surface and groundwater water scarcity has emerged in a range of industries
- Water pollution faces heightened stakeholder scrutiny and is subject to **regulations** targeting Per- and polyfluoroalkyl substances (PFAS) for example, in key jurisdictions

Deforestation: has been linked to effects on an entity's prospects that extend beyond industries with direct impacts and dependencies

- **Value chain impacts and risks** stem from procurement of agricultural commodities such as palm oil, cocoa, coffee, beef, soy, wood and rubber
- Pending **regulation** such as the EU Deforestation Regulation (EUDR)[6] will impose penalties or barriers to market participation in the absence of due diligence

Topics cited in market outreach*:
Water (freshwater use, water pollution)
Land Use (including deforestation)
Biodiversity Loss
Value Chain Risks
Plastic Pollution

According to a 2022 CDP report, 69% of listed equities reported exposure to water risks that could substantially impact their business, totalling a potential value at risk of up to US$225 billion[7]

Exposure to commodities linked to deforestation is another critical risk for businesses, with up to US$941 billion of turnover in publicly listed companies dependent on the commodities most connected with forest loss[8]

* For key topics cited via market outreach it was not always clear if this was directly linked to effects on an entity's prospects

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Case studies

Case Study 1: Liabilities for PFAS Contamination[9]

- A large diversified company deriving 40% of revenues from speciality chemicals incurred a **US$10.3 billion settlement** in 2023 with U.S. municipal water authorities, covering remediation to water suppliers due to extensive water pollution from PFAS chemicals
- Estimates for **total liabilities could grow up to $30 billion** as state, foreign and personal injury claims are factored in
- The company also experienced a sharp **decline in stock price by 40%** from 2019-2023, stemming in large part from the PFAS litigation
- Regulatory developments have prompted a commitment by the company to phasing out various types of PFAS by 2025, which will require considerable expenditures

Key findings
Transition Risk - Regulatory/Legal (impact)

Water pollution-related liabilities and remediation costs are among the most common examples of BEES-related effects on entity prospects.

High profile pollution cases can also trigger share price declines, boycotts and reputational damage with indirect costs affecting an entity's prospects.

Similar settlements have been and will likely continue to be incurred by other chemical companies, alongside other industries.

Emerging PFAS regulations in both the US and the EU pose elevated transition risks for companies to comply or face penalties.

Case study 2: Impairment of mining assets

- A $10 billion copper mine set in Panama's rainforest, accounting for up to 5% of the country's GDP, was closed in November 2023 due to strong economic and environmental backlash less than 5 years after commercial production began
- This closure resulted in a **37% decrease in production** in Q1 2024 from Q4 2023 and a net loss attributable to shareholders of **$159 million**[10]
- Key biodiversity concerns stemmed from risks to diminishing the rainforest's ability to absorb CO_2, host biodiverse species, prevent soil erosion and regulate the water cycle, prompting a commitment by the company to reforest over 11,000 hectares of rainforest – double the area impacted by mining – pending restarting the project
- The mid cap company is now spending **$15-20 million per month** to preserve the site until a final decision is reached[11]

Key findings
Transition Risk – Reputation (dependency/ impact)

There are several high-profile case studies of extractive companies facing asset impairment with billion-dollar implications for statements of financial position based on social and environmental impacts. Increased frequency of such disruptions could lead to sizeable loss, especially for smaller cap companies.

This case study also highlights the complexity and tradeoffs associated with the energy transition. While a key material input to electrification, over half of current copper production is concentrated in high water stress areas, heightening exposure to stranded assets.

Case study 3: Deforestation jeopardises access to capital[12]

- A large Brazilian meat producer was exposed for purchasing cattle from suppliers implicated in illegal deforestation in the Amazon
- Despite its stated commitment to a deforestation-free supply chain, the company's verification efforts fell short of detecting non-compliance deeper down its supply chain
- Whereas fines and litigation costs, alongside investor divestment, have not had material effects on the company to date, its **delayed 2023 listing** on the New York Stock Exchange pending a US Securities and Exchange Commission investigation **jeopardises its access to capital**. The IPO was projected to triple the company's market share through a **US$20 billion market cap gain**

Key findings
Transition risk - Regulatory/Legal (impact)

This case study is somewhat unique to date in that a BEES-related supply chain incident directly jeopardised a large entity's access to capital. Yet such occurrences are likely to become more prevalent.

Increasing regulation targeting deforestation will heighten scrutiny of companies at risk of contributing to forest degradation and biodiversity loss via suppliers.

Despite recent delays, the pending EUDR will require companies trading in seven at-risk soft commodities to conduct extensive supply chain due diligence to mitigate deforestation in production. These commodities include beef, coffee, palm oil, rubber, soya, wood and cocoa.

The EUDR will preclude access to and exports of products from the EU market for companies that do not conduct due diligence demonstrating that they are deforestation-free. Penalties of up to 4% of an entity's revenues may be imposed on companies found to be complicit in deforestation.[13]

The beef industry is the largest driver of deforestation globally, with cattle ranching driving upwards of 70% of Amazon's deforestation

Case study 4: Green financing for nature-based solutions

- A U.S.-based global water technology company developing solutions for water and wastewater management has **tapped into sustainable finance instruments**, aligning its sustainability and financing strategies
- Since 2019, the company has issued a **US$1 billion green bond**, opened an ESG-linked demand deposit account and refinanced a **US$1 billion revolving credit facility** tying interest rates to progress in meeting sustainability performance targets[14]
- The company is also the **most widely-represented stock in solutions-focused biodiversity funds** launched to date

Key findings
Transition opportunity - Access to finance

Pureplay companies targeting nature-related challenges such as water scarcity are of growing interest to investors seeking alpha generation.

In the wake of increased scrutiny of greenwashing, credible sustainable finance instruments can help companies diversify their investor base while showcasing their sustainability performance and credentials. Sustainability bonds and loans have long included nature-related use of proceed categories including pollution prevention and control, sustainable management of living natural resources, terrestrial and aquatic biodiversity conservation, sustainable water management and eco-efficient products, production technologies and processes.[15]

Blue Bonds and blue loans focused on marine and coastal conservation are also of growing interest to fixed income investors.

Global sustainable bond issuance topped more than a trillion US dollars in 2023, bolstered by record levels of green bond sales totaling US$575 billion.[16]

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Takeaways and next steps

Key takeaways

- We are still in the **early stages of understanding** the effects of BEES-related risks and opportunities on entity prospects, though some underlying subtopics, such as water pollution and deforestation, have been areas of focus for some time
- At the nexus of climate change, BEES-related risks and opportunities are **industry and location specific** with heaviest **dependencies** and related risks facing the agriculture, forestry and utilities industries. Risks and opportunities linked to **BEES-related impacts** are also driven by agriculture, as well as the oil and gas, chemicals and metals and mining industries
- There is considerable evidence of BEES-related effects on entity prospects linked to regulatory-driven **transition risks**, which are expected to increase alongside more stringent regulations. While to date such effects have not been financially significant for most entities, transition costs (linked to remediation and compliance) are likely to increase and become more substantive
- Evidence of **physical risks** affecting entity prospects arising from dependencies on nature is somewhat limited to date, given the chronic accumulation of resource depletion and degradation over time. Yet cases of acute BEES-related asset damage, loss and impairment (such as water supply disruptions) are already manifesting and likely to increase in severity over the medium- to long- term
- There is considerable focus on BEES-related **systemic risks** (linking global GDP decline to ecosystem collapse and pandemics), which generally are not translating into risks for specific entities yet
- Despite the heavy emphasis on risks, **opportunities** to invest in BEES-related solutions are of interest to investors seeking value creation. Nature-related solutions are the focus of biodiversity indices and funds, yet constituents tend to be smaller niche players

Next steps

- Continue literature review to further expand sources and take a deeper dive into specific subtopics and industries identified in preliminary findings
- Ongoing strategic market outreach targeting key regions and stakeholders
- Analyse previous research that the ISSB or its predecessor organisations conducted to build evidence of effects on an entity's prospects
- Explore targeted Artificial Intelligence (AI) review of earnings call transcripts and BEES-related incidents
- Develop a database of entity-level real world examples of BEES-related effects on entities' prospects
- Collaboration with staff working on SASB enhancements to share resources and research on BEES-related risks and opportunities affecting SASB Standards prioritised for enhancements
- Interaction with other relevant standard-setters and framework providers including TNFD on research focused on effects on entity prospects from BEES-related risks and opportunities

Question for the ISSB

Does the ISSB have any comments or questions on the matters covered in the paper, or general guidance for the staff on areas of focus for specific BEES-related subtopics or types of risks and opportunities?

Appendix - References

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