

# Welcome to the Jungle: A Step-by-step Approach to Nature and Biodiversity Investment Processes

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SIS 8 – SUSTAINABLE INVESTOR SUMMIT  
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**MSCI ESG Research**

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# Agenda

Introduction

Integration into the Investment Process:

## Step 1: Measurement

- Screening Approaches
- Biodiversity Footprinting
- Capacity to Mitigate

## Step 2: Portfolio Construction

- Portfolio Example
- Deep dive: Water Risk
- Deep dive: nature Opportunities

Step 3: Report, Disclose, Engage

# Biodiversity and ecosystems are declining at an unprecedented rate



**25%**  
of existing animals and plant species could face extinction.<sup>1</sup>

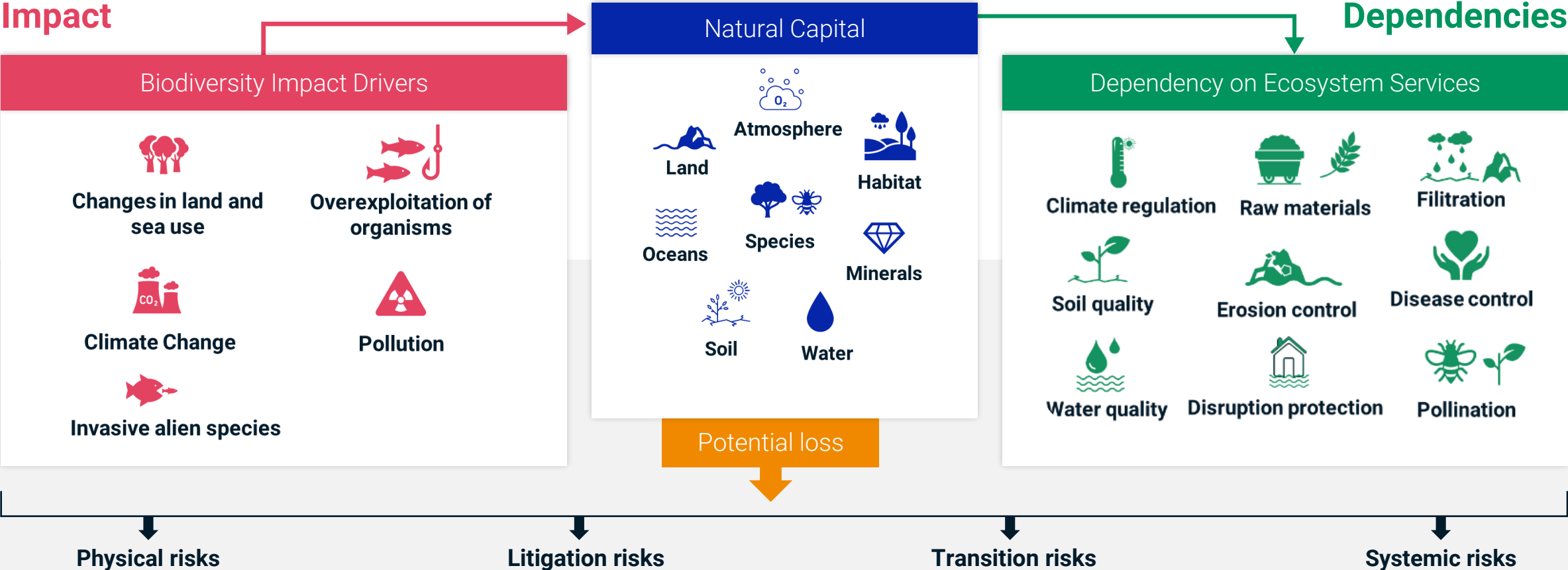


**75%**  
of Earth's land surface has been altered by human activities.<sup>1</sup>

Sources: MSCI ESG Research, March 2023

<sup>1</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). 2019. "The Global Assessment Report on Biodiversity and Ecosystem Services."

# Loss of nature and biodiversity is a driver of financial risks



Source: MSCI ESG Research, Dec 2021, based on ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) 2021; IPBES. 2020. "Global assessment report on biodiversity and ecosystem services".

# Key investor use cases: Nature & biodiversity

01

Corporate  
Engagement

Identify companies to engage with based on **nature and biodiversity-related metrics**



02

Integration in  
Investment Process

Address nature and biodiversity **impacts and risks** in investments by leveraging metrics for **screening**, setting **thresholds**, and **portfolio rebalancing**.



03

Regulatory  
Alignment

Meet **regulatory** disclosure obligations (e.g. CSRD, FINMA's Nature-related financial risks circular).  
Implement **voluntary** disclosure frameworks (e.g. TNFD).



04

Positive  
Impact

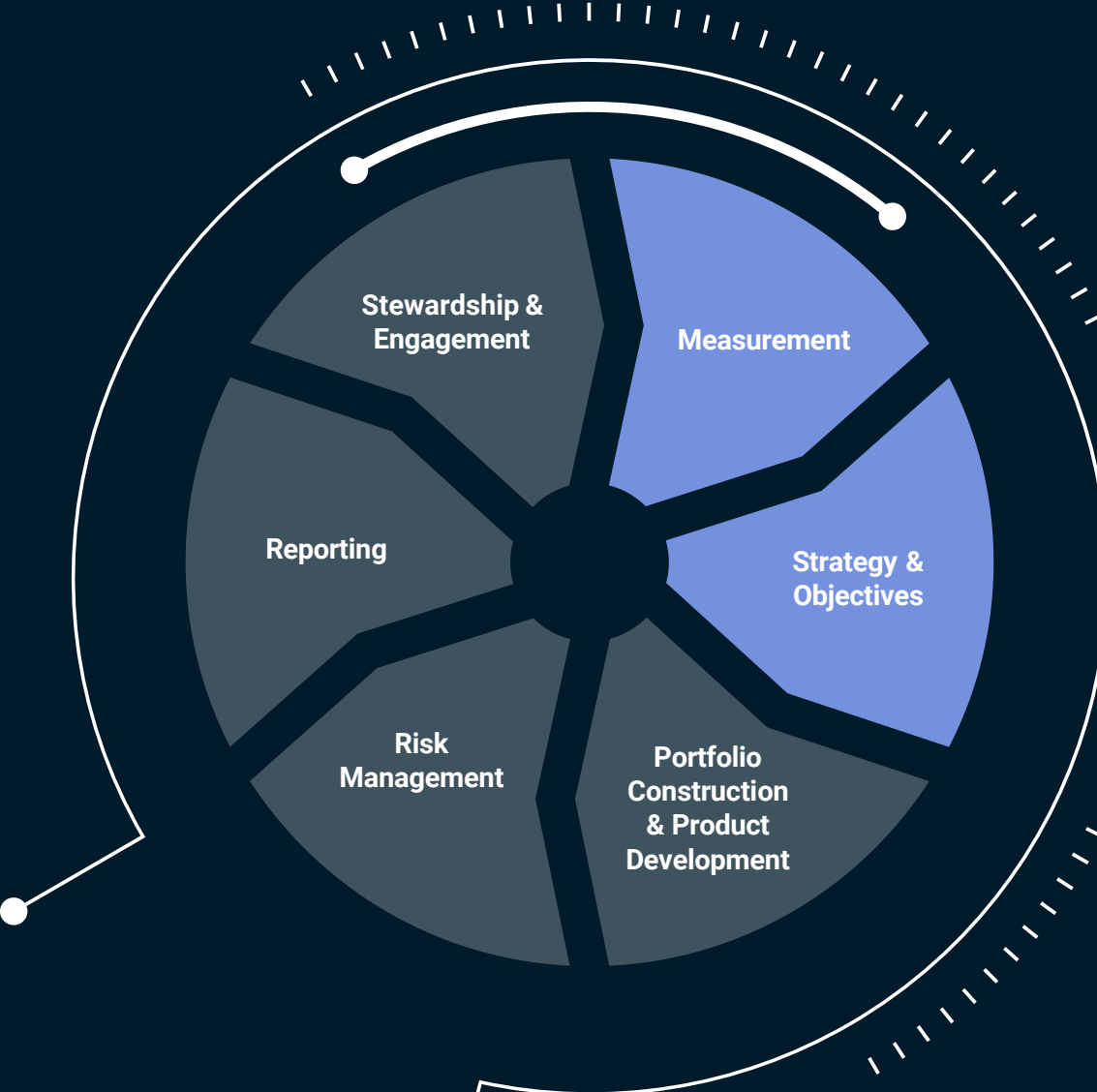
Spotlight companies:

- with **commitments** to reduce **nature impacts**
- seizing **opportunities** for **positive impacts** on nature.



Source: MSCI ESG Research, November 2024

# Step 1: Measure Biodiversity



# What is the difference: Biodiversity screening vs. biodiversity footprint?



## Biodiversity Screening



### Objective

Identify potential impact drivers of biodiversity/nature loss: e.g., assets in sensitive-areas, involvement in sensitive business activities (palm oil, pesticide etc.), controversies.

### Output examples

Flag for involvement, revenues share, score



## Biodiversity Footprint



### Objective

Quantify potential impact of company's activities on biodiversity/nature.

### Output examples

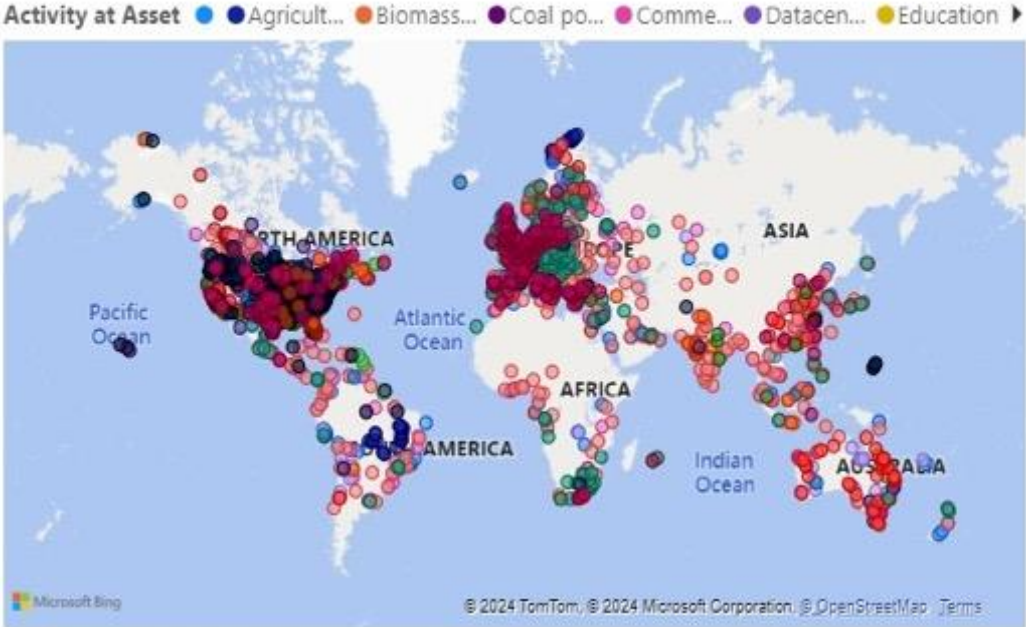
Metrics such as Potentially Disappeared Fraction of Species (PDF), Mean Species Abundance (MSA)

# Sample Portfolio

53  
companies

12,140  
asset locations

## GeoSpatial Assets

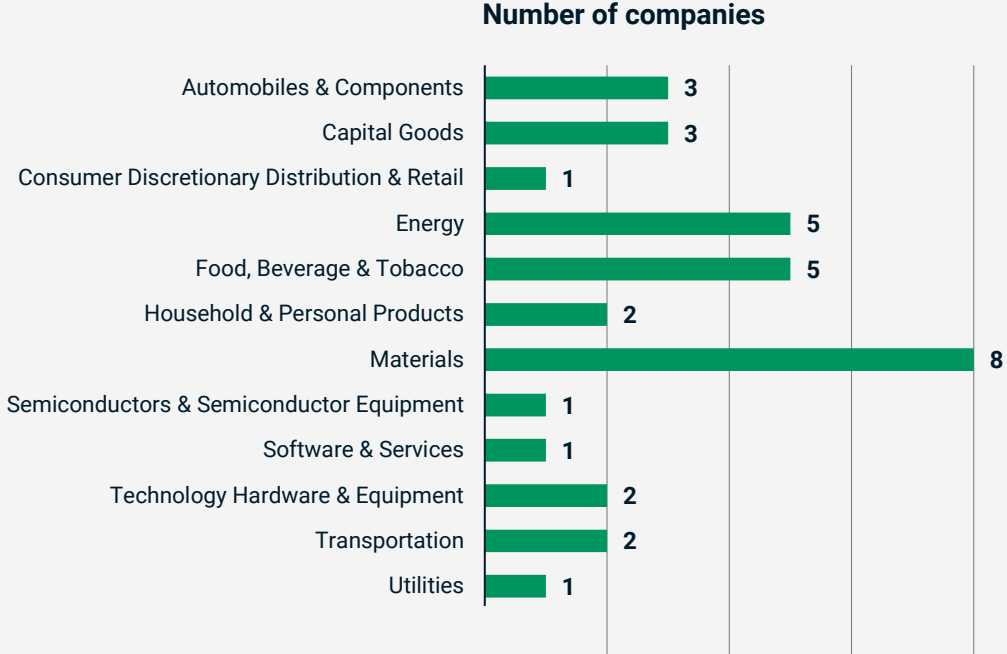


Several activities such as agriculture, coal production, data centres and offices.

Source: MSCI ESG Research, August 2024  
GICS is the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.

Illustrative Example

## Sample portfolio the Global Industry Classification Standard (GICS®): Sector split

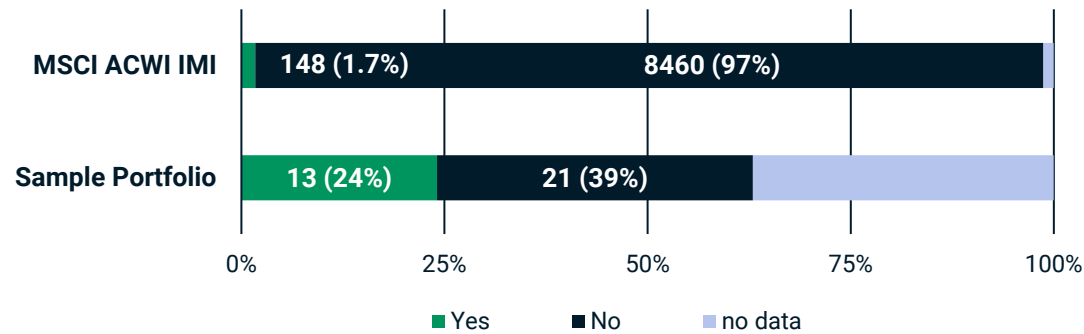




## Deforestation screening

## Use Case: Identify companies with exposure to deforestation

## Direct Contribution



1.7% of companies in the MSCI ACWI IMI\* may **directly contribute** to deforestation.

## Production:

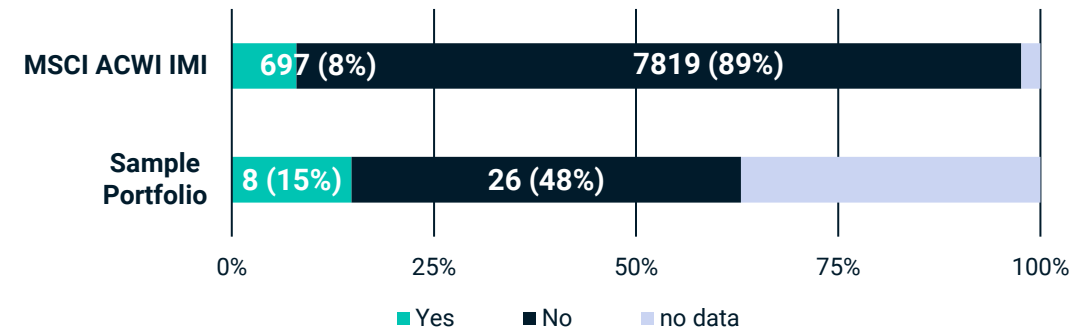
- Palm oil
- Soybean
- Beef
- Timber

## High-risk industry

with physical assets in Deforestation Fronts

Involvement in Deforestation controversies

## Indirect Contribution (Supply Chain)



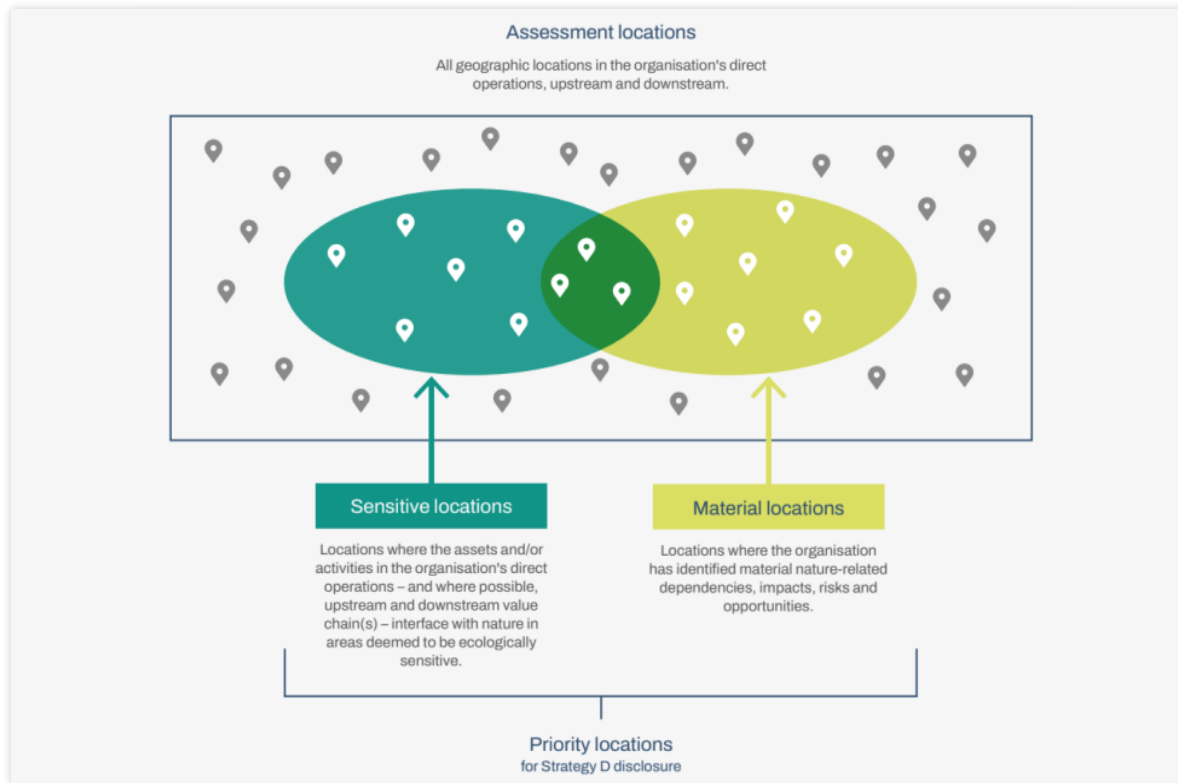
8.0% of companies in the MSCI ACWI IMI may **indirectly contribute** to deforestation.

## Use of:

- Palm oil
- Soybean
- Beef
- Timber

Source: MSCI ESG Research, August 2024, \*All Country World Index Investible Market Index (ACWI IMI)

# Location importance to nature & biodiversity assessment



“Nature is spatially explicit ... Therefore, efforts to identify and prioritise risks should take into account the geographical location of impacts and dependencies.”

**NGFS, 2023**

Source: Taskforce on Nature-related Financial Disclosures (TNFD). (2023).  
Guidance on the identification and assessment of nature-related issues: The TNFD LEAP approach (v1).

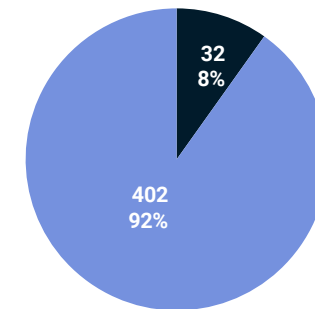
## Company screening

## Identify exposure to operations in biodiversity sensitive areas

Identify exposed companies & locations:  
Screen and set thresholds

Company	Global Industry Classification Standard (GICS)	Locations in biodiversity sensitive areas	Total # locations per Issuer	# of exposed locations
Company A	Paper & Forest Products	True	116	16
Company B	Chemicals	False	79	-
Company C	Metals & Mining	True	240	16

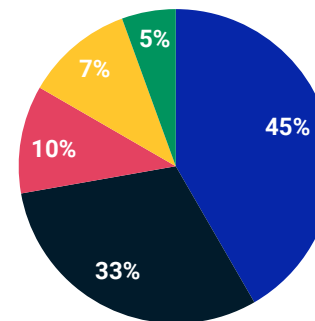
## % Assets in Sensitive Areas



**Flag**

- False
- True

## % Assets in Sensitive Areas per country



**Country**

- Finland
- United States
- Brazil
- Norway
- Germany

Source: MSCI Geospatial Asset Intelligence for illustrative purposes based on August 2024 assessments.

# Biodiversity Footprint Metrics

## Footprint based on Mean Species Abundance (MSA)

Company impact on **local** ecosystem intactness



### Key environmental impact:

Land use

### Question addressed:

What is the change in local biodiversity that can be attributed to a company?

**A company has an MSA value of 100 km<sup>2</sup> - what does it mean?**

This company potentially is responsible for eradicating biodiversity entirely on an area of 100 km<sup>2</sup>.

## Potentially Disappeared Fraction of Species (PDF)

Company impact on **global** species loss



### Key environmental pressure:

GHG emissions, water consumption + land use

### Question addressed:

What is a company's potential contribution to the disappearance of species globally?

**A company has a PDF value of 120 - what does it mean?**

The company's activities, if ongoing over the next 100 years, contribute to the loss of max. 120 species.

Source: MSCI ESG Research, April 2024, Source: MSCI ESG Research, March 2024, based on life cycle assessment frameworks including: Veronesi F. et al., 2020, "LC-IMPACT: A regionalized life cycle damage assessment method;" GLOBIO Model, developed by the Netherlands Environmental Assessment Agency; and Aafke M. Schipper and Jelle P. Hilbers, 2019, "Projecting terrestrial biodiversity intactness with GLOBIO 4."

# Vale S.A.: Transition risks remain after dam collapse

Step 1.2

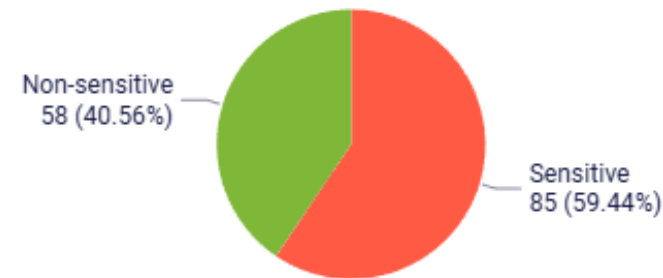
Sub-industry: Steel

## Vale's assets in Brazil located in biodiversity-sensitive areas



- The 2019 **Brumadinho tailings dam collapse** in Brazil killed 270 people and caused massive environmental damage<sup>1</sup>
- The controversy resulted in compensation costs of > USD 7 billion<sup>2</sup>
- **Transition risks remain:**
  - A total of 59% of Vale S.A. total assets and 81% of its mines located in **biodiversity-sensitive areas**<sup>3</sup>
  - **Biodiversity footprint:** Vale could contribute to the global loss of 3,387 species → *Total global potential species extinction percentile* relative to MSCI ACWI IMI constituents: **96 percentile**<sup>4</sup>

### Asset Count in Biodiversity Sensitive Areas ⓘ



Source: MSCI ESG Research, Feb 11, 2025, Map created based on data from MSCI GeoSpatial Asset Intelligence

Company selected as an example of a steel company operating in Brazil that had been involved in a severe Biodiversity & Land Use controversy that resulted in significant compensation costs.

<sup>1</sup> Vale Press Release. "Agreement seals Vale's commitment to full reparation of Brumadinho and support economic development of the State of Minas Gerais," April 2, 2021.

<sup>2</sup> MSCI Controversy Report, as of February 24, 2025.

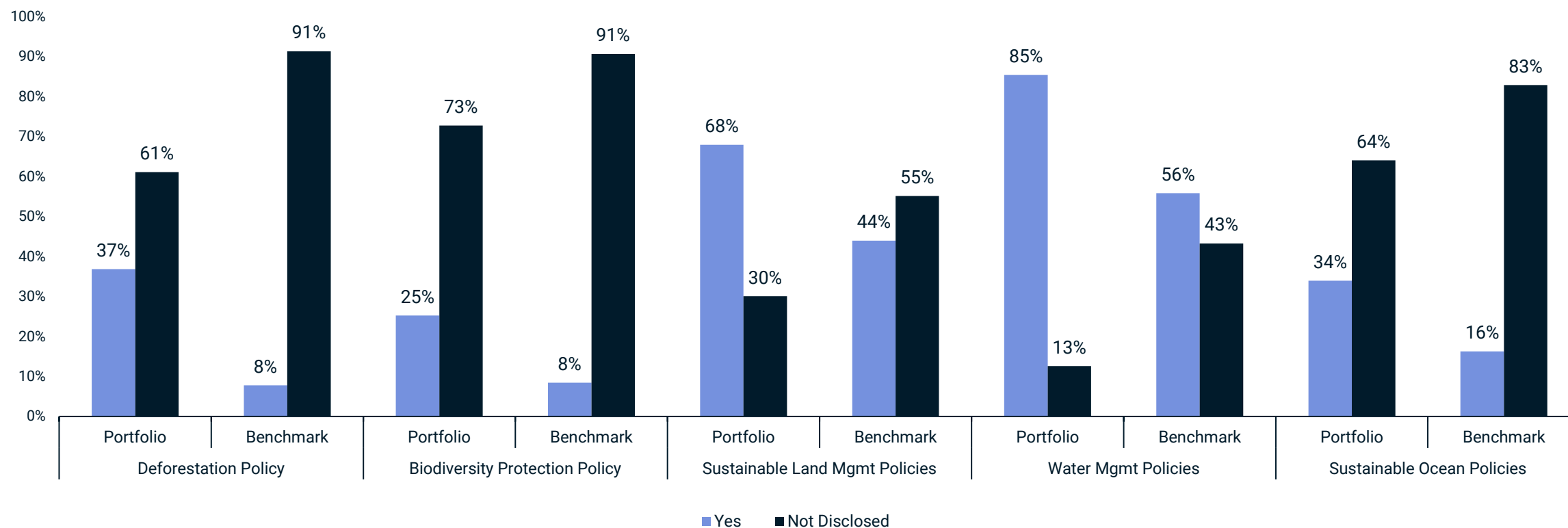
<sup>3</sup> MSCI factor **Biodiversity Sensitive Area**: Known physical asset in Biodiversity Sensitive Areas denoted as either being Healthy Forests, Intact Biodiversity Areas, Prime Areas for Conservation or Deforestation Fronts.

<sup>4</sup> MSCI factor **Total global potential species extinction**: Indicates a company's contribution to potential irreversible extinction of species on a global level related to its spatial footprint, water consumption and GHG emissions, measured by Potentially Disappeared Fraction of Species (PDF), scaled by 10<sup>8</sup> for better readability. This data is provided by fiscal year.

# Sample Portfolio Analysis

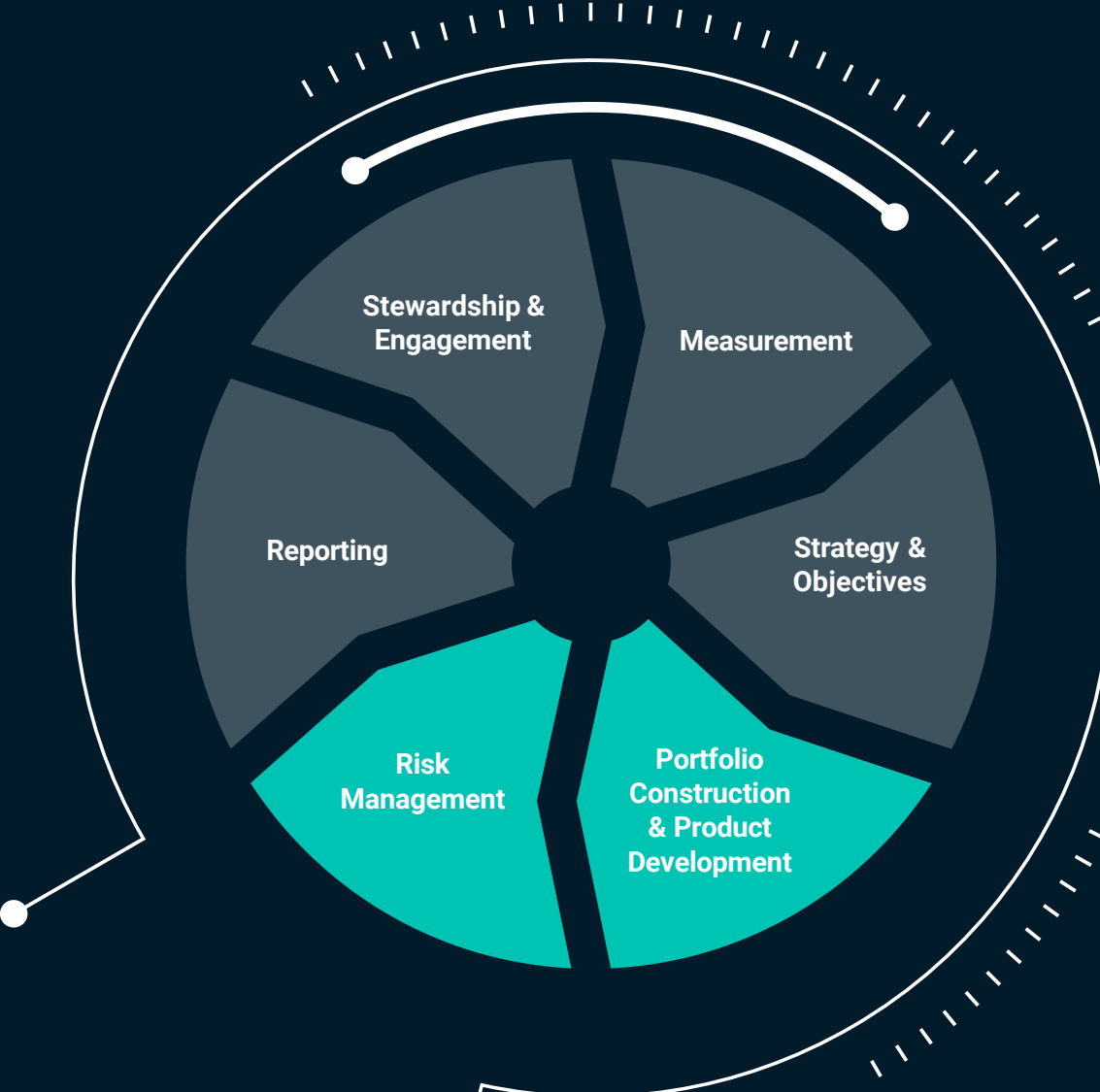
**Capacity to mitigate impact:** Nature and Biodiversity-Related Policies

Illustrative Example



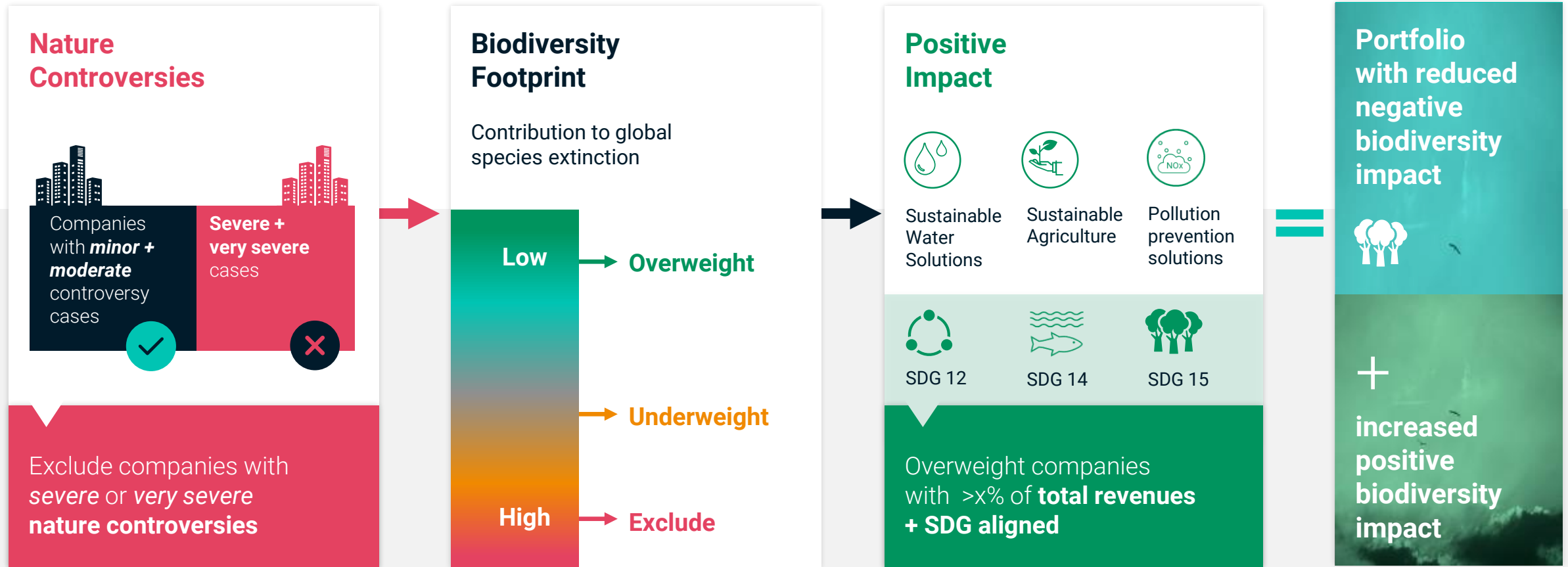
Source: MSCI ESG Research, November 2024, Benchmark: MSCI ACWI Investable Markets Index (IMI)

# Step 2: Identify Risks and Opportunities & Construct Portfolios



Use case: Portfolio construction

Reduced negative biodiversity impact  
+ increased positive impact



Source: MSCI ESG Research, Nov 2024



# Deep Dive: Water-related Risk

# Why Water Scarcity is a Material Risk for Investors

**Unpriced, Unprepared** – Water risk is undervalued, misaligning capital and increasing exposure.

**Essential & Endangered** – Agriculture, energy, and industry depend on water— but supply is shrinking, and sectors are competing for the same water sources.

**Far-Reaching Impacts** – Water scarcity threatens biodiversity, food, health, and infrastructure

Water scarcity threatens 7-9% of global GDP.

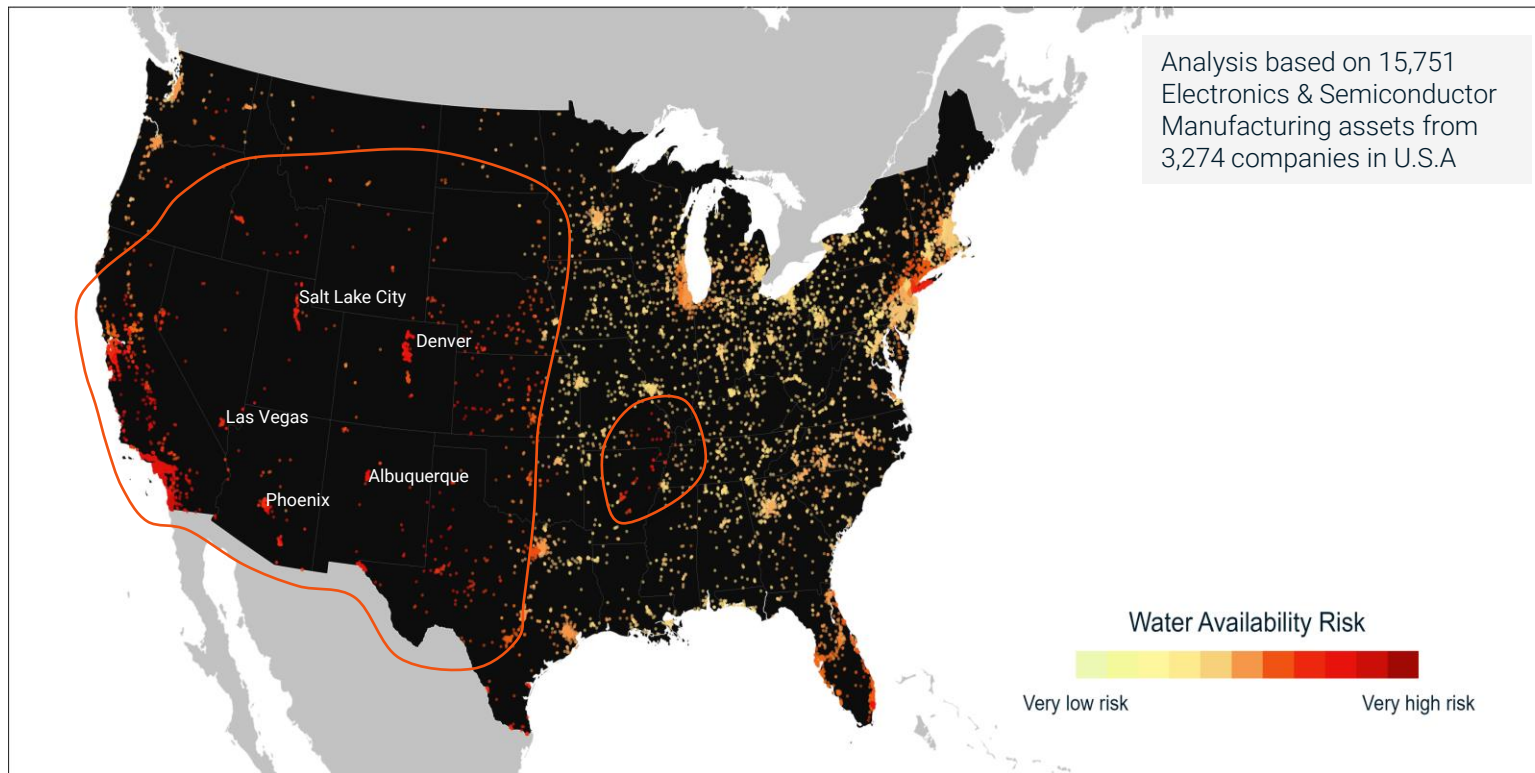
By 2030, demand will exceed supply by 40%.



Step 2.1

# Water Availability Risks for Semiconductor Manufacturing (USA)

WWF BRF & MSCI Geospatial Asset Intelligence Data: Water availability refers to the physical abundance or scarcity of freshwater resources, which is critical for industries like semiconductor manufacturing. Limited water access can lead to production and supply chain disruptions, increased operating costs, and growth constraints.



- High Water Dependence – Semiconductors require large volumes of water for cleaning, cooling, and chemical processes.
- Strategic Investments at Risk – The U.S. is ramping up domestic semiconductor production for economic and security reasons, but Arizona's severe water scarcity threatens long-term viability, posing risks for companies and investors.
- Clear Risk Zones – Western U.S. growth areas face significant water constraints.
- Expanding Risks in the East – Even regions like Memphis may see water shortages due to groundwater overuse.

Source: WWF Biodiversity Risk Filter & MSCI Geospatial Asset Intelligence Data.  
Semiconductor industry water scarcity exposure: <https://www.cdp.net/en/disclose/question-bank/water-security/financial-sector-water-knowledge-hub>

# Deep Dive: Nature Opportunities

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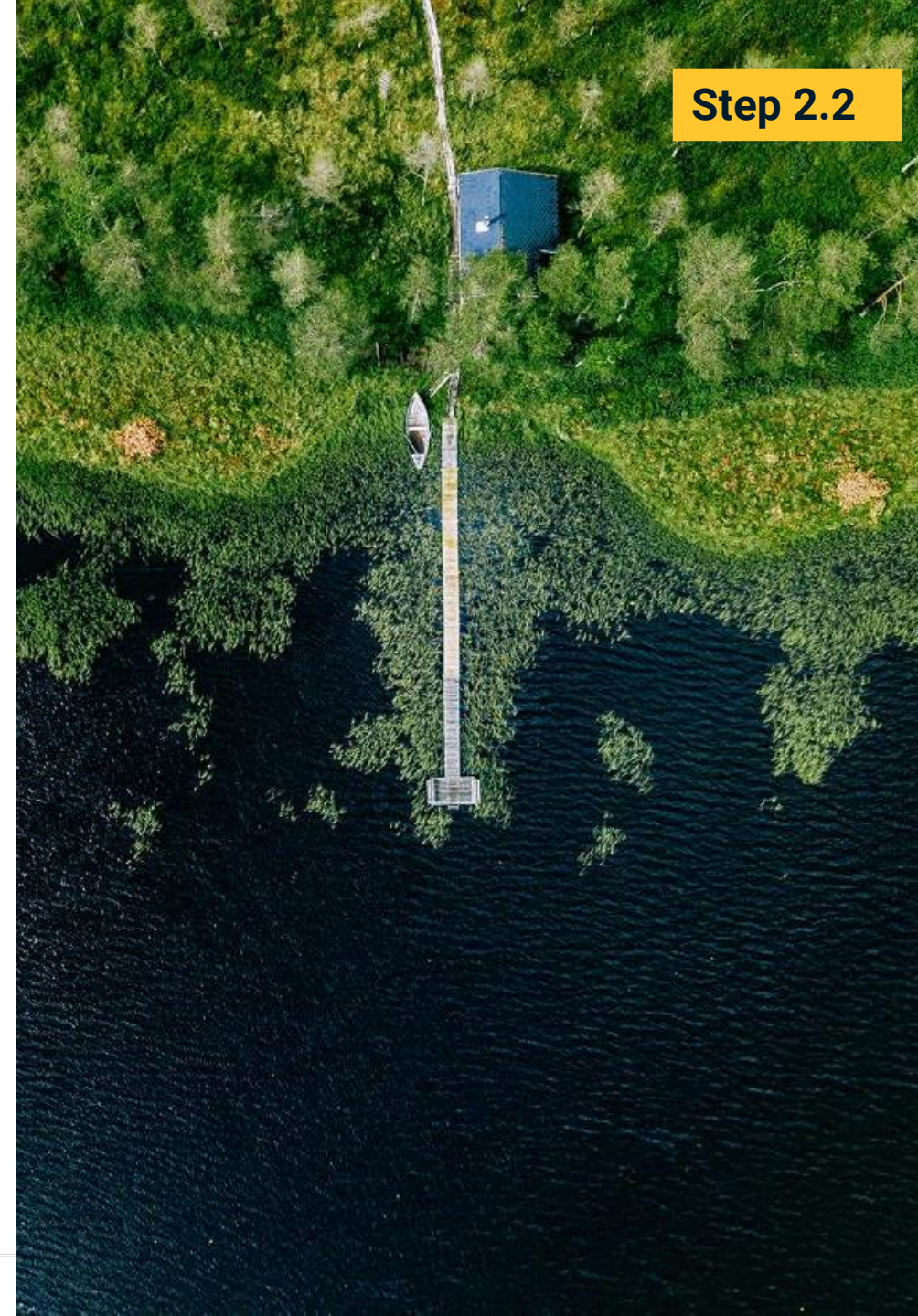
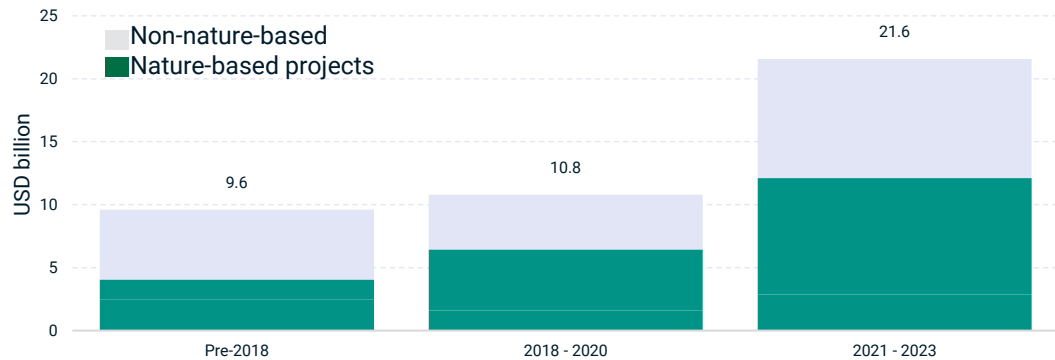
# Nature is becoming an **investable asset**

Companies and financial institutions are recognizing not only the risks associated with nature loss but also the **opportunities that nature-positive investments present.**

Nature-based investments are pivotal in the voluntary carbon market, with USD 16 billion directed into projects from 2012 to 2022. An estimated **USD 9 billion** is anticipated for projects under development by 2025, while new commitments signal an additional **USD 20 billion through 2030.** Institutional investors lead these commitments (42%), followed by corporate investors (29%) and fund managers (17%).<sup>1</sup>

**Market-based solutions and other financial products** have been developed to address climate issues through nature. Several asset managers are allocating capital to **natural capital strategies and adding nature-based solutions (NBS)** to their infrastructure alternatives and real estate allocations.

Discrete annual project expenditure by nature vs. non-nature projects<sup>2</sup>



## Investors

- **Aviva Investors** Launched Carbon Removal Fund in Oct 2024.<sup>1</sup>
- **AXA IM** launched a €500mln Natural Capital Investment fund in 2022.<sup>2</sup>
- **ASN Impact Investors** \$30mln Biodiversity Fund as world first to measure investment impact.<sup>3</sup>

## Corporates

- **Buyer's coalition 'Symbiosis'** pledged to purchase 20mln tonnes of nature-based removal credits.<sup>4</sup>
- **Microsoft** signed separate deal over 8mln reforestation credits.<sup>5</sup>
- **Apple's** \$200 million commitment to Restore fund.<sup>6</sup>

<sup>1</sup> Aviva Investors launches Carbon Removal Fund. 29 October 2024.

<sup>2</sup> AXA IM Alts expands Natural Capital platform with the launch of a €500m strategy and strategic appointments. 21 September 2022.

<sup>3</sup> Every euro invested in the ASN Biodiversity Fund leads to the protection or restoration of 1 square meter of biodiversity! September 2023

<sup>4</sup> Google, Meta, Microsoft, and Salesforce Launch "Symbiosis", Pledging for 20M Tons of Nature-Based CDR Credits. May 2024

<sup>4</sup> Investing in Nature for Sustainability Corporate insights from science and practice. October 2024.

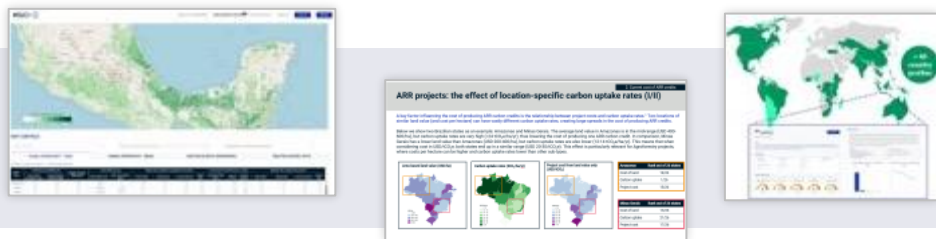
<sup>5</sup> "BTG Pactual Timberland Investment Group to Provide Microsoft with 8 Million Carbon Removal Credits," Timberland Investment Group press release, June 18, 2024

<sup>6</sup> Apple expands innovative Restore Fund for carbon removal. April 2023.

# Multifaceted offerings to support investing in nature

## Part 01

Identify & filter investment opportunities



## Part 02

Conduct due diligence & value assets



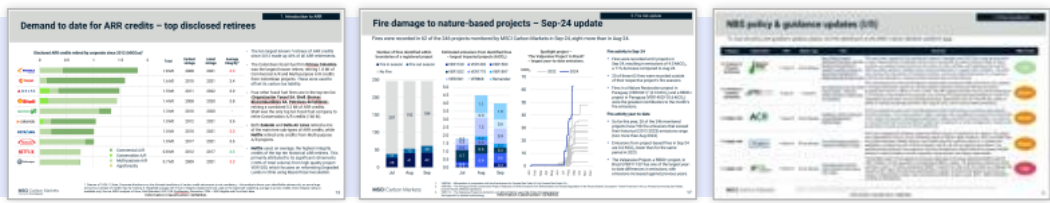
## Part 03

Structure investment & build portfolio



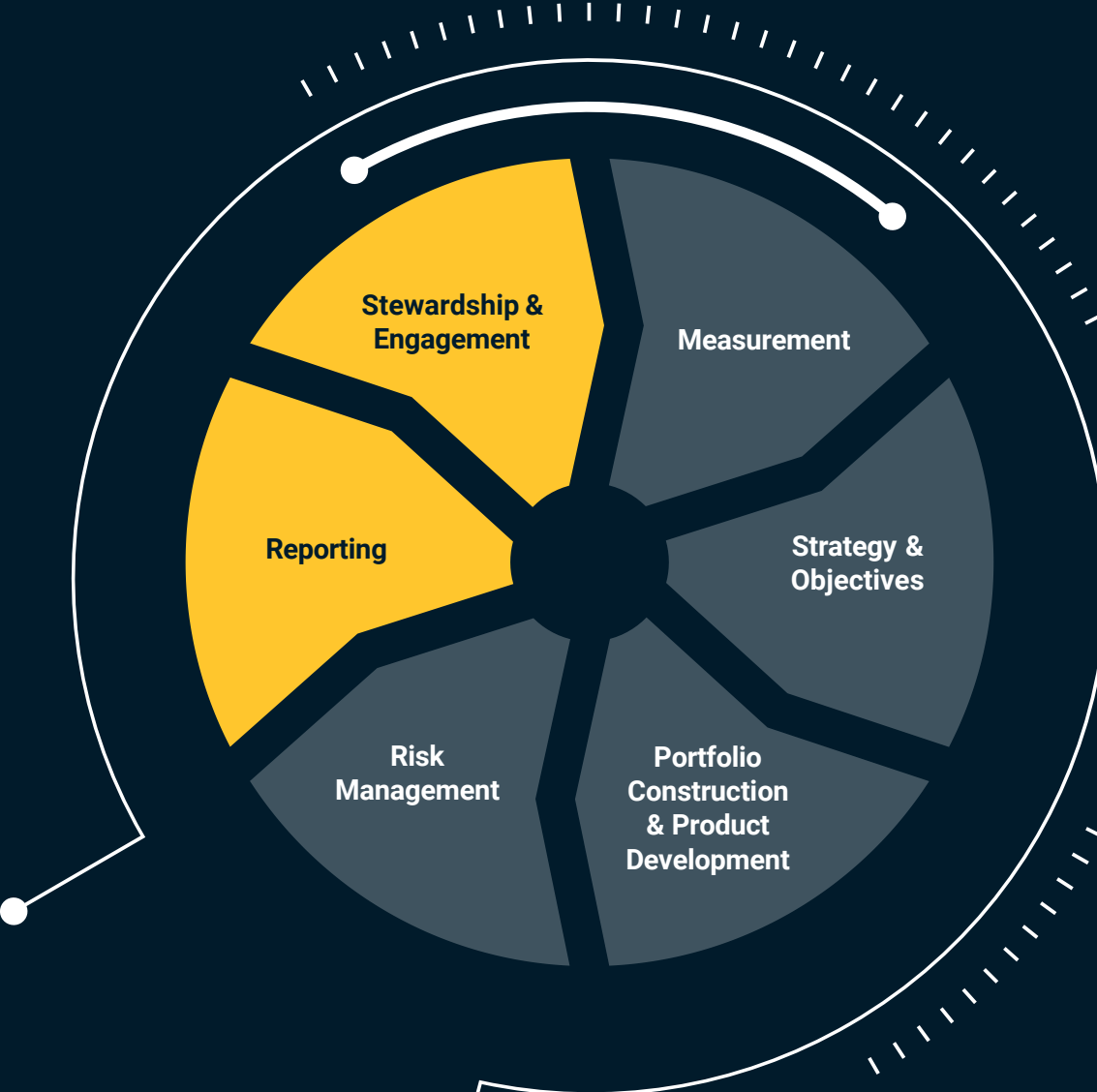
## Part 04

Monitor portfolio, manage risks & engage with stakeholders



Data and Coverage as of 30 October 2024.

# Step 3: Report, Disclose, Engage

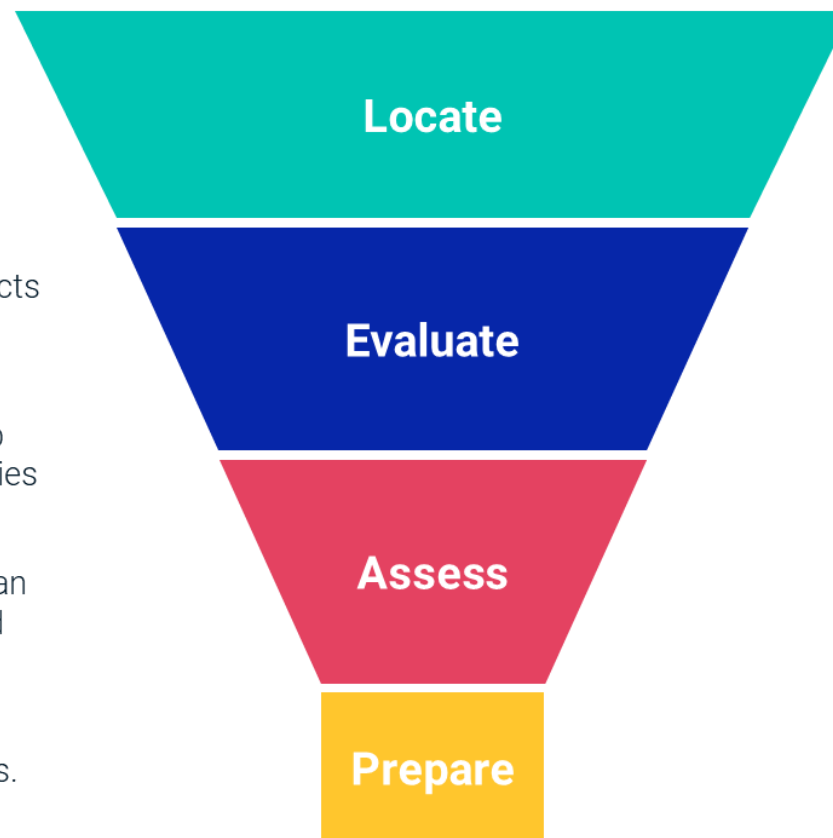




# Summary: What you can do with MSCI data for sector- and portfolio-based nature risk assessment

## How can MSCI help?

- MSCI **LOCATES** assets in biodiversity-sensitive areas and identifies the most material sectors and operations.
- MSCI delivers the data to **EVALUATE** impacts and dependency-driven risks based on TNFD/CSRD recommended metrics.
- MSCI provides benchmark results that help **ASSESS** and prioritize risks and opportunities to guide potential next steps.
- MSCI provides illustrative use cases that can be leveraged to **PREPARE** for reporting and disclosure.
- MSCI can deliver additional datapoints to define strategy; e.g., nature-based solutions.



## Required Client Inputs

- **Provide** the portfolio or Loan book to analyze.
- **Review** of MSCI assessment of portfolio/Loan book evaluation.
- **Selects** key impacts and dependency-based risks for assessment.
- **Prioritize** risks and opportunities based on financial materiality.
- **Drill-down** to specific companies for granularity.
- **Prepare** key information for public disclosure.
- **Decide next steps:** develop strategies, set targets based on LEAP assessment.

# Location Matters

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