

MSCI ESG Ratings Methodology: Biodiversity & Land Use Key Issue

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Introduction

This document provides essential information on the components of the Biodiversity & Land Use Key Issue to enable users of ESG Ratings to understand how our outputs are determined. Biodiversity & Land Use is a Key Issue in the Environmental Pillar of the MSCI ESG Ratings model. Companies are evaluated on the potential impact of their operations on biodiversity in their areas of operation and their efforts to manage the environmental impact of their operations.

For additional details on the MSCI ESG Ratings Model, refer to Section 2, Data, ratings and scores, of “ESG Ratings Methodology.”

Exhibit 1: MSCI ESG Key Issue hierarchy

3 Pillars	10 Themes	33 ESG Key Issues
Environmental	Climate Change	Carbon Emissions
		Climate Change Vulnerability
		Financing Environmental Impact
		Product Carbon Footprint
	Natural Capital	Biodiversity & Land Use
		Raw Material Sourcing
		Water Stress
	Pollution & Waste	Electronic Waste
		Packaging Material & Waste
		Toxic Emissions & Waste
		Opportunities in Clean Tech
Environmental Opportunities	Opportunities in Green Building	
	Opportunities in Renewable Energy	
Social	Human Capital	Health & Safety
		Human Capital Development
		Labor Management
		Supply Chain Labor Standards
	Product Liability	Chemical Safety
		Consumer Financial Protection
		Privacy & Data Security
		Product Safety & Quality
	Stakeholder Opposition	Responsible Investment
		Community Relations
		Controversial Sourcing
Social Opportunities	Access to Finance	
	Access to Health Care	
	Opportunities in Nutrition & Health	
Governance	Corporate Governance	Board

3 Pillars	10 Themes	33 ESG Key Issues
		Pay
		Ownership & Control
		Accounting
	Corporate Behavior	Business Ethics
		Tax Transparency

Risks associated with this Key Issue

- Loss of formal and social license to operate.
- Litigation by landowners and other affected parties.
- Increased costs of land protection and reclamation.

Biodiversity & Land Use Key Issue Score

The Biodiversity & Land Use Key Issue Score evaluates the company's level of exposure to, and management of risks on this Key Issue. The Key Issue Score is based on the Exposure Score and the Management Score using the formula below. The Exposure Score and the Management Score are combined such that a higher level of exposure requires a higher level of demonstrated management capability in order to achieve the same overall Key Issue Score.

$$KI_i = 7 - (\max(EXP_i, 2) - MGMT_i)$$

Where:

- KI_i is the Key Issue Score for company i .
- EXP_i is the Exposure Score for company i .
- $MGMT_i$ is the Management Score for company i .

Biodiversity & Land Use Management Score

The Biodiversity & Land Use Management Score evaluates the company's ability to manage its exposure to risks on this Key Issue. It is based on an average of the scores associated with each of the Management Score categories listed below, modified by Controversies. These scores are derived from data points that are scored on a 0-10 scale, with 10 corresponding to best practice and 0 corresponding

to lack of management. Refer to Section 3.3, Analyzing risk management, of “ESG Ratings Methodology” for additional details. Sources are company disclosures except where otherwise indicated. The following formula is used to calculate the Biodiversity & Land Use Management Score - Excluding Controversies:

$$MGMT_{BIO,i} = \frac{POL_{BIO,i} + PROG_{BIO,i} + PERF_{BIO,i}}{3}$$

Where:

- $MGMT_{BIO,i}$ is the Biodiversity & Land Use Management Score - Excluding Controversies for company i .
- $POL_{BIO,i}$ is the Policies & Disclosure Score for company i .
- $PROG_{BIO,i}$ is the Programs & Structures Score for company i .
- $PERF_{BIO,i}$ is the Performance Score for company i .

The following data points, without constituting an exhaustive list, are representative of the inputs to the Management Score and are used in the Management Score calculation:

Management Score category: Policies & Disclosure Score

- **Involvement with external stakeholder groups to address the biodiversity impacts of its operations.**

Definition: Indicates whether there are external stakeholder groups that work with the company to address the biodiversity impacts of its operations.

- **Scope of third-party engagement or standard to address the biodiversity impacts of operations.**

Definition: The estimated share of operations with ecosystem protection programs certified or assured by an external stakeholder group.

- **Commitment to minimize disturbances on biodiversity.**

Definition: Indicates whether the company has disclosed an explicit commitment to minimize disturbances on biodiversity, for example following the mitigation hierarchy of “avoid, minimize, restore and offset.”

- **Commitment to reclaim habitat on disturbed land.**

Definition: Indicates whether the company has disclosed an explicit policy to eventually reclaim the habitat of all disturbed land.

- **Scope of biodiversity and land reclamation policy.**

Definition: The scope of operations covered by the company's disclosed biodiversity and land reclamation policy, where applicable (i.e., all operations including its supply chain, all direct operations, or partial operations).

Management Score category: Programs & Structures Score

- **Extent of programs to protect ecosystems.**

Definition: Assesses the comprehensiveness of the company's steps to protect ecosystems, for example, whether the company creates ecosystem reserves vs. isolated initiatives to protect single species, and whether such practices apply to all major sites or only selected operations.

- **Conducts biodiversity impact assessments.**

Definition: Indicates whether the company conducts biodiversity impact assessments prior to settling in new areas.

Management Score category: Performance Score

Assesses the company's performance on quantitative metrics related to biodiversity & land use. Expressed as a 0-10 score, where 10 indicates the highest level of performance relative to peers on industry-specific metrics, including oil spill intensity (volume of oil spilled/million USD sales) and freshwater usage intensity (volume of freshwater withdrawal/million USD sales).

Representative performance metrics:

- Oil spill volume/million USD sales relative to industry average.
- Oil spill volume/million USD sales trend.
- Freshwater withdrawal/million USD sales relative to industry average.

- Other industry-specific metrics.

Controversies

A controversy deduction ranging from 0 to 5 points is subtracted from the Management Score - Excluding Controversies, based on the severity and type of controversies facing the company on this Key Issue. The result is the Management Score. The following categories of controversies are used in the assessment:

- Biodiversity & land use controversies.
- Oil spills.
- Toxic releases to water/land controversies.

For more details on how controversies are included in the MSCI ESG Ratings model, refer to Section 3.3.2, Controversies cases, of “ESG Ratings Methodology.”

Biodiversity & Land Use Exposure Score

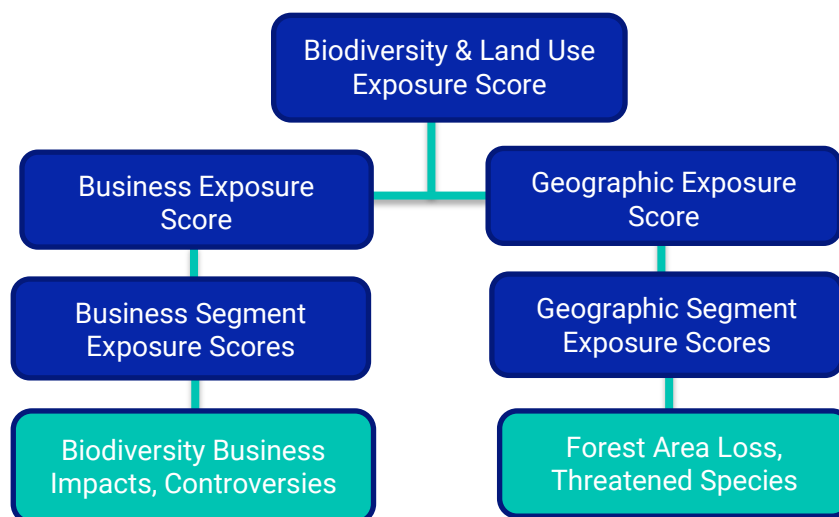
The Biodiversity & Land Use Exposure Score evaluates the company’s exposure to risks on this Key Issue. It is based on the Business and Geographic Exposure Scores. The Geographic Exposure Score functions as a multiplier on the Business Exposure Score, with an impact ranging from -50% to +50%. The Business and Geographic Exposure Scores are scored on a 0-10 scale, with 10 corresponding to the highest risk and 0 corresponding to the lowest risk. Refer to Section 3.2, Analyzing risk exposure, of “ESG Ratings Methodology” for additional details. The following formula is used in the Exposure Score calculation:

$$EXP_{BIO,i} = BUS_{BIO,i}(1 + 0.1(GEO_{BIO,i} - 5))$$

Where:

- $EXP_{BIO,i}$ is the Biodiversity & Land Use Exposure Score of company i .
- $BUS_{BIO,i}$ is the Business Exposure Score of company i .
- $GEO_{BIO,i}$ is the Geographic Exposure Score of company i .

Exhibit 2: Exposure Score components



Business Exposure Score

The Business Exposure Score is a weighted average of the Segment Exposure Scores of a company's business segments. Scores are weighted by the proportion of a company's total assets in each business segment,¹ using the following formula to calculate the Business Exposure Score:

$$BUS_{BIO,i} = \sum_{j=1}^{n_i} w_{Asset,i,j} BSE_{BIO,j}$$

Where:

- $BSE_{BIO,j}$ is the Business Segment Exposure Score for business segment j .
- $w_{Asset,i,j}$ is the weight of business segment j for company i based on the contribution to total company assets.
- n_i is the number of business segments of company i .

¹ The percentage of assets is typically calculated as the company-reported asset value of the segment divided by the total asset value. In certain cases, industry-specific metrics are used to calculate the percentage of assets, such as power generation, production volume or reserve value. In cases where neither segment assets nor a relevant industry-specific proxy is available, the percentage is calculated based on segment revenue.

Business Segment Exposure Scores

The Business Segment Exposure Score of a business segment is based on a mapping of the business segment as disclosed by the company to a corresponding business activity. MSCI ESG Research uses the Standard Industrial Classification (SIC) system along with industry-specific adjustments to define business activities. The score associated with a business activity is used to calculate a Business Segment Exposure Score. Each business activity score is determined by a simple average of the Biodiversity Business Impacts Score and the Controversies Score of the business activity.

$$BSE_{BIO,j} = \frac{BBIS_j + CS_j}{2}$$

Where:

- $BBIS_j$ is the Biodiversity Business Impacts Score for business activity j .
- CS_j is the Controversies Score for business activity j .

The Biodiversity Business Impacts Score of a business activity is assessed by examining the business impacts that are present for that activity. Nine business impacts such as disruption of operations, restricted access to land and resources, litigation, etc. arising from biodiversity and ecosystem changes are considered. For each business activity, each impact is presented as a 0 or 1 value, with 1 indicating that the impact is present. The number of impacts that apply to each activity is counted and scaled to a factor of 10 to calculate the Biodiversity Business Impacts Score.

The Controversies Score of a business activity is determined by the percentage of companies involved in a biodiversity controversy assessed as Moderate to Very Severe among all the companies with the same primary business activity.² Refer to Section 3.3.2, Controversies cases, of “ESG Ratings Methodology” for details on how the severity of controversy cases is assessed.

Geographic Exposure Score

The Geographic Exposure Score is a weighted average of the Geographic Segment Exposure Scores of the countries and regions in which a company operates. Scores

² The primary business activity of a company is the industry, as defined by the SIC System, that is the largest contributor to its total assets.

are weighted by the proportion of a company's total assets in each geographic segment through the following equation:

$$GEO_{BIO,i} = \sum_{r=1}^{n_i} w_{Asset,i,r} GSE_{BIO,r}$$

Where:

- $GSE_{BIO,r}$ is the Geographic Segment Exposure Score of region r .
- $w_{Asset,i,r}$ is the weight of total assets in region r for company i based on the contribution to total company assets.
- n_i is the number of geographic segments for company i .

For geographic segments disclosed as regions (example: Asia Pacific), a nominal GDP-weighted country aggregation is used to calculate region-level scores, using the following equation:

$$GSE_{BIO,r} = \sum_{c=1}^{n_r} w_{GDP,r,c} GSE_{BIO,c}$$

Where:

- $GSE_{BIO,c}$ is the Geographic Segment Exposure Score of country c .
- $w_{GDP,r,c}$ is the specific weight of country c within region r .

Geographic Segment Exposure Scores

The Geographic Segment Exposure Score is determined by a simple average of (1) average annual forest area loss score, and (2) the number of threatened species score in the country:

$$GSE_{BIO,c} = \frac{AFL_c + NTS_c}{2}$$

Where:

- AFL_c is the average annual forest area loss score in country c . It is calculated from the 5-year average annual forest area loss (1,000 Ha) per country.

- NTS_c is the number of threatened species score in country c .

Data Sources

The following sources are used to determine the Biodiversity & Land Use Exposure Score:

World Resources Institute, “Global Forest Watch;” World Resources Institute; UNDP Human Development Reports; Refinitiv; MSCI ESG Research; company disclosures.

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