# ESG inBrief



## Biodiversity & The Boardroom: The Bottom Line on Ecosystem Loss

Environmental externalities such as biodiversity loss impact business revenues and introduce material risks which can now be quantified using big data analytics. Example Use Cases are explored showing the practical applications of several frameworks and data analytics to measuring impact and lifetime value.

### Environmental Threats Are a Broad Set of Concerns

Biodiversity refers to all forms of life on our planet and it is essential to the existence and proper functioning of all habitats including forests, grassland, urban and marine ecosystems. Forests are home to most of the terrestrial biodiversity on Earth and cover 31 percent of the global land area but forests are finite and dwindling.

There are over 307,000 species of plants. Since 1990, an estimated 420 million hectares of forest have been lost through conversion to other land uses Biodiversity in these forests house around 7000 amphibian species (80% of all known species), around 10,000 bird species (75 percent of all birds), and more than 5500 different mammals (68 percent of all species). Fish species number around 32,900. Forests are also home to 5-10 million species of invertebrates including insects, crucial in agriculture. For instance, the Canadian Boreal Forest is home to Indigenous peoples and herds of caribou over centuries. Tropical forests around the world are crucial to preventing climate crises. When forests are cleared or degraded, they can become a source of greenhouse gas (GHG) emissions by releasing that stored carbon. Stopping deforestation is a cost-effective action that has a clear impact in reducing global GHG emissions. Hence it is very important to estimate the risk to biodiversity and forests.

The World Economic Forum (WEF, 2020) stated that over half the world's GDP is moderately or highly dependent on ecosystem services, provided by nature. In the WEF's Global Risks Report 2020, biodiversity loss was ranked *fourth most likely global risk over the next 10 years* and the third most serious in terms of potential impact.

**Eliminating the progressive physical** degradation and destruction of forests, biodiversity, and natural processes (such as rapid deforestation leading to a risk of critical wildlife habitat) have become a significant priority for countries and international agencies. ▲ For businesses to thrive in the 2020s, they will need to understand the forces that will shape the next 10 years and use them to their advantage. There's no doubt that sustainability and societal impact issues will be a leading force for driving value creation"

> **Rich Lesser,** Global Chief Executive Officer, BCG, USA

There is no one-size-fits-all approach to addressing biodiversity threats. As such, supply chain managers, municipalities, business managers, and others must navigate the risks and material impacts in unique ways. This article discusses various aspects to this evolving space and the various types of exposure introduced by biodiversity loss.

#### Biodiversity Loss Goes Beyond Money and Markets and Impacts Societal Well-being

B iodiversity loss poses a financial and business risk that needs to be monitored and measured. Swiss Re Institute estimates that more than half of the global economy depends on high-functioning biodiversity and ecosystem services, estimated at around \$41.7 trillion. Biosphere provides ecosystem services, including food, air, and water security, and multiple other natural benefits (energy).

**Biosphere is embedded in** the UN Sustainable Developments as it provides the foundation to social, and economic goals. See Figure I on next page (based on Stockholm Resilience Centre) which frames the biosphere foundation to SDG goals.

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## UN SDGS (Figure 1

The outer ring, biosphere , shows the UN SDG goals Life on land (#15), Life below water (#14), Climate action (#13), and Clean water and sanitation (#6) that are fundamental to determining the next ring, society and its eight goals such as gender equality, health, food security and other goals. The Inner ring, economy, consist of goals including responsible consumption (#11), reducing inequality (#10), sustainable economic growth (#8), and industry (#9).



**Increasing anthropogenic activity** is accelerating climate change, reducing resiliency, and decreasing biodiversity. If we don't protect and preserve the terrestrial and marine biodiversity, and other SDG goals of the biosphere, it would be difficult to satisfy the goals in two other levels, as shown in Figure 1.

#### Different strokes for different folks

Biodiversity issues are likely to impact different companies and sectors. Forestry, agriculture, fishing, are more impacted than agricultural or forestry equipment manufacturers. Hence, equity risk and performance vary across the sectors as well as specific businesses such as wood flooring, furniture, rubber, or palm oil.

#### What are the data and tools required to assess the impacts of investments on biodiversity?

hat are the sectors and geographies that are at high risk in terms of biodiversity? How do we overlay corporate-level data to measure the risk or impact? We need data ranging from global to regional to company scale to quantify the biodiversity metric.

In Figure 2 below, we show an important area of biodiversity on the planet, SE Asia. This region is home to some of the world's tropical forests and home to iconic species such as the orangutan , sumatran tiger, loris, Irrawaddy dolphin, and several birds, and plant species.



Figure 2 (*Above*). Deforestation in SE Asia 2000-2018 using 2000 as the base year to estimate loss in Sq Km.

Globally deforestation accounts for around 20 percent of emissions — greater than emissions from world's cars, trucks, planes, and ships combined. Figure 3 shows deforestation and carbon emissions (million metric tons), which are substantial contributors to the greenhouse gases emissions (GHG). Deforestation impacts animal habitats, leading to increased vulnerabilities in critically threatened and endangered species.

For the Biodiversity theme, <u>ESGAnalytics.Ai</u> is using diverse data from the World Protected Areas, the IUCN Red List of Threatened Species, Global Forest Watch, World Database of Key Biodiversity Areas, indigenous population, land, water and air quality, economic livelihoods, deforestation, and carbon footprint, and regional investment data. Data sources include satellites, published maps, census, and model estimates. Figure 3 (*Bottom Right*). Carbon Emissions/year in Southeast Asian Forests. Tree Cover Threshold defines the amount needed to ensure reforestation.

Each represents a risk, some measured in monetary value, some in GHG carbon equivalent, or ecosystem service valuation (loss of species). For example, Figure 2 shows biodiversity in terms of deforestation-based loss estimated from the base year 2000 based on Landsat satellite imagery. Figure 3 data is model estimates of GHG emissions from the deforestation data.



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### Data Used for Material Assessment & ESG Analysis

There are two major data streams to assess ESG Ratings: **Dynamic and Static**.

Dynamic data assists in identifying signals and opportunities while more traditional ESG rating data, primarily helps in risk mitigation. Many ESG companies use static data and score all companies across self-reported KPIs. The next level of biodiversity data involves carbon disclosure made by companies in various sectors. The Carbon Disclosure Program (CDP, 2020) gathered disclosed KPI data from 553 companies on the steps they are taking to eliminate deforestation from their operations and supply chains. These companies produce seven commodities, that are major drivers in agriculture-related deforestation: palm oil, timber products, cattle products, soy, natural rubber, cocoa, and coffee. CDP reported on 15 Key Performance Indicators (KPIs) related to six categories.

Each company's performance is assessed based on industry benchmarks and against the company's peers. Figure 4 (Below) shows the Key performance indicators (KPI) where companies are complying fully. Figure 4 indicates that forest-related companies have higher overall adoption on legal compliance compared with engagement with smallholders in their supply chain.

KPIs shows some similarities but also varies across KPI. Timber product companies, for example, have high KPI adoption to certification, commitments, and forest-related external activities or initiatives. This CDP database provides a KPI standard for judging how timber companies are able to satisfy



best practices in satisfying biodiversity KPIs.

Figure 4. Carbon Disclosure Program 2020: KPIs among Forest Related Companies (self-reporting)

## **Expertise, Assessment, & Analysis**

Another type of model traces the carbon emissions from cradle to grave of each product that is produced.

**Products, including furniture, paper and pulp,** and other forestry products, have an impact on the environment by consuming resources and releasing emissions during their production.

We use the commonly accepted holistic method called lifecycle assessment (LCA) or more generally life-cycle analysis to calculate greenhouse gas (GHG) and other emissions for part or all of a product life cycle.

**Companies can use it to** estimate the carbon footprint of a product including its supply chains as well as waste and air pollution shown in Figure 5 (Right).

**SimaPro is software** to perform high-quality life cycle assessments (LCAs). The program enables testing of the sensitivity of the model to input data and assumptions by creating scenarios with different parameters. Figure 6 examines a sample model of furniture life cycle model including disposal of furniture at the end-stage.

5 kg Corrugated board, mixed fibre, single wall, at plant/RER S

Disposal scenario

Disassembly

Waste scenario

Waste treatment

Reuse

Use

Material
 Energy
 Transport
 Processing

0.511 Pt

Assembly
Life cycle



**C**ompanies are highlighting their commitment to addressing climate change; in the context of biodiversity, companies are facing reputational risk when they fail to deliver on the customers' demand for climate-friendly or socially just products and services. For example, the AZEK Company recycles much of its wood and plastic in manufacturing composite deck boards to promote recycling and build its sustainability brand focus. Operational risks include those across their value chain – disrupted supply chains and volatile prices of raw materials, resulting from extreme weather events, geopolitical upheavals, pandemic, and climate effects (physical risks).

**Companies in Europe and N.** America promote locally made furniture instead of importing wood from the rainforest. Regulatory risks arise through shifts to greener economies (transition risks). Market risk includes increasing competition and disruptive technologies in the ESG space; . Financial risk is the market capitalization of companies when investors demand action as they weigh their options and risks. ESGAnalytics.Ai scores these types of risks in its ESG ranking of forestry related products.

**See Table I (Below)** for examples from the furniture industry.

Company	Market Cap \$	PE Ratio	#Employees	Emphasis
Ikea	18B		10,000	Set clear goals - Global leader in sustainability; Social inclusion, circular business, sustainable material use, GHG emission standards set.
Restoration Hardware	9.897B	60.54	4400	Repurposing wood, saving from landfills
Ethan Allen	669.10M	48.24	3369	Responsible sourcing from N. America
Natuzzi	141.352M	27.94	4615	Complies with European regulation

**TABLE 1 - EXAMPLE ANALYSIS - FORESTRY IMPACTED** 

Future trends are headed towards sourcing responsibly, recycling or repurposing old wood instead of landfill dumping, and an entirely new sustainable fashion design.

Our furniture ESG analysis reveals that companies will articulate the following: use of recyclable materials, product durability and reliability, low energy and water consumption, ability to refurbish, less waste during production, clean production techniques, reduction of product weight, use of clean materials, and use of less and/or reusable packaging. The new trend in green furniture design includes designing innovative products and enhancing a company's societal image.

**Evolutionary design and biomimicry** are now used in furniture design. Companies will also highlight social inclusion and diversity as traditional parts of the furniture supply chain are dominated by a diverse workforce. There are many ways to assess Biodiversity risk including Life cycle assessments (LCA), carbon footprint analysis, water footprint analysis, CSR reports, environmental risk assessments. Identify emerging companies and trends in this space using our ESGAnalytics.Ai research reports.

# **ESGAnalytics.Ai**

Our mission is to change the world through empowering investments that make positive impacts on social, cultural, and environmental outcomes. Our founding team comes from decades of experience in academic research and international development using data and analytics. We built ESGAnalytics. Al to bring novel, unique data, metrics, and analysis into the growing realms of Socially Responsible Investing and ESG.

Our analytics and data are used for fixed income, securities, insurance, and risk and compliance, as well as sustainable investment. Special emphasis is around delivering different ESG-specific data and outcomes ranging from Zip Code to County and State or national scales.

We automate the end-to-end preparation and analysis commonly performed by entire teams of researchers, analysts, data scientists, and credit professionals, who work in Excel—prone to errors and omissions. By using Aland advanced models, the solution removes human biases and delivers a more accurate and actionable outcome/score.

# just the legal stuff

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