

# Navigating Climate and Nature-Related Risks: Strategic Opportunities for Sustainable Business

Nirmla Devi Thakur

Excel Innovation Centre, Excel Industries Ltd, Mumbai

E-mail: nirmladevi.thakur@excelind.com

---

## Abstract

Climate change, primarily driven by human activities such as the combustion of fossil fuels, has resulted in an increase in the frequency and severity of extreme weather events, thereby generating economic, social, and environmental challenges on a global scale. These climate-related risks are part of a broader spectrum of risks associated with nature, which also includes biodiversity loss, ecosystem degradation, and resource scarcity. Numerous businesses depend on natural resources, and the decline in biodiversity, jeopardizes agricultural productivity and food security. Additionally, climate change disrupts global water systems, posing threats to industries reliant on water. Nature-related risks encompass both the outputs and inputs of business models, leading to reputational and operational challenges for companies that fail to adopt sustainable practices. Conversely, there are significant benefits to be derived from leveraging nature-based opportunities, such as enhancing resource management, supporting environmentally friendly technologies, and adopting renewable energy sources, all of which contribute to the long-term sustainability of a business. Instruments like carbon credits, Renewable Energy Certificates (RECs), and biodiversity credits play a crucial role in advancing corporate sustainability objectives. India's proactive stance in promoting Environmental, Social, and Governance (ESG) factors, as evidenced by its Business Responsibility and Sustainability Reporting (BRSR) regulations and net-zero commitments, bolsters global efforts to combat climate change. The importance of international collaboration in addressing climate change and protecting natural ecosystems is underscored by the G20's Green Development Pact for a Sustainable Future. Incorporating environmental sustainability into business plans not only promotes the responsible utilization of natural resources but also opens doors for innovation, competitive edge, and improved societal and ecological welfare.

**Keywords:** Climate change, Biodiversity, Sustainability, Environmental Social and Governance (ESG) reporting

## 1 Introduction

Biodiversity, encompassing Earth's vast range of life forms developed over billions of years, is now at risk due to human activities like deforestation. Forests, which support the livelihoods of over a billion people, play a critical role in absorbing carbon emissions. Nonetheless, these ecosystems are in decline, and wetlands, crucial for carbon sequestration, have experienced an 85% reduction in area.

To highlight the problem of biodiversity loss, consider using examples of different pollinators, including bees, butterflies, bats, and hummingbirds. They are vital for ecosystem survival, supporting nearly 90% of wild flowering plants and over 75% of global food crops. They are crucial for food security and biodiversity conservation. However, pollinator populations, especially bees, are declining rapidly due to human activities. Species extinction rates are now 100 to 1,000 times higher than normal, threatening the availability of nutritious crops like fruits, nuts, and vegetables, which could be replaced by staple crops such as rice, corn, and potatoes, leading to dietary imbalances. Factors contributing to this decline include intensive farming, land-use changes, mono-cropping, pesticide use, and climate change (1). These small insects are thus crucial for us as they significantly contribute to preserving our ecosystem and economy by aiding agriculture in growing sufficiently while utilizing fewer natural resources.

Risks associated with climate change, or climate-related risks, are part of the broader framework of nature-related risks. Nature-related risks encompass the wider natural environment, including biodiversity, ecosystems, and the services they provide. While climate-related risks focus on the impacts of climate change, nature-related risks may involve longer-term and systemic effects, such as biodiversity loss influencing agricultural productivity or the disruption of ecosystem services. Climate change involves long-term shifts in temperature and weather patterns. While these changes can occur naturally, human activities, particularly the burning of fossil fuels like coal, oil, and natural gas, are the primary cause. This has led to an increase in the frequency and intensity of extreme weather events such as storms, heatwaves, floods, droughts, and wildfires. Growing impacts caused by climate change are affecting freshwater, marine, and terrestrial ecosystems, leading to

species extinctions, migrations, and habitat degradation. The rising temperature of the planet is endangering coral reefs, which have lost almost half of their biomass in the last 150 years. Climate change accelerates the spread of diseases and weakens essential ecosystem services, creating major risks to human health and livelihoods. These climate-related disruptions are negatively impacting the development of nations globally, resulting in significant economic, social, and environmental challenges.

According to David Sherwood, managing director at Deloitte & Touche LLP, “Climate risk is often generated by the outputs of a business model. A company might burn fossil fuels, creating carbon output, which contributes to climate change. Nature risk includes not only the outputs of a business model, such as impacts to water, soil, and air, but also the inputs companies put into business activities, such as natural resources (e.g., water)”(2).

World’s largest companies are deeply reliant on nature for their operations. The World Economic Forum's Global Risks Report 2020 (3) highlights that the top five risks for the coming decade, ranked by likelihood, are all climate related. These include human-made environmental disasters, climate action failure, natural disasters, biodiversity loss, and extreme weather events. Furthermore, a report by PwC released in April 2023 (4) reveals that 55% of global GDP—approximately \$58 trillion—is either moderately or highly dependent on nature. Nature loss and degradation significantly affects businesses. In the end, consumers face the financial burden through higher taxes for disaster mitigation or increased prices for goods and services. Since every individual relies on the Earth's resources like food, energy, air, and water, it is a collective responsibility to manage and safeguard these resources in a sustainable manner for the well-being of all.

## **2. Understanding Nature-related Risks in Business Operations**

The interdependence of business operations and natural ecosystems, which provide essential resources and services, gives rise to risks associated with nature. As environmental concerns gain prominence, businesses face heightened regulatory scrutiny and evolving consumer preferences that necessitate sustainable practices.

### **2.1 Implications of Extreme Weather Events**

Extreme weather events, including cyclones, floods, and heatwaves, have significant implications for business operations. Elevated temperatures can diminish agricultural yields, while floods can devastate inventory. Industries dependent on forest-based products face vulnerabilities in their supply chains due to deforestation. The diminished availability of these resources can result in increased costs and supply shortages. Industries such as

agriculture, pharmaceuticals which heavily depend on natural resources, may face constraints in accessing raw materials from diverse ecosystems.

## **2.2 Water Scarcity and Its Implications**

The sustainability of sectors like energy production, agriculture, and manufacturing is intrinsically linked to water availability. Water scarcity can lead to operational disruptions, including total shutdowns or reduced production capacity. Water and climate change are closely interconnected, with climate change influencing global water systems in multifaceted ways. It disrupts rainfall patterns, accelerates the melting of ice sheets, raises sea levels, and contributes to both floods and droughts. The loss of trees and other vegetation also worsens soil erosion, lowers groundwater recharge, and increases water shortages, all of which contribute to increased food insecurity (6).

**2.3 Challenges in Securing Critical Minerals:** Similarly, the availability of critical minerals, essential for electronics and renewable energy technologies, is vital for the technology and energy sectors, underpinning their operational continuity and growth. Critical minerals are becoming as strategically important as oil and gas. The extraction and processing of these minerals present significant ESG (Environmental, Social, and Governance) challenges, encompassing substantial water consumption, pollution, and human rights concerns. Scarcity of these minerals can lead to increased costs and supply chain disruptions. To secure energy security, it is imperative to ensure a stable and sustainable supply chain for these essential minerals (7).

## **2.4 Reputational Risks and Regulatory Challenges:**

Businesses that do not implement sustainable practices face serious reputational risks in light of increased biodiversity regulations and rising consumer awareness. Tighter restrictions on water use may also make it harder to access essential water resources, which would reduce production potential. Industries in areas where there is a shortage of water may also encounter opposition from stakeholders and the local community because of what they see as excessive water use. More restrictive laws governing the mining and use of minerals can also limit access to vital resources, which will have an immediate effect on production methods. A significant number of these minerals originate from politically volatile areas, where scarcity of resources can intensify geopolitical unrest and ultimately impact worldwide supply networks.

To effectively identify and manage nature-related risks and capitalize on opportunities that enhance resilience and sustainability, it is essential to understand the intricate interplay

between ecological systems and corporate activities. This assessment demands a comprehensive scientific approach that incorporates ecological considerations into strategic business planning.

## **2.5 Role of TNFD in Addressing Nature-related Risks and Promoting Sustainability**

Given the dual challenges of climate change and biodiversity loss, the Taskforce on Nature-related Financial Disclosures (TNFD) has emerged as a crucial endeavor. TNFD is an international effort that offers guidance on reporting to governments, businesses, and financial institutions worldwide on their effects and reliance on nature. The Taskforce, made up of 40 members from different financial institutions, corporations, and marketing service providers, leads the TNFD. The Taskforce on Nature-related Financial Disclosures (TNFD) defines nature-related risks as potential threats to an organization arising from its own and other organizations' reliance on and impact on nature. This initiative aims to facilitate a strategic reallocation of investments from activities detrimental to natural ecosystems towards initiatives that actively restore and safeguard natural capital (5). The TNFD aims to make it possible for businesses and financial institutions to successfully incorporate these risks into their decision-making processes by developing a reporting structure. The TNFD seeks to raise awareness, promote accountability, and drive action in order to protect biodiversity and encourage sustainable practices across different industries.

## **2.6 Leveraging Sustainability for Business Growth**

Integrating environmental sustainability into business strategies is crucial for long-term success. Sustainability, in essence, involves the responsible use of natural resources today to guarantee their availability for future generations. Implementing sustainable practices by optimizing the use of resources like water, energy, and raw materials can significantly reduce energy consumption and waste disposal costs. This approach not only leads to substantial cost savings but also minimizes environmental impact. Furthermore, adopting sustainable practices enhances brand reputation, attracting environmentally conscious consumers and investors.

## **2.7 Forests as Key Carbon Sinks and Their Potential for GHG Reduction:**

Forests play a crucial role in driving economic, ecological, and sociocultural prosperity for communities worldwide. Functioning as significant carbon sinks, healthy forests effectively absorb and store carbon dioxide. Data from 2001 to 2019 indicate that forests globally absorbed twice as much carbon as they released, equivalent to 7.6 billion metric tonnes of CO<sub>2</sub> annually. The Intergovernmental Panel on Climate Change (IPCC) highlights that the

Agriculture, Forestry, and Other Land Use (AFOLU) sector has the potential to contribute up to 30 percent of the necessary greenhouse gas (GHG) emissions reductions to limit global warming to 2°C, offering a cost-effective solution (8). To meet the Paris Agreement's 1.5°C target, companies must achieve substantial emissions reductions and align with net-zero commitments. With the number of firms pledging net-zero doubling from 500 in 2019 to over 1,000 in 2020, there's a clear trend toward enhanced sustainability (9).

### **3 The Bioeconomy: A Driver of Sustainable Development:**

The term "bioeconomy" describes the portion of the economy that focuses on products, services, and processes derived from biological resources, such as plants and microorganisms. It spans various sectors, either fully or partially, including agriculture, textiles, chemicals, and energy. The bioeconomy is being more widely acknowledged as a crucial force for promoting sustainable development, leveraging biological resources and advanced technologies to address worldwide environmental challenges. Investing in green technologies and sustainable products can unlock new market segments and confer a competitive edge. Leveraging energy-efficient solutions, enhancing dependence on renewable energy sources, and optimizing supply chain efficiencies are strategic measures that can substantially reduce a corporation's carbon footprint.

India's rich resources, including abundant sunlight, fertile land, and agricultural outputs, can be effectively utilized to promote bioeconomy. The nation is anticipated to have 750 million metric tonnes (MMT) of biomass available year, plus an extra 230 MMT of excess. The biomass production capacity reached 10 gigawatts (GW) by FY22, corresponding to a compound annual growth rate (CAGR) of 4%. In comparison to fossil fuel-based products, bio-based products derived from renewable agricultural resources are less hazardous and more environmentally sustainable. Adopting a circularity-based bioeconomy can aid in striking a balance between social, environmental, and economic goals, as the bioeconomy gains traction as a feasible climate solution (14).

#### **3.1 Tax Incentives: Catalysts for Green Technology Adoption:**

Tax incentives are pivotal in advancing sustainable manufacturing practices. By offering financial benefits such as tax credits, deductions, and exemptions to companies investing in green technologies, renewable energy, and eco-friendly processes, governments can alleviate the financial challenges businesses face during their transition to sustainability. These incentives not only foster innovation and reduce costs but also enhance competitiveness, ultimately driving environmental sustainability and economic growth (10).

### **3.2 Role of Carbon Credits and RECs in Achieving Net-Zero:**

Despite advancements, current technologies often make emissions reductions costly or unfeasible for certain sectors—such as cement production, where calcination generates significant emissions. Thus, reaching the 1.5°C goal necessitates "negative emissions" strategies, including the procurement of carbon credits. These credits represent verified reductions or removals of greenhouse gases. McKinsey forecasts a surge in demand for carbon credits, projecting annual needs of 1.5 to 2.0 gigatons (GtCO<sub>2</sub>) by 2030, escalating to 7 to 13 GtCO<sub>2</sub> by 2050 (9).

In the evolving green economy, Renewable Energy Certificates (RECs) and carbon credits are essential tools for businesses aiming to enhance environmental sustainability. RECs focus on reducing Scope 2 emissions, which stem from purchased electricity, while carbon credits address emissions across all scopes (Scope 1 to 3). By integrating RECs and carbon credits into their operations, companies can advance their sustainability objectives, comply with regulations, boost their environmental credentials, and benefit from financial incentives associated with their commitment to reducing carbon footprints (11).

### **3.3 Biodiversity Credits: An Emerging Financial Instrument:**

Biodiversity credits, or biocredits, are an emerging financial instrument gaining traction. While akin to carbon credits used to mitigate greenhouse gas emissions, biocredits diverge by not aiming to offset or compensate for biodiversity-negative actions. Instead, they are crafted to mobilize funding for the conservation, restoration, and sustainable management of biodiversity-rich regions. To advance biocredits, the Biodiversity Credit Alliance was established during CoP15. Despite the promising potential of biodiversity credits, their implementation is nascent, necessitating the resolution of various issues to ensure the development of a viable, transparent, and accountable market (12).

### **3.4 Consumer Preferences for Sustainability: A Shift in Retail**

In recent years, retailers have observed a significant transformation in consumer behavior towards sustainability-driven purchasing decisions. This shift, driven by heightened consumer awareness of environmental and ethical issues, reflects a strong preference for eco-friendly, ethically sourced, and fairly produced products. Companies that integrate sustainability into their operations, such as leveraging recycled materials, minimizing carbon footprints, and endorsing social causes, are increasingly favored by consumers (13).

### 3.5 ESG Reporting in India: Leading the Way in Sustainable Business

According to PwC India's survey, 51% of the top 100 listed companies have voluntarily disclosed carbon emissions, with 31% setting net-zero targets. This trend highlights the growing emphasis on Environmental, Social, and Governance (ESG) considerations driven by the new Business Responsibility and Sustainability Reporting (BRSR) regulations. The transition to BRSR Core underscores India's leadership in advancing transparent and credible sustainability reporting. The survey reveals that 44% of these companies conducted life-cycle assessments, 89% reported leadership indicators, and 49% increased their renewable energy use. Key emission reduction strategies include adopting energy-efficient technologies, transitioning to renewable energy, and purchasing carbon offsets. The enhanced focus on ESG reporting reflects the strategic priority placed on sustainability and positions India as a global frontrunner in sustainable business practices (15).

In 2023, India led the G20 Summit under its presidency with the central theme of "*One Earth, One Family, One Future*," inspired by the Sanskrit concept of *Vasudhaiva Kutumbakam*" that emphasizes the significance of all living forms, including bacteria, plants, animals, and humans, as well as their interdependence on Earth and other planets. During the summit, all participating countries signed the *Green Development Pact for a Sustainable Future*. This agreement encompasses crucial provisions such as financing, pledging to reduce greenhouse gas emissions by 43% by 2030, doubling adaptation funding by 2025, and establishing an international biofuel alliance. These achievements highlight the collaborative efforts of G20 nations to tackle pressing environmental and sustainable development issues on a global level (16).

## 4 Conclusion

Technological advancements are crucial for advancing sustainable development by providing solutions to environmental challenges. Renewable energy technologies, such as solar, wind, and hydro power, present clean, sustainable alternatives to fossil fuels, thereby reducing greenhouse gas emissions and dependency on finite resources. Furthermore, innovations in energy-efficient technologies for buildings and transportation enhance sustainability by decreasing energy consumption and carbon emissions. Progress in carbon capture and storage technologies also offers promising strategies for mitigating industrial and power plant emissions.

Nonetheless, obstacles remain, particularly regarding technology accessibility and cost-effectiveness. To effectively tackle environmental issues and achieve sustainability objectives, it is essential to integrate technology with strategic policy and social initiatives.



Policies are instrumental in setting regulatory frameworks, incentives, and targets that promote the adoption of green technologies. By aligning technological advancements with policy goals, governments and organizations can accelerate the transition to a more sustainable future.

## References

1. We all depend on the survival of bees. World Bee Day, United Nations <https://www.un.org/en/observances/bee-day>
2. Nature: The Other Side of the Environmental Risk Coin- WSJ, Oct 2023
3. World Economic Forum Global Risks Perception Survey 2019- 2020
4. Will Evison, Lit Ping Low and Daniel O'Brien (2023). "Managing nature risks: From understanding to action". PwC
5. The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework, Beta v0.1 Release, 2022
6. Water and Climate Change UN-Water <https://www.unwater.org/water-facts/water-and-climate-change>
7. The Role of Critical Minerals in Clean Energy Transitions. IEA Report, May 2021
8. Forests can help us limit climate change – here is how. UNDP Climate Promise, Oct 2023.
9. Christopher Blaufelder, Cindy Levy, Peter Mannion and Dickon Pinner. A blueprint for scaling voluntary carbon markets to meet the climate challenge. McKinsey Sustainability report, Jan 2021
10. Tax incentives can help enhance adoption of sustainability manufacturing: Expert. The Economic Times. May 2024
11. Eric Chin, Renewable Energy Certificates (RECs) and Carbon Credits: How Do They Compare? InCorp Global, July 2024
12. Vibha Varshney, Why 2024 may see action on biodiversity credits, DownToEarth, Jan 2024
13. Why The Rise of Sustainability is a Shift in Consumer Consciousness, Forbes, May 2024
14. Ravindra Utgikar & Sayali Thakare, "The Promise of Bioeconomy as a Solution for Sustainability. ORF Issue Brief No. 729, September 2024, Observer Research Foundation
15. Majority of top-100 companies making disclosures about carbon emissions: PwC India. The Economics Times, April 2024
16. G20 Achieves Green Development Pact for Global Sustainability And Emissions Reductions. Business Today, Sep 2023