ethos

ENGAGEMENT PAPER

NATURE

2025

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1. Introduction

This document outlines Ethos' expectations for companies in addressing the nature crisis. It begins with an overview of key terms and concepts related to nature. It then examines the main drivers of biodiversity and nature loss, followed by a review of the impacts, dependencies, risks, and opportunities companies may face. The current regulatory frameworks are also presented. More importantly, the document details Ethos' specific expectations for companies, including engagement themes and dialogue approaches. Finally, it provides sector-specific guidance, as well as relevant frameworks and tools.

1.1 A TWIN CRISIS

The unprecedented depletion of nature due to human activities poses a critical threat to biodiversity and the well-being of future generations[1]. Because of the complexity of natural ecosystems and the limited availability of tools and research to fully understand them, companies, academics, financial institutions, and regulatory bodies have significantly underestimated the importance of nature for the economy and for sustaining life on Earth. Climate change has been prioritized instead, notably as it is more easily quantified through greenhouse gas (GHG) emissions.

Nonetheless, climate change and nature loss should not be viewed as separate issues. In fact, nature loss is deeply interconnected with climate change, and the two are strongly exacerbating each other.[2] Furthermore, natural ecosystems play a vital role in climate mitigation, having absorbed 54 % of anthropogenic GHG emissions over the past decade.[3]

According to the International Union for Conservation of Nature (IUCN) Red List, global species survival has declined since 1980, with amphibians being the most threatened group of animals (41 % at risk of extinction)[4], while a 2023 study in Biological Reviews suggests that nearly 50 % of the Earth's animal species are undergoing population decline. The study also shows that human activities are damaging the global environment at an unprecedented rate, leading to a rapid imbalance in biodiversity: species are vanishing much faster than they are being replaced, suggesting that a 6th mass extinction is underway.[5]

A massive erosion of biodiversity would have severe consequences for human society, which relies on biodiversity for its economy, livelihoods, food security, health, and quality of life.[6] Urgent action is therefore needed to sustain life and well-being on Earth by tackling, stopping and reversing nature loss.

As with climate change, companies are key drivers of nature depletion, both directly through their operations and indirectly through their value chains. However, they are also among the most exposed to the impacts of nature loss. According to a 2020 research paper from the World Economic Forum (WEF) and PwC: «more than half of the world's total GDP is moderately or highly dependent on nature and its services and is therefore exposed to nature loss».[7]

1.2 ETHOS' PERSPECTIVE

Ethos is deeply conscious of the profound and systemic risks posed by the ongoing degradation of nature and biodiversity, which pose threats to all companies, the financial system, and the global economy and society at large.

Recognizing the urgency and gravity of the current crisis, this paper aims to help companies understand the critical issues at stake and provides an overview of existing regulatory and voluntary frameworks. It outlines essential measures companies should implement to protect their long-term value and resilience, minimize potential losses, and safeguard investors' long-term interests.

By proactively embracing ambitious transition strategies, companies can mitigate financial and operational vulnerabilities while simultaneously contributing to a sustainable and liveable environment for society at large. Failure to address these challenges could result in irreversible consequences, severely undermining economic and financial stability as well as societal welfare, thereby jeopardising the value of the assets held by Ethos' members and clients.

2. Key definitions

Given the complexity and interconnectedness of the natural world and the planetary ecosystems that sustain life on Earth, the degradation of nature can lead to cascading and potentially irreversible consequences. This risk is heightened by the presence of non-linear dynamics such as feedback loops and tipping points. These processes amplify the urgency of understanding key terms and concepts to fully grasp the essential role of nature in human well-being and economic resilience. Understanding this interdependence is fundamental to recognizing both the critical need to protect nature and the severity of the risks posed by its loss.

2.1 NATURE

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) defines «nature» as «the natural world with an emphasis on the diversity of living organisms and their interactions among themselves and with their environment».[8]

The key characteristic is that «nature» encompasses both **biotic** (living) components, including the full spectrum of biodiversity from genes to ecosystems, and **abiotic** (non-living) elements, such as geological formations and climate processes, along with their complex interactions that shape our planet.[9]

In simpler terms, and as defined by the Convention on Biological Diversity (CBD), «nature is all life on Earth (i.e., biodiversity), together with the geology, water, climate and all other inanimate components that comprise our planet».[10]

By taking a double materiality approach between society and nature, humans will, by construction, be included in the assessment.

2.2 NATURAL CAPITAL

Natural capital can be defined as the world's stocks of renewable and non-renewable natural resources (including geology, soil, air, water, and all living organisms) from which humans derive a wide range of ecosystem services essential for life.[11] [12]

From an economic standpoint, natural capital can be characterized as natural assets that supply resource inputs and ecological services essential for economic production.[13]

2.3 BIODIVERSITY

The term «biodiversity» has increasingly been used by financial scholars and practitioners to address almost any topic related to nature. Yet, the CBD defines biological diversity as «the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part».[14]

Biodiversity includes diversity:

- within species (genetic diversity)
- between species
- between ecosystems

Biodiversity is a fundamental component of nature since high levels of biodiversity (i.e., wide variety of animals, plants, and microorganisms) are crucial for maintaining the processes that support all life on Earth. It promotes the health of ecosystems and provides humans with essential resources known as «ecosystem services».

2.4 ECOSYSTEMS

The CBD defines an ecosystem as «a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit».[15] In other words, an ecosystem is the collection of living organisms, their physical environment, and their relationships (e.g. predation or symbiosis) within a specific area.

Ecosystems are classified into three groups based on their degree of naturalness:[16]

- natural ecosystems, which existed before agriculture, and which can recover from human influence
- semi-natural ecosystems, shaped by human land use and dependent on traditional practices
- anthropogenic ecosystems, heavily altered by human activity, typically species-poor, and in need of restoration.

2.5 ECOSYSTEM SERVICES

Also called «nature's contributions to people», ecosystem services are a "range of material and non-material benefits that humans, directly and indirectly, obtain from nature and that sustain and fulfil human life".[9]

They are typically categorized into four groups as follows:

- **provisioning services**: e.g. food, raw materials like timber, fresh water
- **regulating services**: e.g. carbon sequestration, air and water filtration, and erosion control
- **cultural services**: e.g. recreation and tourism
- **support services**: e.g. nutrient cycling and soil formation

2.6 TIPPING POINTS

Tipping points refer to critical thresholds at which relatively small environmental changes can trigger large-scale, abrupt, and often irreversible shifts in the Earth's ecological, climatic, or environmental systems. Such transitions typically involve strong reinforcing feedback loops, significantly amplifying the initial disturbances.[17] More precisely, nature loss and climate change are mutually reinforcing, creating a feedback loop that heightens the risk of crossing ecological tipping points. As ecosystems lose biodiversity, their resilience diminishes, reducing their capacity to regulate the climate and absorb shocks. In turn, accelerating climate change intensifies habitat degradation and species extinction, further eroding the natural systems that help stabilize the climate. [18]

2.7 PLANETARY BOUNDARIES

The planetary boundaries framework defines nine critical Earth-system processes essential for maintaining planetary stability and resilience. At the time of publication of this engagement paper (October 2025), humanity had already crossed seven of these boundaries, including those for climate change and biosphere integrity, with significant impacts on biodiversity and nature. These transgressions suggest the Earth has moved well beyond the safe operating conditions that characterized the stable Holocene epoch, creating systemic risks where climate and biodiversity impacts amplify each other, potentially leading to irreversible global environmental changes and disrupting ecosystem functions critical to sustaining life and economic systems.[19]

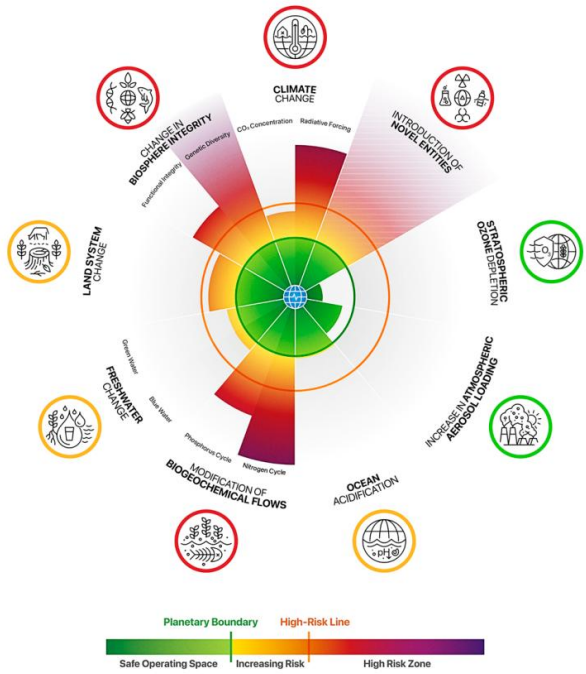


Figure 1: Seven of nine planetary boundaries crossed as of 2025. From *Planetary Health Check 2025: A Scientific Assessment of the State of the Planet* (Planetary Boundaries Science, 2025). Retrieved from https://www.planetaryhealthcheck.org.

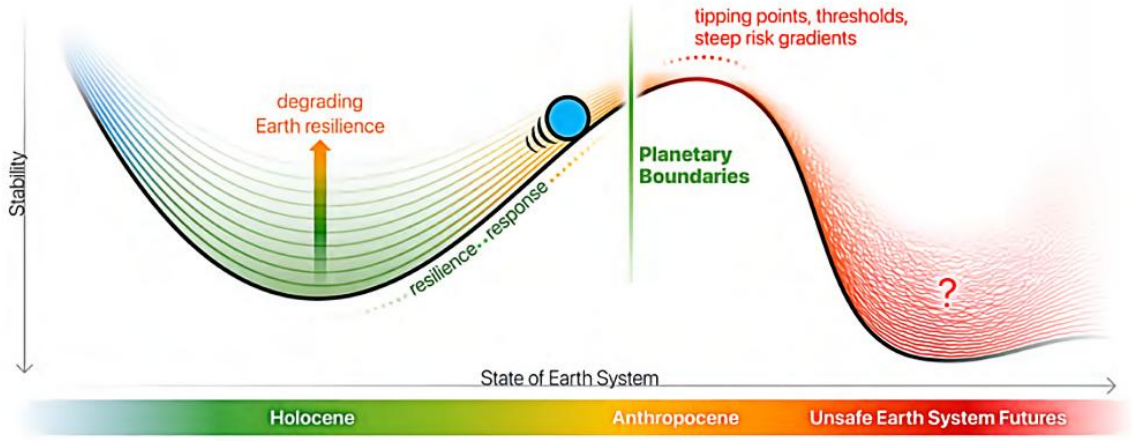


Figure 2: Illustration of Earth's degrading resilience under human pressures, with crossing planetary boundaries risking tipping into unsafe, irreversible futures. From *Planetary Health Check 2025: A Scientific Assessment of the State of the Planet* (Planetary Boundaries Science, 2025). Retrieved from https://www.planetaryhealthcheck.org.

3. Drivers of nature loss

Anthropogenic (i.e., human) activities, mainly through business activities, are the primary cause of the depletion of natural capital and degradation of ecosystem services. Nature loss results primarily from a combination of direct and indirect human-induced drivers.

3.1 DIRECT DRIVERS

The drivers of nature loss vary considerably, depending on the specific ecosystem, geographic context, and associated human activities. Yet, five major direct drivers of nature loss (or pressures on nature) are identified by the IPBES:[20]

1. changes in land/freshwater/ocean use
2. direct exploitation of organisms and natural resources
3. climate change
4. pollution
5. invasion of alien (non-native) species

1. **Changes in land, freshwater and ocean use** are the most detrimental drivers of nature loss, destroying entire local, unique, and biodiverse ecosystems and habitats. The most damaging sectors include agriculture (livestock, palm oil, etc.), construction (urbanization), resource extraction, energy production, and industrial fishing practices (e.g. bottom trawling).
2. **Direct exploitation**, particularly the unsustainable overexploitation of organisms and natural resources, depletes populations and disrupts ecosystems. The economic activities most responsible for the overexploitation of natural resources comprise the fishing industry, logging and forestry, agriculture, hunting and wildlife trade, and extractive industries (mining and fossil fuels).
3. **Climate change** has a detrimental impact on almost any organism and ecosystem through temperature changes and disruption of climate systems. While all companies contribute to climate change via GHG emissions, the heaviest-impact sectors involve fossil fuels and extraction, transportation, industry, and manufacturing, agriculture and forestry, and construction and buildings.
4. **Pollution** from chemicals and waste exerts a severe impact on biotic and abiotic factors and ecosystems, especially on insects, freshwater and marine ecosystems.[21] The chemical and pharmaceuticals industry, plastic production and use of plastics, heavy metals and complex industrial chemicals, agriculture and food (e.g. pesticides, packaging) are all major polluters.[22]
5. **The invasion of alien (non-native) species** harm nature by disrupting ecosystems, outcompeting or preying on native species, and causing extinctions and irreversible ecological changes. The main economic activities responsible for introducing invasive alien species include international trade (shipping, ballast water, and biofouling), tourism and human travel, agriculture, aquaculture, horticulture, forestry, infrastructure development, and e-commerce and pet trade.[23]

3.2 INDIRECT DRIVERS

The indirect drivers, or underlying causes of nature depletion and biodiversity loss, are societal factors that influence direct drivers. The IPBES has identified the following as the main indirect drivers:[24] [25]

1. demographic and sociocultural drivers
2. economic and technological drivers
3. institutions and governance
4. conflicts and epidemics

1. **Demographic and sociocultural**: This driver encompasses changes in the size, distribution and characteristics of human populations, as well as shifting cultural values, norms and lifestyles, that shape demand for resources and people's relationships with nature. Population growth, urbanization and changing consumption patterns all fall under this category.
2. **Economic and technological**: Economic growth, globalized trade and technological innovation alter how rapidly and intensely materials are extracted, processed and transported. Advances in infrastructure, new production techniques and evolving market systems amplify both benefits and pressures on ecosystems and biodiversity.

3. **Institutions and governance**: This covers the formal and informal rules, practices and organisational structures, ranging from property-rights regimes to laws, policies, treaties and social norms, that determine who makes decisions about land and resource use, how benefits are shared, and how environmental regulations are enforced.
4. **Conflict and epidemics**: Includes the societal disorder caused by armed violence, social unrest or large-scale disease outbreaks. Such crises can displace communities, interrupt conservation efforts, and degrade ecosystems, with ripple effects that undermine both nature and human well-being.

DRIVERS OF BIODIVERSITY LOSS: EXAMPLES FROM DEFORESTATION

A systematic review of the most relevant scientific research on biodiversity loss indicates that the direct impact and significance of each driver vary depending on the realms (terrestrial, marine, and freshwater), geographic regions, and specific biodiversity metrics considered. Overall, however, land and sea use changes, alongside direct (over-) exploitation, emerge as the predominant drivers.[26]

Taking deforestation as an example (terrestrial realm), land-use change is identified as the principal driver of deforestations in the Brazilian Amazon, primarily due to cattle ranching and soy production,[27] as well as in Borneo, where primary forests are cleared for palm plantations.[28] Meanwhile, the overexploitation of timber and illegal logging are the prime drivers of substantial deforestation in Myanmar.[29] Additionally, extreme drought and wildfires, driven by climate change (anthropogenic pollution), are becoming an increasingly prominent cause of forest destruction worldwide. Deforestation not only removes crucial carbon sinks but also releases additional carbon into the atmosphere, further exacerbating climate change, intensifying deforestation, and eliminating countless organisms dependent on these ecosystems.[30]

This degradation is visible at the ecosystem, species, and gene levels. Changes in land use, such as the conversion of natural habitats into agricultural land (estimated to use 50 % of the world's habitable land), are the primary cause of habitat loss and, consequently, of biodiversity loss.

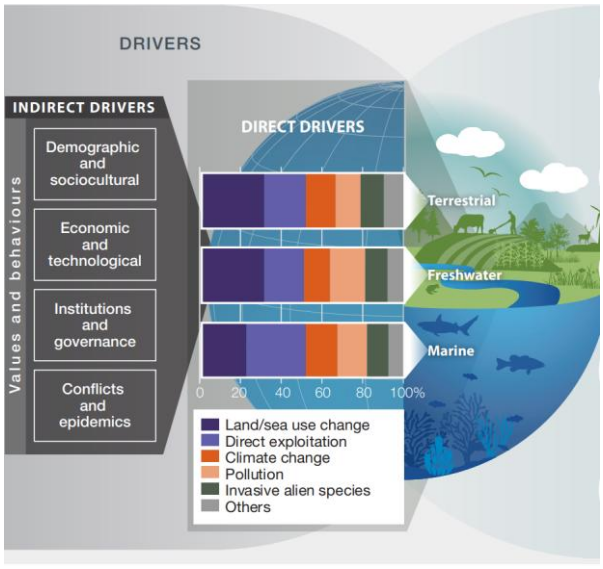


Figure 3: Direct and indirect drivers of change. An IPBES illustration retrieved from: https://zenodo.org/records/3553579

4. Impacts, dependencies, risks and opportunities

4.1 DOUBLE MATERIALITY

Companies, through their activities, are primary drivers of nature destruction. Yet, they are also heavily reliant on the ecosystem services nature provides to sustain their entire value chain. This reflects the significance of **double materiality**, where companies not only impact the natural environment but are also significantly and financially affected by environmental changes, creating a two-way dependency.[31]

4.2 IMPACTS AND DEPENDENCIES

IMPACTS

The Global Biodiversity Framework (GBF), which delineates strategies for sustainable living in harmony with nature by 2050,[32] highlights the essential role of companies in contributing to the goals of conserving nature. In particular, companies should identify their direct and indirect impacts and be transparent about it. They should avoid and reduce any negative impacts.[33]

Companies have traditionally linked nature loss to sectors such as forestry, mining, or agriculture that directly impact nature. However, understanding the complex and interconnected drivers of nature loss reveals that nearly every industry has significant direct and indirect negative impacts on nature.[34] Companies exert direct impacts on nature through their core operations, and indirect impacts through their value chains by sourcing raw materials and essential resources for their activities, together forming their overall environmental footprint.

In addition, the social consequences of the nature crisis should not be overlooked. Corporate pressures on nature often directly harm local and Indigenous communities by polluting and depleting water sources, altering land use, driving biodiversity loss, and exposing people to toxic contaminants that undermine health, food security, and human rights. These impacts threaten their livelihoods and cultural heritage.

DEPENDENCIES

Recent studies find that almost 50 % of companies are highly or very highly dependent on at least one ecosystem service, while almost all companies are somewhat dependent on nature through their value chain.[35] [36] [37] These dependencies are often location-specific and interconnected. They include the provision of raw materials, freshwater, pollination, soil fertility, climate regulation, hazard protection, and biodiversity, all of which are critical for resilient operations. Disruptions can lead to systemic and long-term business risks.

4.3 NATURE-RELATED RISKS AND OPPORTUNITIES

RISKS

According to the Network for Greening the Financial System (NGFS), nature-related financial risks correspond to «the risks of negative effects on economies, individual financial institutions and financial system». Such risks arise from physical, transition and litigation risks, which may lead to systemic risks. All those risks are defined as follows.[9]

Physical risks arise from the physical degradation of nature, including its biodiversity, and the loss of ecosystem services that flow from it. Physical risks may be **acute** (e.g. shocks like oil spills, floods, forest fires, or pests impacting harvests) and chronic (e.g. gradual changes such as pollution from pesticide use, exhaustion of limited resources, or the effects of climate change). Physical events may interrupt a business' operations, destroy assets, deplete resources, and damage supply chains.

Transition risks arise from the misalignment of economic actors with actions aimed at protecting, restoring, and reducing negative impacts on nature. Transition risks include policy, and regulatory changes aimed at nature preservation that may render certain company assets, practices and products obsolete ("stranded"), market risks, technological advancements to mitigate environmental degradation, shifts in consumer preferences for sustainability, and reputational damage from poor environmental practices.[38]

Litigation risks, commonly considered a component of transition risks, are gaining growing importance as lawsuits and complaints related to nature degradation are rapidly rising, not only against states but also increasingly targeting companies and financial institutions. Penalties for such actions are now being enforced in courts.[39]

Systemic risks arise from the complex interdependencies between natural ecosystems and human activities, where the deterioration of biodiversity and ecosystem services can destabilize entire sectors and economies.

For companies, nature-related risks are neither distant nor negligible. These risks materialize in ways that significantly affect operations, demand, and financial performance. Numerous case studies provide real-life examples of companies suffering consequences from poor management of such risks, including halting production, uncontrolled raw material fluctuations, reputational damage, regulatory fines, litigations,[38] and reduced demand leading to material financial impacts.[40] [41] As the probability of extreme events increases, alongside rising scrutiny from regulators, local communities, and shifting consumer preferences toward low-impact products and materials, the tangible costs of mismanaging nature-related risks will become more widespread and expose companies to significant financial and operational risks.

Financial institutions and the financial system as a whole are exposed to comparable nature-related risks faced by the companies they finance and invest in. These risks primarily materialize indirectly, through their lending, equity, or insurance portfolios, via credit and default risk, market and liquidity risk, or insurance underwriting risk. These exposures can result in sudden and severe financial losses. To a more limited extent, financial institutions may also be impacted directly, through their own operations and strategic positioning, mainly by transition risks such as accusations of greenwashing, litigation for failure to comply with emerging regulations, or shifts in consumer preferences toward providers of sustainable financial solutions.

OPPORTUNITIES

Nonetheless, the nature loss crisis does not only threaten business models and the economy; it also presents numerous opportunities. Companies can gain competitive advantages, enhance supply chain efficiencies, reduce costs related to scarce resources, and innovate through technological substitution. Opportunities for innovation, cost-efficiency improvements, and gaining a competitive edge exist across virtually all business sectors. However, the principal opportunities commonly identified include the following:

Differentiating products: Offering nature-positive goods can attract premium pricing and loyal customers.

Leading new markets: Entering early into sectors such as ecological restoration or biodiversity credits secures market share.

Cutting costs and improved efficiency: Improving resource efficiency through circular practices reduces operating expenses.

Boosting resilience: Mitigating nature-related risks strengthens supply chains and can lower capital costs.

Reduced cost of capital: By demonstrating leadership in sustainability, the company can access favourable sustainable investments, loans and green financing at lower rates, thanks to a reduced exposure to nature-related risks.

Building brand trust: Proactive nature stewardship enhances brand reputation and customer loyalty as well as reinforcing talent acquisition and employee retention.

Gaining regulatory advantage: Anticipating environmental regulations adoption allows companies to adapt smoothly and outperform slower competitors, while reducing exposure to litigation and transition risks.

Therefore, companies should not only avoid causing harm but also offer products and services generating positive impacts by respecting planetary boundaries and creating added value for their business, nature, and people. Further examples can be found in Ethos' Positive Impact Methodology, published in 2022.

5. Regulatory frameworks

Nature-related regulatory frameworks are legally binding requirements that are designed to increase transparency, encourage investment in sustainable activities and promote responsible business practices. In recent years, an increasing number of countries and regions have introduced mandatory climate and environmental disclosure requirements for companies and financial institutions.[42]

5.1 EUROPEAN UNION

The European Union (EU) is at the forefront with the Corporate Sustainability Reporting Directive (CSRD)[43] and the Sustainable Finance Disclosure Regulation (SFDR),[44] which impose more specific nature-related disclosure requirements, including biodiversity, for companies and financial institutions, respectively.

CSRD

The CSRD entered into force in January 2023 and encourages all large EU companies, all listed EU companies (except listed micro-enterprises) and non-EU companies generating over EUR 150 million on the EU market to align their business models and strategies with the transition to a sustainable economy and the goals of the Paris Agreement, including limiting global warming to 1.5 °C and achieving climate neutrality by 2050, as set out in the European Climate Law.[45] For this, companies in scope must disclose information on risks and opportunities arising from social and environmental issues, and on the impact of their activities on people and the environment. The reports must align with the European Sustainability Reporting Standards (ESRS)[46] from the 2024 financial year onwards.

Nature-related disclosures are covered by ESRS E4: «Biodiversity and Ecosystems» aligning with the goals to restore biodiversity by 2030 set at the 15th Conference of the Parties (COP15) under the CBD.[47]

SFDR

The SFDR's first provisions took effect in March 2021, requiring Financial Market Participants (FMPs) and Financial Advisers (FAs) with more than 500 and three employees, respectively, to disclose Environmental, Social and Governance (ESG) information on investment decisions and financial products, including an annual Principal Adverse Impact (PAI) statement due by 30 June 2023. The PAI statement includes 18 mandatory indicators, on the potential adverse impact of a fund or organisation on ESG factors.

Nature-related disclosures are covered under PAI7: «Activities negatively affecting biodiversity-sensitive areas».

EU TAXONOMY

Financial market participants and EU Member States meeting specific criteria[48] fall under the EU Taxonomy requirements to identify their taxonomy-eligible economic activities and report their share of taxonomy-aligned turnover, capital expenditure (CapEx), and operating expenditure (OpEx).

EUDR

The EU Deforestation Regulation (EUDR)[49] complements the sustainable finance framework by addressing deforestation risks in supply chains. It also informs reporting under the CSRD and SFDR. Companies, operators, and traders involved in the supply chain of commodities linked to deforestation or their derived products must demonstrate that their goods do not originate from recently deforested areas or contribute to forest degradation. The regulation entered into force in June 2023, but its application has been postponed until the end of 2025.

5.2 SWITZERLAND

Currently, the Swiss Code of Obligations (CO) (Art. 964a et seq.) requires large companies to publish annual sustainability reports covering ESG matters, including material environmental considerations. While there is no explicit obligation to report specifically on biodiversity or nature, Switzerland is nonetheless reviewing potential amendments and regulations to introduce more targeted requirements regarding companies' interactions with nature and biodiversity.

Furthermore, the Swiss Financial Market Supervisory Authority (FINMA) Circular 2026/1 on nature-related financial risks sets out regulatory expectations for Swiss banks and insurers regarding the identification, management, and integration of climate- and nature-related financial risks into their risk frameworks. Entering into force on 1 January 2026, the circular initially applies only to climate-related risks, with a staggered implementation: larger institutions (categories 1 and 2) must comply by 2026, while smaller ones (categories 3 to 5) have until 2027. From 1 January 2028, the circular will fully apply to all nature-related financial risks.

5.3 FURTHER FRAMEWORKS

Other countries have also introduced specific mandatory climate and nature-related disclosure requirements. Some of those are evidenced in the table presented in the appendix (A. Regulatory Frameworks).

The International Sustainability Standards Board (ISSB), under the International Financial Reporting Standards (IFRS) Foundation, is currently exploring the development of standards to address sustainability-related risks and opportunities beyond climate, with a particular focus on nature, biodiversity, and ecosystem services.

6. Ethos' expectations and engagement with companies

This section outlines Ethos' recommendations, as well as general and specific expectations, for companies to develop credible nature-related strategies addressing specific issues such as deforestation, plastic pollution, and water management. Additionally, it describes how Ethos assesses companies' efforts regarding nature-related concerns and defines its approach for constructive engagement on these issues.

Furthermore, to provide clearer insights into sectors facing significant nature-related risks, sector-specific expectations are provided in the following appendices:

- Food and agriculture
- Chemicals
- Pharmaceuticals

These sector-specific expectations detail each sector's impacts and dependencies, associated risks and opportunities, and frameworks for companies to effectively assess, plan, act, and report on their double materiality concerning nature.

6.1 GENERAL EXPECTATIONS

Ethos expects all companies to assess their impact, dependencies, risks and opportunities in relation to nature in their **own operations** and entire **value chains**.

1. Adopt clear and ambitious nature-related policies aligned with the "Do No Significant Harm" (DNSH) principle.
2. Adhere to and follow the TNFD LEAP approach.
3. Assess and monitor impact and dependencies.
4. Assess and monitor risks and opportunities.
5. Define a nature transition plan with ambitious science-based targets.
6. Report relevant and audited indicators according to the TNFD and further issue-specific frameworks.
7. Involve stakeholders and advocate for responsible regulation.

POLICIES & DO NO SIGNIFICANT HARM

Companies should adopt clear and ambitious nature-related policies that seek to significantly reduce their environmental footprint across the entire value chain. These policies should be binding and aligned with the goals of the Kunming-Montreal Global Biodiversity Framework (GBF), which aims to halt and reverse biodiversity loss by 2030 and to restore nature by 2050.

Companies should adopt the «Do No Significant Harm» principle, which requires them to ensure that their activities neither significantly degrade natural ecosystems nor threaten biodiversity. They must avoid any practices that are harmful or controversial in relation to nature and proactively assess and mitigate nature-related risks before initiating any new project, investment, or product launch. Where avoidance is not possible, companies must apply the mitigation hierarchy: first avoid harm to nature, then minimize unavoidable impacts, and finally restore or regenerate ecosystems affected by business activities.

Companies should also adopt binding corporate policies that prohibit harmful practices (e.g. zero-deforestation) and commitments to not operate in nor source from key biodiversity areas (e.g. Amazon, Borneo, Congo Basin, etc.) are essential.

TNFD LEAP APPROACH

Companies should adhere to the LEAP approach developed by the Taskforce on Nature-related Financial Disclosures (TNFD) as follows:

- **Locate** the company's interactions with nature.
- **Evaluate** and understand its impacts and dependencies on nature.
- **Assess** the risks and opportunities associated with the nature crisis for its business.
- **Prepare** to react to nature-related risks and opportunities and to report on material nature-related issues.[50]

IMPACT AND DEPENDENCIES

As a first and early step of the double materiality analysis, all companies must identify their impact and dependencies on nature using appropriate tools for their activities. The ENCORE tool can serve as a starting point for companies to gain a comprehensive understanding of how their activities directly impact nature (pressures) and depend on ecosystem services.

The Natural Capital Protocol also plays a crucial role in helping companies identify, measure, and assess the value of their direct and indirect impacts and dependencies on natural capital.

A more detailed assessment of the entire value chain (upstream and downstream) can be conducted using tools like GLOBIO, Exiobase and BioScope. Further life cycle impact assessment (LCIA) tools and methodologies, such as LC–IMPACT, ReCiPe, and IMPACT World+ can prove useful for evaluating the environmental impacts of a product, process, or service across its entire life cycle. In addition, proprietary and footprinting tools can significantly deepen the understanding of organisations' specific, local, and wide-ranging impacts and dependencies on nature.

The social impacts on Indigenous Peoples and local communities should be assessed and minimised. Companies are encouraged to conduct a Social Impact Assessment (SIA) and to effectively involve these communities, alongside considerations of nature, in their decision-making processes.

RISKS AND OPPORTUNITIES

Companies should identify where in their operations and value chain they are most exposed to nature-related risks and opportunities, including both physical locations (e.g. production sites, raw material sourcing areas) and economic activities. These risks should be clearly identified and geographically mapped using tools such as ENCORE, the WWF Risk Filter Suite and IBAT, to inform mitigation strategies, prioritize actions, and guide decision-making. This assessment should be regularly updated to reflect evolving environmental, regulatory, and business contexts.

NATURE TRANSITION PLAN, DATA & TARGETS

Ethos encourages all companies to start setting ambitious transition plans and targets for nature irrespective of the current availability or quality of data. While data collection, assessment, and reporting should be continuously improved over time, the early adoption of science-based targets for nature, aligned with the Science Based Targets Network (SBTN), represents a forward-looking approach.

Initiating nature transition plans early, using the SBTN process, enables a clearer understanding of a company's relationship with nature and clarifies which data to collect, how to analyse it, and how to report it. It also helps companies quickly identify risks and vulnerabilities, gain a competitive edge in managing nature-related threats, and strengthen their value-chain sourcing against both transition and physical risks. Ethos encourages companies to follow the guidance on science-based targets for nature and on scenario analysis developed by TNFD and SBTN to help them in the establishment of their nature transition plans.

REPORTING

In addition to strictly complying with the regulatory frameworks cited in chapter 5 («Regulatory Frameworks»), all companies should begin reporting relevant and audited indicators assessing their impacts, dependencies, risks, and opportunities linked to the twin crises of nature loss and climate change. The TNFD provides the foundational framework for these disclosures, and emerging sector-specific guidance should be leveraged to focus on the most material aspects for each sector or company (e.g. see Sector-specific expectations).

Furthermore, the Global Reporting Initiative's biodiversity standard (GRI 101: Biodiversity 2024) should be prioritized for companies' impact disclosures as it becomes the biodiversity standard for biodiversity impact reporting by companies publishing sustainability or ESG reports.

Companies with material impacts on, or dependencies on, forest and water resources should also participate in CDP's relevant questionnaires and reporting (CDP Water and CDP Forests).

Overall, seven leading frameworks and standards may be used by companies for nature-related assessment and disclosures. The CDP, ESRS, GRI, ISSB, Natural Capital Protocol, SBTN, and TNFD should be strategically leveraged based on organisation-specific impacts, dependencies, and the geographic locations of their activities. The Accountability for Nature report, published by the United Nations Environment Programme (UNEP), the World Wildlife Fund (WWF), and the Global Environment Facility (GEF), presents an in-depth comparative analysis of these frameworks. It highlights key trends, similarities, differences, and areas of emerging alignment across these approaches, helping companies better understand which combination of frameworks is most suited to their activities.

ENGAGE STAKEHOLDERS AND ADVOCATE FOR RESPONSIBLE REGULATION

Companies should engage with suppliers that they find to be non-compliant with their DNSH policies, whether identified through the monitoring and verification system or reported via the grievance mechanism. Unsuccessful engagement should lead to the termination of the business relationship between the parties.

Companies should also embrace multi-stakeholder initiatives to advocate for responsible regulation (e.g. Global Treaty on Plastic) and aim to have a positive impact on their industry associations. Any lobbying action targeted at dismantling or weakening regulation aimed at protecting nature and ecosystems must be avoided.

Additionally, companies are expected to engage with Indigenous Peoples and local communities. Involving these stakeholders in decision-making is essential, as their participation and knowledge are critical for effective conservation and sustainable resource management. Avoiding environmental and social harm will also protect companies against costly conflicts, including litigation, project delays, and reputational damage. Companies are encouraged to follow the TNFD Guidance on engagement with Indigenous Peoples, Local Communities and affected stakeholders.

6.2 ETHOS' ASSESSMENT

The first, and minimum, requirement for a company to manage its impacts and dependencies on nature and fulfil investors' expectations is to avoid any serious negative impact activity or behaviour. In this regard, Ethos assesses companies in its research universe for any controversy they may be facing.

Ethos' research process consists of two main steps: first, the potential new controversy is classified. Second, it is assessed based on various factors and parameters such as the number of cases, their impact and the company's reaction.

Regarding the first step of classification, some of the potential controversies may be directly, or indirectly, linked to nature-related issues.

For further details on these steps, please refer to the publicly available ESG rating methodology on Ethos' website.

6.3 ETHOS' ENGAGEMENT ACTIVITIES

Ethos engages directly or through collaborative engagement campaigns with companies whose operations or value chains have significant negative impacts on nature. The aims of nature-related engagements are that the companies determine the sources and locations of their negative impacts on nature, assess the associated risks and opportunities and set concrete actions and transition plans to halt and reverse their impacts on nature. Moreover, the final objective of such dialogue on nature is always to sustainably increase the value of the company for its shareholders and its stakeholders (customers, employees, suppliers, civil society).

On nature in general, Ethos supports several international collaborative engagement campaigns such as Nature Action 100 (NA 100) which is supported by more than 230 institutional investors across the globe and targeting 100 companies with high negative impacts on nature.[51] Ethos fully supports its aim to engage with companies and policymakers to reverse nature and biodiversity loss and have positive impact on long-term value of companies by calling for action on six clear expectations: Ambition, Assessment, Targets, Implementation, Governance and Engagement (see Appendix B). The Nature Action 100 Company Benchmark measures the initiative's progress towards these expectations.

Ethos also supports and uses the Nature Benchmark of the World Benchmarking Alliance (WBA), a valuable tool to track and measure companies' negative impacts on, and positive contributions to, nature. It targets more than 800 companies in 20 sectors.[52]

6.4 ISSUE-SPECIFIC EXPECTATIONS

Ethos has begun setting its own expectations for direct engagement campaigns on specific nature-related issues or fully supporting the expectations of collaborative campaigns addressing these topics.

These topics are addressed through Ethos' controversies and engagement activities with Swiss and international companies. While not exhaustive, the current expectations focus on issues such as deforestation, plastic pollution, water pollution, PFAS contamination, and the misuse of pesticides. These issues are discussed in more detail in this section.

DEFORESTATION

Deforestation refers to the conversion of forests to other land use including agricultural croplands, pasture, mining, and buildings.

The United Nations Food and Agriculture Organization (FAO) estimates that 10 million hectares of forest are cut down each year.[53] However, deforestation does not occur similarly across all regions. Most of the forest loss currently takes place in Latin America, sub-Saharan Africa, southeast Asia and Oceania. The Amazon, Sumatra, Borneo and the Congo Basin have been particularly affected by the loss of primary tropical forest.[54] In response to the growing impact of deforestation on nature, Ethos analysed its main drivers and consequences in a 2021 Engagement Paper, which also outlines its expectations for companies to eliminate their negative impact on forests. The document is available here: Ethos Engagement Paper – Deforestation.

In 2021, Ethos launched a **direct engagement** campaign to urge several companies in Europe, in the US and in Brazil across the beef and soy value chains to implement effective practices to prevent deforestation.

Collaborative engagement campaigns on deforestation supported by Ethos:

Spring, coordinated by the Principles for Responsible Investment (PRI), is a campaign to maximise investors' contribution to the global goal of halting and reversing biodiversity loss by 2030, with a focus on deforestation.

Investor Policy Dialogue on Deforestation (IPDD), coordinated by the Tropical Forest Alliance, the WEF and supported by the PRI, is an initiative to engage with public agencies and industry associations in selected countries (Brazil and Indonesia) on the issue of deforestation.

SECTORS PARTICULARLY AT RISK	THRESHOLD FOR CONTROVERSIES	ENGAGEMENT EXPECTATIONS	AVAILABLE TOOLS
• Agriculture • Food & beverages • Automobile • Textile • Chemical • Personal care • Retailers • Construction • Pharmaceutical	• Forest 500 policy score below 30/100 • Qualitative exposure assessment	• Establish a «non-deforestation» policy • Commit to full traceability in the supply chain • Adopt a monitoring and verification system including a grievance mechanism • Engage with stakeholders and advocate to stop degrading forests • Support voluntary certification • Report on the implementation of the policy and traceability commitment	ENCORE IBAT GLOBIO WWF-Wood Risk Forest500 ; Global Forest Watch Science Based Targets Network

PLASTIC POLLUTION

Plastic pollution refers to the accumulation of synthetic plastic products in the environment to the extent that they cause adverse effects for wildlife and their habitats, as well as for human populations.

Plastic production has sharply increased over the last 70 years and more than doubled in the last two decades because of the widespread use of plastics in our life. However, due to mismanagement of plastic waste, it becomes an environmental pollutant. Approximately 0.5 % of plastic waste ends up in the ocean,[55] and only 9 % of the amount of plastic ever produced has been recycled.[56] The most affected regions by plastic pollution are Asia and Africa whereas the plastic waste generation is mostly done in the USA, China and Europe.

Ethos launched in 2023 a **direct engagement** campaign to urge several consumer goods companies to address plastic waste and support the building of a circular economy.

Collaborative engagement campaign supported by Ethos:

- Petrochemical Companies Investor Statement, coordinated by Planet Tracker, is an investor statement calling on petrochemical companies to reduce their dependence on fossil fuels, eliminate hazardous chemicals from their products, and stop opposing the United Nations Plastics Treaty,[57] which aims to end plastic pollution.

SECTORS PARTICULARLY AT RISK	THRESHOLD FOR CONTROVERSIES	ENGAGEMENT EXPECTATIONS	AVAILABLE TOOLS
• Packaging • Food & beverages • Personal care • Chemical • Textile • Automobile • Household & retail	• More than 1.5 % of average pollution (2018-2023)[58] • Average in/out ratio higher than 150 (2019-2022)[59]	• Adopt a «reduce, reuse, replace then recycle» strategy for plastics packaging • Reduce the volume of plastic packaging used • Increase the proportion of recycled materials in plastic packaging • Implement measures to innovate for circularity through investment in innovative materials and packaging design or reuse and recycling technology • Engage with stakeholders and advocate for regulations that facilitate circularity minimise the negative impacts of plastic use on human health • Improve disclosure and transparency on the implementation of the «reduce, reuse, replace then recycle» strategy	ENCORE IBAT GLOBIO Science Based Targets Network

WATER

Water refers to a unique resource that underpins all drivers of economic growth: food production, energy generation, industrial activities, human health, and political stability. Yet water is chronically mismanaged in much of the world, and the accelerating impacts of climate change are making water supplies increasingly unstable.

Collaborative engagement campaign supported by Ethos:

- Valuing Water Finance Initiative, coordinated by Ceres, is an initiative to engage with major corporate water users and polluters to better value water, treat water as a financial risk, and drive the changes needed to protect water systems

SECTORS PARTICULARLY AT RISK	THRESHOLD FOR CONTROVERSIES	ENGAGEMENT EXPECTATIONS	AVAILABLE TOOLS
• Textile • Food & beverages • High-tech • Agriculture • Energy • Meat • Construction • Mining • Automobile	No specific threshold	• No negative impact on water availability in water-scarce areas across the value chain • No negative impact on water quality across the value chain • No contribution to the conversion of natural ecosystems critical to freshwater supplies and aquatic biodiversity, and full support to restoration of degraded habitats • Contribute to achieving universal and equitable access to water, sanitation and hygiene across the value chain • Engage with stakeholders and lobbying activities aligned with sustainable water resource management	ENCORE IBAT ; GLOBIO WWF Water Risk Filter Aqueduct ; Aqueduct Foods Freshwater Science Based Targets Ocean Science-Based Targets

PFAS

PFAS refer to per- and polyfluoroalkyl substances which is a family of thousands of synthetic organic chemicals. They are also known as "forever chemicals" as their chemical properties prevent them from breaking down in the environment, making them indestructible. Therefore, they are considered hazardous chemicals because of their dangerous effects on the environment and human health. They are used notably as coating for everyday products and are known to have polluted soil, groundwater and drinking water supplies and cause health damage to local populations.

Collaborative engagement campaign supported by Ethos:

- Investor Initiative on Hazardous Chemicals (IIHC), coordinated by ChemSec, is a campaign aiming to reduce the adverse impact of hazardous chemicals

SECTORS PARTICULARLY AT RISK	THRESHOLD FOR CONTROVERSIES	ENGAGEMENT EXPECTATIONS	AVAILABLE TOOLS
• Chemical	No specific threshold	• Increase transparency by disclosing production volume of products that are or contain PFAS • Complete phase out of all PFAS • Take responsibility for depollution in directly owned sites or surroundings • Develop safer alternatives to PFAS • Encourage emerging regulations	ENCORE IBAT ; GLOBIO Science Based Targets Network

MISUSE OF PESTICIDES

Pesticides are substances used to control pests and protect crops. They include herbicides, insecticides and fungicides. Pesticides are often produced synthetically and are designed to target specific organisms. While they can be important in protecting crops and increasing yields for farmers, they can have negative impacts and harm nature and biodiversity by contaminating soil and water, reducing pollinator populations, disrupting ecosystems and causing declines in non-target species. They can also be toxic to the farmers or workers who apply them, and to the general population through food, drinking water or contaminated air.[60]

As part of a **direct engagement** campaign launched in 2022, Ethos urges a European chemical company that has severely and repeatedly violated international norms on the use of pesticides to take appropriate corrective action to remedy the incident.

SECTORS PARTICULARLY AT RISK	THRESHOLD FOR CONTROVERSIES	ENGAGEMENT EXPECTATIONS	AVAILABLE TOOLS
• Agriculture • Food • Chemical	No specific threshold	• Remove Highly Hazardous Pesticides (HHPs), associated with an elevated risk of cancer, from the product range • Adopt a constructive approach when facing lawsuits and product use restrictions of HHPs • Remediate the negative impact of the incidents related to the use of HHPs • Improve management processes to prevent further incidents	ENCORE IBAT ; GLOBIO Science Based Targets Network

OTHER TOPICS

In addition to the topics mentioned above, all companies' negative impacts or controversies directly or indirectly linked to nature are assessed by Ethos. On a case-by-case basis, depending on various factors such as the severity of the impacts on nature, Ethos may engage the company specifically on these issues. Non-exhaustive examples of such controversies with negative impacts on nature are:

- **Infrastructure quality:** the collapse of dams, tailings dams, pipelines, power plants or other infrastructures causing severe environmental damage.
- **Pollution issues:** for instance, improper storage or disposal of tailings in mining operations may cause serious water and soil pollution. In addition, hazardous waste disposal bears significant environmental risks.
- **Oil spills:** specific oil spills with long-lasting environmental consequences on ecosystems if not managed appropriately.

SECTORS PARTICULARLY AT RISK	THRESHOLD FOR CONTROVERSIES	ENGAGEMENT EXPECTATIONS
• Industrials • Materials • Utilities • Energy	No specific threshold	Case-by-case engagement expectations

7. Conclusion

Nature is being extinguished at an accelerating rate, and biodiversity-based ecosystem services are collapsing. These trends pose a direct, systemic threat to economic stability and planetary habitability. Scientific consensus confirms that humankind has already crossed safe planetary boundaries. From both financial and societal perspectives, that reality demands urgent, decisive action.

Although frameworks and methodologies to manage nature-related risks are still developing, this cannot justify inaction. The severity, interconnectedness, and irreversibility of nature loss require companies and financial institutions to act now. All organisations are exposed, through operational and supply-chain disruptions, regulatory and litigation risks, shifting consumer preferences, and accelerating technological change. The evolving nature crisis will reshape markets, creating both risks and opportunities. Companies that identify and address their dependencies and impacts on the natural world will be better positioned to adapt and lead in this transformation.

Companies should immediately assess their nature-related impacts, dependencies, risks and opportunities, then develop ambitious and credible nature-transition plans, knowing that imperfect early plans are better than waiting for complete data or mature tools. Ethos urges companies to commit to aligning their business models with the planet's ecological boundaries.

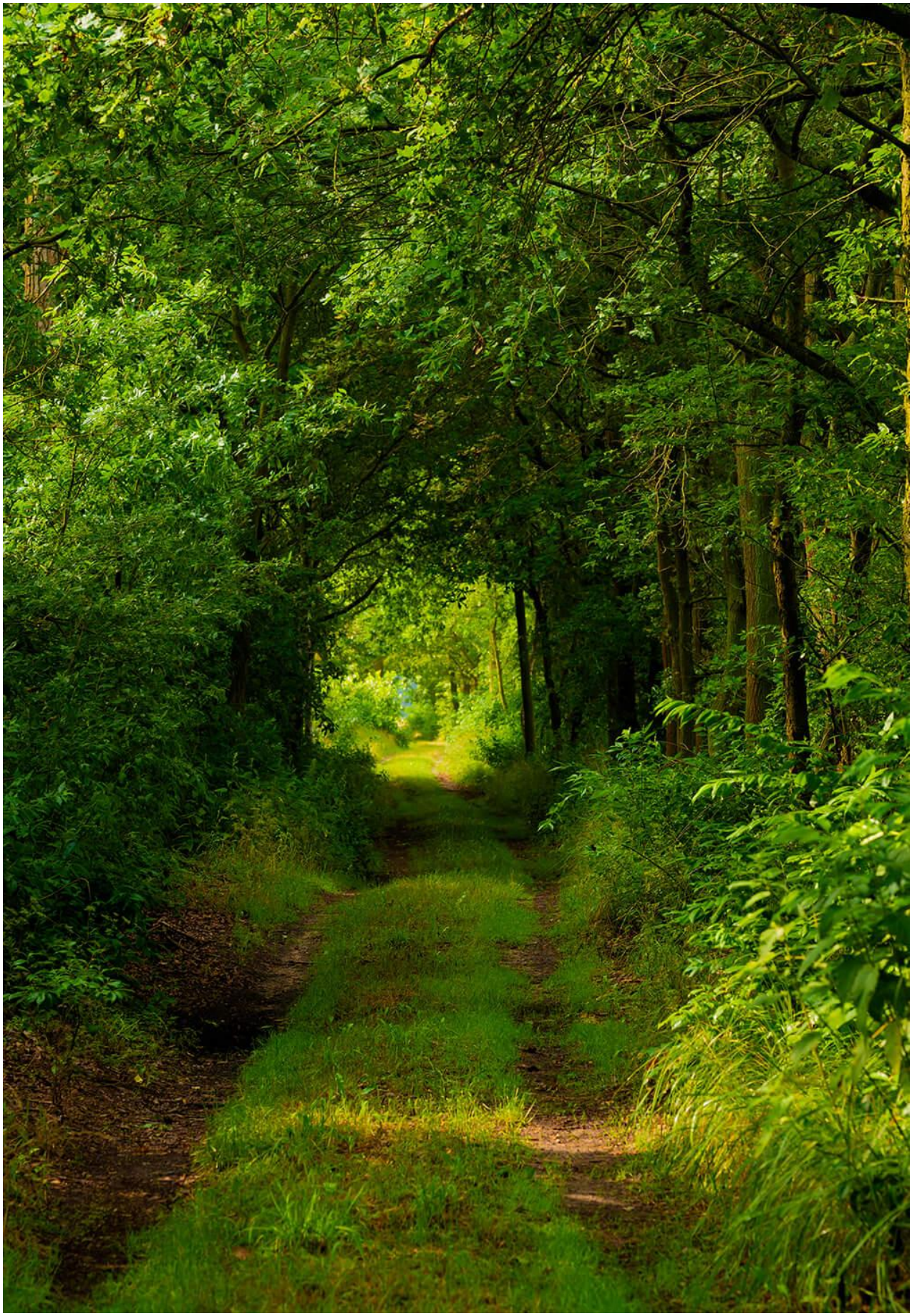
LIMITATIONS

This document represents Ethos's initial guidance to help companies begin assessing their relationships with nature using the tools currently available and within existing regulatory frameworks. It also clarifies Ethos's general and issue-specific expectations and describes its intended approach to shareholder dialogue on this matter. Because scientific understanding, data, and reporting standards remain in flux, the document cannot be exhaustive, final or tailored to every industry. Ethos aims to update this document and publish further sector-specific expectations as new data and best-practice guidance become available.

OUTLOOK

As regulatory regimes expand to require integrated reporting on climate, nature, and biodiversity, companies that postpone action will face intensified scrutiny from investors, non-governmental organisations (NGOs), and courts, which will place reputational, financial, and legal pressures across every aspect of their operations and access to capital. The physical and transition risks for companies related to nature loss are therefore expected to further materialize in the near future. If nature-related risks remain unaddressed, they could cascade across industries and pose systemic threats to the wider economy. By taking proactive measures now, companies can anticipate evolving requirements, safeguard natural capital, and strengthen long-term resilience.

TNFD is set to become the global reference for nature-related disclosures, and SBTN the leading framework for setting science-based nature targets. Early adopters will gain a competitive edge by gathering key data points and clarifying their double materiality with nature.



SECTOR-SPECIFIC EXPECTATIONS

1. Food and agriculture

The food and agriculture sector is identified as having the largest impact on nature and biodiversity loss, notably through nearly all key drivers: conversion of natural habitats into agricultural land, pollution, overexploitation of resources, and climate change (via GHG emissions). Despite causing significant harm to nature, the sector remains heavily reliant on the very ecosystem services it degrades, which serve as essential inputs for its productivity.

IMPACTS

The global food system, from agriculture and fishing through processing, packaging, distribution, and retail, is a primary driver of planetary pressure. Its most material impacts include: extensive habitat destruction from land conversion (e.g. deforestation) and destructive marine harvesting, causing biodiversity loss; severe water stress due to high consumption and pollution via nutrient runoff (causing eutrophication), pesticides, plastics, and effluent; major climate change contribution through GHG emissions across the chain (CO_2 from energy/land use, CH_4 from livestock/waste, N_2O from fertilizers, hydrofluorocarbons (HFC) refrigerant leakage); widespread soil degradation impairing ecosystem function; pervasive plastic pollution originating largely from packaging waste; direct agrochemical toxicity harming pollinators and non-target species; and significant food loss/waste, representing vast resource inefficiency. Furthermore, the global food system is responsible for 80 % of deforestation and 70 % of terrestrial biodiversity loss is associated with food production.[61] An estimated 25 % of all emerging infectious diseases in humans, and over 50 % of zoonotic ones, have been attributed to agricultural drivers since 1940.[62]

DEPENDENCIES

The food and agriculture sectors are fundamentally dependent on natural capital and ecosystem services for their very existence and productivity. Critical dependencies include: reliable access to sufficient quantities of clean freshwater for irrigation, livestock, and processing; healthy, fertile soils, whose structure, water retention, nutrient supply, and resilience rely heavily on soil biodiversity and natural nutrient cycling; crucial pollination services from insects, birds, and bats essential for the yield and quality of numerous crops; a diverse pool of genetic resources found in wild crop relatives and traditional landraces/breeds, vital for resilience, adaptation to changing conditions, and future

breeding; natural pest and disease regulation provided by balanced ecosystems and beneficial species, reducing crop losses; and overarching reliance on a relatively stable climate with predictable weather patterns (temperature, precipitation), which intact ecosystems help regulate.

RISKS

In agriculture, nature loss presents significant physical risks to crops and livestock, threatening the entire industry and the long-term viability of companies. Major risks include the decline of key pollinators, water shortages and quality issues, soil degradation and erosion, pest and disease imbalances (including invasive species), loss of plant genetic diversity, climate feedback loops leading to more frequent extreme weather, and the collapse of ecosystems turning fertile land into arid or desertified areas. Invasive species have created damages amounting to USD 509 billion to agriculture between 1970 and 2020. Also, decline in pollinators alone may put at risk more than USD 577 billion worth of global crop production annually.[63]

Additionally, growing litigation, regulatory, market, and reputational pressures represent major transition risks, particularly for companies with poor environmental practices. Emergence of policies such as the ones targeting deforestation and sustainable land use are increasingly restricting traditional commodity supply chains such as cattle and palm oil.

Ultimately, companies in highly impactful and nature-dependent sectors may face limited access to financing and insurance, as well as higher costs, as financial and insurance institutions increasingly integrate nature-related risks into their credit and underwriting decisions.

OPPORTUNITIES

Consumer demand is rapidly shifting toward more sustainable products, with reduced meat consumption, increased reliance on certifications, and growing backlash against plastic use. This changing landscape presents food and agriculture companies with strong opportunities to lead in sustainability and biodiversity-positive practices. By diversifying crops and creating new products, including alternative proteins, companies can access emerging markets and appeal to health-conscious and environmentally aware consumers.

Meeting recognized sustainability certifications helps build consumer trust and opens access to premium markets. At the same time, regenerative and biodiversity-friendly agriculture can reduce input costs, improve soil health, and strengthen resilience to pests, diseases, and climate change. Adopting biodiversity-positive approaches also attracts green investment, enhances brand reputation, and reduces regulatory and reputational risks.

ETHOS CONTROVERSIES ASSESSMENT

Ethos requires food and agriculture companies to tackle the impact and dependencies of their activities without delay and refrain from the following:

Deforestation: Adopt and implement a clear zero-deforestation policy across all operations and the entire value chain. Monitor and trace all suppliers in the whole supply chain. Implement controlling mechanisms and sourcing from certified suppliers.

Plastic pollution: Reduce volume of plastic use and development of circularity. Increase the proportion of recycled materials in plastic packaging. Disclose and monitor relevant metrics to manage and reduce plastic waste and pollution.

Misuse of pesticides: Ensure no use of dangerous chemicals in own activities and entire value chain. Implement strict and extensive cleaning of polluted sites. Adopt a constructive approach when faced with lawsuits.

Water: Avoid the contamination of freshwater resources due to the use of pesticides and plastic packaging. Ensure responsible use of water resources to avoid droughts and negative impact on production and local ecosystems.

Land conversion: Adopt and implement clear and binding zero-conversion policies across all operations and the entire value chain.

RECOMMENDED FRAMEWORKS

TOPIC	AUTHOR	LINK
Row crop commodities	WBCSD	Roadmap to Nature Positive: Foundations for the agri-food system – row crop commodities subsector
Coffee, Corn, Dairy, Rice, Soy	WBCSD	Roadmap to Nature Positive: Foundations for the agri-food system – landscape deep dives
Nature risks & agriculture	WWF	Bringing It Down To Earth: Nature Risk & Agriculture
Agricultural products, Meat, poultry & dairy, Processed foods, Food retailers & Distributors and restaurants.	TNFD	Additional sector guidance – Food and agriculture
Beverages	TNFD	Additional sector guidance – Beverages
Aquaculture	TNFD	Additional sector guidance – Aquaculture
Fishing	TNFD	Draft sector guidance – Fishing
Plastics in Agriculture	FAO	A Provisional Voluntary Code of Conduct on the Sustainable Use and Management of Plastics in Agriculture Assessment of agricultural plastics and their sustainability
Banking x Cattle, Soy & Palm	UNEP FI	Getting Started in the Agricultural, Forestry and Mining Sectors

2. Chemicals

The chemicals industry has likely already exceeded the planetary boundaries for chemical pollution,[64] [65] yet its overall impact has historically received limited attention in scientific research, where it was often examined only in connection with pesticide and herbicide use.[66] Beyond these substances, the sector extensively utilizes numerous hazardous chemicals whose detrimental effects on ecosystems frequently remain under-recognized. While approximately 95 %[67] of manufacturing industries depend heavily on chemical products, the chemicals sector itself critically relies on healthy ecosystems and freshwater resources for operational continuity and innovation. Thus, addressing the industry's environmental impacts is essential not only for natural capital conservation but also for the sector's long-term sustainability and risk management.

IMPACTS

The chemicals industry contributes to nature and biodiversity loss through chemical pollution, plastic pollution, GHG emissions, water use, and land conversion across its value chain. The industry's widespread release of hazardous substances, such as pesticides, fertilisers, heavy metals, volatile organic compounds, and industrial chemicals, alters species composition, contaminates soil and water, reduces genetic diversity, and ultimately harms human health. These pollutants are highly toxic, persistent (e.g. PFAS), and can impact even protected areas, weakening species' resilience and making them more susceptible to additional environmental stresses such as climate change. Frequent spikes in chemical concentrations from industrial discharge or agricultural runoff exacerbate these impacts by leaving ecosystems little time to recover, potentially causing irreversible declines. Likewise, the massive production and poor disposal of plastics lead to persistent pollution that disrupts ecosystems, harms wildlife and humans, and degrades both terrestrial and marine biodiversity. Therefore, addressing chemical pollution is essential and should be integrated with climate change and habitat loss strategies in global biodiversity conservation efforts.[68]

DEPENDENCIES

Chemicals companies are highly dependent on healthy ecosystems for essential resources such as freshwater (accounting for about 70 % of sector dependency), biomass, minerals, and energy. Many chemical processes like catalytic cracking and crystallization-cannot operate without reliable water supplies. Furthermore, the sector relies on biodiversity for the discovery and development of new products, particularly in pharmaceuticals, where natural compounds are critical for innovation.

RISKS

Nature-related risks for the chemicals industry include regulatory tightening, physical disruptions (e.g. water shortages, flooding), supply chain interruptions, and reputational damage. Failure to address environmental impacts can lead to operational, legal, and financial consequences, including asset impairment, increased costs, and reduced access to capital. Several cases of legal claims against companies from the chemicals sector have led to extreme financial penalties and reputational damages.[69] Chemicals companies linked to environmental scandals and pollution continue to face serious financial consequences decades later, with thousands of legal claims impacting their financial stability, reputation, share prices, and access to financing. As nature becomes a core strategic risk alongside climate change, companies not adapting face growing scrutiny from regulators, investors, and consumers.

OPPORTUNITIES

Adopting nature-positive strategies opens pathways for the chemicals sector to innovate with safer, more sustainable products, support circular economy models, and build resilient supply chains. By investing in ecological data, green chemistry, and nature-based solutions, companies can reduce risks, enhance brand value, and meet emerging regulatory, and stakeholder demands. Leadership in biodiversity stewardship positions the sector to capture new markets and financing opportunities while contributing to global goals of halting and reversing nature loss by 2030

ETHOS CONTROVERSIES ASSESSMENT

Ethos requires companies involved with chemicals production and use to tackle the impact and dependencies of their activities without delay and refrain from the following:

Misuse of pesticides & hazardous chemicals: Adopt a no-use and no-production of highly hazardous chemicals. Adopt a constructive approach when facing lawsuits and product use restrictions. Remediate the negative impact linked to hazardous chemicals produced and used. Do not sell prohibited products to other less-regulated markets.

PFAS pollution: Ensure full PFAS phase-out. Enhance transparency by disclosing production volumes. Develop safer alternatives. Take responsibility for site remediation. Support emerging regulations actively.

Plastic pollution: Invest in innovative materials and recycling technology. Stop opposing the Global treaty on Plastics, which aims to end plastic pollution.

Water: Disclose transparently the volume of freshwater used for the operations and the strategy for sourcing. Implement water management systems to reduce consumption and increase recycling. Avoid the contamination of freshwater with toxic substances.

Land conversion: Adopt a zero-conversion policy for all operations and upstream suppliers in or near Key Biodiversity Areas and other high-value ecosystems. Screen new sites using spatial-risk tools (e.g. IBAT) and require suppliers to do likewise.

RECOMMENDED FRAMEWORKS

TOPIC	AUTHOR	LINK
Chemicals Guidance	TNFD	Additional sector guidance – Chemicals
Roadmap Chemicals	WBCSD	Towards Planet Positive Chemicals: A Chemical Transformation Roadmap
Nature Positive	WEF	Nature Positive: Role of the Chemical Sector
ChemScore Ranking	ChemSec	ChemScore 2024
Global Framework on Chemicals	UNEP	Global Framework on Chemicals

3. Pharmaceuticals

The pharmaceutical sector is both heavily reliant on biodiversity and a contributor to environmental degradation across its value chain. While it depends on natural compounds and ecosystem services for drug discovery and production, it also impacts the environment through intensive resource use, pollution, and habitat disruption.

IMPACTS

From sourcing botanical and mineral ingredients to the disposal of unused medicines, pharmaceutical activities leave a considerable ecological footprint. Raw material extraction often involves clearing biodiverse ecosystems for the cultivation of bio-based feedstocks, such as medicinal plants, contributing directly to habitat destruction and species loss. Manufacturing processes are both energy- and water-intensive, with high GHG emissions and reliance on fossil-based energy inputs, especially in the synthesis of active pharmaceutical ingredients (APIs). These APIs, including antibiotics, analgesics, and hormones, often escape into water bodies through effluents, leading to significant aquatic toxicity and accelerating antimicrobial resistance (AMR).[70] Furthermore, the widespread use of single-use plastics in packaging and sterile operations results in long-lasting microplastic pollution. The sector also generates substantial chemical waste, particularly solvents and reagents, which can accumulate in soil and water systems if not properly managed.

DEPENDENCIES

The pharmaceutical sector is deeply dependent on nature and biodiversity for its core functions: it relies on genetic resources for drug discovery, bio-based raw materials for production (e.g. plant extracts, microbial enzymes, horseshoe crab blood), and essential ecosystem services such as freshwater provision and climate regulation.[71] Drug discovery and production lean heavily on nature's services: diverse genes and organisms that supply novel compounds, reliable flows of clean water for solvents and cooling, and stable climates that keep supply chains running. Without healthy ecosystems, the pipeline of new therapeutics and the basic utilities that support sterile manufacturing are at risk.[72]

RISKS

Loss of biodiversity and degradation of ecosystem services pose significant risks to the pharmaceutical industry. Scarcity or disruption in access to raw natural materials, as well as a reduction in plant quality, can delay drug development and increase production costs.[73] Water scarcity, particularly in countries where pharmaceutical manufacturing is concentrated, such as India and China, can threaten plant operations and regulatory compliance.

Increasing public awareness of pharmaceutical pollutants and their ecological impacts has led to tighter discharge regulations, stricter environmental standards, and growing demands for transparency. Companies that fail to manage their ecological footprint face reputational damage, litigation, and financial penalties. Additionally, non-compliance with emerging disclosure standards may result in reduced investor confidence and capital access. As ecosystems continue to degrade, the ability of the sector to maintain consistent production and innovate effectively will come under pressure.

OPPORTUNITIES

Despite the challenges, the pharmaceutical sector has strong incentives to adopt nature-positive practices. Green chemistry can reduce hazardous waste and improve energy and material efficiency.[74] Developing precision ecotoxicology methodologies may significantly help reduce the environmental impact of pharmaceutical products.[75] Using synthetic or lab-grown alternatives such as recombinant lysate instead of horseshoe crab blood may ease pressure on vulnerable species. Habitat restoration near manufacturing sites can mitigate impacts and support local ecosystems. Finally, integrating nature-related criteria into procurement and supply chains may help reduce risks and meet growing stakeholder expectations, offering a competitive advantage.

ETHOS CONTROVERSIES ASSESSMENT

Ethos requires pharmaceutical and biotechnology companies to tackle the impact and dependencies of their activities without delay and refrain from the following:

Deforestation: Adopt and implement clear zero-deforestation policies across all operations and the entire value chain. Monitor and trace all suppliers in the whole supply chain. Implement controlling mechanisms and sourcing from certified suppliers.

Misuse of chemicals: Adopt a strict no-use of highly hazardous chemicals policy. Publish the list of all hazardous chemicals used in the whole supply chain and a strategy to phase out these chemicals. Avoid, reduce and phase out the use of harmful pharmaceuticals residues (e.g. API, microplastics). Minimize antibiotic emissions from manufacturing and enforce responsible use and supply chain practices to reduce AMR.

Plastic pollution: Invest in innovative materials and recycling technology. Reduce use of plastics and avoid microplastic pollution. Stop opposing the Global treaty on Plastics, which aims to end plastic pollution.

Water: Avoid the contamination of freshwater with pharmaceutical residues. Implement water conservation strategies. Improve wastewater treatment.

Waste management: Adopt a credible strategy for managing pollutant and hazardous waste and improving recycling systems.

RECOMMENDED FRAMEWORKS

TOPIC	AUTHOR	LINK
Sector Guidance for Biotechnology and Pharmaceuticals	TNFD	Additional sector guidance – Biotechnology and pharmaceuticals
Roadmap Pharma	WBCSD	Roadmaps to Nature Positive: Foundations for the pharmaceutical sector
Actions for nature-positive	PwC UK, Business for Nature, WBCSD	Pharmaceutical sector: Priority actions towards a nature-positive future
Antimicrobial resistance	AMR Industry Alliance	AMR Industry Alliance
Responsible value chains in the Pharmaceutical Industry	PSCI	Pharmaceutical Supply Chain Initiative (PSCI)

APPENDICES

A. REGULATORY FRAMEWORKS

TABLE 1: SUMMARY OF MAJOR REGULATORY FRAMEWORKS BASED ON GEOGRAPHIC LOCATION OTHER THAN EU[1]

	REGULATORY FRAMEWORKS AND AUDIENCE	REQUIREMENTS	AIMS
FRANCE	Article 29 of the Energy-Climate Law (LEC 29).[76] [77] All French management companies, including French subsidiaries of foreign management companies, with more than EUR 500 million in assets under management.	Companies in scope must disclose information about the effects of their portfolios on climate change and biodiversity loss, as well as the vulnerability of their portfolios to these two issues (double materiality), and clarify the measures implemented to consider these risks in the investment strategy. An Article 29 LEC report must be published on an annual basis and submitted by 30 June, following templates provided by the AMF (Autorité des Marchés Financiers), from the 2021 financial year onwards. The LEC 29 entered into force in May 2021.	Intended to be more ambitious than the SFDR, focusing on climate and biodiversity issues.
INDIA	Business Responsibility and Sustainability Reporting (BRSR).[78] Corporates and Financial Institutions (FIs) in the top 1'000 listed entities in India by market capitalisation.	Companies in scope are required to publish comprehensive information on their ESG performance, in line with the 9 principles of the National Guidelines on Responsible Business Conduct (NGBRC)[79]. Nature-related disclosures are covered through question number 5, "Impact on biodiversity", of NGBRC's Principle 6. Reporting is required annually as part of the company's report from the 2022-2023 financial year onwards. BRSR entered into force in May 2021.	Provide standardized, quantitative ESG disclosures, enhancing comparability across companies, sectors, and time. Help investors to make more informed decisions and encourage companies to engage more effectively with stakeholders by focusing not only on financial but also on social and environmental impacts.
INDONESIA	Regulation on the Application of Sustainable Finance (No. 51/POJK. 03/2017).[80] Financial Services Institutions (FSIs), Issuers and Publicly Listed Companies under Indonesian jurisdiction or listed on Indonesian stock exchanges.	Companies in scope are required to publish a sustainable finance action plan every five years and a sustainability report every year by 30 April. This includes nature-related disclosure requirements such as impacts on biodiversity and biodiversity conservation. Regulation 51/POJK. 03/2017 entered into force in July 2017.	Promote sustainability disclosure in Indonesia, highlighting the importance of ESG standards and encouraging transparency.

[1] Note that this table represents the regulatory framework at a given point in time, but this landscape is rapidly evolving.

B. NATURE ACTION 100 EXPECTATIONS[2]

ACTIONS	DEFINITIONS AND INDICATORS	NA 100 EXPECTATIONS
AMBITION	"Publicly commit to minimize contributions to key drivers of nature loss and to conserve and restore ecosystems at the operational level and throughout the value chain by 2030." (1.1)	Companies are expected to make a clear statement of their ambition regarding nature-related issues that meets all of the NA100 definition and scope of ambition and integrate this commitment into their sustainability strategy.
ASSESSMENT	"Assess and publicly disclose nature-related dependencies, impacts, risks, and opportunities at the operational level and throughout the value chain." (2.1 – 2.3)	Companies are expected to assess and publicly report on their nature-related dependencies, impacts, risks and opportunities, both at the operational level and throughout their value chain, in line with the NA100 recommendations.
TARGETS	"Set time-bound, context-specific, science-based targets informed by risk assessments on nature-related dependencies, impacts, risks, and opportunities. Disclose annual progress against targets." (3.1 -3.3)	Companies are expected to set comprehensive and robust quantitative targets on nature-related issues in line with the NA100 definition of target setting. Quantitative targets must include detailed information on the base year, target year and targeted percentage of advancement, which advancement should be measurable and supported by Key Performance Indicators (KPIs) reported over a period of at least three years.
IMPLEMENTATION	"Develop a company-wide plan on how to achieve targets. The design and implementation of the plan should prioritize rights-based approaches and be developed in collaboration with Indigenous Peoples and local communities when they are affected. Disclose annual progress against the plan." (4.1 – 4.3)	Companies are expected to report a list of measures they intend to carry out, or which they are currently working on, to reach their nature-related targets, while respecting the rights of Indigenous Peoples and local communities. Such measures should be integrated into a publicly available pathway or roadmap supported by quantitative figures, which allow assessment of how the companies will reach their nature-related targets.
GOVERNANCE	"Establish Board oversight and disclose management's role in assessing and managing nature-related dependencies, impacts, risks, and opportunities." (5.1 – 5.3)	Companies are expected to demonstrate that the highest governance body is given control and decision-making authority over its nature-related issues in line with NA100 recommendations (i.e. board expertise on nature-related issues and implications for Indigenous Peoples and local communities, remuneration linked to nature performance).
ENGAGEMENT	"Engage with external parties including actors throughout the value chain, trade associations, policy makers, and other stakeholders to create an enabling environment for implementing the plan and achieving targets." (6.1 – 6.4)	Companies are expected to engage with their stakeholders, have responsible policies and grievance/redress mechanisms for individuals and communities regarding nature-related issues, in line with NA100 recommendations.

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C. ACRONYMS

AMF: Autorité des Marchés Financiers

AMR: Antimicrobial Resistance

API: Active Pharmaceutical Ingredient

BRSR: Business Responsibility and Sustainability Reporting

CapEx: Capital expenditure

CBD: Convention on Biological Diversity

CO: Swiss Code of Obligations

COP: Conference of the Parties

CSRD: Corporate Sustainability Reporting Directive

DNSH : Do No Significant Harm

ENCORE: Exploring Natural Capital Opportunities, Risks and Exposure

ESG: Environmental, Social and Governance

ESRS: European Sustainability Reporting Standards

EUDR: EU Deforestation Regulation

FA: Financial Advisers

FAO: United Nations Food and Agriculture Organization

FINMA: Swiss Financial Market Supervisory Authority

FMP: Financial Market Participants

FSI: Financial Services Institutions

GBF: Global Biodiversity Framework

GEF: Global Environment Facility

GHG: Greenhouse gas

GLOBIO: Global biodiversity model for policy support

GRI: Global Reporting Initiative

HFC: Hydrofluorocarbon

HHP: Highly Hazardous Pesticide

IBAT: Integrated Biodiversity Assessment Tool

IFRS: International Financial Reporting Standards

IIHC: Investor Initiative on Hazardous Chemicals

IPBES: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

IPDD: Investor Policy Dialogue on Deforestation

ISSB: International Sustainability Standards Board

IUCN: International Union for Conservation of Nature

KPIs: Key Performance Indicators

LCIA : Life Cycle Impact Assessment

LEAP: Locate, Evaluate, Approach, Prepare

LEC: Energy-Climate Law

NA100: Nature Action 100

NGBRC: National Guidelines on Responsible Business Conduct

NGFS: Network for Greening the Financial System

NGO: Non-governmental organization

OpEx: Operating expenditure

PAI: Principal Adverse Impact

PFAS: Per- and polyfluoroalkyl substances

PRI: Principles for Responsible Investment

SBTN: Science-Based Targets Network

SFDR: Sustainable Finance Disclosure Regulation

SIA: Social Impact Assessment

TNFD: Task Force on Nature-related Financial Disclosures

UNEP: United Nations Environment Programme

UNEP-FI: United Nations Environment Programme Finance Initiative

WBA: World Benchmarking Alliance

WBCSD: World Business Council for Sustainable Development

WEF: World Economic Forum

WWF: World Wildlife Fund

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