



PATHS TO BIODIVERSITY FINANCE:

A stocktaking analysis

PATHS TO BIODIVERSITY FINANCE: A STOCKTAKING ANALYSIS

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LIST OF ACRONYMS

AFOLU	Agriculture, forestry and land use
B@B	Business@Biodiversity Platform
CBD	Convention on Biological Diversity
CBI	Climate Bond Initiative
CDP	Carbon Disclosure Project
COP	Conference of the Parties
DNSH	Do no significant harm
ESG	Environmental, social and governance
ESRS	European Sustainability Reporting Standards
EU	European Union
EuGB	European Green Bonds
FDI	Foreign direct investment
FfB	Finance for Biodiversity
FIs	Financial institutions
G20	The Group of Twenty
G7	Group of Seven
GBF	Global Biodiversity Framework
IEA	International Energy Agency
IFC	International Finance Corporation
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
JRC	Joint Research Centre of the European Commission
LAC	Latin America and the Caribbean
LDN	Land Degradation Neutrality Fund
MSA	Mean Species Abundance
NBFPs	National biodiversity finance plans
NbS	Nature-based solutions
NBSAPs	National biodiversity strategies and action plans
NFRD	Non-Financial Reporting Directive
NGOs	Non-governmental organizations
OECD	Organization for Economic Co-operation and Development
PBAF	Partnership for Biodiversity Accounting Financials
PCAF	Partnership for Carbon Accounting Financials
PDF	Potential disappeared fraction of species
PES	Payment for ecosystem services
SBTN	Science-based target network
SDGs	Sustainable Development Goals

SEEA	System of Environmental Economic Accounting
SFC	Colombian Superintendency of Finance
SF4B	Sustainable Finance for Biodiversity in Brazil and Colombia
TCFD	Taskforce on Climate-Related Financial Disclosures
TEG	Technical expert group
TNC	The Nature Conservancy
TNFD	Task Force for Nature-Related Financial Disclosures
TSC	Technical screening criteria
UNEP	United Nations Environment Program
UNEP FI	UNEP Finance Initiative
USD	United States dollar
WEF	World Economic Forum
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

More than 20 years ago, the intersection of the biodiversity-crisis and the financial system was analyzed for the first time. In recent years, the concept of double materiality shed light on the dependencies businesses have with ecosystem services, on the one hand, and the negative impacts the private sector has on the environment, on the other. The business world's acknowledgement of biodiversity risks and their relationship to them is new, and thus this is a wide-open field in which only a small percentage of financial institutions (FIs) are active. But the topic is gaining traction as ever more public and private entities come together to work on it.

One of its central concepts is biodiversity finance, which refers to the financial resources, public and private, that flow into the conservation, sustainable use, and restoration of biodiversity. As proposed in this study, it also relates to the investments made to manage biodiversity-related risks at FIs and non-financial companies.

A clear example of the growing prominence of biodiversity finance is the 2022 Kunming-Montréal Global Biodiversity Framework (GBF) as formulated by the Convention on Biological Diversity (CBD). GBF is the most important accord in the global effort to value, conserve, restore, and sustainably use biodiversity by 2050. For the first time in CBD's 20-year history, its targets now aim for a deep transformation of the financial system (CBD, 2022a). In this pursuit, evidence-based science will guide financial decisions.

Among the tools to bridge science and financial operations, sustainable finance taxonomies are science-based catalogues that facilitate identifying fundable sustainable activities. These kinds of taxonomies are critical to GBF's realization. Translating scientific concepts into concrete activities – for example, the definition of sustainable fishing – makes it easier for FIs to determine their portfolio composition. Nevertheless, developing countries, often biodiversity hotspots, have limited technical capacities to develop, implement, and monitor the kind of taxonomies that have a comprehensive approach to biodiversity.

This is why more alternatives should be considered in addition to taxonomies. There are other tools to measure biodiversity impacts and dependencies. Such measurements are essential to help FIs ma-

nage risks and opportunities. Also, environmental, social, and governance (ESG) frameworks are incorporating more detailed information on the biodiversity-related performance of companies. There are also catalogue-style guidelines employed on a voluntary basis. This means that, more than ever, FIs have access to tools that, on the one hand, facilitate financing activities with measurable positive outcomes and, on the other, inform divestment from activities with harmful impacts.

Despite the progress, biodiversity-related risks are still very difficult for businesses to ascertain and turn into meaningful business practice. This is because these risks are often systemic and location-specific (Dempsey, 2016; Responsible Investor & Credit Suisse, 2021). Critical attention should be paid to developments in this field, as well as adherence to official global conventions, and the formulation of decisions based on science and local conditions. FIs must make themselves accountable and pull together in the same direction. Actors committed to using emerging concepts, such as biodiversity credits and nature-positive activities, should strive for consensus and scientific coherence, as well as seek political support.

Beyond science, it is key that traditional knowledge also be considered. It is a powerful source to define worthy sustainable activities. This is of special importance in regions where indigenous and local communities co-manage territories. Moreover, traditional knowledge also enhances social empowerment and ownership.

This critically minded stocktaking report is based on the topics examined in the Sustainable Finance for Biodiversity in Brazil and Colombia (SF4B) project. Its aim is to inform and inspire stakeholders to develop strategies to address the financial risks of biodiversity loss and the risks that business as usual poses to biodiversity.

Although the content has been prepared for professionals working at FIs, it also pertains to public entities, companies, NGOs, civil society organizations, and local communities. The transformation to overcome complex environmental crises requires synergies and collaboration: biodiversity maintenance must be tackled in a multidisciplinary way.



1

INTRODUCTION: FINANCIAL RISKS AND BIODIVERSITY FINANCE

1.1. – THE CONCEPT OF BIODIVERSITY FINANCE AND STRUCTURE OF THIS REPORT

Biodiversity finance is a recent term that refers to “expenditure that contributes – or intends to contribute – to the conservation, sustainable use, and restoration of biodiversity” (OECD, 2020). Biodiversity finance stems from public and private sources. Some of the most common financing instruments are direct government expenditure, subsidies, development finance, debt-for-nature swaps, payment for ecosystem services (PES), impact investing, philanthropy, and biodiversity offsets (OECD, 2019).

This stocktaking report explores diverse, sometimes evolving, approaches to biodiversity finance. It explores initiatives created to bring more private funds to biodiversity conservation efforts. It also expands the concept of biodiversity finance by including a comprehensive approach to risk management that attempts to divest from harmful sectors.

The report presents a general overview of evolving aspects of biodiversity finance with the objective of critically informing readers. Hence, without claiming to be all-encompassing, the authors explore the progress, challenges, and critical considerations to inspire further analysis.

The report follows a qualitative methodology. The authors conducted a desk review analyzing secondary sources, including journal articles, regulations, sustainable finance taxonomy reports, and government documents, as well as publications from international organizations, NGOs, and companies. Interviews took place in 2022 and until mid-2023 with taxonomy developers from several countries, the European Commission, FIs, conservation experts, and ESG data rating companies.

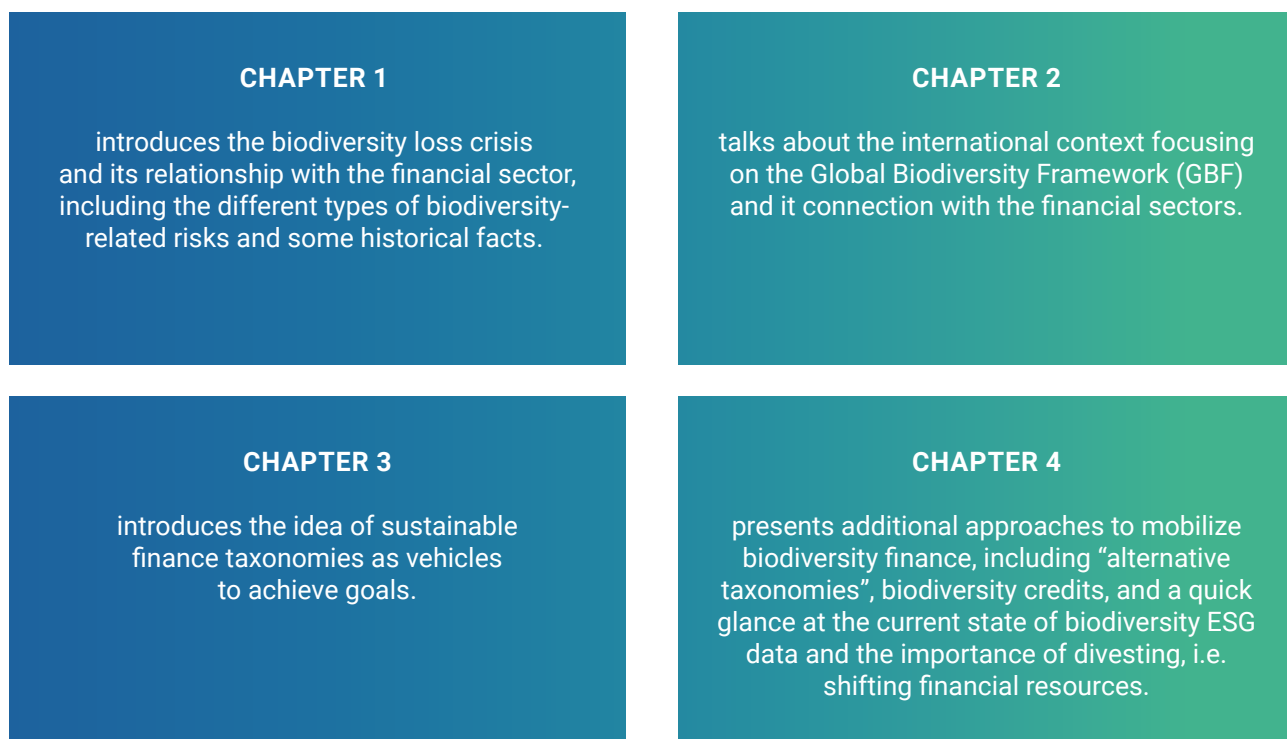


Figure 1 Report structure

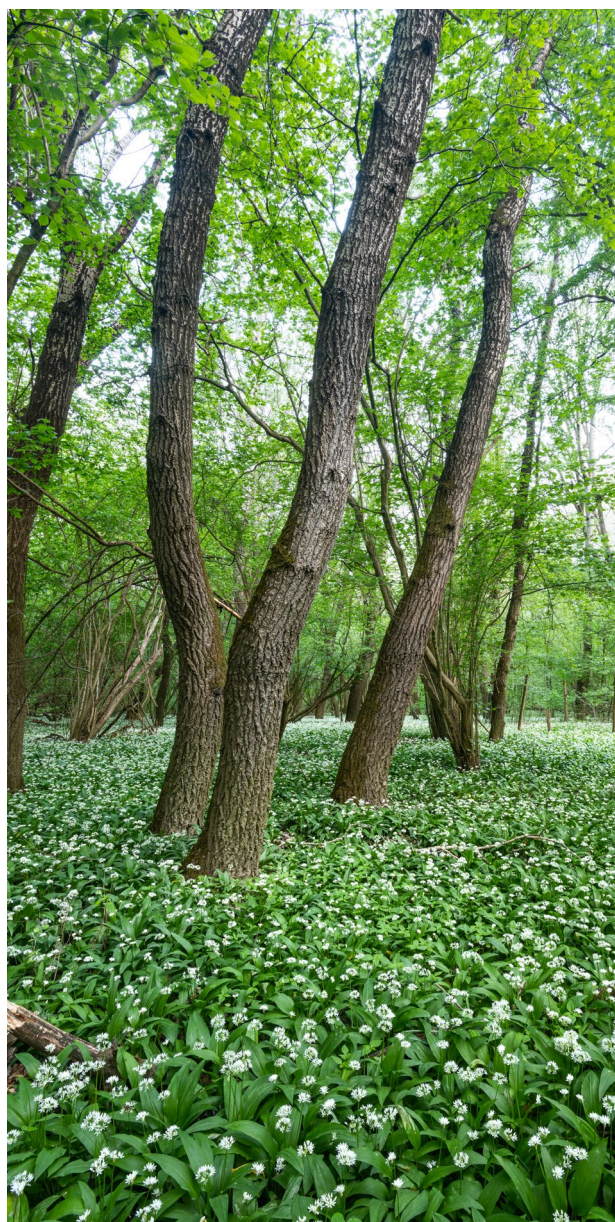
1.2. – FINANCIAL IMPLICATIONS OF BIODIVERSITY LOSS

As human societies have developed, they have exerted increasing pressure on natural ecosystems, leading to a dramatic decline in biodiversity (Bradshaw et al., 2021). Especially in recent decades, as wealth has grown, diversity in genes, species, and ecosystems (i.e. biodiversity) has declined¹ (Wiedmann et al., 2020). This relationship is called dependency and it presents physical financial risks. Ultimately, all economic activities depend on biodiversity and ecosystem services in some way, such as freshwater, pollination, weather regulation, soil fertility, and fibers. Biodiversity is thus essential for economic systems. Most ecosystem contributions are co-produced together with anthropogenic assets, such as knowledge, institutions, technology, infrastructure, and financial capital. Not all contributions by nature, however, can be substituted with anthropogenic assets (IPBES, 2019).

The main drivers of biodiversity loss – changes in land use, overexploitation of resources, climate change, pollution and invasive species – originate from companies in the real economy (IPBES, 2019). The activities of these businesses are financed through loans, investments, and insurance. Through these services, FIs contribute indirectly to the degradation of biodiversity. In other words, they too generate impacts. Unfortunately, most FIs do not monitor or measure their impact on biodiversity (portfolio.earth, 2020; Responsible Investor & Credit Suisse, 2021).

The dependencies and impacts linked to economic activities create a vicious circle of financial materiality that FIs and stakeholders now increasingly acknowledge (NGFS, 2022). The Dutch central bank (DNB & PBL, 2020), French central bank (Svartzman et al., 2021), and World Bank (Calice et al., 2021) all concur that a considerable share of the financial sector's portfolios depends substantially on biodiversity and ecosystem services. The biodiversity-related risk that results from declining ecosystem services is classified in the following ways:

There is a terminology section at the end of this report.



¹ For instance, since 1970, global populations of wild species have fallen by nearly two-thirds.

DEFINITIONS: ALL DEFINITIONS AND EXAMPLES ARE DRAWN FROM (SVARTZMAN ET AL., 2021; TNFD, 2022; WEF & PWC, 2020; WWF, 2019)

<p>Physical risks</p>	<p>Arise from material destruction or depletion – such as damage to infrastructure or disruption of operations – as well as the failure to deliver goods and services due to shortages of production supplies and required ecosystem services (e.g. soil nutrients, freshwater, pest control, etc.) Example: A blight that wipes out significant parts of a harvest results in economic losses for agricultural producers.</p>
<p>Transition risks</p>	<p>Transition risks result from a misalignment of an organization’s or an investor’s strategy and management, on the one hand, and the changing landscape in which it operates, on the other. Developments aimed at halting or reversing damage to ecosystems, such as government regulations or policy, technological developments, market changes, litigation, and changing consumer preferences, can result in transition risks. Transitions risks are divided into:</p> <p>Regulatory and legal risks Risks linked to higher costs and economic losses arising from laws, policies, regulations, and court actions aimed at protecting biodiversity. Example: The proposed EU Deforestation Law results in higher costs for companies because of mandatory value chain due diligence.</p> <p>Market risks Customers adapt demand by renouncing products whose production negatively affects biodiversity. Also, the increased pressure from competitors who produce innovative products that customers prefer over the original product. Example: The demand for non-animal protein rises as consumer awareness about controversies in meat production emerges, translating into financial risks through lower sales for meat producers.</p> <p>Reputational risks Companies face reputational risks by being held accountable for negative impacts on biodiversity. Lawsuits negatively affect the company’s reputation by lowering brand value and decreasing sales. Example: The public increasingly acknowledges business responsibility on the state of biodiversity. NGOs scrutinize firms and design public campaigns against companies that can cause decreased sales.</p>

Table 1 Types of biodiversity-related risks

Biodiversity-related risks are systemic. A World Economic Forum (WEF) report explains the concept as: “the risk to collapse an entire financial system or entire market, as opposed to risk associated with any one individual entity, group or component of a system” (WEF, 2010a). Their impacts are largely location-based, accumulate gradually, and depend on interactions between multiple variables.

These categories of risks also describe the financial impact of climate change. One difference though is that the road to the standardization of the management of climate-related risks has been more broadly examined and integrated into FIs’ portfolio management than biodiversity risks (FSB, 2023). Scientific evidence from the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC) shows that these two crises should be addressed together. Indeed, they reinforce each other (Pörtner, Hans-Otto et al., 2021). There is clearly a priority to plan beyond thematic siloes and act to manage cli-

mate and biodiversity-related financial risks (Kedward et al., 2022). This is a key requirement for comprehensive sustainability strategies (CISL, 2022).

The concept of double materiality was first introduced in 2019 in the EU Non-Financial Reporting Directive (NFRD). Businesses face impact materiality as their own operations and value chain impact the environment and society. Financial materiality refers to the significance of sustainability policies on the entity’s ability to create monetary value (EFRAG, 2021).

This graph illustrates it:

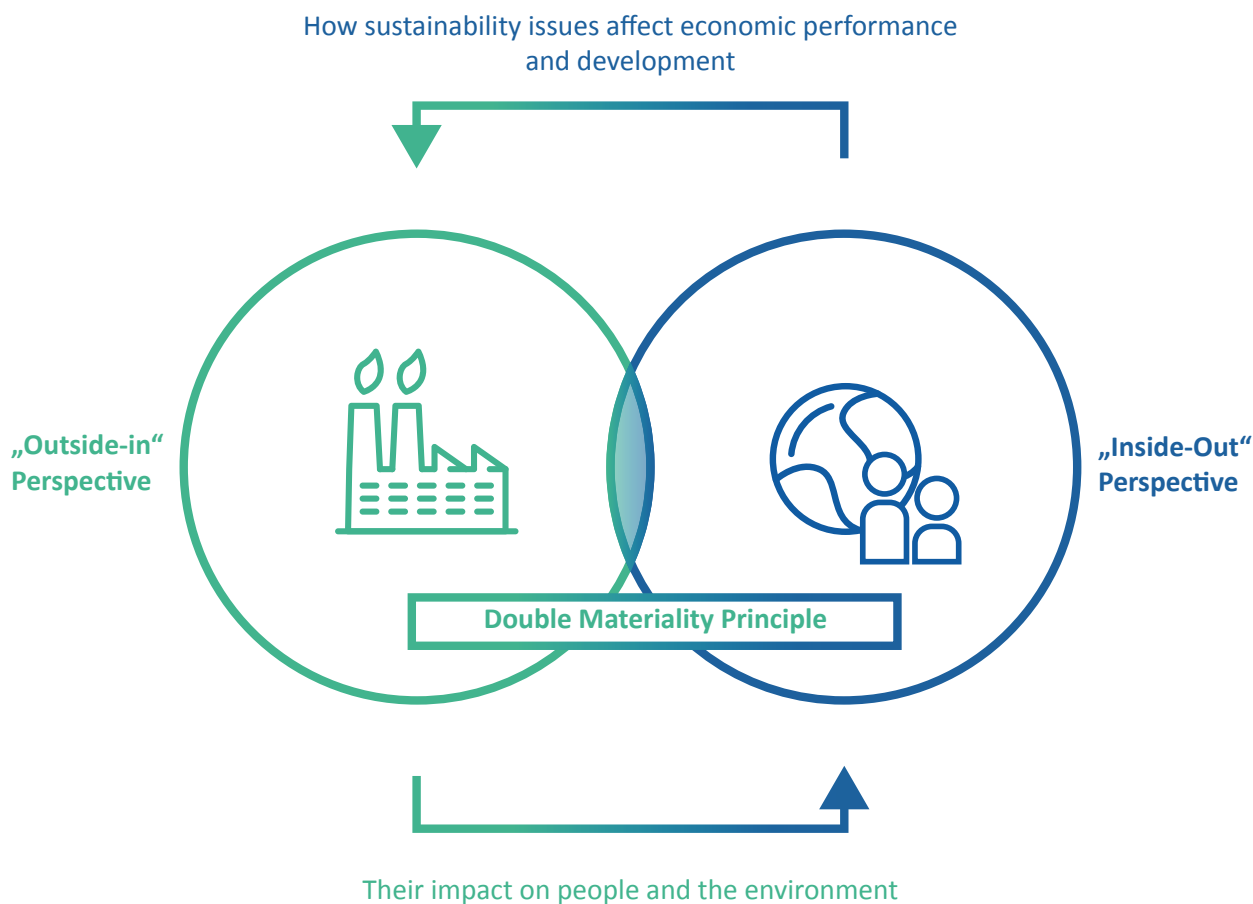


Figure 2 Double materiality

Source: (EFRAG, 2021) as in (Tamayo Tabares et al., 2022)

Biodiversity dependencies and impacts are measured with quantitative tools, methodologies, and metrics – most of which have specialized impacts (footprint). Most of these resources are relatively new and on steep learning curves. Thus, they have limited applications and include complementary qualitative analysis that accounts for location and ecosystem-based information frequently not available in the datasets used by the tools (Tamayo Tabares et al., 2022). There are several publications compare biodiversity measurement tools, including: EU Business@Biodiversity Platform (B@B)’s [Assessment of biodiversity measurement approaches for businesses and financial institutions](#), a [Navigation Tool](#), and [the Guide on Biodiversity Measurement Approaches – Finance for Biodiversity Pledge](#).

However, despite the growing awareness of biodiversity loss and its implications, as well as progress in tools and methodologies, there is still limited guidance on incorporating biodiversity risks into investing. Some research exists (e.g. (Tamayo Tabares et al., 2022; WEF, 2022b)) but its like is quickly outdated as the development of frameworks and measurement approaches has increased significantly since 2019. We expect that through regulation and global voluntary initiatives, like the Taskforce on Nature-Related Financial Disclosures (TNFD), FIs and corporates will be better able to navigate and apply such resources.

1.3. – QUICK HISTORY: WHEN FINANCE MET BIODIVERSITY

Since 2020, there has been many new publications on the relationship between biodiversity and finance, issued mostly by large NGOs and international organizations. There are also a handful of journal articles. International business organizations and private firms sponsored the first publications in the early 2000s – with the aim of protecting profit.

The table below documents some of the early reports (most of them listed at (Dempsey, 2016)):

2004	Is biodiversity a material risk for companies (F&C Investment Trust PLC)
2007	Biodiversity, the next challenge for financial institutions? A scoping study to assess exposure of financial institutions to biodiversity business risks and identifying options for business opportunities (IUCN)
2008	Dependency and impact on ecosystem services – unmanaged risk, unrealized opportunity: a briefing document for the food, beverage, and tobacco sectors (The Natural Value Initiative)
2009	The global state of sustainable insurance: understanding and integrating environmental, social, and governance factors in insurance (UNEP FI's insurance group including. Allianz and Swiss Re)
2010	Biodiversity and Business Risk (PwC)
2010	The next environmental issue for business (McKinsey)
2010	Demystifying Materiality (UNEP FI)
2010	'COP' Out? Biodiversity loss and the risk to investor (EIRIS Foundation)
2011	The Nature of Ecosystem Service Risks for Business (KPMG)
2011	Biodiversity principles: Recommendations for the financial sector (Association for Environmental Management and Sustainability in Financial Institutions – Germany)
2013	Business, Ecosystems, and Biodiversity. Journal Article. (M. Winn & S. Pogutz)
2014	EU Business and Biodiversity (B@B) Workstream 1: Natural capital accounting for business (Sustain Value commissioned by EU B@B)
2015	Making the invisible visible: Analytical tools for assessing business impacts & dependencies upon ecosystem services (Business Social Responsibility Network)

Table 2 Reports addressing the risks of biodiversity loss



It was not examined which other publications were released between 2015 and 2020, as the objective was to show the origin of the attention to the business and financial risks posed by biodiversity loss. A recent list of publications can be found in the bibliography.

Over time, ever more reports raised awareness. In 2010, for example, the WEF Global Risks Report placed biodiversity loss at the same materiality level as international terrorism, with a 15 to 20 percent likelihood of occurring. It called the issue one to “keep on the radar.” WEF estimated that “the consequences of these ongoing losses will not only affect businesses dealing directly with natural resources but will also touch the supply chains and growth objectives of most industry sectors” (WEF, 2010b). Recognition of the severity of biodiversity loss continued to rise to such an extent that, in its 2022 report, WEF identified “biodiversity loss” as the third most severe risk in the coming five to ten years, after climate action failure and extreme weather events (WEF, 2022c).

Nevertheless, after almost 20 years of private sector-led analysis on biodiversity loss risks, the issue today is not integral to FIs and corporates’ risk management strategies. Indeed, it has gained nothing close to the attention of climate change. Over the last decade, new impact measurement tools were designed and implemented. Nevertheless, biodiversity-related risks are still very difficult to ascertain in terms meaningful for business decisions. This is because of the systemic and location-specific character of such risks. Market actors demand streamlined, standardized, reliable, and cost-effective assessment tools (Dempsey, 2016; Responsible Investor & Credit Suisse, 2021). Ongoing initiatives in the voluntary and mandatory realms attempt to respond to the requirements (Tamayo Tabares et al., 2022) but their effectiveness is unsubstantiated.



2 INTERNATIONAL CONTEXT AND DISCOURSES

2.1. – THE CONVENTION ON BIOLOGICAL DIVERSITY AND THE NEW GLOBAL BIODIVERSITY FRAMEWORK

In 2006 in Curitiba, Brazil, during the eighth Conference of the Parties (COP) to the Convention of Biological Diversity (CBD), conversations veered ever more toward neoliberal axioms. Basing their analysis on economic dynamics, diplomatic participants began talking about ecosystem services and biodiversity offsets – economic not biological or environmental categories (Dempsey, 2016). This shed light on the economic relevance of biodiversity loss and began to catalyze analyses from different types of actors, such as NGOs, international institutions, and some large IFs.

Since about 2000, CBD has set ten-year targets – and has learned from the failure to achieve them. The broad 2010 goal to reduce biodiversity loss and boost planetary well-being, for example, went unmet (ISSD, 2010). Subsequently, the goals for 2010 to 2020, called Aichi Targets, were formulated as SMART (specific, measurable, ambitious, realistic, time-bound), and include, for the first time, sustainable practices for central sectors such as agriculture, fishing, and forestry. And yet, the Aichi Targets themselves faced four key shortcomings: ambiguity, low levels of quantifiability, complexity, and redundancy. And they were not achieved as a result of limited funding (mostly public sources) and a lack of political will to translate the targets into specific actions and (Butchart et al., 2016).

Another global joint effort is the 2030 Agenda for Sustainable Development with its 17 Sustainable Development Goals (SDGs), begun in 2015. This approach is more integrative as it puts the biodiversity agenda into a broader context of sustainability across society. The most relevant SDGs for biodiversity are SDG 14 “life below water” and SDG 15 “life on land.” These SDGs break down into specific goals with associated indicators. None of those with 2020 deadlines have been entirely reached. Some countries performed better than others; for many there is no published data (SDG Tracker, 2023).

Nevertheless, the latest CBD targets have new and greater ambitions. In December 2022, delayed by two years because of the COVID-19 pandemic, CBD’s Kunming-Montréal Global Biodiversity Framework (GBF) was signed at COP 15. Two aspects are unprecedented: indigenous and local communities’ rights and crucial role in conservation, as well as gender equality, were granted a more prominent role in the final document – thanks to years of advocacy (Abulo & Ghosh, 2022). Another novel aspect was the #MakeltMandatory Campaign, backed by over 400 businesses and FIs from 52 countries. The campaign demanded that GBF include mandatory assessment and disclosure of impacts and dependencies on biodiversity for all large companies and FIs. #MakeltMandatory recognized that voluntary actions are insufficient to deliver the required transformation at the scale and pace necessary to realize the CBD agenda (Business for Nature, Capitals Coalition, CDP, 2022). The campaign’s petitions are part of GBF’s Target 15.

GBF has four overarching goals that should be met by 2050: halt loss of and restore nature, use lands and seas sustainably, share benefits and services equitably, and mobilize necessary resources. The final goal includes private and public funding (domestic and international) for the conservation and sustainable use of biodiversity and ecosystems (CBD, 2022b).

There are 23 specific targets that CBD’s member states agreed to achieve by 2030. Although the indicators and language are more concrete than the previous versions, critics still consider them vague and insufficiently binding (Abulo & Ghosh, 2022). The tables below depict the targets with the most direct connection to FIs (only applicable details are noted.)²

² The publication “[Stepping Up on Biodiversity. What the Kunming-Montreal Global Biodiversity Framework Means for Responsible Investors](#)” (UNEP, 2023) presents a detailed analysis of all 23 targets and their relationship with FIs.

TARGET 14

Relevance for the financial sector	Progressive alignment of all relevant public and private activities, fiscal and financial flows with the goals and targets of the GBF (CBD, 2022a)
Component and complementary indicators	<ul style="list-style-type: none"> • Indicator based on Task Force for Nature-related Financial Disclosures (TNFD) • Number of countries with Implementation of the System of Environmental Economic Accounting (SEEA)(CBD, 2022b)
Comments	<p>This target is a means to align financial flows in order to design sustainable finance taxonomies. The instrument helps countries match their policy targets and fiscal incentives with concrete activities and assets in the real economy. Nevertheless, biodiversity loss is not an integral part of existing and developing taxonomies (Aceituno et al., 2022).</p> <p>FIs can increasingly expect systems of national accounts and global accounting standards to include biodiversity and ecosystem-related values, and should consider how to reflect these appropriately in their risk analyses and impact assessments. Metrics and guidelines, such as TNFD, exist or are being developed to support this process (UNEP, 2023b).</p>

Table 3 GBF - Target 14 for FIs

TARGET 15

Relevance for the financial sector	<p>Development of legal, administrative, or policy measures to encourage and enable business to ensure that large and transnational companies and FIs (CBD, 2022a):</p> <ul style="list-style-type: none"> • regularly monitor, assess, and transparently disclose their risks, dependencies, and impacts on biodiversity; • provide information needed to promote sustainable consumption patterns; • report on compliance with access and benefit-sharing regulations; • reduce negative impacts on biodiversity; • increase positive impacts; • reduce biodiversity-related risks to business and FIs; • promote actions to ensure sustainable patterns of production.
Component and complementary indicators	<ul style="list-style-type: none"> • Species threat abatement and restoration metric • Ecological footprint • Number of companies publishing sustainability reports (CBD, 2022b)
Comments	<p>CBD asks governments to make this series of procedures mandatory for large companies and all FIs. This might pose transition risks due to the elevated costs of collecting and assessing information. Additionally, clients interested in sustainable finance products might invest elsewhere once information is publicly available.</p> <p>CBD encourages common requirements for all market actors. Considerable public and private efforts must happen to enable this approach. Small businesses do not currently have finance and technical capacities to undertake such a complex process. Recent efforts to incorporate robust biodiversity-related criteria for reporting at the EU level have been watered down, despite the ambitious recommendations of experts (European Sustainability Reporting Standards (ESRS)) (Eurosif et al., 2023; T&E, 2023). Thus, this target will likely face significant challenges.</p>

Table 4 GBF - Target 15 for FIs

TARGET 18

Relevance for the financial sector	Identify by 2025, and eliminate, phase out or reform incentives, including subsidies harmful to biodiversity, in a proportionate, just, fair, effective, and equitable way while substantially and progressively reducing them by at least USD 500 billion a year by 2030. Also, scale up positive incentives (CBD, 2022a).
Component and complementary indicators	<ul style="list-style-type: none"> • Number of countries with biodiversity-relevant taxes • Number of countries with biodiversity-relevant charges and fees (CBD, 2022b)
Comments	<p>Environmentally harmful subsidies encourage unsustainable production or consumption and harm, in this case, biodiversity. Such subsidies were part of the Aichi Targets. However, progress was very slow since such subsidies are difficult to identify and track, even for governments that create them. Many government departments operate in silos without awareness of subsidies offered by other ministries. Additionally, sectoral and political elections hinder improvement (Dempsey et al., 2020).</p> <p>This target might also mean considerable transition risks since many harmful economic activities are profitable, not least because of subsidies and lax legislation on environmental damage. Also, cleaner options will likely become more attractive to investors (Koplow & Steenblik, 2022). Hence, FIs should assess which operations and assets may be affected by the elimination of subsidies, such as those related to food and agriculture, and monitor opportunities arising from repurposing subsidies to activities and industries contributing to GBF goals (UNEP, 2023b).</p>

Table 5 GBF - Target 18 for FIs

TARGET 19

Relevance for the financial sector	<p>Increase the level of financial resources – substantially and progressively – from all sources, in an effective, timely, and easily accessible manner, including domestic, international, public, and private resources by 2030, mobilizing at least USD 200 billion per year. The means include (CBD, 2022a):</p> <ul style="list-style-type: none"> • increasing total biodiversity-related international financial resources from developed countries; • significantly mobilizing domestic resources; • leveraging private finance (e.g. impact funds) and promoting blended finance; • stimulating innovative schemes such as payment for ecosystem services (PES), green bonds, biodiversity offsets and credits, and benefit-sharing mechanisms, with environmental and social safeguards; • optimizing co-benefits and synergies of finance targeting the biodiversity and climate crises; • enhancing the effectiveness, efficiency, and transparency of resource provision and use.
Component and complementary indicators	<ul style="list-style-type: none"> • Foreign direct investment (FDI), official development assistance, and South-South cooperation • Amount and composition of biodiversity-related finance reported to the OECD creditor reporting system (CBD, 2022b)
Comments	<p>PES have already been introduced in different countries (Calvet-Mir et al., 2015). Their application could be innovative if businesses incorporate such payments as part of their balance sheets, while recognizing dependencies on biodiversity and responsibility in ecosystem services. PES are based on valuation methods that cannot account for the incommensurability of different values attached to biodiversity (Liso et al., 2020).</p> <p>The climate-biodiversity nexus is a topic of increasing attention under the promising-yet-contested idea of nature-based solutions (NbS) (Seddon et al., 2020, 2021). Biodiversity credits and offsets are also in the sights of researchers and private-sector developers.</p>

Table 6 GBF - Target 19 for FIs



Clearly, to achieve GBF's goals, CBD has tasks for everyone. As shown in the tables above, CBD urges organizations of all sizes to align their financing and programming decisions with GBF (CBD, 2022c). Hence, actions from private and public sectors need to be monitored and results aggregated. GBF must be ratified by all of CBD's 196 member states and translated into national and subnational objectives through the national biodiversity strategies and action plans (NBSAPs). This should help address GBF's vagueness. The NBSAPs should be updated or drafted accordingly with GBF by 2024 (COP 16) (CBD, 2022a). Consequently, and although countries commit to comply, the only way to reach the targets and monitor the progress is to have strong NBSAPs linked to national legislation, with allocated financial resources and capacity development and monitoring plans. Thus, NBSAPs should incorporate specific national biodiversity finance plans (NBFs) (UNEP FI et al., 2023), such as map internal financial resources from private and public sources, and design a resource mobilization plan (blending suitable private and public sources and instruments). For this process, it is crucial that governments learn from previous experiences and refer to documented lessons learned and cases studies on NBSAPs (Shames et al., 2023).

Such policy, financial, and technical tasks are particularly challenging for developing countries, which are the most biodiverse (Cardona Santos et al., 2023).

To remedy this problem and boost funds transfer from richer countries, CBD welcomes initiatives such as NBSAP Accelerator Partnership, the High-Ambition Coalition for Nature and People 2.0, the Legacy Landscapes Fund, the Kunming Biodiversity Fund, and the Japan Biodiversity Fund (CBD, 2022c).

In an effort to address local financial limitations, it calls for:

A fundamental transformation of the global financial architecture and the reform of multilateral development banks and international finance institutions, including investment banks, to make them fit for purpose in supporting implementation of the global biodiversity framework, sustainable development, and just transition efforts in developing countries (CBD, 2022c).

While governments prepare themselves and commence to roll out financial pledges and strategies, a number of papers already advise FIs how to manage biodiversity double materiality (e.g. (Tamayo Tabares et al., 2022)). Additionally, initial GBF guidance has been published specifically for FIs. United Nations Environment Program (UNEP, 2023b) and UNEP Finance Initiative (UNEP FI, 2023) connected GBF with recommendations for investors and banks.³ The central request is to take immediate and ambitious action to align operations and portfolios with GBF, which can help prepare for policy developments.

³ There are several papers with recommendations to mainstream biodiversity finance, most of them published in the last three years. [Biodiversity and Finance: Managing the Double Materiality](#) offers a good overview of existing guidance.



Figure 3 Recommendations to align FIs with the GBF (UNEP, 2023b)

Considering CBD's record of failure, researchers have recommended a new and transformative approach to biodiversity governance to inspire a new era of GBF. This approach should apply to all actors and be led by governments. This approach focuses on addressing underlying causes (indirect drivers) of sustainability issues and should be described as (Visseren-Hamakers & Kok, 2022):

- integrative by addressing challenges and sustainable solutions at all scales and sectors;
- inclusive by, for instance, empowering the most vulnerable to contribute to biodiversity conservation, e.g. with special traditional knowledge;
- adaptive by learning from feedback and by sharing openly lessons;
- transdisciplinary by incorporating different knowledge systems and fields;
- anticipatory by applying the precautionary principle, especially with new technologies to select at an early-stage risk mitigation or transfer mechanisms.

REGIONAL APPROACH TO GOAL SETTING IN THE EU

Regional efforts have been made to address biodiversity loss at the EU level. The main objective of the 2030 EU Biodiversity Strategy is to ensure the recovery of Europe's biodiversity by 2030 (European Commission, DG ENV, 2021). In the same vein, the European Green Deal (2019), a plan to sustainably transform Europe's economy, considers preserving biodiversity a chief priority in the transformation of the EU into a resource efficient and competitive economy (European Commission, 2021b). Both policy documents acknowledge that the biodiversity and economic crises are intrinsically linked, and actions needed to address them should be aligned. The EU taxonomy, presented in next chapter, aligns both policies.

Tip: The Leaders Pledge 4 Nature is a collaboration of 94 national governments to foster actions to reverse biodiversity loss by 2030. Its [website](#) offers an overview of actions taken in the member countries, such as binding policies, legislations, and declaration of protected areas.

Text box 1 Regional approach to goal setting in the EU

2.2. – VOLUNTARY AND PRIVATE INITIATIVES

Worldwide private actors, sometimes with public sponsorship, have come together to face the challenges of biodiversity loss. However, such initiatives did not gain traction and a new wave of joint actions began around 2019. The table below illustrates some of the most active and recognized initiatives.

Taskforce on Nature-related Financial Disclosures (TNFD)	An international initiative based on a model developed by the Taskforce on Climate-Related Financial Disclosures (TCFD). Its mission is to provide a framework to organizations indicating how environmental risks and opportunities can be addressed by turning capital flows into positive environmental action. The final TNFD framework is currently in progress.
Finance for Biodiversity (FfB) Foundation	Was set up in March 2021 with the aim to support a call to action and collaboration between FIs in the form of working groups, as a connecting body for contributing signatories and partner organizations. FIs that have signed the FfB pledge can become a member of the FfB Foundation. Currently, 45 FIs are members.
Partnership for Biodiversity Accounting Financials (PBAF)	An independent foundation based in the Netherlands and a sister-initiative of the Partnership for Carbon Accounting Financials (PCAF). PBAF's primary aim is to develop the PBAF standard that enables FIs to assess and disclose impact and dependencies on biodiversity of loans and investments.
Science-based target network (SBTN)	A collaboration of more than 45 global non-profits working together to equip companies as well as cities with guidance to set science-based targets for all of Earth's systems. In May 2023, SBTN launched a set of science-based targets for nature building on global momentum on climate with over 2,600 companies setting science-based targets for climate. The guidance draws on science and includes collaboration with Earth Commission, a scientific group. It is also aligned with GBF, the Paris Agreement, and the SDGs.

Table 7 Main private-led initiatives on biodiversity

ON OTHER GLOBAL TRENDS: WHAT DOES "NATURE-POSITIVE" MEAN?

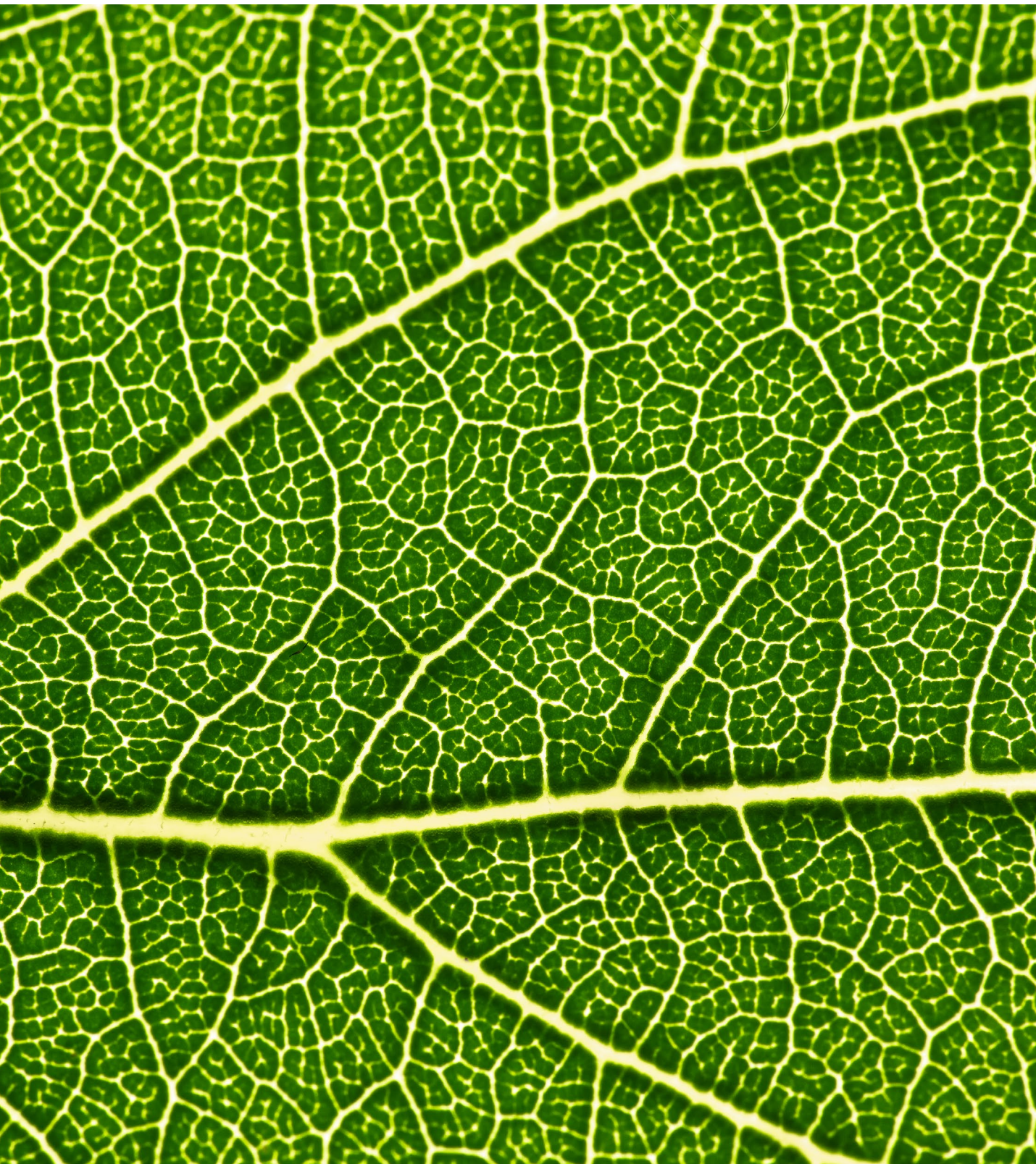
Nature positive is a term increasingly used at the international level to articulate an ideal situation in the interface between economic activities and nature that drives improvement of nature's condition (CISL, 2021). To date, the concept remains vague.

Some stakeholders describe it as a movement (WEF, 2021). It also linked to a Global Goal for Nature adopted primarily by large NGOs (WWF, Conservation International, TNC, and others) – as a global state to be achieved. Theoretically, it aligns to GBF goals: halt and reverse nature loss by 2030 and live in harmony with it by 2050, with 2020 as baseline (Multiple organizations, 2022). It appears, thus, as an interpretation of the CBD „2050 Vision and 2030 Mission.“ However, and contrary to expectations (Fernández & Nele, 2022), the CBD main text and annexes do not refer to the concept (CBD, 2022a). There are neither standard indicators nor guidelines on how to measure the level of positiveness of company strategies.

If one breaks down the concept, it becomes even more vague. Nature is a complex term that means different things to different people. Positive is also complicated since measurement from local to global scales is still largely based on proxies and existing (and to some extent limited) science. It also related to the concept of „net-zero,“ which opens the doors for the contested ideas of offsets and compensations (119 experts, 2022; Fernández & Nele, 2022; Greenpeace, 2022) (for more on this topic see box 6 in the last chapter).

The vagueness of nature positive could facilitate its use for greenwashing (Zu Ermgassen et al., 2022). Public and private actors should stick to official global conventions and decisions based on science and local conditions. Critics argue that they must make themselves accountable and all pull in the same direction. Actors committed to using the concept should strive for consensus, political support, and scientific coherence.

Text box 2 Nature-positive concept



3 SUSTAINABLE FINANCE TAXONOMIES AND THEIR LINK TO BIODIVERSITY

3.1 – ROLE OF SUSTAINABLE FINANCE TAXONOMIES TO ACHIEVE GOALS

To accelerate the highest priority shifts in capital flows, sustainable finance taxonomies have emerged as a tool to classify economic activities contributing to environmental goals.

These types of taxonomies work as a classification system that catalogue economic activities considered ecologically benign. They provide clear instructions and precise environmental performance metrics and criteria for each activity (Xu et al., 2022). The goal is to guide investors and other market stakeholders, support their decision-making toward sustainability, and avoid greenwashing. By outlining the types of data required to evaluate an asset's contribution, taxonomies categorize an asset or activity depending on how well they support specific sustainability goals (Ehlers et al., 2021).

Additionally, taxonomies⁴ help governments track financial flows directed to policy objectives as they are commonly designed and implemented in the framework of national strategies and plans (Aceituno et al., 2022). Consequently, taxonomies are set for specific jurisdictions such as countries and regions (e.g. the EU). The jurisdictional approach enables the alignment with national or regional policies and local conditions, the determining of baselines, and achievement of goals. However, crossborder relationships imply that some FIs and companies would face the challenge of expanding the application of taxonomies to other jurisdictions or observing multiple regulations depending on location (Aceituno et al., 2022).

Market actors seeking to enlarge the positive impacts of their portfolios benefit from standardized definitions of sustainable activities. Simultaneously,

in cases where mandatory reporting is part of the application, like in the EU, FIs and companies might struggle to gather and disclose the required data.

The reason is that technical details concerning environmental performance are generally not reported. In particular, long global value chains are riddled with data gaps. The hope is that through taxonomies and related regulations, the capacities of implementers will improve over time. This is why, typically, the application of taxonomies includes a preparatory phase.



Types and uses of sustainable finance taxonomies

Current trends show that existing taxonomies often adhere to the following three approaches (UN-DESA & IPSF, 2021):

Whitelist-based: This approach includes a list of activities, assets, technologies, and projects considered green or sustainable in the taxonomy. The Chinese, Mongolian, and Russian taxonomies follow this approach.

Technical screening criteria (TSC)-based: Specific screening criteria must be met by an activity or project to be included in the taxonomy. EU and South Africa follow this approach.

Principle-based: A set of principles is used to assess and categorize economic activities based on their alignment with climate objectives and contribution to facilitating the transition toward a low-carbon economy. Malaysia and Japan adopted this approach to develop their taxonomies.

⁴Sustainable finance taxonomies and taxonomies are used interchangeably in this publication.

Additionally, two broad starting points have been identified – although the underlying local reasons, objectives, and methodological characteristics of national taxonomies vary. First, there are countries that consider the EU taxonomy as a benchmark but follow other international standards as well, and adapt them to the local context. The second approach seeks to close existing gaps in taxonomies or include activities that are not already covered (Gondjian & Merle, 2021).

These instruments can differ widely. Experts insist on the importance of taxonomies to reflect local conditions while incorporating equivalence and interoperability considerations to allow for their application beyond borders (Aceituno et al., 2022).

COMMON FRAMEWORK OF SUSTAINABLE FINANCE TAXONOMIES FOR LATIN AMERICA AND THE CARIBBEAN (UNEP, 2023A)

This framework was developed to guide the creation of new taxonomies as well as the updating of existing ones in Latin America and the Caribbean, a region where the number of taxonomies is constantly growing. Its objective is to foster interoperability and the application of science, which implies that taxonomies must be based on similar guiding principles and have common design elements.

This framework prioritizes sectors based on the objectives of climate change mitigation and adaptation for LAC. It also provides guidance for the inclusion of activities, as well as guidelines for the definition of metrics and thresholds for certain sectors of the taxonomy.

Guiding Principles

- Seek interoperability with other taxonomies globally
- Make material positive contribution to well-defined objectives and avoid damage
- Provide clear definitions that are science-based for environment or evidence-based for other sustainability issues
- Allow for a credible transition of high emission sectors with a clearly defined final goal, regardless of the pathway
- Be dynamic and subject to regular reviews
- Ensure good governance, transparency, and practical applicability

Biodiversity-related objectives will be addressed between 2023 and 2024. For now, the framework includes the relevant DNSH principles. The development may benefit from guidance around GBF and the finalization of the TNFD framework.

Text box 3 Common framework of sustainable finance taxonomies for Latin America and the Caribbean

3.2 – THE IMPORTANCE OF SCIENCE IN TAXONOMY DEVELOPMENT

Transforming sustainability goals into measurable targets, such as the SDGs and those in the Paris Agreement, requires scientific methods. The scientific approach links objectives with quantifiable results, such as specific reductions in greenhouse gas emissions, decreased deforestation rates, or targeted levels of biodiversity preservation (Ehlers et al., 2021). Hence, science is a cornerstone of taxonomies: from the establishment of goals and the identification of priority sectors to the definition of milestones, transformation pathways, and monitoring frameworks.

Building on the experience of existing taxonomies and the recommendations from experts, the core taxonomy elements to incorporate scientific knowledge are as follows:

- **Technical expert groups (TEG):** Independent of the public or private institutions leading the development of the taxonomies, collaboration with sectoral and environmental experts (according to the objectives) is indispensable. Only experts with a sectoral and scientific background can evaluate the extent to which policy goals, current circumstances, and capacities align with the safe operating space within planetary boundaries. A TEG developed the EU taxonomy draft presented to the European Commission in 2021. This group consisted of experts from finance, academia, and civil society who engaged with 200 additional experts from different backgrounds to define the taxonomy elements outlined below (DG FISMA, 2020). It is worth mentioning that this TEG did not start from scratch. European Commission's Joint Research Centre (JRC) was tasked to perform a preliminary analysis of methodologies and options for developing criteria for substantial contribution to the four objectives beyond climate, which include biodiversity (Canfora et al., 2022) The EU taxonomy will be presented later in this paper.
- **Definition of substantial contribution:** For activities and assets to be listed in a taxonomy, their substantial contribution must be proven. Experts should then follow several steps, which according to the JRC include (Canfora et al., 2022):
 - **Defining types of substantial contribution.** For example, reducing pressure on the environment, directly improving the state of the environment, or enabling other activities.
 - **Introducing possible approaches to define substantial contribution.** Quantitative or qualitative methods to assess contribution.
 - **Setting the level of ambition.** Based on available reference points (policies and scientific literature), experts should set which level of contribution should become the goal to be employed as a reference.
 - **Establishing technical screening criteria (TSC).** The previous steps and selection of the priority economic sectors are crucial inputs for experts to define TSC used to select the activities and assets eligible for the taxonomy.
 - **Selecting the most suitable approach.** According to the decisions made in the previous steps.
- **Do No Significant Harm (DNSH):** One underlying characteristic of multi-objective taxonomy is that the achievement of one of goal should not harm the rest.⁵ Science is critical in evaluating the interactions of multiple activities and environmental aspects (Canfora et al., 2022).
- **Metrics and indicators:** Science provides the basis for defining thresholds, indicators, and guidelines to develop sector-specific criteria. Expert groups involved in the development of the Climate Bond Initiative taxonomy, for example, utilized up-to-date climate science, incorporating findings from IPCC and International Energy Agency (IEA). These scientific resources were leveraged to iden-

⁵ In the case of the EU taxonomy, there are six environmental objectives: climate change mitigation and adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, and the protection and restoration of biodiversity and ecosystems.

tify eligible assets and projects that align with the taxonomy's criteria and objectives (World Bank, 2020).

There are also multiple benefits from a science-based approach:

- **Transparency and consistency:** There are challenges to applying similar measurement metrics in different jurisdictions. Therefore, science-based quantifiable, verifiable, and comparable metrics set an international standard that can be followed by all jurisdictions and reduce inconsistency in taxonomies (World Bank, 2020).
- **Structured revision and update processes:** Taxonomies are living documents that must be updated regularly. The updating process normally is twofold: 1) policy-wise to adapt to new policies and laws, and 2) science and technology-wise to account for technical developments (UNEP, 2023a).
- **Policy support:** Robust and evidence-based recommendations are more likely to receive political support and drive effective policies as they are viewed as independent and objective (Lucrelli et al., 2020).

- The EU taxonomy is usually a reference when discussing taxonomies since it was the first and was designed following a comprehensive science-based approach. Since it was prepared to be part of a mandatory regulation on sustainable finance, it went through a process of European Commission and EU parliament deliberations, adjustments, and final approval. In the end, the TEG's recommendations were only partially observed – a product of political compromise influenced by multiple industries' lobbies. In the case of climate change, and against TEG advice, the Commission incorporated the classification of certain fossil gas and nuclear energy activities as transitional activities that contribute to climate-change mitigation. These activities are thus deemed sustainable. Multiple experts, academics, and civil society organizations protested this classification, claiming that this undermines the credibility of the taxonomy as a tool for economic transformation (Azizuddin & Holmstedt-pell, 2022).

The next subsection will examine the biodiversity component of the EU taxonomy and others.

THE ROLE OF TRADITIONAL KNOWLEDGE FOR SUSTAINABILITY

Traditional knowledge is the information, innovations, and practices of indigenous and local communities around the world. Developed from experience and observations over centuries it is usually transmitted orally from generation to generation (UNEP & CBD, 2012). Traditional knowledge often holds invaluable insights about the environment and ecosystems. Indigenous and local communities have developed a deep understanding of their surroundings over generations, including knowledge about plants, animals, weather patterns, and natural resources. This knowledge can inform sustainable practices, such as land management techniques, resource conservation, and business innovation (Biró et al., 2019; Thakuria, 2014).

GBF recognizes the relevance of traditional knowledge by stressing "the roles and contributions of indigenous peoples and local communities as custodians of biodiversity and partners in the conservation, restoration, and sustainable use. Its implementation [the GBF] must ensure their rights, knowledge, including traditional knowledge associated with biodiversity, innovations, worldviews, values, and practices of indigenous peoples and local communities are respected, documented, and preserved" (CBD, 2022a).

Despite the instrumental contributions of traditional knowledge, guidelines to develop sustainable finance taxonomies do not mention it for the definition of screening criteria (e.g. TSC). The common framework for LAC also does not highlight indigenous and local practices as sources to define what can be called sustainable, although Latin America and the Caribbean have over 45 million indigenous people living in vast territories (CEPAL, n.d.). Studies in the region prove that they can contribute to address climate change and build resilience (UNESCO & FILAC, 2021).

Respect for and recognition of traditional knowledge should go beyond the boundaries of social safeguards, and be reflected and integrated in the technical components of taxonomies. This is of outmost importance in regions with indigenous and local groups. Doing so can further

Text box 4 The role of traditional knowledge for sustainability

3.3 – BIODIVERSITY IN SUSTAINABLE FINANCE TAXONOMIES

Scientific knowledge is obviously a fundamental component of taxonomy development. This study has also mentioned how biodiversity considerations have been largely overlooked in conjunction with economic development and financial operations. One of the reasons for this is the perceived complexity of the topic and the prominence of gained by climate crisis. Climate change mitigation and adaptation are covered by almost all the taxonomies around the world (CCAP, 2022).

Our interviews with taxonomy developers made clear that developing countries often lack the technical expertise to include biodiversity-related considerations, without which an integral approach to sustainability cannot happen. FIs in developing countries struggle to implement and comply with climate-based taxonomies because of their limited capacities, expertise, and lack of data from clients. Regulators are also concerned that biodiversity and ecosystem-related data are constricted for business use cases and complex verification processes. Hence, even in cases where biodiversity has been included in taxonomies, developers do not expect high levels of implementation. Financial incentives could support the application but there are currently no plans to introduce them (FS interviews, June 2023).

As for the role of biodiversity in existing taxonomies, of 17 megadiverse countries only a third of them have sustainable finance taxonomies: Brazil, China, Colombia, Malaysia, Mexico South Africa. Another 17 percent are currently working on their development. Of the 30 current sustainable finance taxonomies, only 12 incorporate or plan to incorporate nature-related factors into their framework. This inclusion often means one of the objectives refers to nature protection (also meaning water, soil, etc.) and DNSH aspects (Aceituno et al., 2022) (see graph).

There is considerable difference in terms of detail and activities that the taxonomies cover. Some of the adopted taxonomies cover nature-relevant environmental objectives – water conservation, pollution prevention, the protection of biodiversity and ecosystems – while others don't. For example, the Malaysian taxonomy only focuses on climate change objectives; other categories are considered by way of DNSH principles. The Russian and Mongolian taxonomies label the objective of biodiversity as „improvement of the environment“ and „improvement of livelihood“ (Merle & Gondjian, 2021).

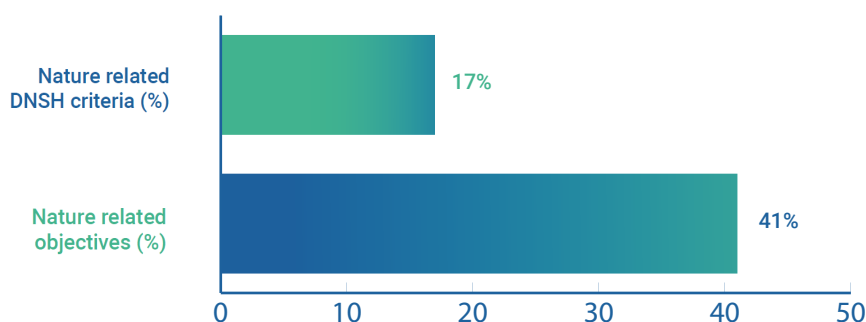


Figure 4 Nature and biodiversity covered in existing sustainable finance taxonomies (Aceituno et al., 2022)



In the Sri Lankan taxonomy, „ecological conservation and resource efficiency“ and „pollution prevention and control“ are among the main four objectives, although merged as „other green objectives“ besides the climate change category. A lack of technical expertise in Sri Lanka explains the failure to adequately incorporate biodiversity and ecosystem considerations into the development of sustainable finance taxonomies (FS interview, 2023). In Georgia, biodiversity conservation is highlighted in the taxonomy and technical standards are aligned with national policies. But FIs have less interest in biodiversity and as a consequence Georgia has not issued any green loans. Though the country lacks the expertise to implement the taxonomy and measure biodiversity, the taxonomy helps to share a common definition across sectors (FS interview, 2023).

In 2022, a study carried out by WWF and Climate & Company, a sustainable finance think tank, provided the following recommendations to improve nature-related issues in sustainable finance taxonomies and contribute to GBF goals (Aceituno et al., 2022):

- G20 countries should include biodiversity issues comprehensively in existing and developing ta-

xonomies. Sustainable finance strategies should account for nature-positive outcomes.

- Policymakers from megadiverse countries should introduce interoperable taxonomies that can be used for international trade. Given the high complexity of globalisation processes and production supply chains, identifying those responsible for causing ecosystem degradation is a challenging task. This often results in the burden of ecosystem destruction falling disproportionately on the most biodiverse countries. These countries endure the negative consequences without simultaneously enjoying the immediate economic gains.
- Another crucial aspect is the consideration of value chains to go beyond direct impacts in a specific location. Final products are commonly the result of complex processes across regions. Hence, impacts and dependencies have a multi-location character. International voluntary sustainability standards can help address such globalization challenges to define what counts as green or environmentally harmful.

- Policymakers should also strive for taxonomies that cover both “green” and “transition activities” (i.e., intermediate environmental performance), as well as “significant harm” aligned with GBF.
- Jurisdictions should use an „adopt-or-adapt“ approach to drive the convergence of critical taxonomy design features (see for example, text box 3 on the LAC Common Framework).

At the same time, there are efforts to recognize that transitions to sustainability happen in a gradual manner. As defined in the EU taxonomy, transition activities are activities that contribute to the transition to the net-zero emission goal by 2050, but are not “green” at the moment. Graded taxonomies of-

fer a solution as they allow for the identification and classification of activities that actively work toward adopting more sustainable practices (International Platform on Sustainable Finance, 2022). In general, the transition component in taxonomies is rather new. Many stakeholders criticize the often-used binary design of taxonomies that only allows economic activities or assets to be either aligned with the taxonomy or not. Using a binary design makes it difficult to allow gradations, sometimes called “shades of green.” Not all economic activities can immediately meet the criteria for environmental sustainability, but are on a path that reduces their impact and improves their environmental performance.

COLOMBIA'S GREEN TAXONOMY

The conservation and sustainable use of biodiversity is a component of Colombian sustainability policies, such as green growth policy and long-term climate strategies. In the particular case of sustainable finance, the national green taxonomy adopted in 2022 includes two sets of objectives: climate mitigation and land-use sectors. The second category includes the objective of „conservation of ecosystems and biodiversity“ and connects to agriculture, forestry, and land use (referred to as the AFOLU) sectors. However, the activities that meet the taxonomy's requirements are not defined for each environmental objective. Biodiversity aspects are considered throughout the classification as the main criteria or as part of the national environmental regulation (Gobierno de Colombia, 2022).

To illustrate the Colombian taxonomy's understanding of diversity, biomass, biofuel, and biogas-based electricity generation require:

- full traceability of the supply through the relevant chain;
- all forest biomass used in the process must comply with the forestry regulatory framework;
- the biomass used must conform to the requirements defined in the national biomass and biofuels regulations and to those requirements defined in the taxonomy's forestry section.

The criteria are not as detailed as in the EU taxonomy (next subsection) and rely primarily on existing regulations. Fortunately, work on specific biodiversity criteria for the taxonomy is expected. This is encouraging since much can be accomplished through new sustainable thresholds beyond compliance with regulation.

Text box 5 Example - Colombian Green Taxonomy

3.4 – BIODIVERSITY IN THE EU TAXONOMY

One of the six environmental objectives in the EU taxonomy is the „protection and restoration of biodiversity and ecosystems.“ The ambition guiding the definition of TSC and aligned with the EU Biodiversity Strategy was (European Commission, 2020):

To ensure that by 2050 all of the world’s ecosystems and their services are restored to a good ecological condition, resilient, and adequately protected. The objectives of the EU Biodiversity Strategy will be achieved at latest by 2030. From today the world’s biodiversity needs to be put on the path to recovery and no deterioration in conservation trends and status of all protected habitats and species by 2030 will be ensured.

The activities substantially contributing to the achievement of this goal were, in the first place, described by the TEG of the Sustainable Finance Platform. Approved in June 2023, it reflected the changes incorporated through feedback and review periods.

The TEG’s initial drafts (2019 to 2021) contained sustainability criteria for activities central to tackle the loss of biodiversity, such as agriculture (animal and crop production), construction, fishing, and forestry. But they are not part of the delegated act,⁶ which does not mean they cannot be included in the future (European Commission, 2023; Schrems & Bär, 2021). The reason given for this exclusion is that „further assessment and calibration of criteria“ are needed. TEG members criticized that Commission decisions – similar to the case of gas and nuclear energy – deviate from the TEG’s science-based recommendations. They charge that if policymakers opt to ignore experts advise, backed with convincing evidence, they should explicitly justify their reasoning (Allen & Hiller, 2023).

Annex 4 of the second delegated act for EU taxonomy outlines general criteria for the following activities:

Environmental protection and restoration activities:

Conservation, including restoration, of habitats, ecosystems, and species. Related activities include in-situ conservation and different forms of restoration. TSC, among others, include a detailed description of the initial ecological situation, the establishment of a management plan (content described in the annex), and regular audits.

Accommodation activities: Hotels, holiday, camping grounds, and similar accommodation. The activities must contribute to the conservation of restoration of biodiversity and ecosystems following an action plan, a sustainable supply chain, environmental management system, and regular audits.

Although the scope of the EU taxonomy for biodiversity has shrunk significantly, TEG members were relieved to discover that as they recommended, biodiversity offsets were not part of the regulation. This means that ecosystem benefits derived from conservation and restoration activities cannot be traded to compensate environmental damage caused by other activities (WWF, 2023).

⁶ Original fishing criteria included, for example, % of minimum sea surface as no-take zone, thresholds for by catch of protected, endangered or threatened species. In the case of construction, buildings contributing to biodiversity restoration should have at least 60% of the external horizontal surface area (excluding surface area that is required for renewable energy sources in order to comply with mandatory local requirements), dedicated to natural habitat or biotopes.

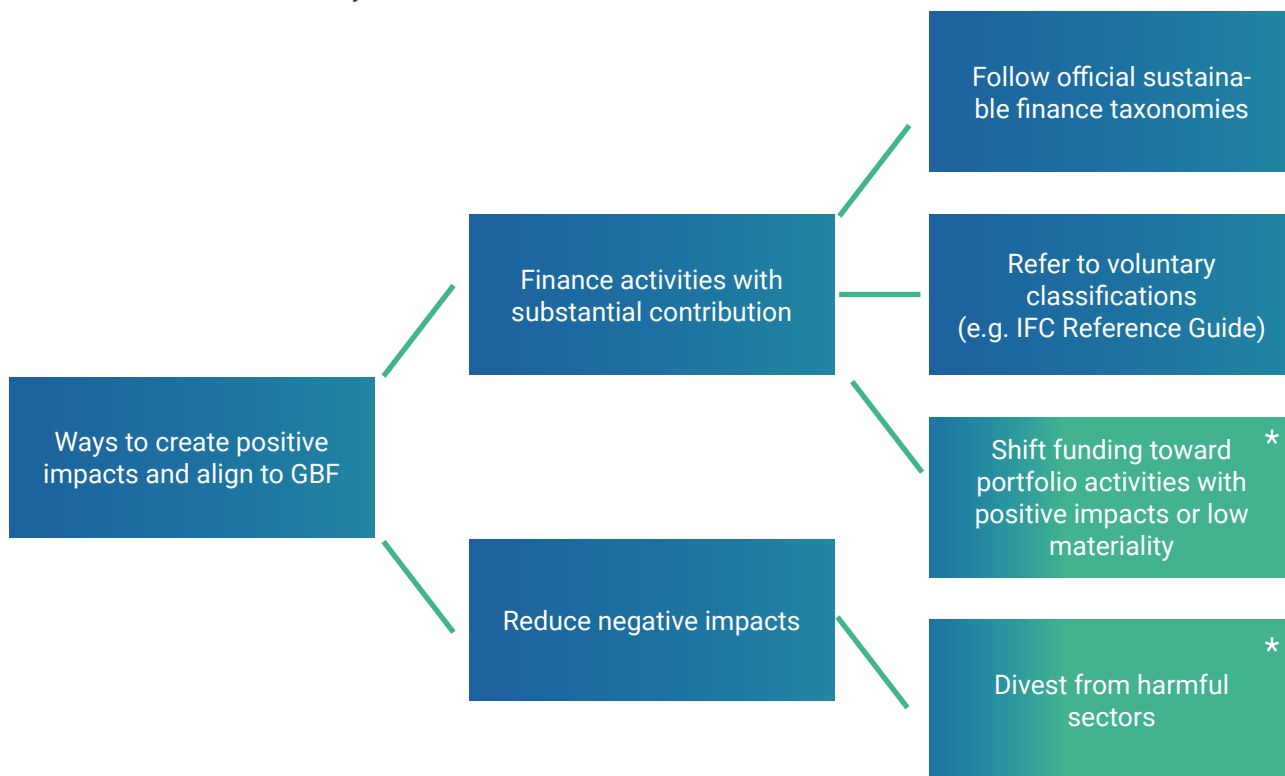


4 OTHER APPROACHES TO BIODIVERSITY FINANCE

4 – OTHER APPROACHES TO BIODIVERSITY FINANCE

The figure below illustrates two pathways for FIs to improve their performance on biodiversity. One option includes mainstreaming activities with proven positive biodiversity outcomes. The other calls for divesting from harmful sectors. The result will depend on both. An FI with products fostering sustainable practices but with large investments with negative impacts will have a final balance with high risks and adverse effects on the ecosystem services. In ot-

her words: such an IF is not constructively managing double materiality (Tamayo Tabares et al., 2022). This chapter will present examples of the progress and challenges FIs experience when navigating the world of biodiversity finance.



***Information is needed either from own impact and dependency assessments or ESG data**

Figure 5 Ways to create positive impacts and align to GBF

4.1. BIODIVERSITY-LINKED FINANCIAL PRODUCTS



The sustainable finance taxonomies introduced in the previous chapter can be used in different ways. For instance, companies and project promoters can choose to meet the criteria of the EU taxonomy to attract responsible investors. Alternatively, investors can use the taxonomy criteria for due diligence screenings and identifying sustainable investment opportunities to achieve a positive environmental impact. They can also design financial products specifically for sustainable activities. The TSC and DNSH principles support the selection of clients and monitoring activities (impact assessment). In this sense, taxonomies facilitate the advancement of FIs that otherwise were not ready to undertake the required technical development of such products to green their portfolios (European Commission, 2021a).

In fact, taxonomies already play a pivotal role in establishing standards for diverse financial products, as well as foster the development of new ones in a standardized manner. The EU, for example, has come to a provisional agreement about the creation of European Green Bonds (EuGB). The legal framework puts uniform standards on bond issuers who want to refer to their green bonds as EuGB. These bonds must follow the EU taxonomy and be consistent with its environmental objectives (European Council, 2023).

Supervised entities under the Colombian Superintendency of Finance (SFC) are encouraged to leverage the Colombian Green Taxonomy for multiple objectives. These include identifying funding and investment prospects, assessing portfolio alignment with green assets, and designing sustainable products and solutions (Circular Externa 005 de 2022, 2022). Green credit instruments can be exempt from of-

fering fees to incentivize the issuance of thematic instruments and promote the utilization of this taxonomy. Alternatively, compliance with international standards and indicators is acceptable for economic activities or assets not covered by the country's green taxonomy (Resolution 0586 - 2023, 2023).

If policymakers follow the recommendations outlined in the previous chapter, new and updated taxonomies will increasingly cover biodiversity issues in coming years. Meanwhile, existing guidance and standards can be adapted as "voluntary taxonomies." FIs can seek reference cases of existing financial products with a focus on biodiversity. This includes exploring the data behind such products' design, implementation, and monitoring procedures.

Take, for example, the Biodiversity Finance Reference Guide, which builds on the Green Bond Principles and Green Loan Principles of the International Finance Corporation (IFC). The aim of the guide, intended for FIs and investors, is to offer an indicative list of investments, activities, and project components that contribute to biodiversity conservation, ecosystem services, and sustainable natural resource management. The guide has been updated to align with GBF and offers the following (IFC, 2022):

- a structured approach for investors and financiers to identify eligible use of proceeds that constitute biodiversity finance;
- a guideline for policymakers to design biodiversity finance taxonomies; and
- an indicative list of biodiversity finance investment activities and project components.
- The biodiversity finance eligible activities fall into three categories:
 - investment activities that seek to generate biodiversity co-benefits;
 - investments in biodiversity conservation and/or restoration as the primary objective; and
 - investments in nature-based solutions to conserve, enhance, and restore ecosystems and biodiversity.

The following table summarizes the technical input of the guidance (first four columns), while the fifth column responds to a matching process completed by the authors. The financial products in the list were selected exclusively based on their thematic description and are used as examples. There is no further analysis of their transparency, environmental integrity, and impact.⁷ As shown later in this chapter, this type of analysis is challenging to conduct.

⁷ These financial instruments are based on the "objectification" and "singularization" of (parts of) biodiversity and by which financial transactions become possible. This approach has advantages and limitations that can be explored further in [Biodiversity Finance and Transformative Governance: The Limitations of Innovative Financial Instruments](#).

Biodiversity Finance category	Subcategory (example)	Green Bond/ Green Loan Principles' Environmental Objectives ⁸	GBF Targets	Potentially aligned financial products
Investment activities that seek to generate biodiversity co-benefits	Productive land use/ agriculture that increases crop yields/quality on existing land without increasing the environmental footprint.	B, NRC, PPC, CCM, CCA	T1, T10	Land Degradation Neutrality Fund's (LDN) mission is to catalyze transformative capital, uniting public and private investors to finance projects that advance Land Degradation Neutrality. It includes sustainable agriculture (UNCCD & Mirova, 2017).
	Forestry and plantation such as sustainable forest production and management that meet international best practices.	B, NRC, CCM	T10, T16	ASN Biodiversity Fund's objective is to contribute to the preservation, protection, and restoration of biodiversity through global investments in projects and businesses, focusing on sustainable forestry, agroforestry, seas and fisheries, and ecotourism sectors (Green Finance Institute, 2022).
	Freshwater/marine sustainable production via sustainable fisheries and fishery practices (adhere to gear restrictions and modifications, offtake and sourcing procedures, vessel modifications, minimize by-catch).	B, NRC	T10, T5	Sustainable Ocean Fund seeks to support the sustainable use of ocean resources by investing in a range of sectors, including sustainable fisheries, aquaculture, and ocean-related renewable energy projects (Mirova, 2020).
Investments in biodiversity conservation and/or restoration as the primary objective	Freshwater and marine habitat conservation or restoration, such as seagrass beds, coral, and mangroves, that protect important species, improve habitats, and provide services or important ecological functions.	B, NRC, CCM	T1, T2, T3, T4, T11, T19	DWS Concept ESG Blue Economy primarily invests in companies addressing issues like ocean acidification, marine pollution reduction, marine conservation, sustainable resource management, and fisheries sustainability (DWS, 2023).
Investments in NbS to conserve, enhance, and restore ecosystems and biodiversity	flooding and soil/ water salination.	B, NRC, CCM, CCA	T2, T8, T11	Wetlands Environmental Impact Bond aims to bridge funding gaps for essential coastal wetland restoration projects in Louisiana by mitigating the effects of coastal erosion, sea level rise, storm surges, and nuisance flooding on communities (Quantified Ventures, 2021).

Table 8 Biodiversity Finance Reference Guide (IFC)

⁸B= Biodiversity, PPC= Pollution Prevention and Control, NRC= Natural Resource Conservation, CCM= Climate Change Mitigation, CCA= Climate Change Adaptation.

TRENDING TOPIC ON ALTERNATIVE APPROACHES: BIODIVERSITY CREDITS

Biodiversity credits (or biocredits) may sound familiar to the highly contested carbon credits (Fischer & Knuth, 2023; Hache, 2019). Nevertheless, the organizations promoting them emphasize that biodiversity credits are different because in contrast to carbon credits, they are not intended to be used as offsets (i.e. actions taken to compensate for the negative impacts on the environment).

Biodiversity credits are defined as (Porras & Steele, 2020):

an economic instrument that can be used to finance biodiversity-enhancing actions (such as protecting or restoring species, ecosystems or natural habitats) through the creation and sale of biodiversity units. Potentially, biocredits would be generated by those who conserve biodiversity and bought by those who want to invest in biodiversity conservation. Once purchased, biocredits could be retired from the market or potentially sold in secondary markets.

It is envisioned that through the purchase of these credits, companies will demonstrate their commitment to managing nature-related risks. One example is the “voluntary biodiversity credits” of the Spectacled Bear Habitat Bank in Colombia. Each credit (priced at USD 30) corresponds to 30 years of conservation and/or restoration of ten square meters of forest. Another example is the Australian “biodiversity unit” that combines one carbon credit with one biocredit equivalent to 1.5 square meters of habitat protection (WEF, 2022d).

By mid-2023, at least ten initiatives were working on biodiversity credits. The idea is to include existing and potential regulation on impact and dependency disclosure that will attract attention to companies’ biodiversity performance (The Biodiversity Consultancy, 2022).

Though no international standards to develop biocredits exist – that is, to determine a fungible unit of measurement – there are at least three specific methodologies (Ducros & Steele, 2022) and multiple others that can be adapted to develop credits, i.e. quantify biodiversity gains (Nature Finance & carbone4, 2023). Also, there are efforts to design global principles (Biodiversity Credit Alliance, 2023; The Biodiversity Consultancy, 2022).

Information on this topic is growing, but it does not necessarily mean that the concept is becoming clearer. In some sources, the conceptual framework and practical

use of credits versus offsets becomes tangled (Porras & Steele, 2020; South Pole, 2023). A recent biodiversity credits taxonomy clearly mentions offsetting as one of the possible typologies (Nature Finance & carbone4, 2023). Additionally, the concept links to the not-so-straightforward “nature positive” movement (introduced in chapter two), which inherently relates to the concepts of net-zero, not-net-loss, and net gain, which in principle imply compensatory activities (119 experts, 2022).

Although advertised as different, market developers emphasize that biocredits developers should reflect on the lessons learned from the performance of carbon credits. Crucial elements must be ensured such as environmental integrity and additionally.⁹ Equally important, fair and timely inclusion of indigenous peoples and local communities to safeguard their rights and ensure an equitable distribution of monetary benefits as well as adequate governance structures (Taskforce on Nature Markets, 2022; WEF, 2022a).

Additional reflections should include the ethical issues around biodiversity offsetting. For instance, offsetting may exacerbate environmental harm because it erodes ethical barriers. Indeed, it can be used as a “permit to destroy” (Ives & Bekessy, 2015). Commonly, mandatory compensation does not capture the intrinsic value of biodiversity correctly (Karlsson & Edvardsson Björnberg, 2021). The zero-sum character of offsetting also lacks substantial contribution; in other words, it does not create value (Apostolopoulou et al., 2018)). This is why it was left out of the EU taxonomy, as the TEG recommended.

This market-based solution is quoted in GBF as one innovative schemes to mobilize financial resources on Target 19. Simultaneously in the same target, CBD suggests also relying on non-market-based approaches, such as community-based natural resource management, and civil society cooperation and solidarity (CBD, 2022a). Finding ways to reconcile both approaches is critical and must be evaluated by governments. Critics point to the dangers of disproportionate focus on the market-based approach and biodiversity financialization (119 experts, 2022). In a world where markets have grave failures, governmental institutions should safeguard the wellbeing of people and ecosystems. At the same time, most biodiverse countries face weak governance and government structures. There are grounds for caution as market development moves faster than policymaking.

⁹ A (bio)credits project is additional if the level of conservation or restoration achieved would not have occurred without revenue from the sale of the credits.

4.2. ESG DATA AND MEASURING CHALLENGES

An important piece to this puzzle is keeping FIs and corporations accountable for the results of their biodiversity-relevant products and actions. The required analysis is essential for market actors to make decisions. The challenge is that this information is frequently difficult to retrieve at the location and asset-specific level (GDFA, 2022). Reports on existing footprinting tools, certifications, and data sets show alternative ways to generate the required information (CREM & Pré Sustainability, 2019). Nonetheless, these approaches are often based on proxies or sectoral assumptions that cannot account for causality or are not flexible enough to incorporate sustainable practices, i.e. results stem from traditional production processes.

Another aspect is ESG data. A recent analysis indicates that although climate disclosure has gained significant attention in the business world, corporate disclosure related to biodiversity is not progressing at the same – and urgent – pace. Last year, more than 18,700 companies disclosed their climate data through Carbon Disclosure Project (CDP), reflecting a remarkable increase of 42 percent. In the same period, data on forests – just one aspect of ecosystems – was disclosed by just over 1,000 companies, showing a growth rate of only 20.5 percent compared to 2021 (Business for Nature, Capitals Coalition, CDP, 2022). In addition to insufficient reporting obligations, FIs face various data and measurement challenges concerning biodiversity which, in turn, result in limited disclosure practices.

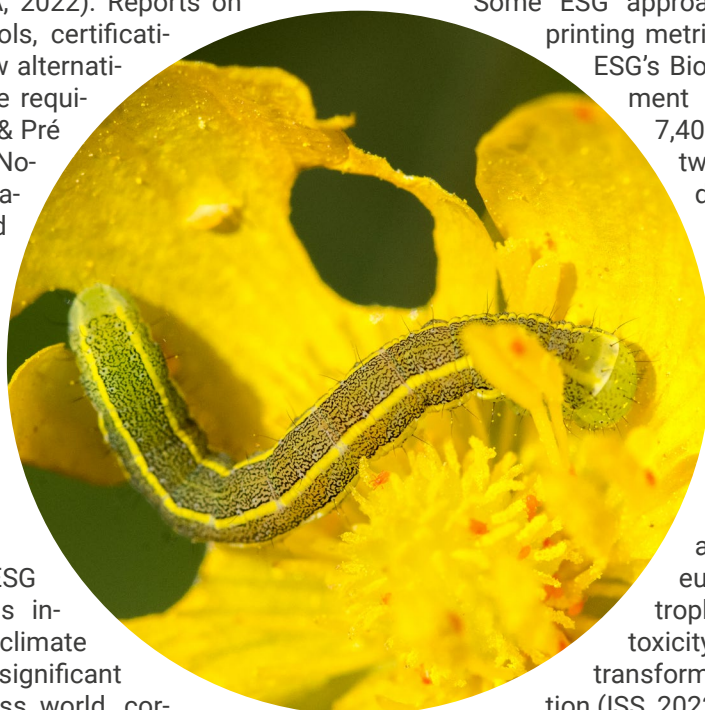
In general, there are increased references to biodiversity in ESG frameworks and with data providers

while building the ESG materiality matrix (WEF, 2022b). ESG rating agencies tend to include variables such as: the impact of companies on land, forest, water, and biodiversity; management strategies to

protect biodiversity and ecosystems; and the alignment with SDG 15 (life on land). However, ESG data providers measure these variables based on publicly available data. This affects the accuracy of biodiversity impact data.

Some ESG approaches use special footprinting metrics. For instance, the ISS ESG's Biodiversity Impact Assessment Tool (coverage about 7,400 issuers) focuses on two main biodiversity indicators: the Potential Disappeared Fraction of species (PDF) and the Mean Species Abundance (MSA). Additionally, it considers ten other environmental midpoint factors: climate change, marine acidification, freshwater acidification, terrestrial acidification, freshwater eutrophication, marine eutrophication, freshwater ecotoxicity, water availability, land transformation, and land occupation (ISS, 2022).

As biodiversity risks are highly location and region-specific, geospatial analysis is at the core of tools that enable companies and investors to focus on impact. Some tools also analyze ecological and environmental risks of companies through location-based multi-layer geospatial analysis. They measure species distribution, proximity of protected areas, and provide biodiversity due diligence data, among other things (MSCI, 2022b; RepRisk, 2022). Screening methods are also used in biodiversity-related risk assessment. MSCI tools include biodiversity-sensitive area and deforestation screening metrics in their ESG database (MSCI, 2022a).



Though tools exist for assessing and integrating biodiversity risk into the ESG framework, there is no standard methodology for determining and reporting biodiversity (CREM & Pré Sustainability, 2019). FIs and non-financial companies consider biodiversity in their ESG database according to different standards. To address this inconsistency, TNFD's reporting guidelines can be crucial for ESG practices. The applicability of the TNFD framework will be determined when it is released in full and applied. EU regulation and other international standards will be key to enhancing disclosure.

As already argued, impacts assessments depend on the specific production process, the location (ecosystem), and environmental risk management practices. Proxy approaches are difficult to apply. Sustainable finance taxonomies represent a solution as they delimit what is considered sustainable, normally following science-based evidence for a certain jurisdiction. If taxonomies are robust, FIs can utilize them as a catalogue and create positive impacts on biodiversity.

This chapter shows that there is available, though not perfect information to help FIs begin their journey toward transforming their portfolios to the benefit of biodiversity.

SHIFTING FINANCIAL RESOURCES AWAY FROM HARMFUL ACTIVITIES

In 2020, a study estimated that the funding needed to halt biodiversity loss ranges between USD 722 and USD 967 billion annually. However, this estimation considers only the sustainable transformation of agriculture, forestry, and fishing practices (Deutz et al., 2020). While these sectors significantly inflict much of the damage on biodiversity, factors such as local economic practices and ecological conditions should be factored in to obtain a more accurate estimation. In other words, global figures serve as indicators to convey urgency. They are, however, highly imprecise. Activities in mining, oil and gas extraction, industrial production, energy generation, infrastructure, and transportation are also central to the transformation (Kurth et al., 2020).

Even in cases where biodiversity loss is “compensated,” the final balance of lost versus gained entails uncertainty as it is based only on estimations (Apostolopoulou et al., 2018). Certainly, FIs should foster activities that preserve, restore, and sustainably use biodiversity, but they should also shift the billions invested in harmful activities. One analysis of biodiversity-related risks put it this way: “To prevent extinction, banks have to stop funding it” (portfolio.earth, 2020). Transition risks might push in that direction, but since adequate regulation must be developed and then enforced, FIs committed to the protection of the planet should not wait to embark on far-reaching transformation (Tamayo Tabares et al., 2022).

Text box 7 Shifting financial resources away from harmful activities

CONCLUDING REMARKS

The success of GBF relies substantially on the financial sector's involvement. Contributions of FIs and companies need to be more concrete, ambitious, and aligned with GBF targets. Moreover, the private financial sector must take a proactive role by voluntarily participating in joint initiatives. The new era posed by the GBF demands a transformative approach to biodiversity governance that is integrative, inclusive, adaptive, and anticipatory. This new approach to biodiversity loss crises requires efforts from all actors, and a fundamental transformation global finance's architecture.

Sustainable finance taxonomies offer the opportunity to contribute to this transformation by utilizing science-based criteria to define sustainable activities that contribute to the conservation and restoration of biodiversity. Nevertheless, trends show that biodiversity is not comprehensively integrated in current taxonomies. Although there is not a best practice to follow, guidance exists to enable taxonomy developers and "updaters" to expand taxonomies to biodiversity-related issues by including new sectors contributing to conservation, restoration, and sustainable use. At the same time, negative impacts should be halted in the short term by fostering transition finance and strengthening environmental regulation. Impact and dependency measuring are also strategies to support an informed divesting from harmful sectors.

More than 20 years ago, FIs, companies, and international organizations began discussing the financial risks of biodiversity loss. Models, methodologies, metrics, and tools have been developed to measure biodiversity impacts and dependencies. Nevertheless, they are not widely utilized, and little has been done to transform the relationship between humans and other species and ecosystems.



TERMINOLOGY

Biodiversity: The variability among living organisms in terrestrial, marine, and other aquatic ecosystems. This includes diversity within species (genetic), between species, and of ecosystems (CBD, 1992).

Biodiversity finance: Expenditure that contributes – or intends to contribute – to the conservation, sustainable use, and restoration of biodiversity (Hanson et al., 2012; OECD, 2020).

(Biodiversity) dependency: A business's reliance on or use of nature where nature functions as an input, or enables, enhances, or influences environmental conditions required for successful business performance (Natural Capital Finance Alliance & UNEP-WCMC, 2018).

Biodiversity loss: Global trend in which life on Earth declines at various levels, ranging from reductions in genetic diversity to the degradation of entire ecosystems. For instance, vertebrate species populations monitored across years have declined by an average of 68 percent over the last five decades (WWF, 2020). Biodiversity loss also implies a reduction in ecosystem services (Bradshaw et al., 2021). Estimations of biodiversity loss rely on mathematical equations that allow for discrete quantitative measures to account for the uncertainty that not all species have been described (Dempsey, 2016).

Biodiversity offsets: Conservation measures employed to compensate for unavoidable residual damage occurring at the final stage of the mitigation hierarchy (Bull et al., 2013).

Biodiversity-related risks: Financial or economic risk related to biodiversity loss (NGFS, 2022).

(Nature) conservation: The prevention of the destruction, degradation, and decline of species, landscapes, and ecosystems and measures to ensure their long-term survival (Lanjouw, 2021).

Convention on Biological Diversity (CBD): Signed by 150 government leaders at the 1992 Rio Earth Summit, the CBD is the central intergovernmental biodiversity process. CBD has three main objectives: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The Conference of the Parties (COP) to the CBD meets every two years (CBD, 1992).

Double materiality: This concept acknowledges the double character of materiality in terms of nonfinancial/sustainability reporting. Namely, it refers to how businesses contribute to the unprecedented biodiversity loss and how, at the same time, such loss impacts the performance of companies. Businesses face “impact materiality” as their own operations and value chain affect the environment and society. “Financial materiality” refers to the level of significance of a sustainability issue on the reporting entity's ability to create financial value (EFRAG, 2021).

Ecosystem services: The benefits people obtain from ecosystems, including biodiversity. Ecosystem services can be classified as follows (Alcamo et al., 2003):

- Provisioning services are products such as timber and fuel wood from forests, freshwater from rivers.
- Regulating services are the benefits obtained from the regulation of ecosystem processes, including climate, hydrological, and biochemical cycles.
- Cultural services are the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences.
- Supporting services are processes necessary for the production of all other ecosystem services. Their impact on people are either indirect or occur over a long period. Examples include soil formation and the nutrient cycle.

ESG: A framework system that integrates environmental (E), social (S), and governance (G) factors in financial operations. ESG refers to responsible investment as “a strategy and practice to incorporate ESG factors in investment decisions and active ownership.” (Li et al., 2021).

Impacts: A positive or negative effect of business activity on the quantity or quality of biodiversity levels or ecosystem services (Hanson et al., 2012; Natural Capital Finance Alliance & UNEP-WCMC, 2018).

Megadiverse countries: the 17 countries that harbor 70 percent of species diversity of the planet. Seven such countries are in the Americas: Brazil, Colombia, Ecuador, Mexico, Peru, USA, Venezuela (IPBES, 2023).

Nature: Nature includes biodiversity, ecosystems (both physical structure and functioning), evolution, biosphere, humankind's shared evolutionary heritage, and biocultural diversity. Nature is inextricably linked to humans and not a separate entity (IPBES, 2017). Nature is a very complex and plural concept. "Context-specific, subjective, normative and dynamic worldviews and values are at play in any definition of nature. Being aware of this pluralism is essential for avoiding "objective" definitional attitudes that risk disregarding and marginalizing the plurality of values and worldviews connected to different definitions of nature." (Visseren-Hamakers & Kok, 2022).

Nature-based solutions (NbS): Umbrella term for solutions to societal challenges that involve working with nature. They encompass a wide range of actions, such as the protection and management of natural and semi-natural ecosystems, the incorporation of green and blue infrastructure in urban areas, and the application of ecosystem-based principles to agricultural systems (Seddon et al., 2020).

Nature-related risks: arise when a change in a business's impacts or dependencies on nature become a threat to that business's operations and profitability (WWF, 2019). Unlike biodiversity-related risks, nature-related financial risks are financial or economic risks posed by natural processes, including climate, weather, and biodiversity loss (NGFS, 2022).

(Ecological/nature) restoration: The total set of ideas and practices – social, scientific, economic, political – involved in assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed (Clewell et al., 2004; Higgs, 1994).

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