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ACADEMY

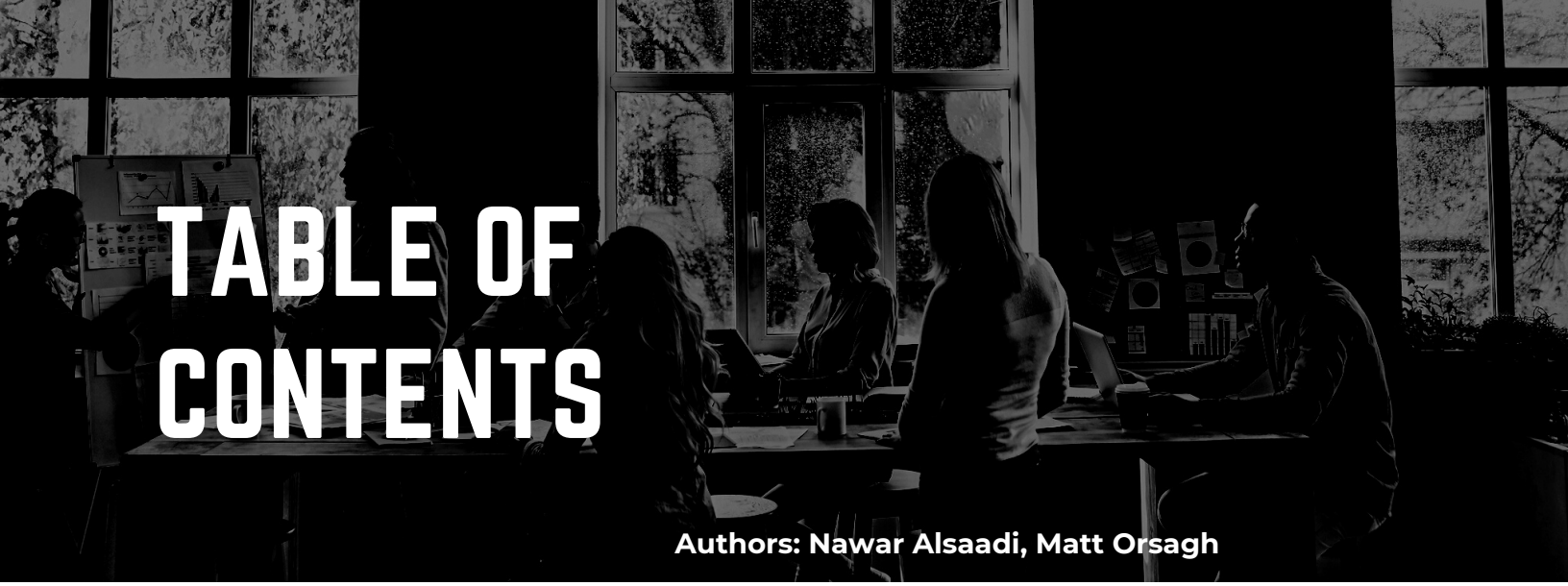
Biodiversity loss negatively impacts our economy. Investors can change that, if they chose to.

BIODIVERSITY LOSS

THE HIDDEN THREAT TO OUR ECONOMY

January 24, 2024

WHITE PAPER



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INTRODUCTION

We as humans perceive ourselves to be the evolutionary pinnacle of this planet, yet when it comes to finding ourselves stranded in a slow boiling pot of water, our reaction is hardly different from that of a frog's reaction, namely do nothing. This unflattering analogy is exactly where we find ourselves when it comes to biodiversity loss.

The term biodiversity refers to the rich variety of life, at all levels, from genes and unique lifeforms at the individual species level to entire ecosystems such as forests and coral reefs. The myriad and complex interactions between these elements have sustained life on this planet for billions of years. To paraphrase the philosopher Thomas Berry, biodiversity is a communion of subjects, not a collection of objects. The air we breathe, the water we drink, and the food we eat are ultimately dependent on the preservation of this natural capital and the ecosystem services it provides. When we talk about biodiversity loss, we either refer to the erosion of this natural heritage or the loss of the ecosystem services it provides. An example of such ecosystem services would include services such as soil formation, nutrient cycling, water filtering, crop pollination, and carbon sequestration, among others. Ecosystem services also extend to the cultural interactions between humans and nature, interactions depicted in human drawing of pictures of animals of planets and animals on cave walls.

The rich biodiversity of our planet is being shattered by our ceaseless economic development, and this accelerating loss in biodiversity (both natural capital and ecosystem services) presents an existential risk to our society and our civilization. According to a key 2019 report by the OECD our planet is facing a sixth extension[1]:

"Humans have destroyed or degraded vast areas of the world's terrestrial, marine and other aquatic ecosystems. Natural forests declined by 6.5 million hectares per year between 2010 and 2015 (in total, an area larger than the U.K.), and natural wetlands declined by 35% between 1970 and 2015. Over 30% of corals are now at risk from bleaching, and 60% of vertebrate populations have disappeared since 1970. These striking changes are driven by land-use change, over-exploitation of natural resources, pollution, invasive alien species and climate change."

"Humans have destroyed or degraded vast areas of the world's terrestrial, marine and other aquatic ecosystems." OECD

A 2020 report by the World Economic Forum[2] on biodiversity loss was no less alarming:

"Although the world's 7.6 billion people represent only 0.01% of all living things by weight, humans have already caused the loss of 83% of all wild mammals and half of all plants. The current rate of extinction is tens to hundreds of times higher than the average over the past 10 million years – and it is accelerating... We are breaching the planet's boundaries beyond the ability of natural systems to cope, which is increasing the risk of large-scale, irreversible environmental and societal changes."

"Although the world's 7.6 billion people represent only 0.01% of all living things by weight, humans have already caused the loss of 83% of all wild mammals and half of all plants."

Outside of the obvious moral, societal, and environmental implications, the economic costs associated with the aforementioned biodiversity loss are staggering. According to the already cited OCED report, between 1997 and 2011, the world lost an estimated $4-20 trillion per year in ecosystem services owing to land-cover change and $6-11 trillion per year from land degradation. The report goes on to estimate the total value of ecosystem services delivered today by biodiversity at $125 to $140 trillion per year.

Now that you have the economic and biodiversity loss facts, it will perhaps not surprise you to learn that biodiversity loss has been classified by the 2020 World Economic Forum Global Risk Perception Survey as the[3] third foremost long-term existential threat to humanity. In a 2019 UK government-commissioned report[4] on the economies of biodiversity, Cambridge University economist Professor Partha Dasgupta, made the following grave observation:

"We have failed to manage our global portfolio of assets sustainably. Estimates show that between 1992 and 2014, produced capital per person doubled, and human capital per person increased by about 13% globally; but the stock of natural capital per person declined by nearly 40%. Accumulating produced and human capital at the expense of natural capital is what economic growth and development has come to mean for many people. In other words, while humanity has prospered immensely in recent decades, the ways in which we have achieved such prosperity means that it has come at a devastating cost to Nature. Estimates of our total impact on Nature suggest that we would require 1.6 Earths to maintain the world's current living standards."

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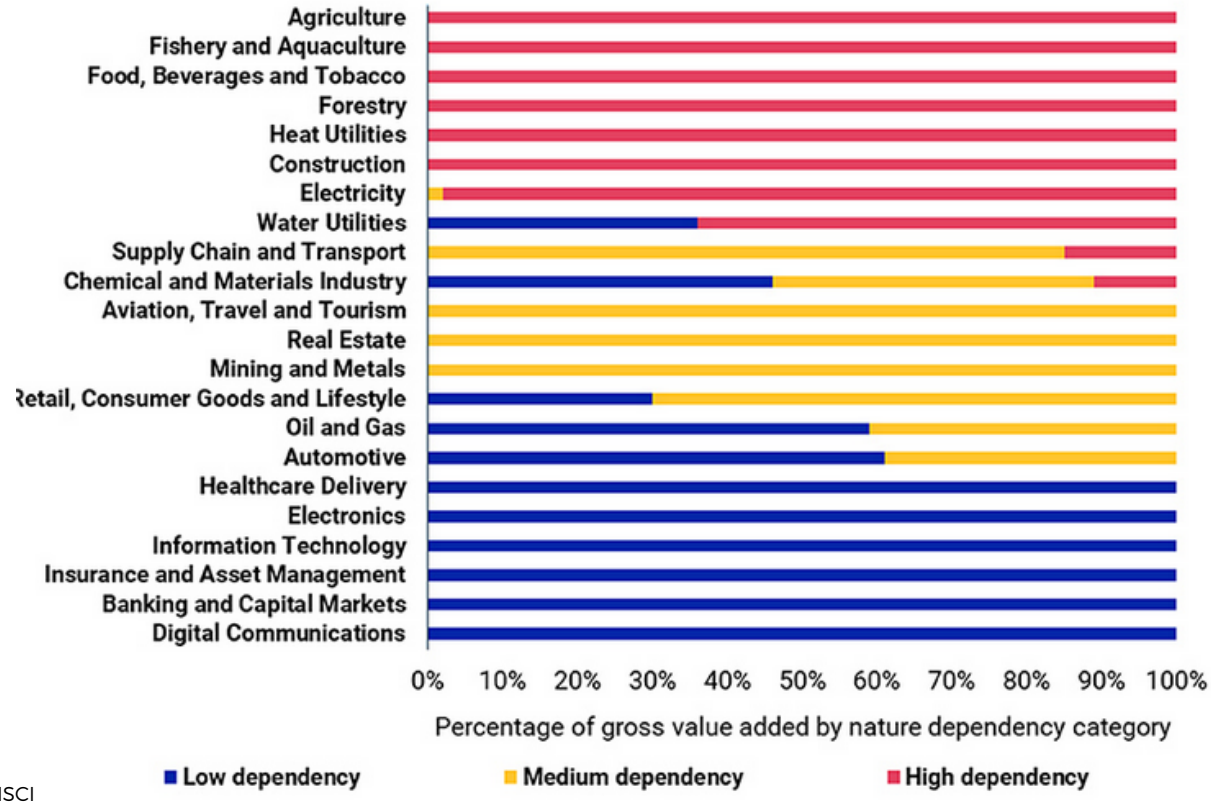
ECONOMIC IMPACT & BUSINESS IMPLICATIONS

What all these numbers, observations, and statistics mean is that we are on an unsustainable path when it comes to our future on this planet. While we are damaging the planet a great deal, the greatest damage we are causing is to ourselves, and future generations, people from whom we have borrowed the present.

According to the World Economic Forum, industries that are highly dependent on nature generate 15% of global GDP, or $13 trillion a year, this number expands to 37% or $31 trillion if we include moderately dependent industries. The following table by PWC provides a breakdown of the direct and indirect (supply chain) exposure of various industries to nature:

Figure 1: MSCI provides breakdown as to the degree of dependency of different industries on natural capital



Source: MSCI

This economic and industry dependency on nature also varies between countries, some of the fastest-growing economies in the world such as India and Indonesia generate 33% and 32% of their GDP respectively from sectors that are highly dependent on nature; this number shrinks to around 10% for larger economies such as the United States and the EU, but the absolute numbers remain substantial at $2.1 trillion and $2.4 trillion, respectively.

An extensive 2020 study by the WWF on Natural Capital looked at the potential economic impacts of "business as usual" or the cost of doing nothing and concluded that the cost to the global economy from the continued degradation of six key ecosystem services amounts to $10 trillion by the year 2050[5].

The six ecosystem services they studied were:

Figure 2: Ecosystem services considered in the global futures model

Ecosystem service	Description (economic benefit)	Natural assets providing this service
Pollination	Pollination of commercially important agricultural crops by insects	Forests, grasslands and other important feeding and shelter habitats for pollinating insects
Coastal protection	Protection of coastal infrastructure and agricultural land from erosion and flooding	Coral reefs, mangroves, seagrasses, saltmarshes that supply/anchor sediments, reduce/absorb wave energy and regulate flooding
Water yield	Water supply for agriculture / irrigation	Forests, wetlands and other habitats that store and influence the flow of water / evapotranspiration in catchments
Timber production	Supply of timber	Forests (natural and commercially planted) that provide timber for commercial / subsistence uses
Fish production	Supply of fish / fishery products	Marine habitats such as coral reefs, mangroves and seagrasses that sustain fisheries
Carbon sequestration	Absorption and storage of carbon	Forests, peatlands and other high-carbon habitats

Source: WWF and Natural Capital

According to a landmark biodiversity loss study by the global insurer Swiss Re, a fifth of countries globally are at risk of ecosystem collapse due to a decline in biodiversity and related beneficial services[6]. The study talks of potential "biodiversity loss shocks" in countries highly dependent on agriculture such as Kenya, Nigeria, Vietnam, Pakistan, and Indonesia.

BIODIVERSITY LOSS & EVERYDAY LIFE

Unfortunately, it is often the case that when we talk about billions and trillions the numbers become abstract and potentially meaningless. This in itself is a major issue since the challenge we are facing with biodiversity is so large that it is hard for us as individuals to grasp the scale of its consequences. It is easier for us to be concerned about the pollution of a small nearby lake than the destruction of an ocean. Having said that, in nature, nothing is too small or too big, everything is interconnected. This inability to appreciate the impact of environmental degradation is made worse by our growing alienation from nature and the outdoors, or what author Richard Louv dubs Nature-Deficit Disorder[7].

To bring the conversation from the abstract to the tangible, let's look at coffee, who of us doesn't drink coffee, or knows someone who does? A 2019 study published in Science Advances indicates that 60% of coffee varieties are in danger of extension due to climate change, disease, and deforestation[8]. The coffee market, which generates $83 billion in retail sales[9], employs tens of thousands of people in the service industry and is the source of livelihood for a multitude of smallholder farmers, mostly in developing countries. Not to mention, what would happen to our collective productivity without a cup of joe in the morning?

If you think you will just substitute tea for your morning coffee, you might be mistaken. Tea is in trouble as well. Tea is the most popular beverage in the world, and it too is under threat from climate change. The regions that grow the tea the world drinks, primarily in Africa and India will undergo climate changes that will often alter the taste of your favorite tea, if that tea can be grown there at all. For example, Kenya produces about half of the tea consumed in the UK. However, the area of optimal tea-growing conditions in Kenya will likely be reduced by more than a quarter by 2050. About 39% of areas with medium-quality growing conditions are facing destruction, according to a 2021 report by Christiann Aid[10].

It is estimated that 90 percent of humanity uses the world's most popular drug, caffeine, in some form every day[11]. Most of that caffeine is delivered in coffee or tea. A loss of coffee and tea won't just impact our tastebuds. It will sap our productivity.

Obviously, it's not only coffee and tea that will be impacted. Other vital crops such as rice, wheat, and maize are at a serious threat from the proliferation of invasive species[12]. A 2023 report published in Nature, shows that without climate adaptation measures, the simulated global crop yield losses for cereals (wheat, corn, sorghum, millet, and rice) are between 7% and 23%[13]. The negative effects of climate change on cereal yields can be mitigated by adaptation efforts. But such efforts are very expensive.

Source: Pixabay Creative Commons

Beyond crops, timber production, a vital industry in many countries is directly affected by biodiversity loss. According to a study published in Science magazine, a 10% loss in forest biodiversity leads to 3% loss in productivity.[14]

Outside of agriculture and forestry, biodiversity is essential to drug discovery, a venom from the vipers of Latin American jungles pointed scientists to a new class of blood pressure-reducing drugs with relevance to one billion people. As a matter of fact, half of the top ten prescription drugs in the United States, are of animal, plant, or microorganism origin.[15] The economic value of such vital health discoveries is for the most part missing when we talk of the value of biodiversity.

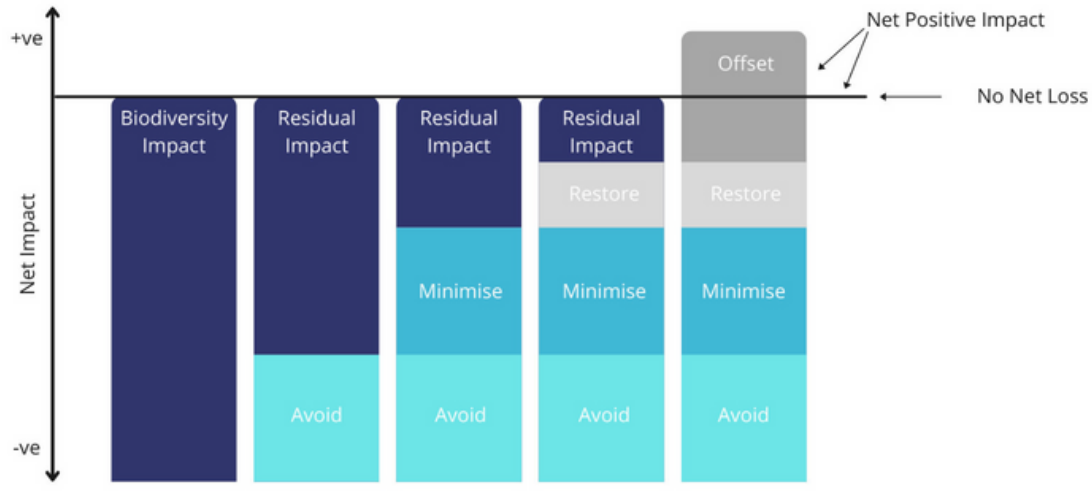
BIODIVERSITY BUSINESS & INVESTMENT OPPORTUNITY

It is important to note that when it comes to business, biodiversity management is not only a question of preventing natural degradation. It is also an incredible business opportunity to develop new business lines and services that enhance and promote biodiversity.

The Biodiversity Consultancy proposes a four-step biodiversity mitigation hierarchy[16]: avoidance (preventing impacts altogether), minimization (reducing harm), restoration (rehabilitating affected ecosystems), and finally offsetting (compensating for residual damage elsewhere and creating net positive impact). The goal of this hierarchy is to guide decision-makers and developers toward a more sustainable approach to development, where efforts are made to conserve biodiversity and minimize environmental harm.

In the category of net positive impact, the International Finance Corporation (IFC) has identified three key markets where private business can promote and support biodiversity[17]:

Figure 3: The mitigation hierarchy



Source: Biodiversity Consultancy

1. Markets for sustainably produced goods

Markets for biodiversity products that are produced in a manner that is demonstrably beneficial to biodiversity have grown rapidly in the past decade, most notably for sustainably harvested forestry products and some foods. These markets are also driven by an increasing focus by consumers on the quality and safety of products they consume, particularly food.

2. Consumer markets for non-consumptive uses of biodiversity

One of the largest markets that places an intrinsic value on biodiversity resources themselves is the tourism and recreation sector. Tourism, the world's largest industry, depends significantly on healthy ecosystems. Nature-based tourism, the fastest growing segment of the global tourism industry, now accounts for a significant percentage of tourists worldwide and represents a major source of foreign revenues for many emerging markets.

3. New markets for ecosystem services

The increasing recognition of the financial value of ecosystem services is a growing business opportunity for some sectors. While there are several examples of market transactions for carbon sequestration or maintenance of water quality and supply, other markets for ecosystem services are just beginning to emerge or are still ideas for the future, including those for natural disaster mitigation, pollination, biomass production and absorption, and maintenance of genetic diversity.

Figure 4: Summary of future investment needs

Type of NbS	Total cumulative investment (2021-2050) USD billion	Additional annual investment in 2050 USD billion per year
Re/afforestation	4,684	203
Mangrove restoration	15	0.5
Peatland restoration	301	7
Silvopasture	3,130	193
Total investment needs	**8,130**	**403**

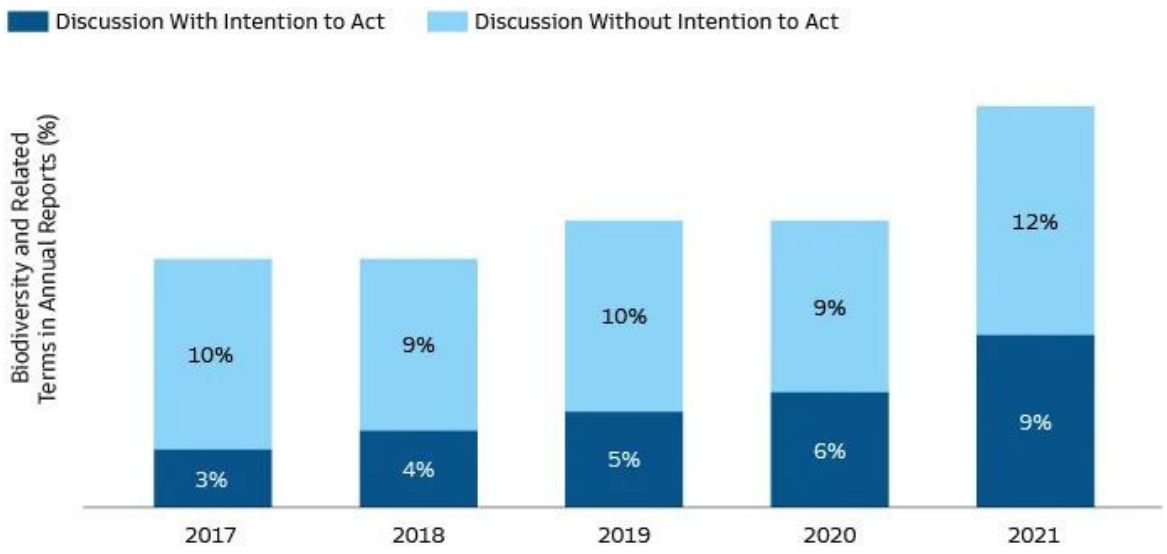
Source: UNEP FI

A 2021 report[18] by the United Nations Environmental Programme (UNEP) indicated that annual private sector investments in nature-based solutions to protect biodiversity and landscapes such as sustainable forestry amount to $18B compared to $113B invested by governments.

The report goes on to highlight the need for annual sustainable investments (public and private) to reach $536B to prevent human activity from pushing the planet's environment to the point where it can no longer regenerate itself. The private sector can play a critical role in meeting this funding gap through a combination of private-public partnerships, and other related investment opportunities.

Yet, despite the immense economic risks, and opportunities, associated with biodiversity management and protection, only 23% of companies worldwide at risk from biodiversity loss are currently disclosing this risk in their corporate reporting according to KPMG[19]. Goldman Sachs published similar findings earlier this year, stating that only 21% of the companies in the MSCI ACWI Index mention biodiversity-related topics such as deforestation in their 2021 annual reports[20]. The lack of corporate biodiversity risks disclosure is the low-hanging fruit as to where investors can make an immediate and tangible impact in this field. But obviously disclosure is a starting point and not an end point.

Figure 5: Summary of future investment needs



Source: Goldman Sachs - MSCI

THE ROLE OF INVESTORS

As highlighted earlier, biodiversity loss represents a significant social and economic risk for the world, and thus at a minimum and purely from a risk management standpoint, investors have a responsibility to account for and mitigate this risk. Nonetheless, unlike climate risk, tools to identify and manage biodiversity risks at the corporate level remain in their infancy.

In 2020, the UN PRI underlined a need for investors to act on biodiversity loss and called for investors to address this issue systematically rather than focus on individual holdings[21]. The accompanying report made eight distinct investor-related biodiversity loss recommendations:

- Allocate capital to sectors or business models which are avoiding and reducing biodiversity loss and increase opportunities for positive outcomes on the ground, including restoration.
- Engage investees on reducing negative biodiversity outcomes and design stewardship approaches to deliver positive biodiversity outcomes.
- Engage policy makers on reforming incentives, including subsidies, to activities that drive biodiversity loss.
- Building internal capacity to ensure awareness of biodiversity's importance.
- Testing new tools and measurement approaches to understand how investments shape biodiversity outcomes.
- Engaging with companies and data service providers to provide meaningful, consistent data.
- Engaging with green funds, bonds, commodities, and certification schemes to integrate biodiversity into existing standards.
- Collaborating with peers and stakeholders to enhance nature-related financial disclosure.

Since the UN PRI guidance, several investors have launched multiple initiatives to protect the natural environment and reverse biodiversity loss. Follows are some of the major investor and business-led biodiversity protection initiatives:

Business for Nature: Business for Nature is a global coalition that brings together business and conservation organizations and forward-thinking companies. In 2020, Business for Nature, having the support of 700 companies with over $4.3 trillion in revenues, issued a call for governments to adopt policies to reverse nature loss this decade.[22]

Natural Capital Finance Alliance (NCFA): The NCFA is an initiative that goes beyond 'sustainability'. It is about the materiality of natural capital to the health of financial institutions and the finance sector. The NCFA proposes that natural capital-related risks be included in the financial metrics used by the private sector, where appropriate[23]

Taskforce on Nature-related Financial Disclosure (TNFD): The Taskforce launched its disclosure recommendations for companies in September 2023. The TNFD uses the proven TCFD framework of governance, strategy, risk & and impact management, and metrics and targets as the organizing principles of the standard. These standards are already being used by investors and companies to better track biodiversity-related risks and opportunities.

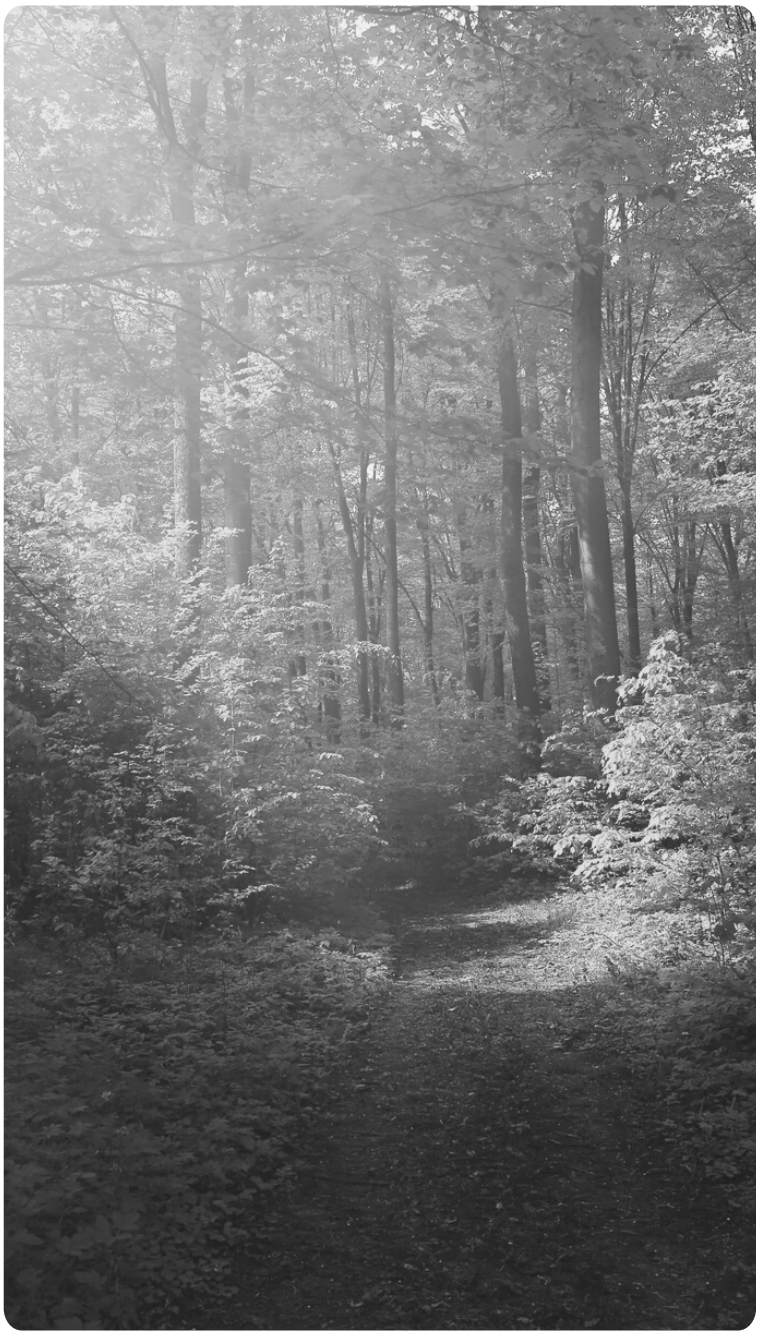
Mission Économie de la Biodiversité (MEB): is an initiative of Caisse des Dépôts (A major French financial institution) spearheaded and run by CDC Biodiversité. It is tasked with researching and devising innovative solutions that strike a balance between economic development and the preservation of biodiversity. In early 2021, the MEB launched the Global Biodiversity Score (GBS), a tool to assess the biodiversity footprint of businesses and financial assets[24].

Academic institutions are also working to provide both the private and public sectors with the tools they need to better manage and protect Earth's natural capital endowment; most noteworthy:

Natural Capital Project (NatCap): The Natural Capital Project, or NatCap, works to integrate the value nature provides to society into all major decisions. NatCap operates as a partnership between Stanford University, the Chinese Academy of Sciences, the University of Minnesota, the Stockholm Resilience Centre, The Nature Conservancy, and the World Wildlife Fun.[25]

Impact-Weighted Accounts Project: The mission of the Impact-Weighted Accounts Project, a Harvard Business School initiative, is to drive the creation of financial accounts that reflect a company's financial, social, and environmental performance[26].

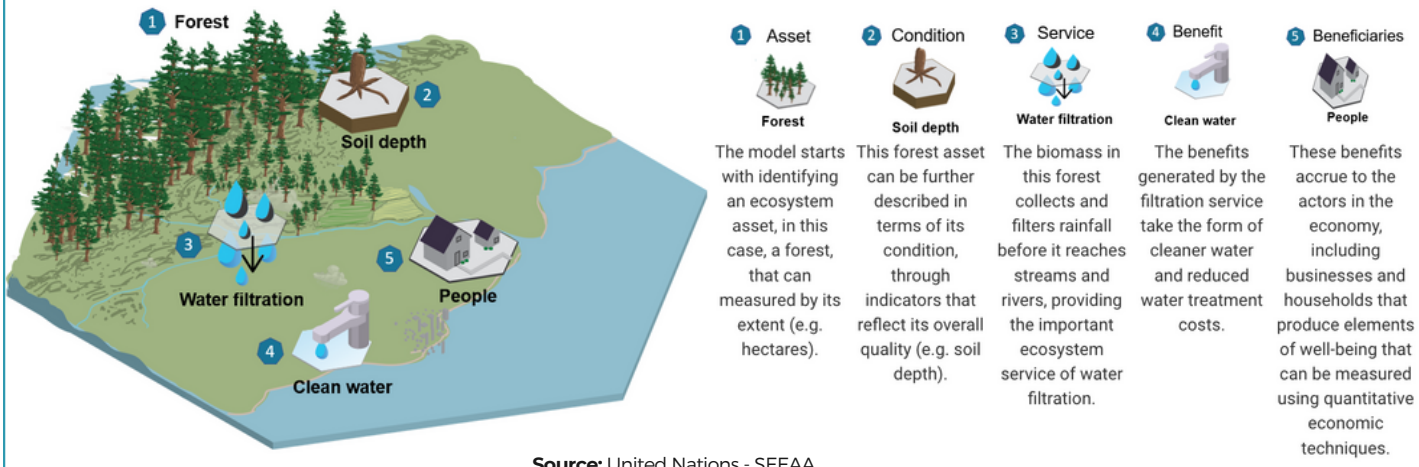
Nature Action 100+: Theis's investor-led initiative engages companies in key sectors that are deemed to be systemically important in reversing nature and biodiversity loss by 2030. The initiative opened to investors in June 2023.[27]



Of note, in April 2021, the United Nations adopted a landmark framework to integrate biodiversity reporting in economic reporting.

The **System of Environmental-Economic Accounting—Ecosystem Accounting (SEEA EA)** — which marks a major step forward that goes beyond the commonly used statistic of gross domestic product (GDP) that has dominated economic reporting since the end of World War II. This measure would ensure that natural capital—forests, wetlands, and other ecosystems—are recognised in economic reporting.[28]

Figure 6: In the following schema SEEA clearly maps the relation between people, natural capital, and ecosystem services:



Source: United Nations - SEEAA

As of 2022, the 15th Conference of the Parties to the UN Convention on Biological Diversity resulted in the adoption of the Kunming-Montreal Global Biodiversity Framework (GBF).

The GBF aims to reverse nature loss. The framework consists of global targets to be achieved by 2030 to safeguard biodiversity.

These targets include closing the biodiversity finance gap of $700 billion per year. Goals also include a 30 percent conservation of land, sea, and inland waters, 30 percent restoration of degraded ecosystems, halving the introduction of invasive species, and $500 billion/year reduction in harmful subsidies.[29]

These new tools, regulations, and frameworks should prove decisive in boosting investors' interest in biodiversity and land-use finance bonds or nature bonds, which represented a mere 3% of the Green Bonds market in 2019.[30] In a sign of changing attitudes towards nature bonds, emerging market nations have started looking at issuing biodiversity bonds in collaboration with the World Bank.

Pakistan was one of the first markets to use this scheme to issue a $1 billion nature-performance bond, where the interest rate paid on the bond will reduce if the country reaches a pre-set biodiversity loss reduction target.[31] Private investors can play a key role in the development of this market by providing liquidity and working with issuers to further define and standardize Nature Bonds issuance standards.

In aggregate, biodiversity financial flows as 2022 were about $166 billion, with most coming from domestic government issuance.[32]

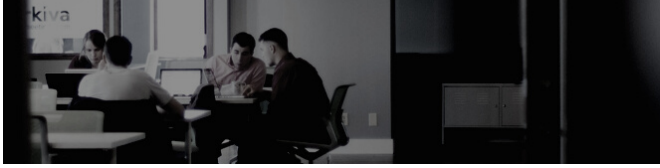
CONCLUSION

The magnitude of the biodiversity loss challenge is beyond a single company, investor, or country to resolve, biodiversity loss is a global and generational challenge that requires urgent, collective action, and a well-defined systematic approach. Investors are only one piece of the puzzle to address the challenges of natural capital and biodiversity loss. However, they have a key role to play by providing capital to nature-accretive industries, and by using their shareholders' rights to engage with portfolio companies to better manage their biodiversity externalities. Investors can also use their clout to engage with policymakers and standard-setting organizations on critical issues such as corporate biodiversity loss disclosure, and biodiversity protection and restoration standards.

In concluding his biodiversity loss report, Professor Partha Dasgupta of Cambridge University said it best,

> ***"At their core, the problems we face today are no different from those our ancestors faced: how to find a balance between what humanity takes from Nature and what we leave behind for our descendants. While our ancestors were incapable of affecting the Earth system as a whole, we are doing just that. The transformative change needed in choosing the sustainable path requires the sustained commitment of actors at all levels."***

Finally, we at ED4S remain committed to advancing investor education, training, and capacity building, on sustainability issues as ecologically and as economically critical as biodiversity loss. As such, we do hope that the information put forward in this biodiversity loss and natural capital overview will spur investment committees, investment teams, board of directors, and other economic decision makers to think deeply and act decisively to address this urgent planetary challenge.



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THANK YOU!

ANY QUESTIONS?

Contact hi@ed4s.org