

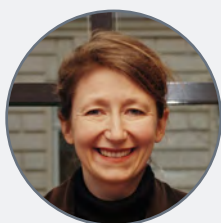
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Biodiversity: Next Frontier in Sustainable Investing?

CANDRIAM ACADEMY 
INVESTORS FOR TOMORROW

Based on Candriam Academy's ESG Talk

In conversation with



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**“If we care about our
common future and the
common future of our
descendants, we should
all in part be naturalists”**

Professor Sir Partha Dasgupta¹

Author of [The Economics of Biodiversity: The Dasgupta Review](#)

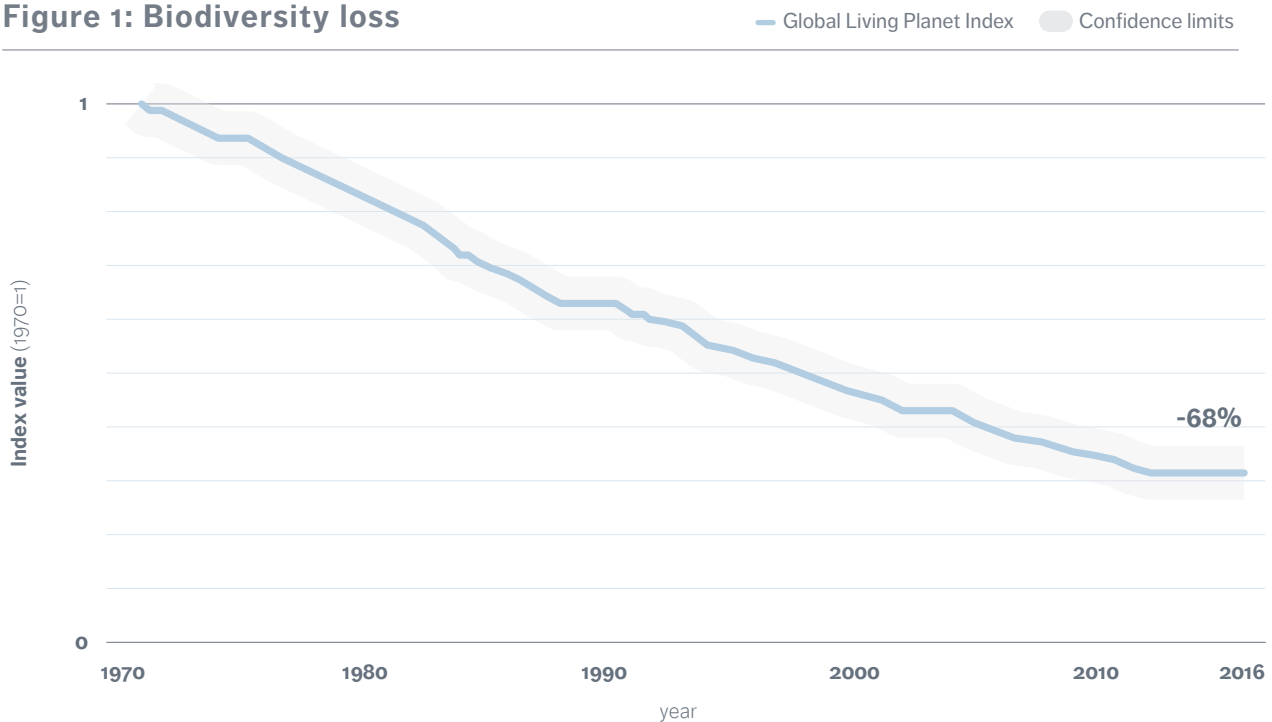
Biodiversity: Next Frontier in Sustainable Investing?

In June 2022, in our [ESG Talk](#) before the Summer holidays we turned to the risks around biodiversity loss. Based on that fascinating discussion and Q&As, we offer you this paper that looks at the scale of the problem, its key drivers and the effect on markets and the global economy, what types of investments could potentially encourage positive change and the level of investments needed to make a real difference.

Our planet's biodiversity – the variety of species of animals and plants – **is collapsing. It is falling at the speed from tens to hundreds of times higher than it did, on average, over the past 10 million years. It is also accelerating²** (see Figure 1). Our flora and fauna are the engines of every ecosystem **providing our civilisation with clean water, the air rich in oxygen and nutritious food.** We now take from our planet 56% more than it can regenerate but a lot of these resources are wasted to overconsumption³.

According to the World Economic Forum's 2022 Global Risks Report, **biodiversity loss is one of the top three risks in terms of likelihood and impact in the next 10 years⁴**, it cannot be seen with a linear world view, but once triggered can have far greater than average implications.⁵

Figure 1: Biodiversity loss



Source: World Wildlife Fund (WWF) and Zoological Society of London (ZSL), 2020.

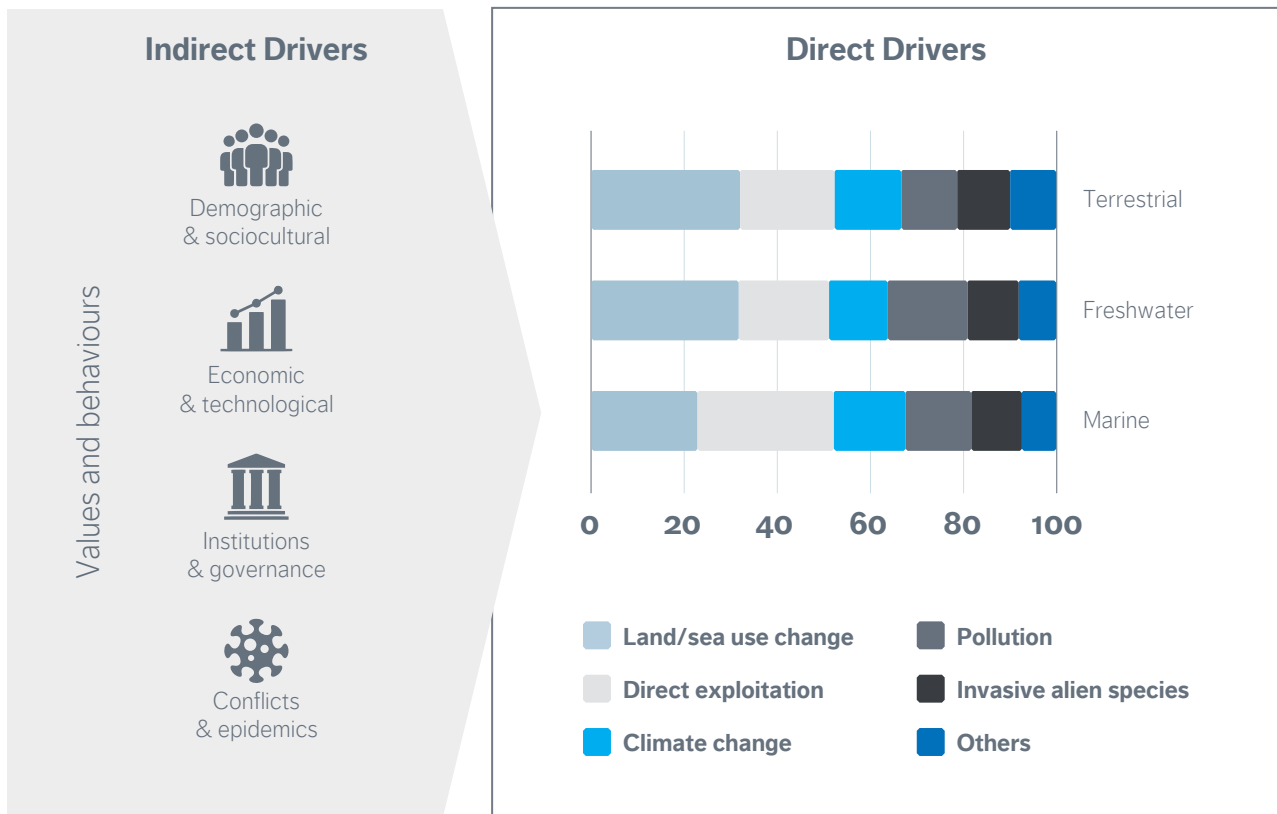
Climate change is just a start

At last, the industry is becoming fluent in climate change – and has a framework to respond to it, guiding the flow of trillions of dollars of capital. There is no doubt that stopping climate change is today's main priority. Achieving carbon neutrality will give us the best chance of preserving living conditions for our children, and for other creatures living on our planet.

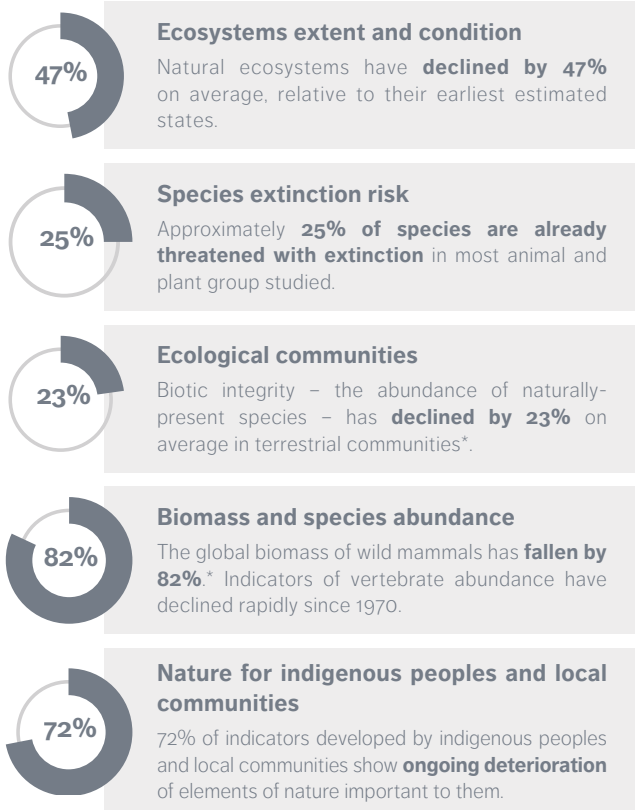
So while to save biodiversity without properly addressing climate change will be impossible, it won't be enough. Nurturing biodiversity back to health will require a lot more – a new and effective framework to address other key drivers of its destruction (see Figure 2), including pollution, deforestation, and overexploitation of wildlife on land and in sea.

The scale of the challenge is grave – direct consequences of **human activity have in fact displaced disease, natural disasters, hunger and drought as the biggest cause of death of species**. And if that was not bad enough, the effects of human consumption (the five key colour-coded drivers on Figure 2) are becoming more powerful, spired by exponential population growth, more people joining the middle class with its wealth aspirations, and the wasteful use of natural resources⁶.

Figure 2: Drivers of Biodiversity Loss



Examples of declines in nature



*since prehistory

Source: IPBES¹, Candriam, July 2022.

- **Land/sea use change** – this is the biggest cause of biodiversity loss. It includes land conversion, for agriculture and building projects, which leads to degradation of soil, deforestation, and detrimental changes in ecosystems, most of them irreversible.
- **Direct exploitation** – another huge driver, referring to the over-exploitation of animal and plant resources for human consumption. Most of it is used for food production and timber.
- **Climate change** – this significant factor is linked directly to biodiversity and has ability to inflict irreversible changes to ecosystems or destroy them completely (see Climate Change and Biodiversity Loss: Example).
- **Pollution** – from a variety of sources, industrial, transportation and consumer-led, that affects contaminates air, water and soil.
- **Invasive species and disease** – this factor is growing in importance. Invasive species can damage ecosystems by altering the food chains and introduce new diseases posing immediate risk to the animal stock used for food production. In some cases, invasive animals can pass their infection on to people.

An aerial photograph of a winding road through a snowy, mountainous landscape. The road is a light brown color, contrasting with the white snow. The terrain is rugged and hilly, with the road curving through the valleys. The overall scene is serene and quiet, typical of a winter in a high-altitude region.

Climate Change and Biodiversity Loss: **Example**

Some 2.5 million square miles of permafrost – 40% of the world’s total – could disappear by the end of the century, according to recent research. This will release large volumes of greenhouse gases (GHGs), including methane, carbon dioxide, nitrous oxide, as well as pathogens, that were locked inside for ages. This process is already triggering landslides and slumping at alarming rates, resulting in stream flows changing, lakes suddenly draining, seashores collapsing, and water chemistry being altered in ways that could be deleterious to both humans and wildlife. All across the warming Arctic, shrubs are expanding into tundra where grasses, sedges, and lichens once prevailed. Not only are the taller shrubs shading out the smaller plants below, they are also changing the hydrology of the ecosystem. The snow in tundra areas dominated by shrubs such as dwarf birch tends to melt a week earlier than it does in areas where there are no shrubs. This results in more permafrost thawing, accelerating the process of global warming⁸.

The cost of doing nothing

About **half of the global GDP (about USD44 trillion of its value) is highly dependent on nature** (see Figure 3). Together, the three largest sectors that are highly dependent on nature generate close to USD8 trillion of gross value added (GVA): construction (USD4 trillion); agriculture (USD2.5 trillion); and food and beverages (USD1.4 trillion). This is roughly twice the size of the German economy.

Figure 3: Biodiversity is Central to our Economies



Source: PLB

Even financial institutions have a much bigger exposure to biodiversity risks than was thought previously. Some recent evidence of that came from 'Indebted to nature', a study published by De Nederlandsche Bank (DNB), the Dutch Central Bank and financial regulator in June 2020. It found that Dutch financial institutions alone have EUR 510 billion of exposure to biodiversity loss risks, which affects 36% of all assets held by Dutch banks, pension funds and insurers covered by the report⁹.

According to The Global Futures study published by WWF in 2020, **the decline of natural assets will cost the world at least £368 billion a year - adding up to almost £8 trillion by 2050** - roughly equivalent to the combined economies of the UK, France, India and Brazil¹⁰.

Quantifying the task

Developing the optimal framework for embedding biodiversity considerations will be key. The awareness and interest are already there, mostly among institutional and large long-term investors. A search for the most effective ways of taking full account of biodiversity in business and investment considerations is also being encouraged by regulators (Do No Significant Harm – **Taxonomy and SFDR**) and assisted by initiatives such like **Taskforce on Nature-related Financial Disclosures (TNFD)**, which aims to mainstream biodiversity impacts, dependencies and risks in the financial sector.

Some companies and investors already take account of biodiversity loss risks but, according to OECD, **less than 1% of business models of the 3,500 companies representing 85% of global market capitalisation align with SDGs 14 and 15**¹⁴. To have real impact we need a focused approach, which can be used consistently across

Given that at that at the current rate of consumption we take from ecosystems about 1.6 times what they can re-generate in a year¹¹, it will not be long until the human decimation of resources will start causing whole industries to collapse.

Some tipping points for ecosystems have already been reached, such as the availability of uncontaminated freshwater. Once a tipping point is reached, **a large ecosystem is expected to gradually collapse within 50 years**^{12,13}.

sectors and geographies, by companies and investors alike. The lack of a relevant and easily measurable metric/indicator for biodiversity (like carbon emissions for climate change) is definitely the key difficulty in accounting for biodiversity fully in business and investment decisions.



SDG14: Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development



SDG15: Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, and Halt and Reverse Land Degradation and Halt Biodiversity Loss

A big question – still unanswered fully – is **how to measure companies' impact and dependency on nature?**

In the case of climate change, the answers that were needed to build that framework came from science. **On biodiversity, all eyes are on science too, but this is a much more complex world, with intricate, mostly unexplored interdependencies.** It is highly unlikely that for biodiversity the science will provide one “magic” crucial factor that can make all the difference, such as the volume of carbon emissions did for climate change. **Biodiversity loss is driven by a multitude of individual factors,** and their importance and composition will vary depending, for example, on the type of company, its sector and geographic location.

The Stern Review on Climate

This 700-page report published by the British government in 2006 and led by economist Nicholas Stern was the first to quantify the costs of addressing **climate change** and present an economic perspective on different scenarios. It found that achieving a cut to carbon emissions to the range of 450-550 parts per million would cost 1% of global GDP every year but **ignoring climate change could cause economic damage on the order of up to 20 percent of the GDP.**

Dasgupta Review on Biodiversity¹⁵

In 2021, the British government followed the Stern Review with a landmark **economic impact study into biodiversity** – the Dasgupta Review¹⁶, led by Professor Sir Partha Dasgupta. It concluded that at the heart of the problem lies deep-rooted, widespread institutional failure. It stated that **nature's worth to society is not reflected in market prices** because much of it is open to all at no monetary charge. These **pricing distortions have led us to invest relatively more in other assets, such as produced capital, and underinvest in our natural assets.** In fact, the report stressed that governments invest more in the destruction of natural resources than in their protection, with **government subsidies that damage nature amounting globally at around USD 4 trillion to USD 6 trillion a year¹⁷.**

Double materiality will be key

That said, we know that the future framework will have to be based on the concept of **double materiality**, i.e. encompassing financial and non-financial **impact, as well as dependencies**. For example, agriculture companies drive biodiversity loss through soil degradation and contamination with poisonous chemicals, deforestation, and land use change, but at the same time their activities will depend on pollination by bees and other insects, access to water, absence of insect plagues such as locusts, and favourable climate.

Currently, most methodologies focus on impact, but there is also a database called Encore¹⁸ which provides data regarding dependencies. We believe double materiality is transforming ESG analysis and biodiversity is an excellent example of that – without applying this concept we do not believe it will be possible to address biodiversity loss risks effectively.

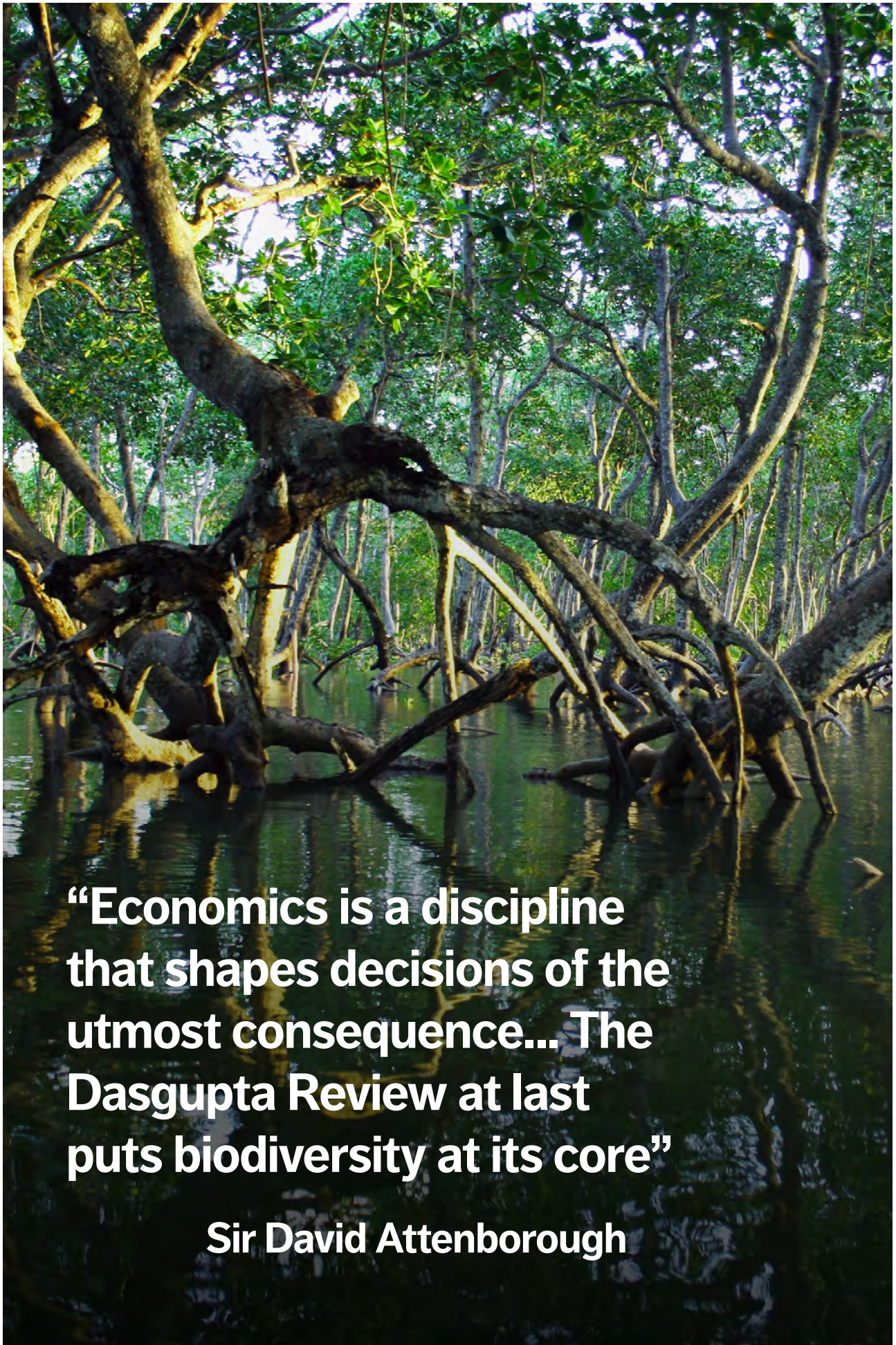
Breaking down the risks for corporates

The Taskforce on the Nature-related Financial Disclosure (TNFD) has been helping corporates and financial institutions, to identify – and define – nature-related risks. It has identified three types of potential threats facing a company, regardless of its sector and activity: physical, transition, and systemic:

- **Physical risks** refer to physical changes to the planet from the loss of nature, such as the one million species that are currently at risk of extinction. For example, if honeybee populations are reduced or eliminated, that will put at risk over USD50 bn worth of crops in the United States as without pollination seeds will not grow¹⁹. That is an example of a chronic physical risk, while an example of acute physical risk are invasions of locusts, which do not tend to happen every year.

- **Transition risks** arise from costs associated with the inevitable regulatory or market adjustment towards a nature-positive economy. These measures designed to stall the destruction of our environment can negatively impact companies. For example, anti-deforestation legislation increases due diligence costs for businesses in related sectors²⁰.

- **Systemic risks** relate to a deterioration of one ecosystem can trigger significant problems for human civilisation in many different areas. For example, poisoned, contaminated soil will not yield nearly as much as before, which in turn can lead to famine.



**“Economics is a discipline
that shapes decisions of the
utmost consequence... The
Dasgupta Review at last
puts biodiversity at its core”**

Sir David Attenborough

Opportunities and Investment Strategies

Leading on biodiversity may offer several important commercial advantages for companies:

- Open profitable new markets by pioneering valuable new products, services and evolving their business models.
- Improvement in their value proposition and brand – by being seen as doing the right thing for the planet.
- Better access to capital and potential operational synergies, including through reductions in raw material and energy costs.

These types of corporate transformation will, clearly, require funding – but **how much is required** and **where will the money come from?**

Biodiversity funding targets so far have been badly missed. By 2020, the world was supposed to achieve the Aichi Biodiversity Targets. Created in 2010 by the Convention on Biological Diversity (CBD) and signed by 194 countries, they aimed to protect and conserve biodiversity. Based on 2010 figures, it was calculated that USD51bn – USD53bn per annum was spent globally on funding biodiversity and ecosystem services, compared to the CBD's target of between USD150bn and USD440bn a year that would have achieved the Aichi Biodiversity Targets (Bor, Müller, & Duke, 2018).²¹

The Aichi Biodiversity Targets also failed because they were difficult to measure.²² Parties to the UN Convention on Biological Diversity will meet in December 2022 to determine the post-2020 global biodiversity framework. Its key objective is to agree on new global targets that are measurable, underpinned by science, with explicit outcomes.²³

The focus of this government-led biodiversity initiative will aim to protect 30% of our lands, rivers, lakes, and wetlands by 2030²⁴. This initiative will be accompanied by **sovereign investment opportunities through green bonds**, such as the recent example of Belize sovereign debt issue²⁵.

There is also much excitement around biodiversity credits, with at least a dozen new initiatives underway or getting started. Some of the key benefits include the implementation of deforestation- and conversion-free supply chains.²⁶ However, it is also a very risky area for investors.

The development of a nature-aware economy cannot happen without meaningful government support at this stage. There must also be financial incentives to stop the damage to biodiversity.

We can see some momentum building towards the important conference in December 2022. For example, the International Union for Conservation of Nature (IUCN), which uniquely composed of both government and civil society organisations, called on governments to guarantee the additional investment in nature every year for the new biodiversity framework to succeed, with the increase equivalent between 0.7% and 1% of annual global GDP. The IUCN also stressed that government stimulus programmes must do no additional harm to nature, and should direct at least 10% of the overall recovery investment to protecting and restoring nature.

Financial institutions can help by expanding investment opportunities. For example, in green bonds, **low-interest green loans, impact bonds, and other green financial products**. In 2021, HSBC worked with the International Capital Market Association (ICMA) to strengthen biodiversity-related KPIs and facilitate the dialogue between corporates and financial institutions to structure that kind of proposition.

In Europe, new investment measures included a proposed update to the EU Taxonomy to incorporate biodiversity risk.²⁷

Other investment opportunities will include more biodiversity models of the agriculture, timber production and tourist industries.

In infrastructure, investors may consider **green-gray projects**ⁱ, which can deliver important ecosystem services such as watershed or coastal protection.

Next Stop: Biodiversity!

The main ambition of the UN Biodiversity Conference²⁸ is to replicate the Paris Agreement on climate for biodiversity. For the first time, it will include onboarding a variety of stakeholders in the private sector and the financial industry. It is expected that the new Agreement will feature a formal article defining **the role of financial institutions in delivering its key objective: halting and reversing biodiversity loss by 2030**. Investors will be central to this, as human civilisation, for its own sake, returns some of what it has taken from the blue planet.

ⁱ **Green infrastructure refers to natural systems including forests, floodplains, wetlands and soils that provide additional benefits for human well-being, such as flood protection and climate regulation. Gray infrastructure refers to structures such as dams, seawalls, roads, pipes or water treatment plants.**

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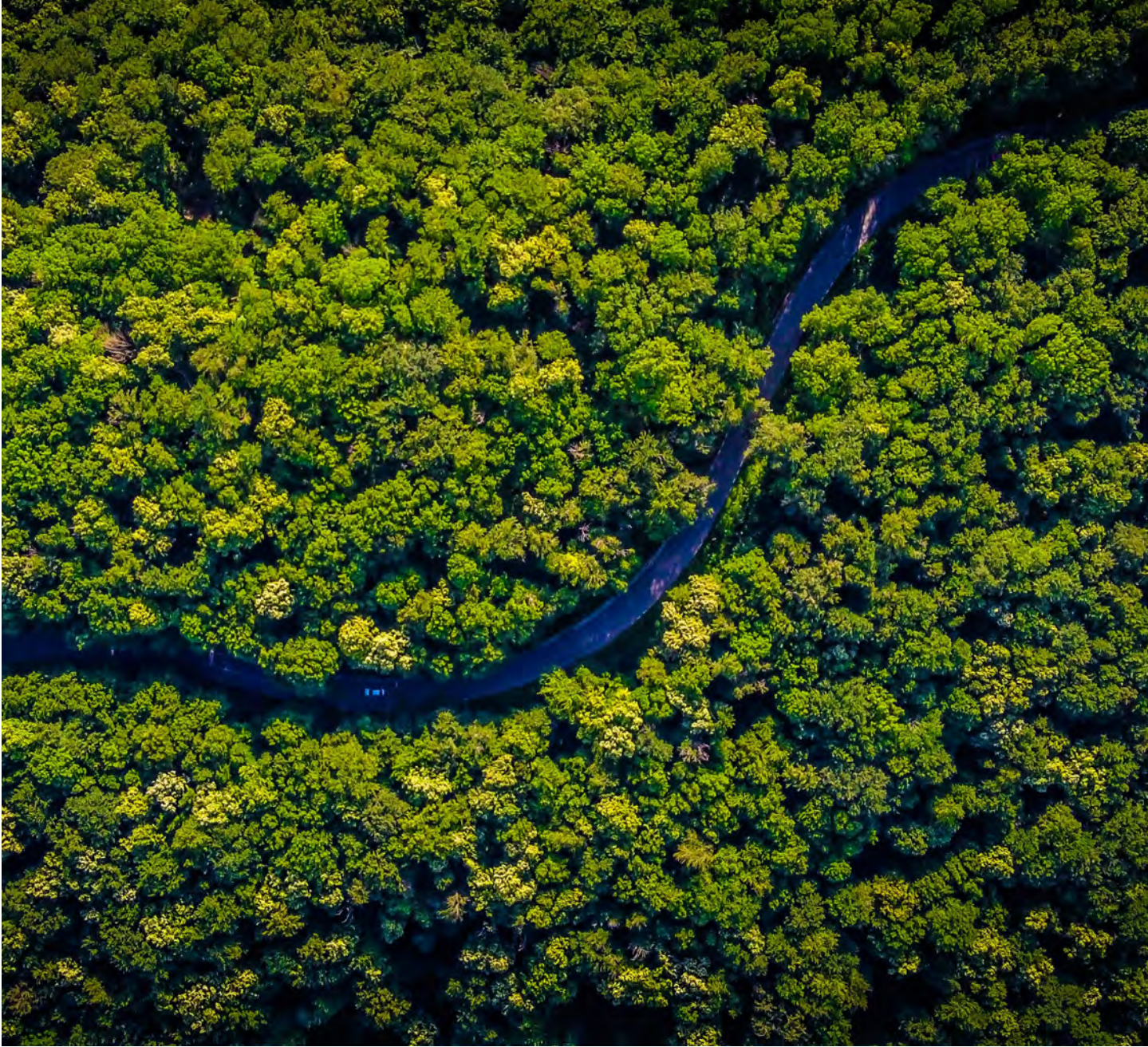
²⁴ <https://www.nrdc.org/resources/30x30-nrdcs-commitment-protect-nature-and-life-earth#:~:text=To%20prevent%20mass%20extinctions%20and,lakes%2C%20and%20wetlands%20by%202030>

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²⁶ <https://www.thebiodiversityconsultancy.com/knowledge-and-resources/biodiversity-credits-risks-and-opportunities-143/>

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