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## Deloitte Climate & Sustainability Competency Lab

From science to business: providing companies with the knowledge to turn sustainability into action

**LECTURE N°11** | Nature positive impacts in business organizations: measuring and valuing biodiversity

### Interview with Ben Groom by Daniele Strippoli

**Ben Groom** has a PhD in Economics from the Department of Economics at University College London, and he joined the University of Exeter from the London School of Economics in 2020 as the Dragon Capital Chair in Biodiversity Economics. He is a member of the HM Treasury Biodiversity Working Group.

**Daniele Strippoli** has over 20 years of international experience in sustainability and has cross-sector expertise gained from implementing sustainable strategies in more than 40 countries worldwide. He has developed approaches aligned with the most innovative sectoral frameworks (TCFD-TNFD, SBTI-SBTN).





### Q.1 Why should we measure and value biodiversity?

It all comes down to <u>dependency</u>, as the economy is embedded in the biosphere and therefore our economic activities are complementary to it. The **Dasgupta review** provides a summary of the different values of biodiversity. However, it also highlights that <u>natural capital</u> and its value are typically not captured in our general measures of economic performance. What is more, trillions of dollars are used for activities that are detrimental to nature (e.g. agriculture and pesticides).

Against this backdrop, transformational changes are required and, on top of that, we need a **positive price** for biodiversity to guide decision making in finance, governance, and our day-to-day consumption. This in turn means that we firstly need to be able to **measure biodiversity** and to establish those **natural capital** values that are missing from our typical economic exchanges.

**Dependency**: an aspect of environmental assets or ecosystem services that a company relies on to operate (e.g. water, climate regulation, scientific and technological inspiration)

<u>Natural capital</u>: the world's finite stocks of natural resources (assets) from which humans derive a wide range of Ecosystem Services.

## **Q.2**

### How does biodiversity intertwine with economic activities? Can you give us some practical examples?

There are several **stories** that highlight the crucial **contribution of biodiversity to people and well-being** and demonstrate that the removal of species providing ecosystem services causes problems, in terms of costs for the agricultural sector and impacts on health.

A study from 2024 focused on a painkiller used in India to improve productivity. In the 1990s the patent on this painkiller ran out, it became cheap and was therefore applied in great doses across India. However, it turned out to be toxic to **vultures**, that, by cleaning up the carcasses of cattle, started dying. The ecological response was that dogs and rats started doing vultures' job, but they were also vectors for disease. This had an effect on **public health and child mortality**, which increased.

Another research on **bats** found out that they can suffer from a disease called "White Nose Syndrome" (WNS). Bats are fundamental for natural pest control, as one of the ecosystem services they perform is eating insects in agricultural areas. Once they disappear, agricultural productivity decreases because of pathogens attacking crops. Farmers start using more insecticide, which leads to higher costs and lower profits and returns. Researchers demonstrated that the greater use of insecticides also leads to an **increase in infant mortality**.

### **C-TAKEAWAYS**

#### Fast facts for the C-level

- Despite our economy depending on the biosphere, economic performance does not account for natural capital and its value
- Biodiversity strongly impacts businesses and people alike
- Beyond individual species, we need to consider the combination of elements that make up ecosystems
- There could be up to 570 different types of metrics for biodiversity, and choosing one of them depends on the purpose of the metric
- Pricing biodiversity could help in the valuation process
- Companies are being pressured by consumer trends and regulatory evolutions
- Significant progress has been made in on-site data collection and biodiversity mapping

Similar dynamics involve **pollinators** that provide services to agriculture and food security. Research illustrates the relationship shown in **Figure 1**: the likelihood of getting increased fruit yield from the trees increases as there are more pollinators. So, the distribution in the chart shifts to the right and narrows, which means that the risk of getting a lower yield decreases.





Source: Henselek et al., 2021

## Q.3

### While the economy is highly quantitative and has more easily recognizable boundaries, defining and measuring biodiversity appears to be more challenging. Are there some metrics?

The stories I described are important as they bring together ecology and economics, but they aren't necessarily the only ways in which we think about **biodiversity**. They are all just about **single** species, but we also have to consider a **combination** of elements, including animals, plants and others.

We could think about biodiversity in different ways depending on the **context**, which is connected to the **multitude** of **metrics** that exist to measure biodiversity. These are some examples:

- **Species richness**: this metric allows to focus on the number of species and therefore the value of **multiple species** within the ecosystem.
- Evenness: it focuses on the distribution of species.
- Genetic distinctiveness: if we assemble a list of species in a taxonomic tree to explore their evolutionary history, we could focus on the length of the branches and discover the last common ancestor of a given species. If the divergence occurred a very long time ago, the species is likely to be genetically distinct.
- **Risk measures**: the IUCN Red List of Threatened Species is the most well-known example (**Figure 2**). It categorizes species based on their threat status, ranging from Least concern and Near threatened to Vulnerable, Endangered, and Critically endangered. Beyond this classification, species face extinction.
- Intactness measures: extremely commonly used in biodiversity footprinting to assess disclosures like TNFD. An example is the Mean Species Abundance metric (MSA), which compares the present biodiversity to what would have existed in a reference context in terms of species composition.

**<u>Biodiversity</u>**: the variety of life on Earth, encompassing the diversity of genes, biological species, and ecosystems.

"The choice of the metric really depends on the kind of context in which it is applied and its intended purpose. We should know what we want to change, and what is the most impactful measure that captures people's attention."

## Q.4

## How should we choose the most suitable metric for our case study?

As we have seen, there is a **taxonomy** of different types of metrics. In this context, there is a review paper where researchers came across **570 different types of metrics for biodiversity**. My take is that metrics are useful, but it is also helpful to **reduce** this multitude down to the essential components of biodiversity.

The choice of the metric really depends on the kind of **context** in which it is applied and its intended **purpose**. We should know what we want to change, and what is the most impactful measure that captures people's attention. And then of course there is **value**: we choose a particular metric as, in our view, it focuses on the most valuable aspect of biodiversity.

You might also want to choose depending on **properties**, as metrics all have their own problems. Evenness, for example, decreases as population size increases, which may not be useful if you're interested in conservation; distinctiveness doesn't value population or species richness; the extinction risk index doesn't take into account that we might value certain species more than others in terms of their functionality within the ecosystem; and so on.

To find a solution in selecting metrics, you could always just **ask people**, which is exactly what we did in a paper with other colleagues. For an experiment we asked the UK public and a group of experts to choose between two different conservation scenarios which varied in different dimensions of biodiversity. We found out that the preferences of the two groups were broadly aligned: they had the same kind of ordering. So, we concluded that if we want to influence the way people invest and make decisions, it might be useful to **focus more on the things they're interested in**. Additionally, engaging in a conversation about their priorities can help align efforts more effectively.



Source: IUCN Red List

### **Q.5** How can we value biodiversity?

We talked about measuring biodiversity, but it is equally important to value it in order to quantify the monetary worth of ecosystem services.

Pricing biodiversity for decision making is for sure one of the ways we could do that. This means coming up with a set of prices that will allow us to change the way people and governments invest their money, financial institutions organize their portfolios, and consumers consume. There is something called a **target and cost-based approach** to biodiversity. The idea it refers to is how we price carbon in the UK. Instead of conducting a full cost-benefit analysis of the avoided damages from removing carbon from the atmosphere, it was agreed to set Net Zero as a target by 2050 and then determine the abatement costs required to achieve it. So, the price we use is based on the **marginal abatement cost** required to reach the target: what's it going to **cost us to meet this target**? And then, what is the **marginal cost** we can use to price any intervention that reduces carbon?

The proposal here is to do the same for biodiversity, because we do not have a full range of studies which tell us the intricate values associated with diversity. So, let's agree that there's a **target** we need to hit and then see **how much it costs** to meet that target. The way I'm going to explain this is in terms of extinction risk, because, as the empirical study showed, both people and experts find this really important. Much of conservation funding is structured around reducing extinction risk globally. Therefore, we can ask: how much does it **cost to move a species from its current state to a restored state**? By doing so, we can develop a **restoration cost curve** and establish a **marginal price** for biodiversity.

**Ecosystem services**: the world series of services that natural systems generate directly or indirectly for humanity, playing a fundamental role in human well-being and in the planet's ecological balance.

"People tend to feel more **optimistic** about biodiversity than climate change because they can **observe** biodiversity and changes in ecosystem services. This visibility makes it easier for them to connect **actions** with **outcomes.**"

## **Q.6** What are the main trends you're noticing at the moment? Have you seen changes?

Daniele Strippoli: Our clients find it very hard to navigate these topics, despite knowing how important biodiversity is in nature. We know for example that **50%** of the gross domestic product is highly dependent on nature, but we also know that **only 1%** of corporations fully understand what it means. This gap clearly reflects the challenges we see our clients facing on a daily basis. For example, while working on CSRD disclosure requirements, we see how challenging it is for them to identify the areas in their operations and supply chains where **biodiversity is highly important**.

We also see that there is the ambition for corporations to set **targets**. 2030 is approaching faster but setting targets in absence of a universally defined matrix is very difficult. We see more and more corporations and financial institutions that are exploring the concept of ecosystem services, and I believe that this is a way to streamline the effort to allocate economic value and to determine financial risks and opportunities related to nature.

*Ben Groom:* The complexity comes from the fact that there are so **many metrics** that we don't have a complete understanding of the relationship between biodiversity and human well-being. That being said, it must be recognized that **there has been an upswelling in the concern for biodiversity among businesses and financial institutions**.

There are two reasons for that. One is that **people** are becoming **more interested**: on the consumer side, people are concerned about what they're **investing in** and what they're **buying**. The second reason is that we ought not to forget that there's a huge **regulatory aspect**. So, just like with climate change, firms and financial institutions have now to consider all the changes in the regulations we have in Europe, in the UK and internationally. So, the interest is being driven by both the demand and the supply, as well as regulations.

People tend to feel more **optimistic** about biodiversity than climate change because they can **observe** biodiversity and changes in ecosystem services. This visibility makes it easier for them to connect **actions** with **outcomes**. Whereas with climate change, for many years, the benefits were perceived as something that would only impact future generations, making it difficult to convince people of the value of investing in mitigation efforts.

On the other hand, the fact that many of biodiversity's benefits function as **public goods** presents a challenge, as the institutions responsible for transferring this value are probably absent and typically ineffective.

## **Q.7**

Regulations can serve as a catalyst for initiating multi-stakeholder discussions on ecosystem investment. Do you think that ecosystems valuation can be a solution to match stakeholders' different interests?

According to the **Nature Restoration Law**, countries must have a plan of action for the restoration of degraded lands. This is the objective in the short to medium term, and companies have to organize around it. We have something quite similar in the UK with the Environment Act (2021) which has particular targets on biodiversity. So, there are lots of **opportunities** for businesses to provide those services because companies have to meet obligations to nature. There's a huge potential for environmental markets to act on the supply side, because **a big question is: who's going to provide this restoration and for what purpose?** 

Now that a target is in place, we can meet it from the supply side. However, from an **ecosystem** valuation perspective, it can be frustrating for environmental economists, as these **discussions have been ongoing since the late 1990s**. The innovation now is that you can do benefit analysis studying causality. This natural capital valuation has always been useful in highlighting that just because something doesn't appear in a market doesn't mean it lacks value.

When it comes to **national accounts**, the UK and France, for instance, have done a great job in valuing ecosystem services. In the UK, these valuations have played a crucial role in determining **investment** locations and shaping government funding decisions.

How this works at the **corporate level** is a slightly different story. The key question is: where do the **financial streams** come from when investing in Nature-Based Solutions? I think there are good examples of insurance companies investing in flood management through Nature-Based Solutions. However, when it comes to biodiversity, the key question remains: where do the financial flows come from? For any company investing in biodiversity, it's like it is providing a **public good**. So, there is a **dilemma** here: if I invest in it and someone else does too, we don't truly "own" it, which can lead to a situation where **no one invests** at all, ultimately causing the system to unravel. So these essential coordination problems also have to be addressed, as we cannot ignore the **public good** nature of ecosystem services.

**Ecosystem**: a dynamic complex of plant, animal and microorganism communities that interact among them and with the non-living environment, creating a functional unit.

### **Q.8**

### Biodiversity highly depends on site data. How does the local data gap affect the capability to have a very accurate valuation of biodiversity?

On the data side, the key thing to ask here is: if we had better biodiversity data on every little square centimeter of the planet and we were able to connect that across supply chains for each company of interest, how would that change our behavior? And **what impact would it have on biodiversity**?

My point is that even if we had complete knowledge of what's happening on the ground, we would still need **policies** to drive action and to make that information and decision relevant. So, while there's a lot of renewed and heightened interest in disclosure in this area, we have to ask: once we've disclosed, what happens next? How does this actually change things and the way in which companies operate?

There are positive things happening on the data side. For instance, there is the combination of **satellite data** with citizen **science** for **biodiversity mapping**, and, whilst I've been slightly critical of the metrics of biodiversity which are being used to disclose biodiversity footprints, I think the positive takeaway is that **this is happening** at all, and that this is moving in the right direction. It's not as granular as it should be, but it is just a matter of time. **The big question is: once we have that level of granularity, how will it actually drive behavioral change?** 

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