SPEECH

Nature’s bell tolls for thee, economy!

Keynote speech by Frank Elderson, Member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the ECB, at the Naturalis Biodiversity Center

Leiden, 22 May 2025

Thank you for inviting me to speak at this annual biodiversity dinner. The wide range of speakers here this evening – on international biodiversity day – is testament to the relevance of biodiversity across disciplines.

Nature isn’t just the roots and shoots of biologists, macroecologists and natural scientists. Beyond its intrinsic value, nature provides vital services that are relevant for all of us – for entrepreneurs, workers, policymakers and bankers, but also for central bankers and financial supervisors.

A thriving natural environment provides vital benefits that sustain our well-being and serve as a crucial driving force for the global economy. Think of fertile soils, pollination, timber, fishing stocks, clean water and clean air.

But we are well aware of the daunting facts that confirm the dire state of ecosystem services. Intensive land use, the climate crisis, pollution, overexploitation and other human pressures are rapidly and severely damaging our natural resources.

75% of land surface ecosystems and 66% of ocean ecosystems have been damaged, degraded or modified.

We are using natural resources 1.7 times faster than ecosystems can regenerate them. Consequently, the contribution that nature can make to our economies – and our way of life – is steadily diminishing every day.

These fateful facts and figures confront us as vividly as Edvard Munch’s iconic scream. Yet, accounting for nature and the services it provides is challenging. What nature provides to the economy is typically not measured directly in statistics like GDP.

We price portfolios instead of pollinators, we monitor markets instead of mangroves and we watch wages instead of water supplies. However, the reality is that while our economies are heavily reliant on ecosystem services, the economic value of those pollinators, mangroves and water supplies is not sufficiently taken into account.

Nature is too often still wrongly seen as a free good, readily available and abundant in supply, without opportunity costs. For such a good, there is no market – and therefore no price.

So, why can't governments intervene by pricing and creating a market for nature as has been done for emissions?

Unlike for the climate crisis – which can be quantified through carbon emissions and their direct links to rising temperatures – there is no single metric that can be used to quantify the wide range of ecosystem services.

What is the common denominator of clean air, fertile soils and coasts protected by mangrove forests? Nature is beautifully complex, but this complexity makes it harder to establish a market for nature than a market for climate, such as the carbon markets created through emissions trading systems.

For central banks to effectively fulfil their mandates, we need to enhance our capacity to measure the vital services that nature provides to our economy and identify the financial risks caused by the degradation of these services. And while this is admittedly not an easy task, it is encouraging that multiple stakeholders are making progress, including academia, firms and also the ECB. We are enhancing our tools, methodologies and data to assess the economic implications of ecosystems and their degradation. And I am pleased to be able to share some of our latest insights this evening.

I will argue that while nature services may appear to be freely available, they are in fact not abundant at all and there are substantial costs to using and losing them. Costs that we currently overlook when headlines report on GDP growth.

Accounting for nature in monetary policy and banking supervision

Nature being of vital importance for the economy and the financial system is hardly a novel insight. Besides scientists, a number of central banks and prudential supervisors have also been highlighting their interlinkages for several years now.[1] And while the climate crisis has received most of the attention, it is encouraging that work on nature-related risks has also significantly evolved.

Moreover, the ECB has taken significant steps to account for nature-related risks in the pursuit of its mandate. For instance, we take into account the effects nature degradation can have on banks' balance sheets. The degradation of nature could damage companies' production processes and consequently weaken their creditworthiness, which might in turn impair loans granted by banks. In our role as the supervisor of Europe's largest banks, we therefore aim to ensure that the banks we supervise adequately manage both climate-related and nature-related risks.[2] Encouragingly, we are seeing a growing set of good practices among the banks we supervise in terms of identifying, quantifying and managing nature-related risks.

But are we fully aware of – and sufficiently alert to – how nature degradation could eventually hit balance sheets?

Advancing our understanding does not mean that economists and supervisors should start studying ants in Aragon, ladybirds in Lombardy or honeybees in Holland (although it is very important that entomologists do!).

Instead, central banks and supervisors need to gain a better understanding of just how vulnerable the economy and the financial system are to nature degradation.[3]

Capturing the risks related to ecosystem degradation

An ECB study in 2023 found that nearly 75% of banks' corporate lending goes to firms that are highly dependent on at least one ecosystem service.[4] This finding underscores just how interconnected nature, the economy and the financial system really are.[5] But that study does not tell us exactly how much of our economic activity is at risk, or which economic sectors and regions will be most affected.

To better understand this impact, the ECB has teamed up with the Resilient Planet Finance Lab at the University of Oxford.

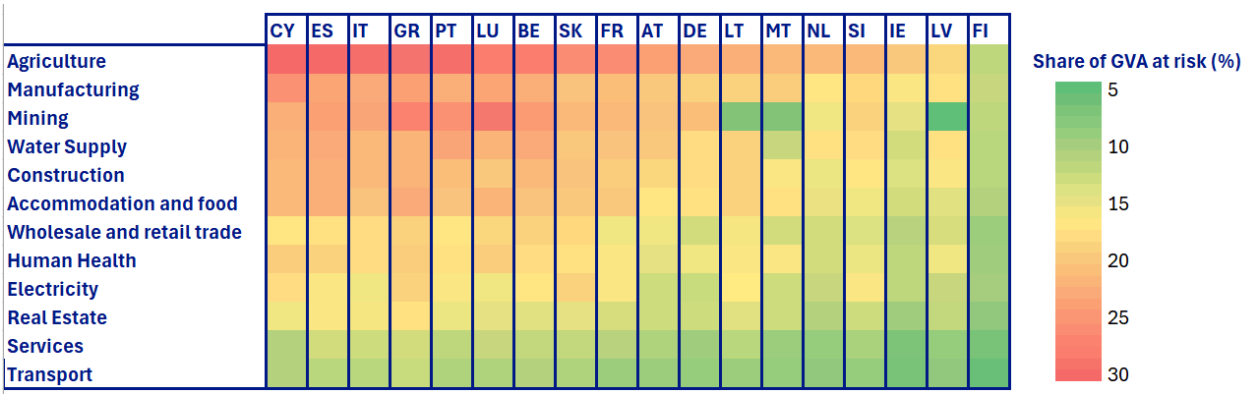
The interdisciplinary team has developed systemic risk indicators that move beyond dependency analysis to a comprehensive assessment of nature-related financial risks. In essence, this indicator assesses the economic implications of the deteriorating state of ecosystems. It shows how much of the economic value added by a particular industry– what economists call "gross value added" – is at risk when ecosystem services degrade. Tomorrow we will publish a blog post showing some of the preliminary results of our work, but I can already share some findings with you this evening.

Water – the natural currency underwriting purchases, investments and trades

Our preliminary findings indicate two things. First, water – too little, too much or too dirty water that is –has been identified as posing the most significant risk to the euro area economy. Losses related to water scarcity, poor water quality and flood protection emerge as the most critical from a value added perspective. Concretely, surface water scarcity alone puts almost 15% of the euro area's economic output at risk. This is not surprising because water is not just any resource – it is one of the most essential natural resources we possess. Second, agriculture is the most exposed sector, as it would suffer the largest proportional output losses due to a decline in surface water. But other sectors are also likely to be significantly affected.

Chart 1

Proportion of national gross value added (GVA) at risk due to surface water scarcity in Europe and globally (supply chain risks)



Water is, for instance, an indispensable resource in industry. In the Netherlands, industry alone uses over 2.6 trillion litres of fresh water a year.[6] This water usage is more than three times the total annual water consumption of all households in the Netherlands. Water is also essential for energy production, not only in hydropower plants but also in thermal power plants – including nuclear – where it is used for cooling and steam generation. It is consumed in vast quantities for mining and mineral processing, which are crucial for the energy transition, as well as in the construction sector for producing concrete, to name just a few examples.

The risk posed by water scarcity is not hypothetical, we are already experiencing the impact today. I am sure that many of you remember when the summers of 2018, 2019 and 2020 brought severe droughts and heatwaves even to the Netherlands. In 2018 alone, economic losses in the Netherlands were up to €1.9 billion for agriculture and €155 million for shipping, with widespread but hard-to-quantify damage to ecosystems. This year's drought is especially alarming: spring 2025 is on track to become the driest ever recorded in the Netherlands, likely surpassing the previous record set nearly 50 years ago. And droughts are only projected to increase further as the climate crisis continues to develop. Worryingly, in the driest scenario an average summer in the 2040s will be about as dry as an extremely dry summer now.

Effective water management will thus be crucial for sustaining production. However, the risk persists that during periods of drought, production might need to be scaled down. Some industrial processes may become economically unviable and might need to relocate.

For example, some have even gone as far as to point at a risk that more frequent droughts could render traditional tulip-growing regions such as the Bollenstreek unsuitable for bulb cultivation.[7] This may compel growers to explore better-positioned locations where water is more reliably available to safeguard the iconic Dutch tulip industry.

Hence, as a consequence of water scarcity, our economies could produce less, and production costs are likely to rise during any inevitable transition phase.

Let me also point out that biodiversity is a critical – and often underestimated – factor in ensuring the availability and quality of fresh water. Ecosystems such as forests and wetlands regulate the quantity, timing and purity of water flows by stabilising soils and filtering pollutants. Maintaining healthy and diverse ecosystems will be crucial for resilient water provisioning as climate change intensifies, particularly in regions facing growing water stress.

Beyond these macroeconomic impacts, ecosystem degradation can significantly affect financial stability, for example through the loans that banks grant to households and firms. In essence, the greater the impact on firms, the higher the risk of defaults and the higher the risk on banks' balance sheets.

For example, in our research with the University of Oxford we found that more than 34% of banks' total outstanding nominal amount – over €1.3 trillion – is currently extended to sectors exposed to high water scarcity risk.

As the next step in our research, we will examine changes in the probability of default in the sectors most affected by dwindling ecosystems. Think about it as stress-testing the resilience of banks' credit portfolios to nature degradation. We plan to publish these results later this year, complete with a more in-depth analysis on the topic, so stay tuned.

Multiple stakeholders are taking action

Encouragingly, our work with the University of Oxford is not an isolated case. We are in fact seeing a wide range of stakeholders taking action to better account for ecosystem services.

For instance, I hear that our host this evening – the Naturalis Biodiversity Center – has teamed up with banks to combine insights from science and finance to further develop indicators quantifying ecosystem services.

We are also seeing a growing set of good practices among the banks we supervise in terms of identifying, quantifying and managing nature-related risks. Banks typically conduct materiality assessments to understand where they are most affected. And banks also grapple with the challenge that nature-related risks are difficult to express in a single metric. Once they know where they are exposed, they then typically conduct deep dives on specific topics.

One bank, for example, has conducted a quantitative scenario analysis to understand how the profitability of its customers could be affected if a water pollution tax were to be implemented.

Other banks design customer scorecards and engage with the most vulnerable counterparties, sometimes offering small discounts or other incentives when customers meet key performance indicators that increase their resilience.

It is also encouraging that progress is being made at the international level. The Network for Greening the Financial System (NGFS) – a network of 145 central banks and supervisors from around the world – has developed a conceptual framework offering central banks and supervisors a common understanding of

nature-related financial risks and a principle-based risk assessment approach.[8][9] And the Financial Stability Board recently took stock of supervisory and regulatory initiatives among its members, finding that a growing number of financial authorities are considering the potential implications of nature-related risks for the financial sector.[10]

So scientists, banks, policymakers and supervisors are in fact taking action. That's good news. Given the high level of uncertainty regarding impacts, non-linearities, tipping points and irreversibility, continuous scientific input and engagement are essential to determine the transmission channels from nature to our economies.

Reliable and comparable data are key to managing risks and identifying opportunities

Before I conclude, let me stress a vital enabler to better measure ecosystem services: data. Closer cooperation with natural scientists can help us better understand the data they have available on the status of nature and the ecosystem services it provides. The National Hub for Biodiversity Information provided by our host tonight is an excellent example.[11]

Moreover, continuous engagement with the scientific community can also help improve our understanding of non-linearities, tipping points and the irreversibility of the biodiversity crisis.

Similarly, the availability of reliable and comparable data from companies is essential for us to know where the risks are hiding and where opportunities can be found. Such data can, for example, provide insights into companies' reliance on fresh water for their production processes. In this context, the reporting requirements in the EU's sustainable finance framework are not merely a "nice to have", they are providing indispensable information about financial risks and are a solution to the patchwork of different reporting criteria.

Does that mean that there is no room for simplification? Does it mean that there is no room to ease the reporting burden on smaller firms?

Of course not.

As the ECB noted in its recent opinion[12] on the Commission's omnibus package, striking the right balance is crucial – the balance between how much data firms report and how many firms are required to do so. Excluding too many firms from the Corporate Sustainability Reporting Directive may reduce the availability of vital data needed to assess climate-and nature related financial risks.

So when carefully calibrating a balanced degree of simplification, one should look at what data points we need most and make sure that sufficient companies report on precisely those data. Not only because reliable and comparable data are important for identifying economic impacts and managing financial risks, but also because such data helps identify investment opportunities to unlock a clean, green and competitive European economy.

Conclusion

Let me conclude.

Encouragingly, multiple stakeholders are making progress in better accounting for ecosystem services. That's good news, and this work must continue. Because dwindling ecosystems are no longer peripheral – they are central to financial stability, the economy and, ultimately, our daily lives.

When you saw the title of my remarks this evening, some of you might have recognised a reference to John Donne's poem "For Whom the Bell Tolls". Donne beautifully expresses that we are all part of a bigger whole: "No man is an island, Entire of itself."

Nor is our economy an island – it is not "entire of itself", it depends on nature.

If nature's services suffer,
And they do!
Send not to know
For whom the bell tolls.
It tolls for thee, ECOnomy!

Thank you for your attention.

1.

De Nederlandsche Bank (2020), *Indebted to nature: Exploring biodiversity risks for the Dutch financial sector*, June; De Nederlandsche Bank (2019), *Values at risk? Sustainability risks and goals in the Dutch financial sector*; Svartzman, R. et al. (2021), "A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France", *Working Paper Series*, No 826, Banque de France, August; ECB (2020), *Guide on climate-related and environmental risks – supervisory expectations relating to risk management and disclosure*, November; Network for Greening the Financial System (2022), "Statement on Nature-Related Financial Risks", 24 March.

2.

This is in line with the supervisory guide that we published in 2020 containing expectations about banks' risk management practices for both climate-related and nature-related risks. See ECB (2020), op. cit.; Elderson, F. (2022), "Natura finis magistra – acknowledging nature-related risks to make finance thrive", keynote speech at De Nederlandsche Bank/Official Monetary and Financial Institutions Forum conference on "Moving beyond climate: integrating biodiversity into financial markets" at Artis Zoo in Amsterdam, 29 September; Elderson, F. (2024), "Taking into account climate and nature in monetary policy and banking supervision around the world", remarks at an event on climate-related financial risks hosted by the Banco

Central do Brasil, 27 March. The ECB has also made nature one of the focus areas of its climate and nature plan for 2024 and 2025.

3.

Elderson, F. (2024), "Taking account of nature, naturally", speech at the tenth Green Finance Forum "Innovate in Nature", 19 November.

4.

For dependency analysis, see Boldrini, S. et al. (2023), "Living in a world of disappearing nature: physical risk and the implications for financial stability", *Occasional Paper Series*, No 333, ECB.

5.

Elderson, F. (2023), "The economy and banks need nature to survive", *The ECB Blog*, ECB, 8 June.

6.

CBS (2021), "Watergebruik binnen de Nederlandse economie; Milieurekeningen", 11 April 2025.

7.

Schreuder, A. (2025), "Watermanagers willen niemand bang maken, maar wéér zo'n droge zomer als in 2018? 'Dan hoop ik dat we überhaupt nog water beschikbaar hebben'", 16 May.

8.

Network for Greening the Financial System (2024), *Nature-related Financial Risks: a Conceptual Framework to guide Action by Central Banks and Supervisors*, July.

9.

Last year the NGFS published a report on nature-related litigation to raise awareness among financial institutions, central banks and supervisors. The report highlighted that while nature-related litigation is still in its infancy, the number of cases is expected to grow rapidly. This trend underlines the real risk of doing too little for governments, companies, banks, central banks and supervisors. See Network for Greening the Financial System (2024), *Nature-related litigation: emerging trends and lessons learned from climate-related litigation*, July.

10.

Financial Stability Board (2024), *Stocktake on Nature-related risks: Supervisory and regulatory approaches and perspectives on financial risk*, 18 July.

11.

See the Naturalis Biodiversity Center website for further information.

12.

Opinion of the European Central Bank of 8 May 2025 on proposals for amendments to corporate sustainability reporting and due diligence requirements (CON/2025/10).