

Paying the price for loss of habitat

Emmanuel Monnier examines the difficulties of trying to put an economic value on the loss of biodiversity caused by the destruction of natural ecosystems

Because it has been focused on climate risk, the financial services sector is only just starting to realise the true extent of another threat: the ongoing destruction of natural ecosystems. The risk here is not just to charismatic megafauna such as pandas, polar bears or white rhinos, but to the overall economy. A study published in 2021 by the Banque de France – ‘A ‘Silent Spring’ for the Financial System’ – estimates that ‘42% of the value of securities held by French financial institutions comes from issuers that are highly or very highly dependent on one or more ecosystem services’.

But ecosystems are dying. According to the [Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services](#), species are disappearing between ten and 100 times faster than on average over the past several million years. Ancient forests and wetlands are disappearing under the combined effect of the exploitation of land and sea, intensive fishing and other large-scale exploitation of living creatures, climate change, pollution and the proliferation of invasive species. The bottom line is that human development has a cost for the planet, which we’re going to have to meet.

Natural services

Nature is already presenting us with the bill. The loss of biodiversity is having an impact on agricultural yields – and that’s just the beginning. It will have a major impact on the economy because ecosystems provide many services that, until now, have been treated as so-called ‘externalities’ – that is, as something we don’t price in.

Those services include the provision of food, wood, hydrocarbons and drinking water, the regulation of the natural environment through crop pollination, climate stabilisation, and the opportunities for recreation that the outdoors bring. [The World Bank estimates](#) that around 50% of global GDP depends on natural capital “that is undervalued and unaccounted for”.

Some of those services can be quantified accurately by ecologists. Professor Harold Levrel, an ecological economist at Université Paris-Saclay, AgroParis Tech, and a researcher at the International Centre for Development and the Environment, says: “We use satellite data together with field data. If you know the topography of the area, the plant cover, the depth of the soil and of the roots, etc, you can estimate the rate at which water is filtered through it. That allows us to estimate, for example, how many tons of nitrates are filtered each year

through a given surface.”

He says it becomes more complicated with more complex ‘ecosystem services’, such as the recycling of organic waste by soil micro-organisms, and is more challenging in developing countries, where data is harder to get and the reliance on natural ecosystems is much greater.

“*Ecologists are good at quantifying the loss of function that comes with destruction of an ecosystem*”

Ecosystem services are economically precious. Some studies put their global value at around 1.5 times global GDP ([Costanza et al. 2014](#)). Their disappearance would hit the economy. That’s why financial institutions, especially central banks, are starting to pay attention to ecosystem services through initiatives such as the Network of Central Banks and Supervisors for Greening the Financial System or the Taskforce on Nature-related Financial Disclosures, which is working on a voluntary reporting framework for biodiversity issues that will be launched this year.

France has required companies to report on the financial risks of biodiversity loss since 2020. That applies whether the risks are physical – linked, for example, to the decline in the number of pollinating insects – or transition risks that come from, say, drastic changes in regulation or consumer behaviour to which companies will have to adapt.

The first reports were made in 2021. “To an extent, we’re learning as we go along,” says Marguerite Culot, the Director of Programmes, of Strategic Development, and of Institutional Relations at the [Paris Institute of Sustainable Finance](#), formerly known as Finance for Tomorrow.

Ecologists are already good at quantifying the loss of function that comes with the destruction of an ecosystem. The construction of a hotel complex in wetlands, for example, reduces the biophysical capacity of the area to sequester carbon, filter water or regulate the climate in ways that can be calculated.

The impact on functions that are strictly ecological, such as pollination, are much harder to estimate. That’s because it’s



necessary to know which species are present and to what extent – from the soil micro-organisms and small vertebrates, up to larger mammals and birds, and including all the plant species – and how they interact. But there is limited systematic data at the regional or national level.

“We’re still in the early stages of this,” admits Level. That’s because, in contrast to climate change, which can be captured with one parameter – ie the total quantity of carbon equivalents released into the atmosphere – the destruction of biodiversity can’t be summed up in a data point. The damage done in one place won’t be the same as the damage done elsewhere, even if the type of pressure is exactly the same.

Ecosystems are unique

“If you emit carbon in Europe, you can make that good again in China. Carbon is carbon. But when it comes to biodiversity, if you lose it in the Amazon, you can’t make that up in England. There’s no equivalence,” says Culot.

Every ecosystem has its own dynamic. [The Canadians rediscovered that when they passed a moratorium on cod fishing in their coastal waters in 1992](#), after decades of intensive over-fishing that had seriously reduced stocks. Contrary to expectations, the cod did not bounce back.

“The species should have recovered,” says Level. “Except that their ecosystems had changed.” [The 1995 Canadian Senate Committee’s fisheries report](#) said: “The scientific assessment of fish populations and fisheries management in general is not a precise discipline; the fishery is a complex system and no individual species within it can be treated in isolation. Significant tinkering with any part of it can set up reverberations that echo throughout the whole.”

Such interconnections mean it’s impossible to put a number on the individual ‘services’ of an ecosystem and just add them up.

It’s also hard to come to a global economic value for biodiversity and for the cost associated with its destruction. That’s especially so when we try to add in the value of regeneration of a particular landscape. Judges trying to estimate the level of financial reparations due after accidental pollution often struggle with this.

One way around this is to make a ‘contingent evaluation’ and ask a representative sample of the population how much they would be willing to pay to continue to benefit from the destroyed environment. But the value that people put on it will be subject to biases and will vary according to the exact question asked.

“Whatever price you might like to put on a species, if it’s extinct, it’s extinct. There’s no compensating for that”

That’s why contingent evaluations tend to be rejected by courts in favour of another approach. The preferred way is to list the species and the natural habitats lost, and then to estimate the cost of reinstating them and the cost of compensating for the loss of all the ecosystem services. Those services could be reinstated by, for example, clearing up an unauthorised dump. The underlying logic is of an ‘ecological transaction’, which aims to offset each destruction of biodiversity with an equivalent gain.

Following that logic, destroying nature could start to cost businesses dearly. In the construction sector, for example, the bill could be around 10% of revenues. “That’s the cost of restoring degraded land to offset the impact of this industry,” says Level.



“It should encourage construction companies to reduce the extent to which they degrade.”

Tools have been set up to compare the impact that various economic activities have on ecosystems and to evaluate better the risk taken by investors. For example, [Encore](#), which stands for ‘Exploring Natural Capital Opportunities, Risks and Exposure’, assesses which of 21 ecosystem services 167 ‘economic sub-industries’ depend on for their production processes.

[The Global Biodiversity Score](#) reports on the biodiversity of an ecosystem by comparing it with one that has not been degraded. “These tools are not perfect,” says Culot, “But they do at least exist and they have the benefit of clearly flagging up the issues on which we need to work.”

All these evaluations rely on one principle: quantifying the economic value of a service provided by the ecosystem and the cost of restoring that function once lost.

“There is no attempt to put a financial value on natural entities themselves,” says Level. “Putting a value on pollination doesn’t put a value on the insect that actually carries out the pollination because that insect also represents value in other ways. It might provide food for birds, for example.”

Some creatures, such as mosquitoes, can also be both beneficial for the natural ecosystem and bad for human health, as well as

for businesses such as tourism. Then there is the option value, which is the possibility that one species turns out to be better adapted to a changing environment than another, or that it becomes the source of a new ‘service’, such as a medicine.

How can we put a price on that? “It’s not possible,” says Level. “It’s very hard to assess the value of an option. One alternative is to specify some ecological limits (boundaries), which represent a kind of environmental insurance, to avoid or adapt to dramatic changes. It’s perhaps the most important thing we have to do in the face of the risk of socio-ecological – as well as economic – collapses.”

Putting a price on a particular species, therefore, has its limits. “Whatever price you might like to put on a particular species, if it’s extinct, it’s extinct,” says Culot. “There’s no way of compensating for that.”

It may be then that when it comes to protecting biodiversity, market logic has its limits. ■



Emmanuel Monnier is a French journalist who has been covering science and technology for over 20 years for leading French publications including *Science & Vie*. He recently launched a press agency – *les Chemineurs* – which specialises in science and technology including soft sciences