INTRODUCTION

Julia d'Astorg - Head of Science Department & Nature Department, AXA Foundation for Human Progress
Sandrine Bouttier-Stref - Group Head of Corporate Social Responsibility, Sanofi
Nicolas Renard - Executive Director, Veolia Institute

Nature sustains life, yet everywhere is under threat. Almost every ecosystem is eroded, contaminated, or degraded. Although biodiversity is in reality far richer than previously imagined, since we know about only a tenth of existing species, populations of many species are in freefall. It is believed that species are disappearing at least 10 to 100 times faster than during the five previous mass extinctions.[1] The sixth mass extinction event is now under way, and humans are the prime culprits. Fragmentation and destruction of natural habitats, pollution from chemicals, light and sound, overexploitation of land and sea, climate breakdown, invasive species, excessive resource extraction: these are the primary drivers behind biodiversity erosion.

Biological invasions, involved in 60% of plant and animal extinctions recorded globally, are one of the most powerful factors in biodiversity loss (see article p. 44). 7,000 to 10,000 different marine species travel the seas in ships' ballast tanks every day. And every year 200 alien species colonize new environments and begin competing with indigenous species. Asian hornets in Europe, Nile perch in Africa, Japanese knotweed in North America: invasive species – species that have managed to survive then thrive when introduced outside their natural range – are becoming more widespread, disrupting local balances.

Chemical pollution is global and permanent, just like climate change. To take one example, recent studies show that two thirds of the planet's watercourses have significant concentrations of antibiotics (see article p. 26). Certain forms of pollution are well known but most are not, notably emerging pollutants such as microplastics, pesticides, hydrocarbons or endocrine disrupters.

And when we harm biodiversity we harm our own health. Ecosystem erosion alters the prevalence and transmission of diseases to humans. Most emerging zoonotic diseases can be traced back to deforestation, changes to natural habitats, trading in wild animals and the intensification of farming practices. Invasive species can also act as vectors for transmitting pathogens to humans. Then there is the issue of ecosystem transformations that create food insecurity and increase the risk of hunger and malnutrition among vulnerable groups.

The disappearance of species deprives us of remedies that could have provided tools for combatting current or future diseases. The natural world is also a vast therapeutic reservoir that has, in a process of trial and error, solved extremely complex medical problems over millions of years. Nature is astoundingly inventive. Seven centuries ago Leonardo da Vinci was already advising us that "nature is the source of all true knowledge."

We cannot escape the fact that we are dependent on other species. Human health and the health of environments where we live are inextricably linked: there is, ultimately, only one health. It is well known that restoring and preserving biodiversity is very much in our interest, that it should attract as much attention as climate heating. Using the prism of human health is a more effective way of defending biodiversity as it impacts us directly. And defending biodiversity is all the more important because time is running out. Biodiversity decline is happening almost out of sight, apparently slowly but actually very rapidly in terms of geological cycles: a matter of falling birth rates rather than generalized calamity.

How can declining biodiversity be reversed? Although some issues have to be tackled at the global level, there are many others where people can act at the local level: fragmentation and destruction of natural environments, pollution, overexploitation of land and fishery resources, invasive species, and so on. Better and more accurate knowledge, multiple indicators for mapping and tracking regional data, and the accretion and cross-referencing of multi-disciplinary datasets are of considerable help in acting accurately and effectively for the long term. There is no question that biodiversity erosion could be slowed by implementing more ambitious regeneration strategies and, most of all, increasing conservation efforts: the fact is that one of the best ways to protect nature is leaving it in peace. But do we want to? Are we capable? Nature is wonderfully resilient; the self-cleaning capacity of wetlands is just one example. Very often, providing that the irreversibility threshold has not been reached, the natural world can return to its initial state simply by being left alone for a few decades.

Reducing environmental pressures, regulating risky interfaces between humans and the natural world to limit pathogen spillover, eco-epidemiological surveillance in sensitive regions, and controlling the trade in wild animals are all important measures. By explicitly embedding human health into biodiversity protection policies, and incorporating biodiversity protection into public health policies, governments can roll out actions that deliver a double benefit.

1 IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. https://doi.org/10.5281/zenodo.3831673.

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They also need to move beyond curative health policy approaches to ensure that prevention of zoonotic diseases is embedded as a feature of biodiversity protection policies. Sadly, the success of a prevention policy is not visible; it succeeds when nothing happens. But our health is dependent on preventive rather than curative policies.

Improved insights and understanding are vital to better protection for ecosystems and human health. Many new human diseases come from animals, wild animals in particular. Without in-depth knowledge of wildlife and, more generally, how ecosystems operate, it will be difficult to properly protect human health.

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Experience shows it is possible to preserve biodiversity and restore degraded ecosystems. Their decline is not irreversible. In France, populations of many species of hoofed wild animals, raptors, egrets, and white storks are all increasing strongly. Beavers, grey wolves and European otter populations are rising fast. In 1970 there were only three species of fish living in the Seine in Paris; today there are around 40.[2]

Appropriate financial support and regulatory frameworks are needed to encourage scaling up of solutions. The solutions for protecting and restoring biodiversity exist, are proven and immediately deployable. Looked at in isolation they can seem derisory, but adopted massively and persistently over time they will have a major impact. What we lack is not so much the solutions as the political will and financial incentives for everybody to get involved, from policymakers, businesses and farmers to administrations, NGOs, and private individuals.

Biological diversity is how nature adapts to change. For people, it offers a form of health insurance. Nature and humanity share a common destiny: depleting nature depletes humanity, protecting nature protects humanity. If humanity is biodiversity's worst enemy, we can also, when we want to and when we give ourselves all the tools we need, be its best friend.

2 SIAAP, Service Public de l'Assainissement Francilien [Public Service for Sewage Treatment in the Ile-de-France Region], https://www.siaap.fr/metiers/biodiversite/.