Leibniz Institute of Plant Genetics and Crop Plant Research (IPK)
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Forest, Covid-19, Food and Extinction of Species: Research network publishes "10 Must Knows" on biodiversity

Press Release

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Gatersleben, 25.03.2022 **"10 Must Knows from Biodiversity Science", ranging from climate stress for German forests, the restructuring of agriculture to the corona virus that has jumped from animals to humans, are now published for the first time. More than 45 experts from the Leibniz Research Network Biodiversity and colleagues have compiled this inventory on the preservation of nature as the basis of human life. In the run-up to the World Summit on Nature - the UN Biodiversity Conference in Kunming, China - the report is intended to invite dialogue, the researchers say. At the same time, they voice clear policy demands.**

„If we continue business as usual, we will undermine the foundations of our life on this planet," explains Kirsten Thonicke from the Potsdam Institute for Climate Impact Research, speaker of the Leibniz Research Network Biodiversity. "It is important not to look at individual phenomena such as a single species threatened with extinction but to look at the connections. In the end, it is about the air we breathe and the water we drink. We want to encourage people to tackle the challenges. The longer we delay, the more difficult and the more expensive it becomes - there are clear parallels here with the climate issue."

The Gene Bank of the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), which comprises more than 151,000 accessions, is of great importance in this respect. "As one of the largest institutions of its kind in the world, the Federal Central Ex situ Genebank makes important contributions to the preservation of the diversity of important cultivated plants and wild-associated species," says Prof. Dr. Andreas Graner, Managing Director of the IPK. "Research into this diversity provides the basis for breeding crops for climate-adapted agriculture that conserves natural resources. The knowledge-based harnessing of biodiversity creates options for our future."

Current stocktaking on biodiversity

1. Achieving climate and biodiversity protection together: Ecosystems on land and the oceans have absorbed about 55% of human-made CO_2 emissions in the past ten years. Destroying ecosystems such as peatlands or forests releases large quantities of greenhouse gases. Intact ecosystems therefore benefit the climate. In turn, a stable climate also benefits biodiversity. The extinction risk of tropical species could be halved if global warming was kept below 2°C, and one third of the land area was protected. Both, climate and biodiversity protection, have been agreed upon internationally or is currently being negotiated; the only thing lacking is their implementation.

2. Strengthening planetary health: 75% of new infectious diseases – currently including COVID19 - are zoonoses, i. e. diseases transmitted from animals to humans. This can happen when humans increasingly encroach on natural areas, or in factory farming, which often already contributes to the destruction of nature by cultivating feed on what used to be untouched lands. Protecting ecosystems and reducing factory farming can therefore directly and indirectly benefit the health of people and nature.

3. Considering hidden biodiversity: Everyone wants to protect elephants or tigers, but life below the surface dies invisibly. In rivers and lakes, the number of larger vertebrates has decreased by 84%. More research on the death of microorganisms in the soil is urgently needed. The microorganisms below the ground are important for everything that grows on earth.

4. Promoting biocultural habitats: About 5,000 indigenous peoples remaining on earth depend on an intact nature as hunters, gatherers, and fishermen. Biodiversity, cultural, and linguistic diversity are closely related; for example 70% of all languages are spoken on only 24% of the earth's surface, where we also find the greatest diversity of species. If we lose the languages, we not only lose the knowledge about biodiversity, but also traditional ecological knowledge that is instrumental in preserving and sustaining their natural habitat.

5. Using forests sustainably: After three drought years (2018-2020), 79% of all trees in German forests have less dense foliage. Many forests are becoming more susceptible to insect damage or fire due to climate stress. At the same time, forests are considered suppliers of climate-friendly raw materials because trees take CO_2 out of the air and store it in the wood. The concept of sustainability, which originated in forestry, must be redefined here. Forests need management, for example through certification, the planting of new resilient species, or by supporting natural forest development.

6. Transforming agriculture: The production of food for humanity - an enormous achievement - often contributes to the death of species through monocultures and too many pesticides and fertilisers. Only a few types of grain grow on 40% of the world's harvested land, namely maize, wheat and rice. At the same time, almost 40% of plant diversity is threatened with extinction. In order for farmers to preserve biodiversity, they need financial incentive systems and advice, for example through German or EU agricultural policy.

7. Protecting land and resources: 77% of the world's land areas, with the exception of the ice-covered Antarctic, are already heavily modified by human use. Natural areas must therefore urgently be protected and additional areas renatured if they are to continue to provide their ecosystem services and contribute to climate protection. Expressing these

services in euros and cents in order to manage them is not easy. It is currently unclear how much resource consumption humanity can still afford. But: As little as possible if it wants to minimise risks.

8. Expanding transnational infrastructures and education for sustainability: Damage to nature often occurs along supply chains and in global production networks. Strategies such as the EU's to protect biodiversity must therefore be transnational. But it also depends on citizens. More than 70% of all biodiversity data worldwide is collected by people active outside science. Citizen science is growing.

9. Ensuring access and open use of research data: Sharing data is the basis for effective biodiversity management. For example, a relevant database of the INSDC (International Association of Gene Sequence Databases) already offers more than a quintillion gene sequences for free use worldwide – they help to identify new species through gene comparison or to detect changes in known organisms, for example in pathogens. Restricting access to data hinders research progress, more digitisation promotes it.

10. Setting biodiversity-friendly incentives: Around 140 billion US dollars are spent annually on biodiversity conservation worldwide, from public and private funds – but 500 billion in public subsidies plus an estimated 2,600 billion in private investments in sectors that harm biodiversity. This imbalance could change if the financial sector included biodiversity impacts in investment risk assessments, as it is already increasingly doing with climate impacts. This would be an important lever for the conservation of our natural livelihoods.

Scientists from the following institutes played a leading role in the "10 Must Knows from Biodiversity Science":

Leibniz Research Network Biodiversity:

- Potsdam Institute for Climate Impact Research
- Academy for Territorial Development in the Leibniz Association
- Leibniz-Centre General Linguistics
- Leibniz Institute of Agricultural Development in Transition Economies
- Leibniz Institute of Vegetable and Ornamental Crops
- Leibniz Institute of Freshwater Ecology and Inland Fisheries
- Leibniz Institute of Ecological Urban and Regional Development
- Leibniz Institute of Plant Genetics and Crop Plant Research
- Leibniz Institute for Zoo and Wildlife Research
- Museum für Naturkunde Berlin - Leibniz Institute for Evolution and Biodiversity Science
- Senckenberg Society for Nature Research

- Other institutions:
- Helmholtz Centre for Environmental Research (UFZ)
- German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig
- University of Zurich

Weblink to the complete 10 Must Knows:
https://zenodo.org/record/6257527#.Yj13i5Yo8cQ

Weblink to the Leibniz Research Network Biodiversity:
https://www.leibniz-verbund-biodiversitaet.de/en/

Weblink to the Leibniz Association:
https://www.leibniz-gemeinschaft.de/en/

Weblink to the UN Biodiversity Conference:
https://www.unep.org/events/conference/un-biodiversity-conference-cop-15