



Sustainability tomorrow: Identifying challenges, analysing approaches and assessing future strategies

Audio Transcript

Biodiversity Loss: Challenge

[Prof. Dr. Patricia Holm] Biodiversity, or «Biological diversity», is defined by the International Union for Conservation of Nature as «the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems».

So, biodiversity is a natural resource. Almost all the goods and services that we need come from nature. These are the resources that we mean when we talk about «needs» in sustainability definitions.

The direct use of natural resources is obvious, especially for rural populations, fishing communities and forest-dwelling households. But biodiversity is the foundation of our entire food security. You might think: «Well, I only eat hamburgers, I don't need biodiversity». The fact is that even then, biodiversity is essential. Although a very small number of plant species, just 15 crop plants, provide 90% of the world's food energy intake, we depend strongly on the diversity of their genes.

Diverse environments need different, specialised varieties – in other words, different sets of genes – to resist harsh climatic conditions. Pests and pathogens put additional pressures on these cultivars. A cultivar is a type of cultivated plant that people have selected for certain desired traits; and when they propagate, the plants retain those traits. Since the cultivars are bred to gain highest yield, other traits might have disappeared over the generations.

Because of this, we depend strongly on the pool of natural resources – on what we could call «crop wild relatives», or cousins of our food crops. These «crop wild relatives» still grow in nature and are able to survive tough conditions and continue to evolve in the wild. They have developed traits such as drought tolerance or pest resistance. We can cross them with domesticated crops to produce new varieties.

«Crop wild relatives» therefore provide an important pool of resources for the future. It is important to explore how climate change threatens our crops.

Besides the direct use of natural resources, indirectly, biodiversity provides numerous ecosystem services. These are benefits which are typically grouped into four categories.



First, **provisioning services** are all products obtained from ecosystems, such as food and water; but also, for example, wood for construction.

Second, **regulating services** are, for example, climate regulation, pollination or waste treatment.

Third, **supporting services** comprise nutrient cycles and production of biomass and oxygen, as the basis of all food webs.

Fourth, we distinguish **cultural services**, such as cognitive, aesthetic, spiritual and recreational benefits.

For all of these services, biodiversity is key. For example, if you explore how ecosystems treat waste, you realise that uncountable numbers of sometimes hardly detectable organisms, such as ants, worms, beetles and microbes, are necessary to decompose dead plants and animals into simpler organic and inorganic material, such as minerals, salts, and carbon dioxide. This process is the basis for soil fertility and an effective ability to regenerate.

We are now faced with one of the biggest biodiversity losses on our planet, and, for the first time, this decline is man-made. The latest «Living Planet Report» by the World Wide Fund for Nature reported an almost 70% decline in the wild populations of mammals, birds, amphibians, reptiles and fish across the globe in the last 50 years.

Pollinating insect species are in decline globally as well. And pollinators, such as honey bees, wild bees, hover flies and many others, are essential for the reproduction of their host plants, and therefore for biodiversity. In addition, more than 75% of globally important food crops at least partially rely on pollinators.

Studies show that having a rich variety of plant and bird species has a positive impact on human mental health. Consequently, biodiversity loss may significantly affect humans and their health, wealth and well-being if ecosystem services are no longer sufficient to meet human needs. So, the survival of the human species is built upon other species, and ultimately on the diversity of species, genes, and ecosystems.

Since biodiversity loss is less visible for most people and the impact is less tangible than the effects of climate change, this decline is taken less seriously.

In answer to this, the Conference of Parties to the UN Convention on Biological Diversity adopted a new set of goals in 2022. This set of goals is called the Kunming-Montreal Global Biodiversity Framework. Among the four goals and 23 targets to be achieved by 2030, the nations agreed that 30% of Earth's lands, oceans, coastal areas, and inland waters have to be protected.

So why is biodiversity loss a topic for sustainable development? Because if we lose biodiversity, we lose our food security, we lose almost all our basic goods, and we lose numerous ecosystem services. Without biodiversity, the very survival of the human species is under threat.