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Why are biodiversity research and protection so important?

Biodiversity is the basis of life on earth and the foundation of human well-being. Biodiversity provides essential ecosystem services for humans, such as food, timber, medicine, clean water, or air. This foundation is often overlooked as humans appear to be able to replace these ecosystem services with human-derived services. Nevertheless, biodiversity is essential for the stable, long-term provisioning of these ecosystem services, especially under global climate change. Research on biodiversity is important because we still have only a preliminary understanding of the evolution of biodiversity, its current dynamics, and how it might change in the future. However, this knowledge is essential for the protection and sustainable use of biodiversity going forward.

Please provide of one or two examples of projects that you are currently working on with your team.

In one of our projects, we are studying the biodiversity of birds and their ecosystem functions (i.e. seed dispersal and pollination) on Mt. Kilimanjaro in Tanzania. We are investigating the impact of climate and land use change by studying the relationship between biodiversity and ecosystem functioning along the large elevational gradient of this mountain. We are able to show that the diversity of fruit-eating birds is essential for seed dispersal and that land use and climate change have a multiplicative effect on biodiversity. In another study, we are investigating the importance of large mammals, such as antelopes, lions, and cheetahs, for wildlife tourism in African national parks. We are able to demonstrate that a large number of predators is the most important factor driving wildlife tourism in Africa, but that these predators rely on a "healthy" ecosystem, in particular, large ungulate densities and specific types of vegetation.

To what extent does human land use impact the biodiversity of ecosystems?

Human land use has a profound impact on biodiversity. In general, human land use causes decreases in biodiversity, which is of particular concern for especially

rare and threatened species. Human land use today is the most important factor for global biodiversity loss.

How will ongoing changes in biodiversity affect the lives of future generations?

The human impact on biodiversity is greatly increasing. The degree to which humans now use the net primary productivity on earth has increased from 13% in 1910 to 25% in 2005. It is difficult to predict in detail how the loss of biodiversity will influence the lives of future generations. As mentioned earlier, we still lack a profound understanding of the relationships between global change, biodiversity, and human well-being. Nevertheless, we do know that our ability to respond to further global change is declining with the ongoing biodiversity loss. That is, the biodiversity loss heavily reduces our options to adapt to future change, and increases the risk of reaching a tipping point beyond which severe consequences for human well-being are to be expected.

How do you foresee research on biodiversity changing in the future?

We are currently at a most exciting point in biodiversity research. We have made huge progress in experimental research as we have developed the genetic tools to understand the evolution of biodiversity. With citizen science, we have the ability to collect biodiversity data on large spatial scales and we have achieved the computing power to model biodiversity at the regional and global levels. We are currently on the cusp of making a tremendous step forward of integrating these different components and of gaining a profound increase in our knowledge and understanding. At the same time, with the Intergovernmental Platform on Biodiversity and Ecosystem Service (IPBES) or "World Biodiversity Council," we also have a science-policy interface with which we are able to feed this scientific progress into political decision-making. Therefore, I consider biodiversity research as one of the key scientific research fields of the future.