



The Sustainable Development Goals - conceptual approaches for science and research projects

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Challenged to provide answers to some of the world's biggest societal and environmental problems, the scientific community has consistently delivered exciting and solid information that is often used to assess the situation in many different parts of the globe to document the anthropogenic cause of environmental changes and to provide perspectives on possible development scenarios. With the adoption of the Paris climate agreement and the 2030 Agenda for Sustainable Development (and its 17 Sustainable Development Goals (SDGs)) major issues for society are now in its complexity in implementation. That are: consistency with other political processes (e.g. UNFCCC, IPBES), implementability (e.g. interactions between SDGs, pathways) and measurability (e.g. indicators). We argue that science can contribute to all these aspects by providing fundamental knowledge necessary for decision-making and practical implementation of the SDGs. Cooperation beyond disciplines and national borders is essential, as well as the integration of concepts and methods of natural and social sciences.

The outcome of two international conferences has called out four specific areas where science can make significant contributions towards SDG implementation: First, deep and integrated scientific knowledge is needed for better understanding key interactions, synergies and trade-offs embedded in the SDGs. Second, sound scientific input is needed for co-designing and executing of scientific assessments in the context of the SDG process (going beyond the good examples set by IPCC and IPBES). Third, science can support the establishment of evidence-based procedures for the development of scenarios and identify possible pathways for the world in 2030 or beyond. Fourth, progress on SDG implementation needs to be supported by a meaningful indicator framework, and this framework needs scientific input to refine indicators, and further develop and standardise methods.

The main conclusion is that a comprehensive approach is needed that combines basic science and solution-oriented science, and integrates knowledge from natural science, social sciences, engineering and humanities (but also from other knowledge domains) to meet the overall objective of the 2030 Agenda. Foresight, integrated assessment and integrated modelling can be possible successful approaches for knowledge exchange, learning, and identifying possible coherent development pathways towards global sustainability. To ensure rapid and effective uptake of new research results the concepts of co-design of research projects and co-production of knowledge show promise.