

Future Biodiversity Research: How a Social-Ecological Perspective Makes a Difference

Marion Mehring^{1,2}, Diana Hummel^{1,2}, Stefan Liehr^{1,2}, Alexandra Lux^{1,2}

1 ISOE – Institute for Social-Ecological Research, Hamburger Allee 45, 60486 Frankfurt/Main, Germany

2 BiK-F Senckenberg Biodiversity and Climate Research Center, Senckenberganlage 25, 60325 Frankfurt/Main, Germany

Background

In 2010, there was a bold commitment by the world's governments to take action in halting global biodiversity loss by 2020. At the mid-point of this 10-year period, this mission of the CBD's strategic plan 2011–2020 is seriously at risk (Global Biodiversity Outlook 4, 2014; Tittensor et al., 2014).

At the CBD COP 12 in Pyeongchang, Republic of Korea a **lack of action was acknowledged** and key parameters were identified in order to address this issue (UNEP/CBD/COP/12/9/Add.1).

Take home message

A decisive turn in biodiversity research is needed, that considers the hybrid notions of biodiversity between science, politics and society. Social-ecological biodiversity research is:

- 1) problem oriented with regulation and transformation of biodiversity protection and use constituting the research (**analytical characteristic**)
- 2) normatively focused on sustainable development (**normative characteristic**)
- 3) conceptualized through social-ecological systems (**descriptive characteristic**).

Lack of action – the role of transdisciplinarity

In the field of biodiversity protection, there is a great deal of uncertainty, ignorance and contested knowledge, while at the same time the claims for evidence-based political decision making are high. Given this kind of complex problem structure there is an increasing consensus in sustainability science that new ways of knowledge production are necessary. Here, **transdisciplinarity** can provide adequate answers to these challenges since it seeks to **produce new knowledge by integrating different scientific insights and extra-scientific knowledge**. Transdisciplinary research is conducted at the interface of society and science.

Social-ecological perspective

Social-ecological systems conceptually formalize this interface realizing a transdisciplinary research process (Fig. 1).

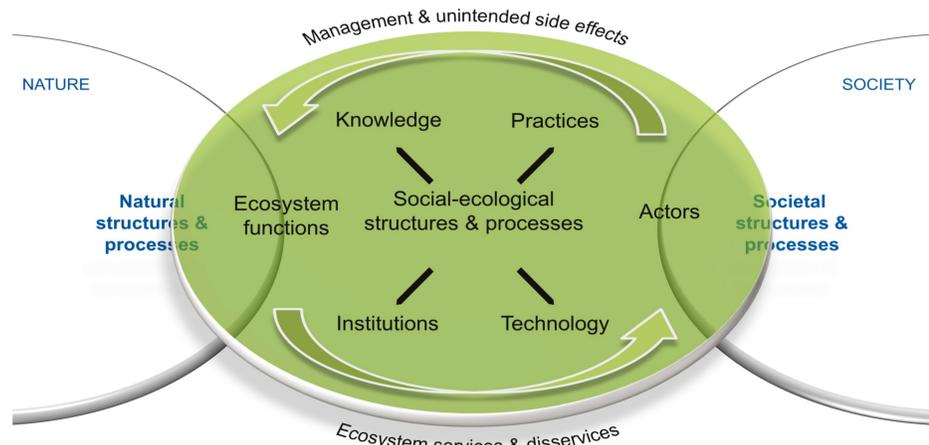


Figure 1: The concept of social-ecological systems (Hummel et al., 2011, modified)

Social-ecological systems are defined as a

hybrid and emergent system, nested in both society and nature drawing on societal and natural structures and processes, respectively

Core components are

actors and ecosystem functions

Core relations are

ecosystem services and disservices; intended management activities and unintended side effects thereof

The analytical core is determined by

1. social-ecological structures and processes: societally and naturally shaped
2. practices, knowledge, institutions, technology

(Source: Liehr et al. submitted to Ecology and Society)

Acknowledgements

We thank our colleagues from Research Activity "Ecosystem Services and Climate" at the Senckenberg Biodiversity and Climate Research Centre (BiK-F), Frankfurt/Main, Germany for discussion on previous versions of the SES conceptual framework.

Literature

Global Biodiversity Outlook 4 (2014). Secretariat of the Convention on Biological Diversity, Montréal, 155 pages.
Hummel, D., Jahn, T., Schramm, E. (2011). Social-Ecological Analysis of Climate Induced Changes in Biodiversity – Outline of a Research Concept. BiK-F Knowledge Flow Paper No. 11. Frankfurt/Main, Germany.
Liehr, S., Röhrig, J., Mehring, M., Kluge, T. (subm. to Ecol./Soc.): Addressing water challenges in central northern Namibia: How the social-ecological system concept can guide research and implementation.
Tittensor, D.P. et al. (2014). A mid-term analysis of progress toward international biodiversity targets. *Science* 346, 241–244.
UNEP/CBD/COP/12/9/Add.1. List of potential key actions to enhance progress towards the implementation of the strategic plan for biodiversity 2011–2020 and the achievement of the Aichi biodiversity targets.

Contact:

Dr. Marion Mehring
Biodiversity and People (Head), ISOE – Institute for Social-Ecological Research
Hamburger Allee 45, 60486 Frankfurt/Main, Germany
E-Mail: mehring@isoe.de, Phone: +49 69 7076919-39



Institute for
Social-Ecological
Research

