

Capturing Water-Energy-Food (WEF) Nexus as a network phenomenon in social-ecological systems

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Research questions

- Which approach may effectively capture the interconnections and interdependencies in the Water-Energy-Food Nexus?
- How can such an approach be applied to develop policy recommendations together with decision-makers and resource users?

Case study

- Canton of Bern, Switzerland, Europe

Method

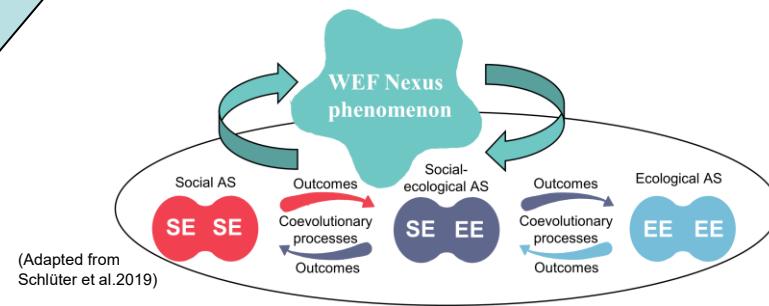
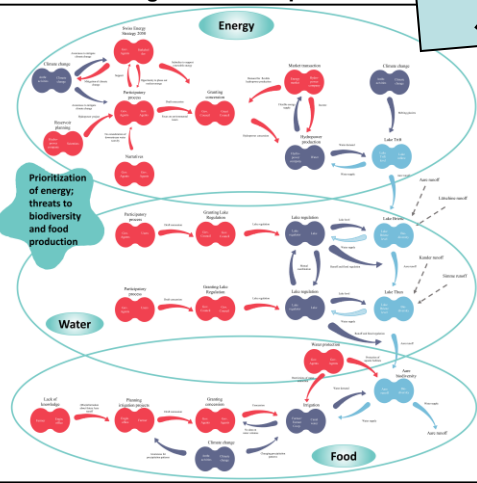
- Semi-structured interviews
- Document analysis
- Transdisciplinary co-production

Approach to understand WEF Nexus phenomena (“system knowledge”)

- Adapted from Social-Ecological Action-Situations (SE-AS) framework (Schlüter et al. 2019)
- Links social and ecological systems across spatial and temporal scales → “intertwined” nature of social-ecological systems (Folke et al. 2016)
- Allows to overcome the dichotomy of ‘humans’ and ‘nature’ (Biermann 2020)
- Allows to capture dynamic social-ecological interactions across scales
- Understands system development as a dynamic process of co-evolving social-ecological relationships (Haider et al. 2021)
- Understands WEF Nexus phenomena as network phenomena with interactions between human and ecological entities = social and ecological action situations

Current WEF focus	SE-AS focus
Trade-offs and synergies	Understanding the dynamic network
System knowledge (problem focus)	Target- and transformation knowledge
Linear cause-effect links	Co-evolutionary circular processes with mutual interdependencies
Dichotomy of humans and nature	Intertwined nature of social-ecological systems

Understanding WEF Nexus phenomena



Transformation of WEF Nexus phenomena (“transformation knowledge”)

- Transdisciplinary co-production (Schneider et al. 2019)
- Finding leverage points in the network (add, remove, shrink, extend AS; add, remove, change interactions) (Fischer et al. 2019)
- Changes in the network result in the targeted WEF Nexus phenomenon (“target knowledge”), e.g. compromise between biodiversity of aquatic ecosystems, energy security, food security

Transformation of WEF Nexus phenomena

