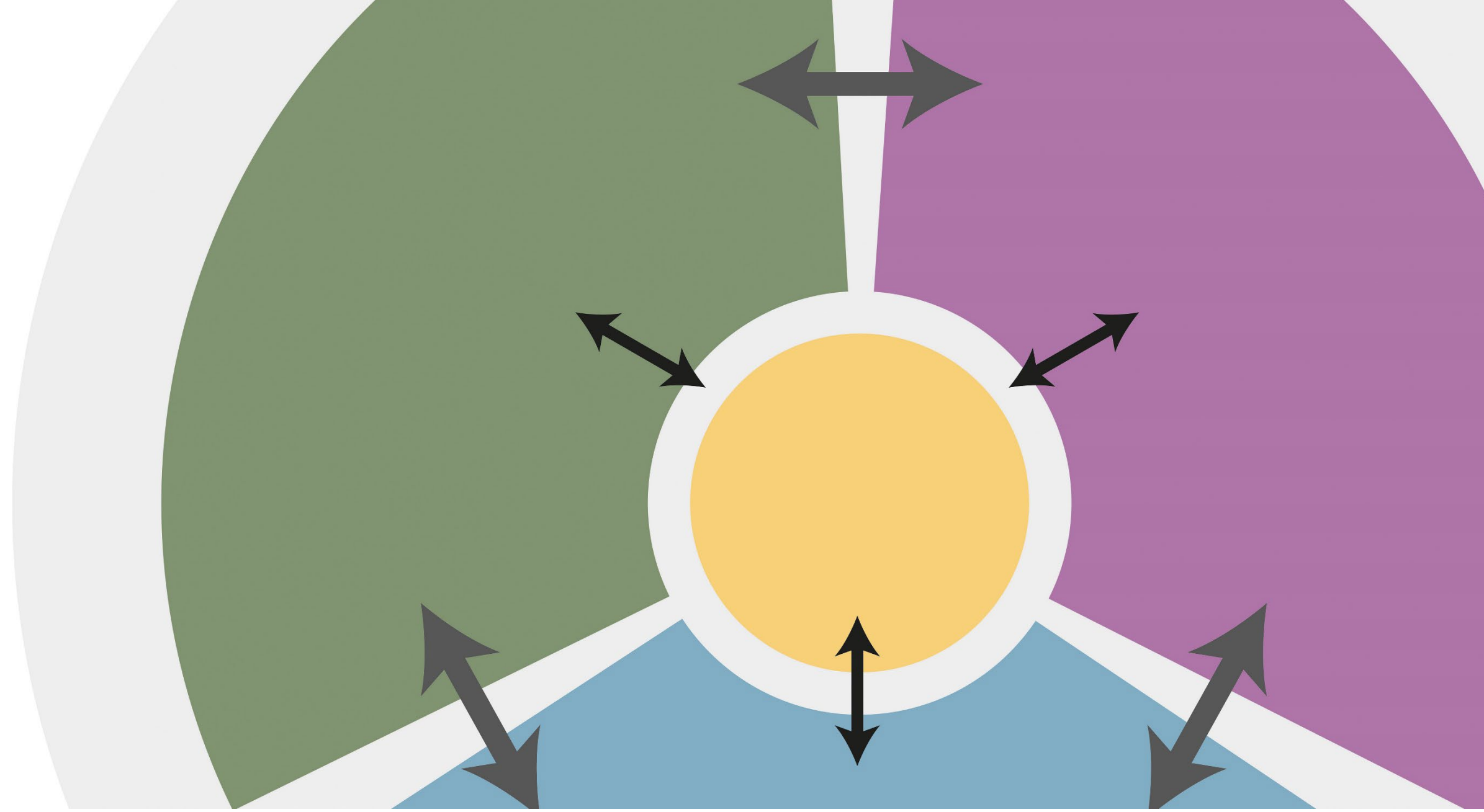


The effect of environmental perception of hydro-climatic uncertainty and risk on agricultural decision-making



Motivation & Innovation

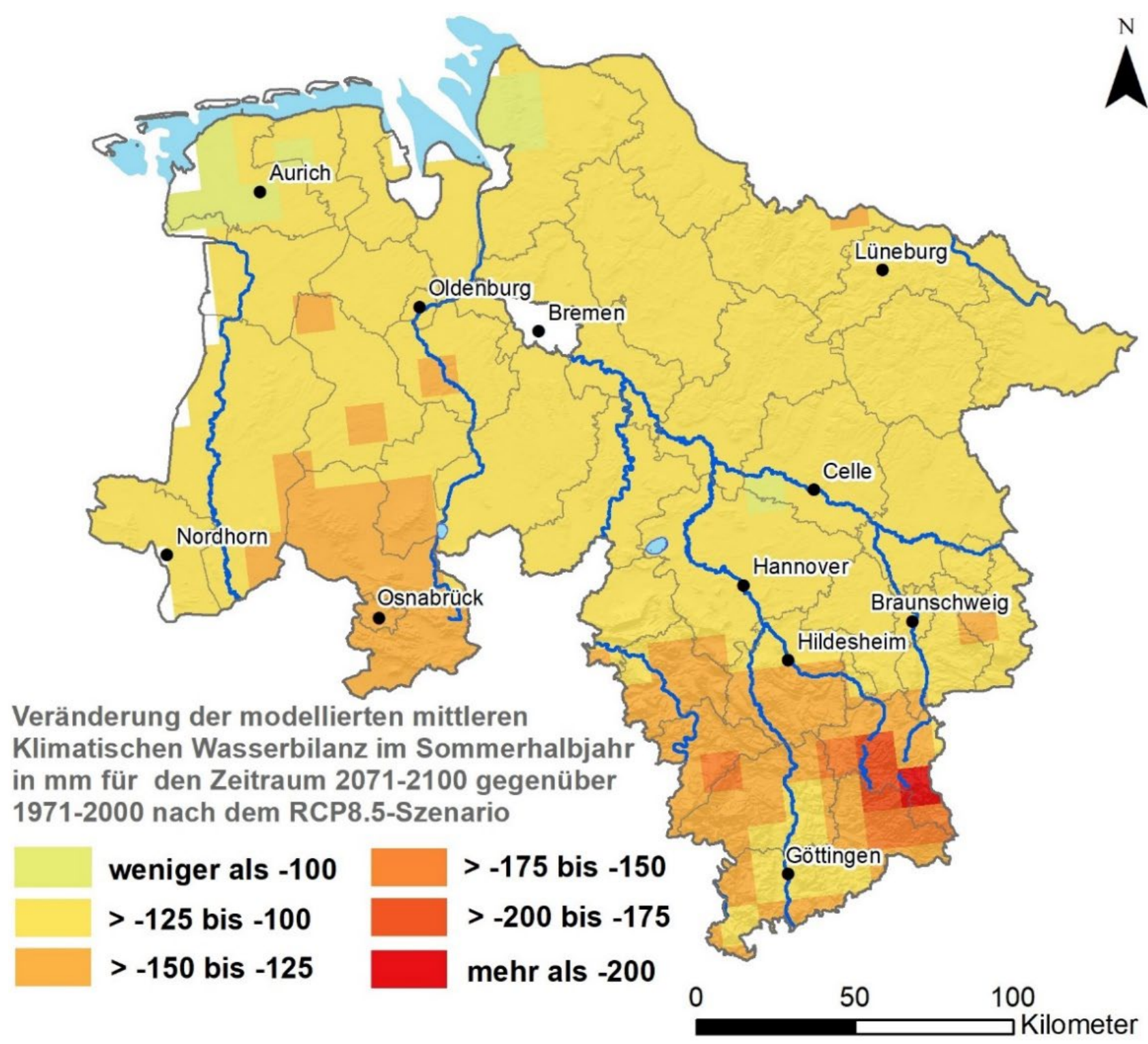
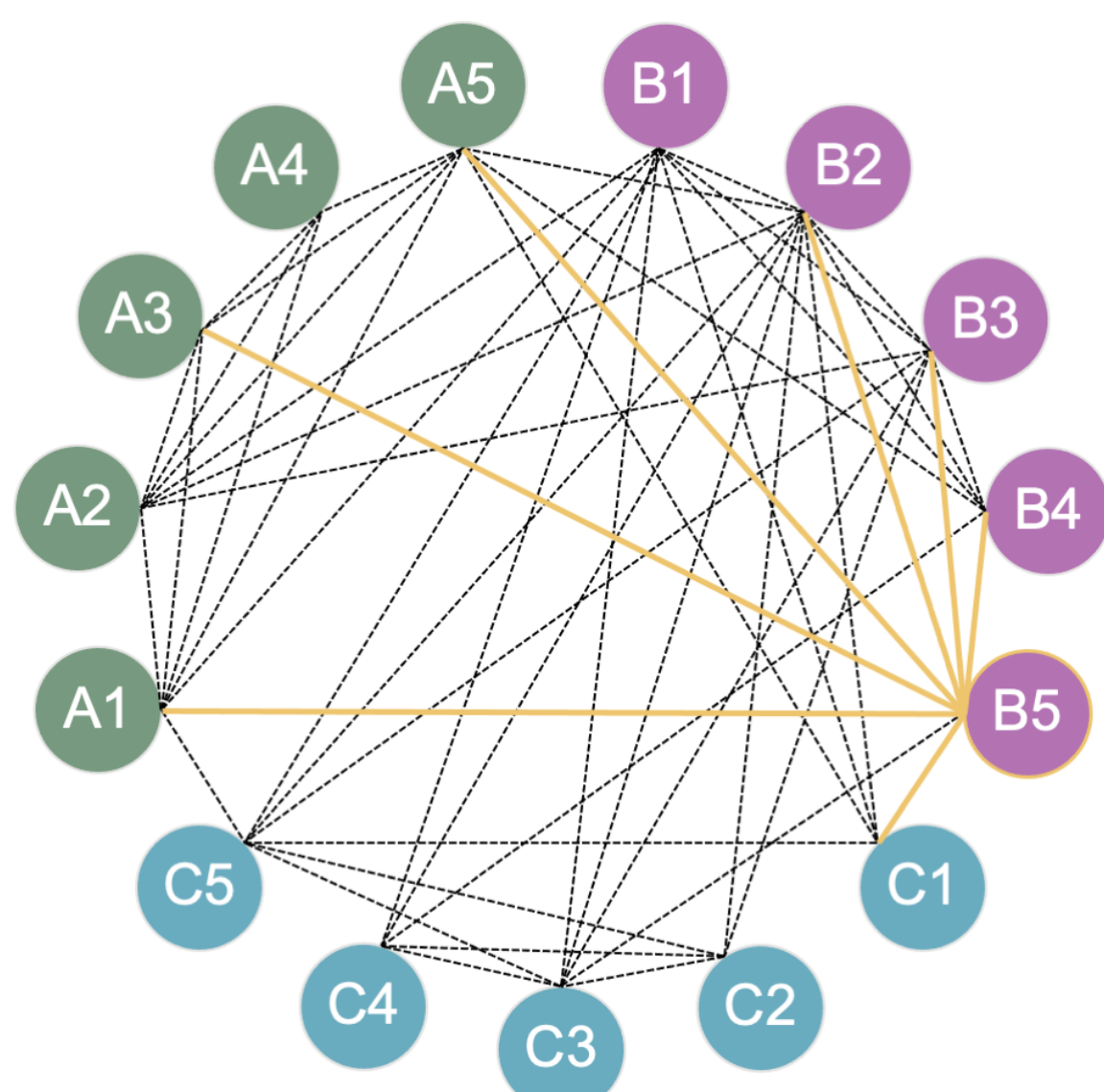


Figure 1. Summer months water balance (04-09) for Lower Saxony. Projected change 2071–2100 in mm (Reference period 1971–2000, RCP 8.5 scenario) (LBEG 2020: 9)

Farmers are experts in coping with climate variability, but increasing hydro-climatic extremes force them to apply new strategies (Heinzel et al. 2022) to reduce systemic risks. Paying attention to farmers' heterogeneity and unevenly distributed levels of agency and aspiration affecting their management strategies, is critical to understand how agricultural decisions influence regime shifts (Höllermann et al. 2021).

Linkages



- Complementing a vertical integration from individual to institutional level (C1)
- Provide starting point for scenario impact assessment (A5)
- Exchange of finding on human behavior (B2, B3, B4)

References

Heinzel, C., Fink, M., & Höllermann, B. (2022). The potential of unused small-scale water reservoirs for climate change adaptation: A model- and scenario based analysis of a local water reservoir system in Thuringia, Germany. *Frontiers in Water*, 4.

Höllermann, B., et al. (2021). Dynamics of Human–Water Interactions in the Kilombero Valley, Tanzania: Insights from Farmers' Aspirations and Decisions in an Uncertain Environment. *The European Journal of Development Research*, 33, 980–999.

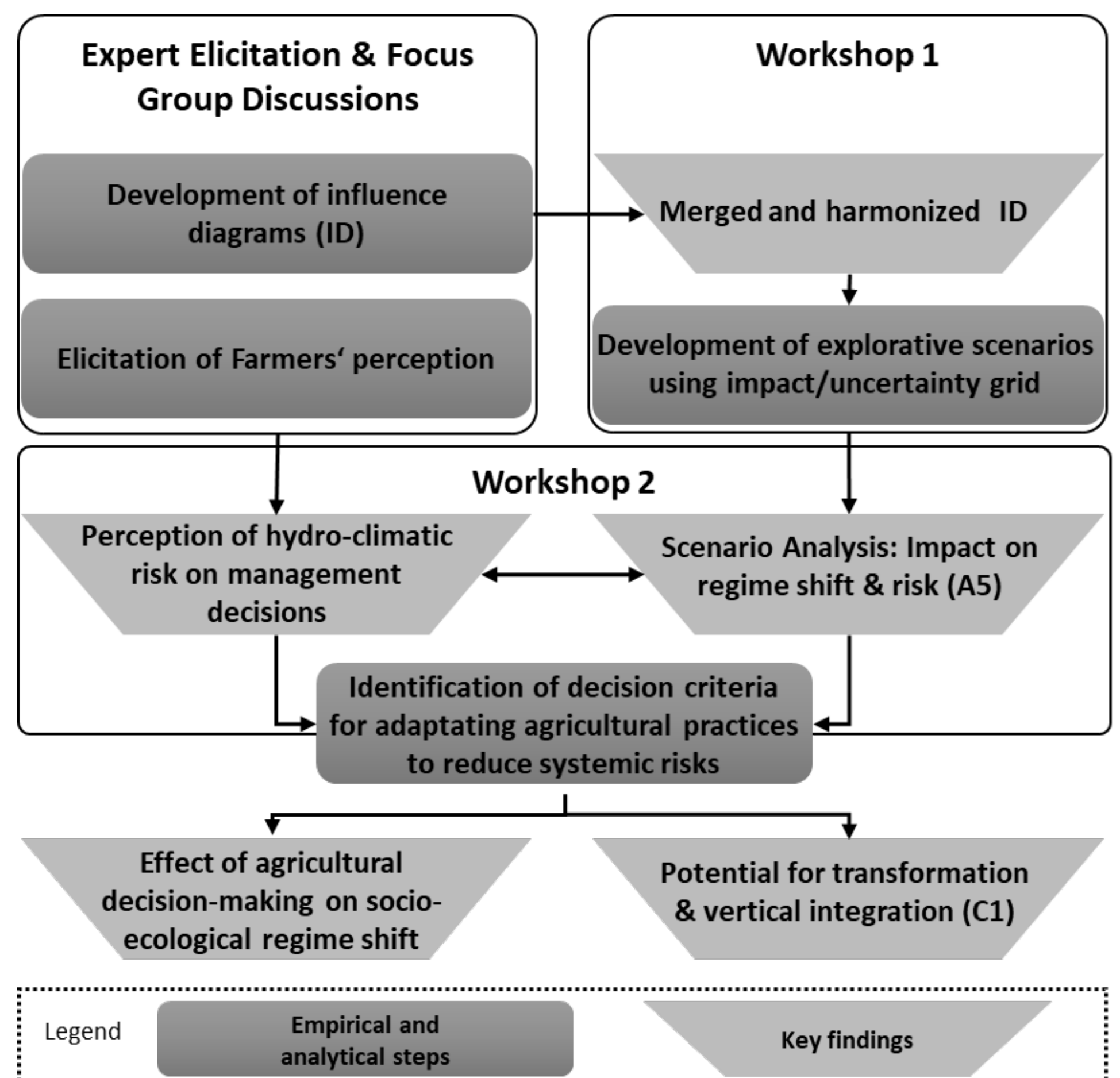
LBEG (2020). Auswirkungen des Klimawandels auf Böden in Nds. *Bericht Klimawandel*.

B5. Human activities

Objectives

- How do farmers' perception of hydro-climatic variability paired with their agency and aspiration **shape agricultural decision-making**?
- How does the perception of environmental and socio-economic **uncertainties impact** balancing bio-physical criteria - such as projected rainfall variability - against other important decision criteria (e.g., market price)?
- How do agricultural practices - guided by environmental perception, aspiration and agency - **influence a socio-ecological regime shift**?

Scientific Design



Principal Investigator

Prof. Dr. Britta Höllermann

- Socio-hydrological interactions and dynamics (agriculture, floods)
- Perception and handling of uncertainties of hydro-climatic risk in water resources management and agriculture
- Participatory system and scenario analysis

