

WaterStressAT - Climate change induced water stress

– participatory modeling to identify risks and opportunities in Austrian regions



Susanne Hanger-Kopp, Steffen Birk, Peter Burek, Luca Guillaumot, Martina Jauck, Taher Kahil, Veronica Karabaczek, Helga Lindinger, Awan Nauman Kurshid, Martina Offenzeller, Wolf Reheis, Reetik Sahu Kumar, Christian Sailer, Thomas Schinko, Alois Schläffer, Katrin Sedy, Theodor Steidl, Peter Waltl, Christian Wawra,

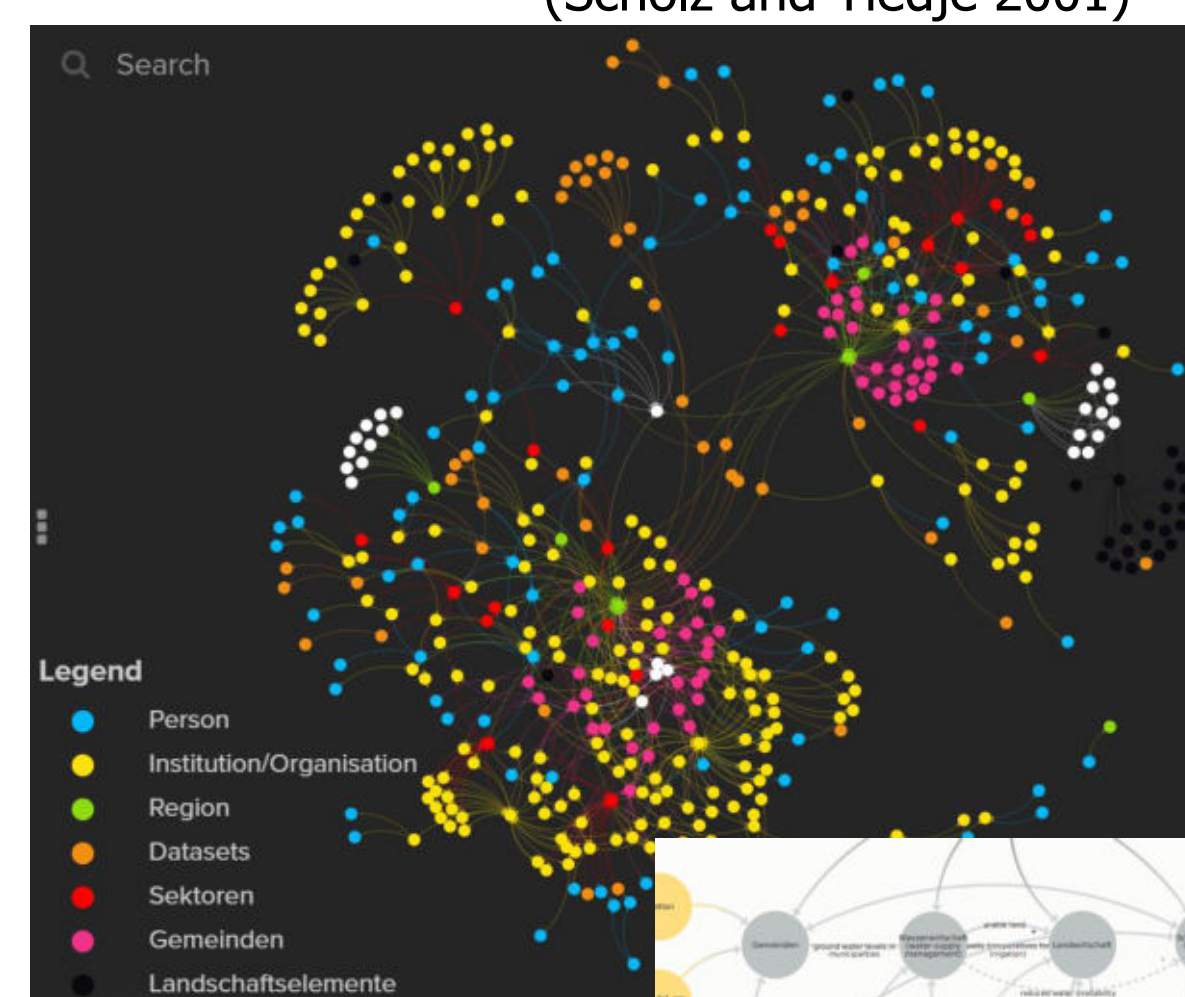
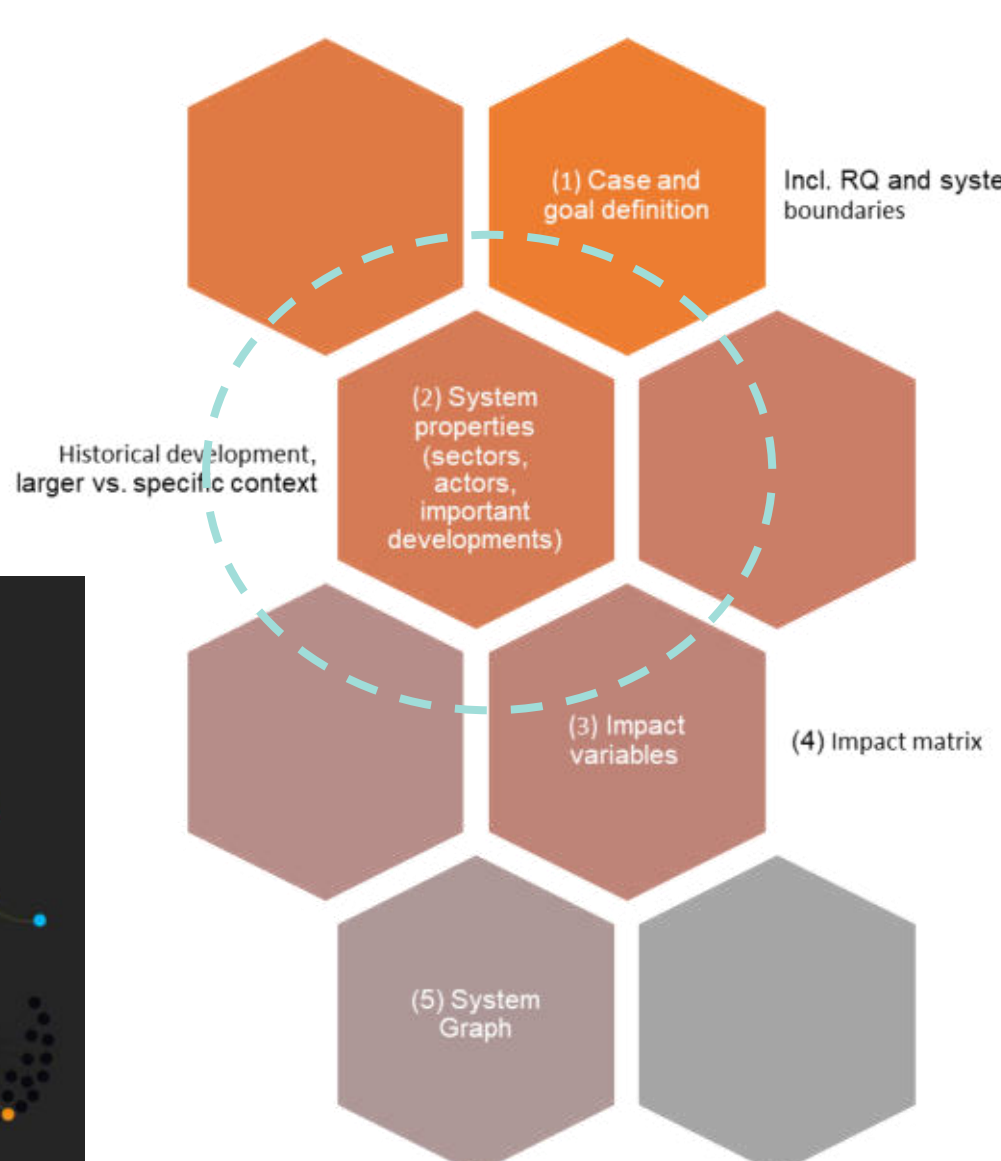
Problem description

- In Austria, increase in demand as well as climate change might create local and seasonal hot-spots of water stress.
- It is thus important to understand the status quo and future development of these phenomena to identify potential areas of tension.
- WaterStressAT assesses water availability and demand in two Austrian case studies under a set of regional development and climate change scenarios.

Qualitative systems modelling

Formative Scenario Analysis

FSA is a scientific technique to construct well-defined sets of assumptions to gain insight into a case and its potential development (Scholz and Tiedje 2001)



We use qualitative systems dynamics to collect data for the FSA. Examples are the Stakeholder map and core team protocol Seewinkel. Done in kumu.io.

Qualitative data integration – Tests start 04/21

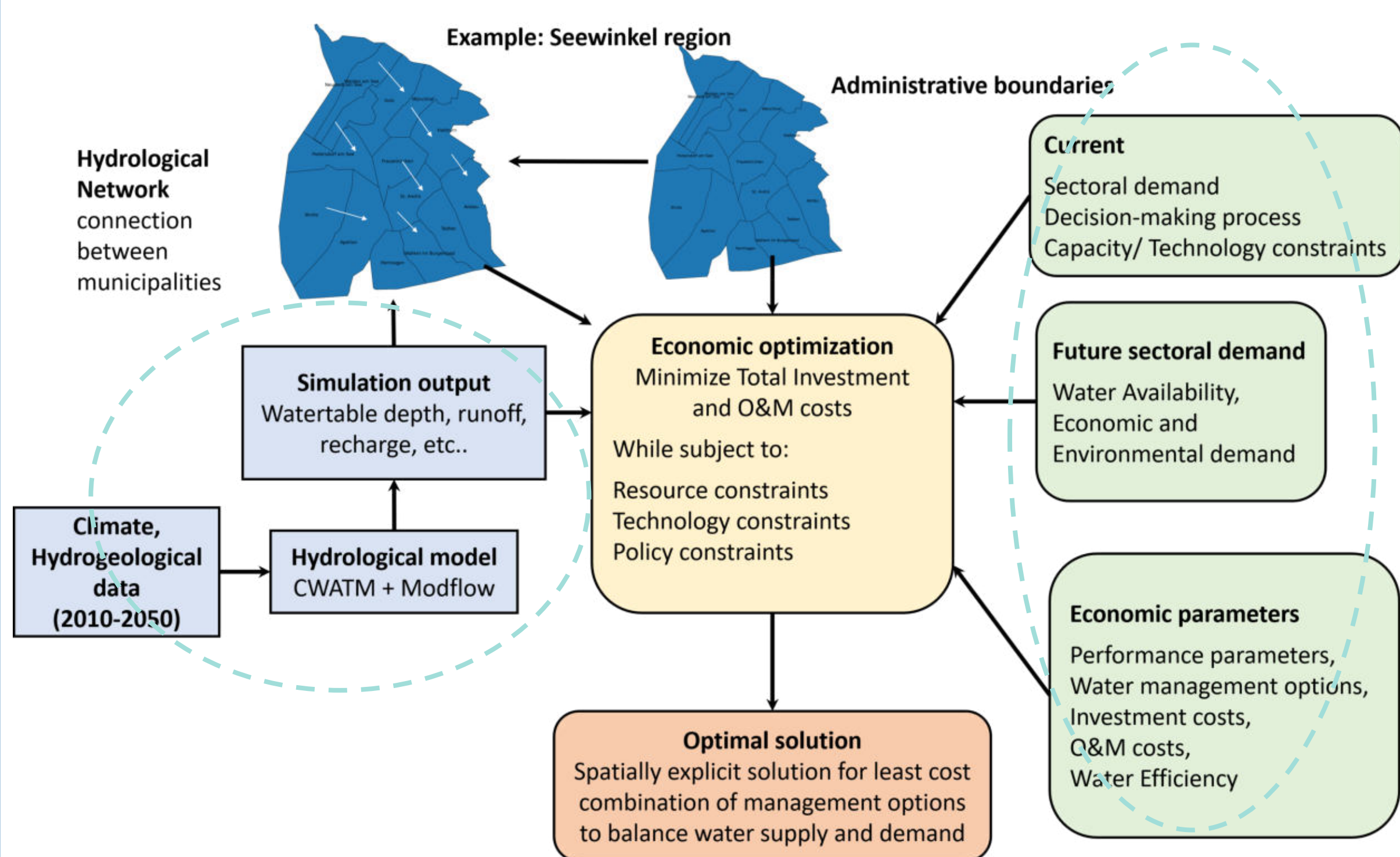
Transdisciplinary core team meetings (monthly since 12/20)

Workshops I – Scenario design and options generation (10/21)

Workshops II - Discussion of model results, need for adaptation, and publication formats

Quantitative data integration - ongoing

ECHO (global hydro-economic model in the process of being downscaled)



Optimization model identifies:

- optimal sustainable pathways to ensure economic benefit and water security
- management options to mitigate climate risks
- potential benefits of a cooperative and predictive decision-making process

Link: [Wasserschatz Österreich](#)

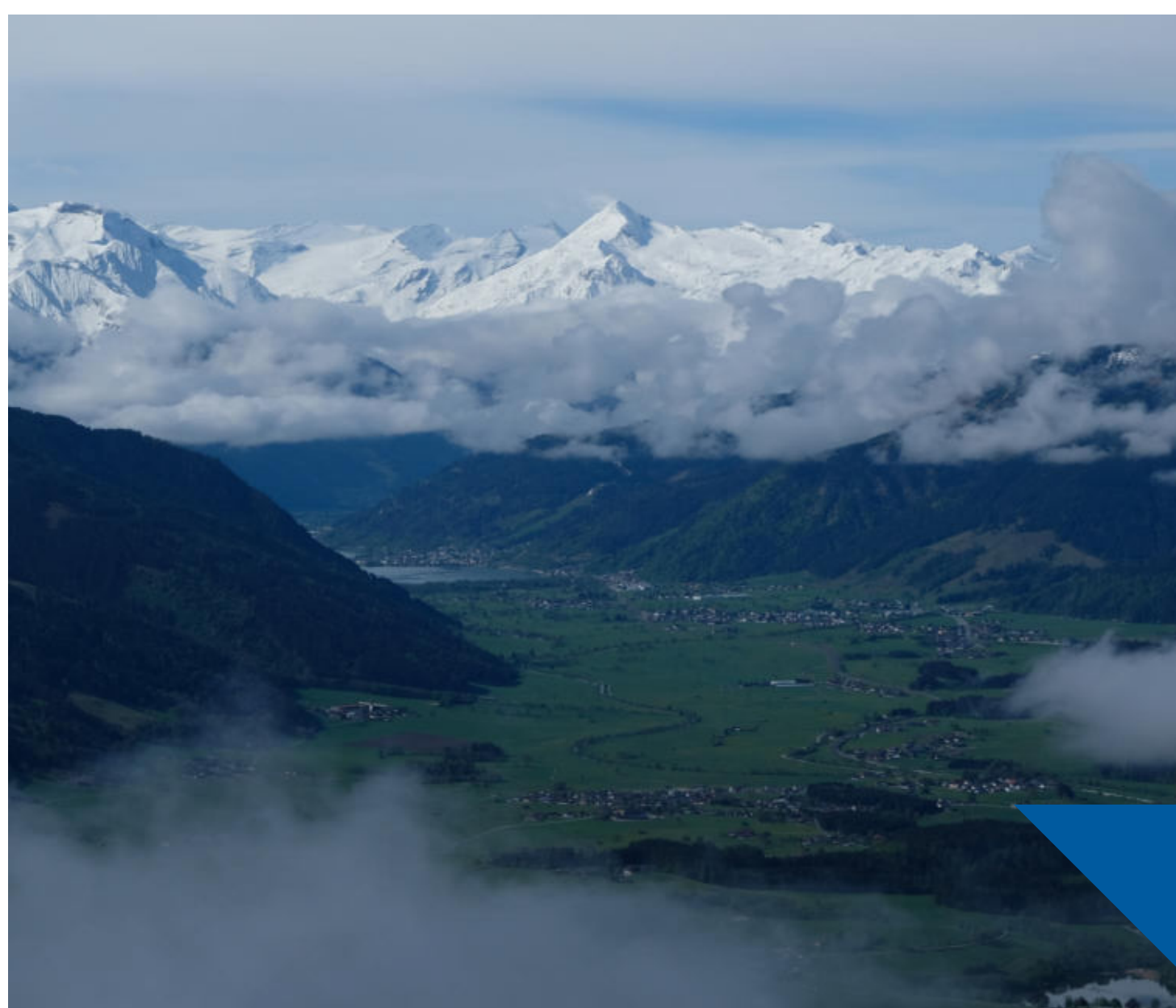
Hydro-economic model

Case study Pinzgau (Central Austria)

Alpine environment dominated by grassland areas, mostly used for livestock farming, and forests.

Tourism important source of income, with plans to further expand infrastructure for accommodation, touristic activities and the organisation of large-scale events.

Recently, dry periods have led to negative impacts on agricultural productivity, discussions on irrigation techniques, and strategies for technical snow making.



Case study Seewinkel (Eastern Austria)

Originally a floodplain with valuable nature conservation areas such as lakes and fens, large areas were drained in the past for land cultivation.

One groundwater body for water supply. Recently, water levels reached critical lows, with negative effects on agriculture, ecosystems, and tourism.

Important objective is to keep the water in the region while keeping settlements dry.



Current project stage

co-designed options for future water (demand) management