REsilienT water gOvernance Under climate CHange within the WEFE NEXUS: Upper Main case study

TUM

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THE RETOUCH NEXUS PROJECT

8 European countries

3M€ EU funds

5 innovative dimensions

48 months

6 governance schemes

13 partners

12 engagement mechanisms

6 case studies

35 governance metrics

CASE STUDY OVERVIEW

CONTEXT OF THE CASE STUDY

The upper main catchment is located in the northern part of Bavaria in Germany, compare figure 1. The catchment has an area of 4.646 km^2 (Gauge Kemmern) (Schaffhauser, T., 2017) and is characterized by an east-west slope reaching the highest elevations with 1042.99 m.a.s.l in the Fichtel Mountains. However, 75% of the area is located in lower elevations (Barth, et al., 2004). Soils with low storage capacity predominate (Schaffhauser, T., 2017) and the most common soil type is brown earth (Barth, et al., 2004). The largest part of the catchment area is used for agriculture and forestry with a proportion of 47.2 % and 43.2 % respectively, whereas 8.0 % of the area is sealed. The largest proportion of agricultural area (60.3 %) is not irrigated. As can be seen in figure 2 the upper main has two springs (white and red main) and several tributaries (Schaffhauser, T., 2017). In addition to more than 350 mini-Hydropower Plants, one hydropower plant has a capacity > 1MW (LfU,2023).
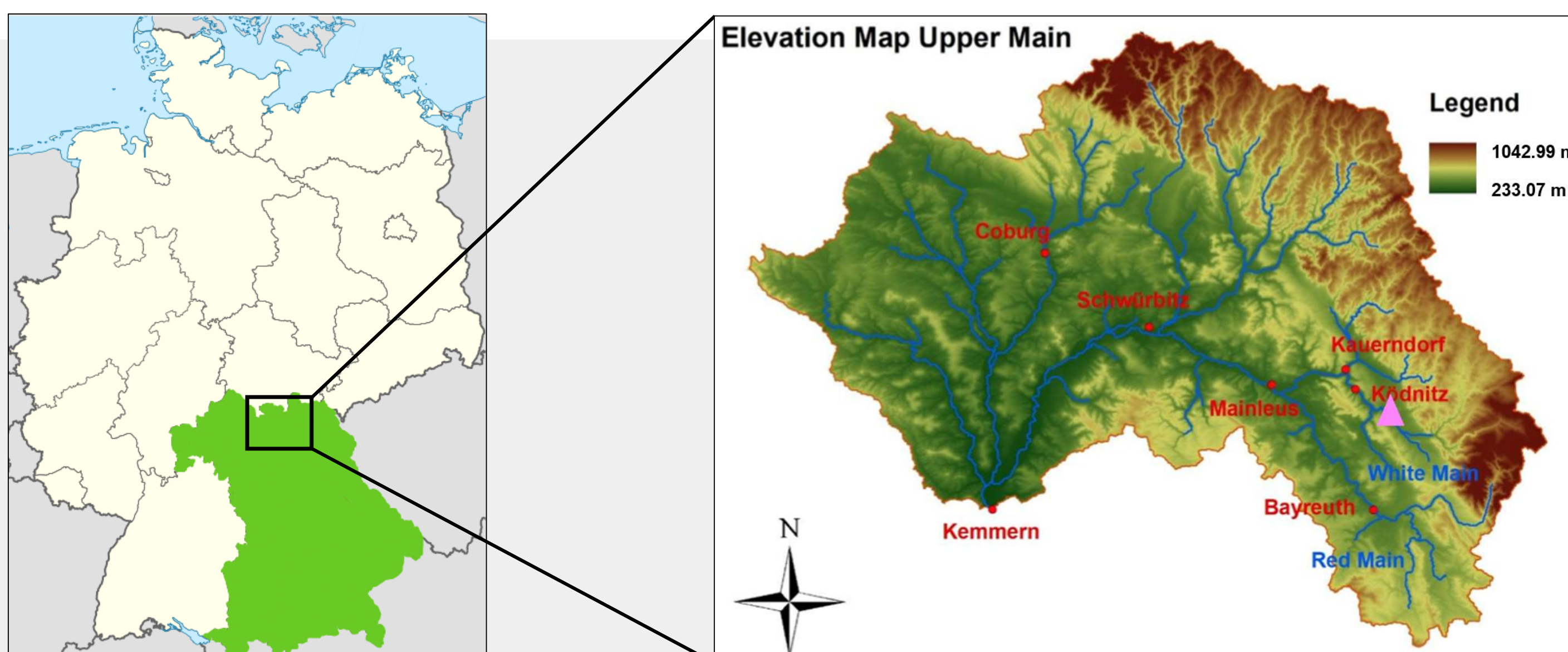
CATCHMENT LOCATION

Figure 1: Location of Bavaria (Tubs, 2022), modified.

Figure 2: Elevation Map with main gauge stations, hydropower plant > 1MW (▲) and headwater streams (Schaffhauser, T., 2017), modified.

WATER EXTRACTION AND WATER USERS

Most of the public water supply is provided by groundwater (64.0 %), followed by spring water (16.1 %), surface water (18.6 %) and bank filtrate (1.4 %) (LfS, 2020). The main water users are households and small business (81.9 %). Whereas 18.1 % of the water is used by industry and others. (LfS, 2020).

EXISTING AND ARISING CHALLENGES

Challenges	Adaptation and/or Mitigation
• Floods and Droughts	• Climate resilient landscape water balance
• Water pollution	• Protection of water
• Security of water supply	• Supraregional storage and distribution of water
• Climate Change	
• Declining groundwater levels	• Climate-resilient settlement development
• Hydromorphological deficits	• Ecosystem functions of waterbodies and lakes

CONTRIBUTION

• identify success factors of water governance schemes and monitor their impacts on the socio-economic and environmental welfare

• evaluate the scope for scaling up successful water governance solutions (as e.g., governance practices, policy instruments, pricing policy policies)

WATER REGULATIONS & EXPECTED RESULTS

MOST IMPORTANT NATIONAL AND REGIONAL POLICY PRIORITIES

EU
• Floods Directive (2007/60/EC)
• Groundwater Directive (2006/118/EC)
• Water Framework Directive (2000/60/EC)
• Natura 2000
• Nitrate Directive(1991/676/EEC)

NATIONAL
• Fertilizer Act
• Federal Nature Conservation Act
• Groundwater Ordinance
• Drinking Water Ordinance
• Surface Water Ordinance

REGIONAL
• Bavarian Nature Conservation Law
• Bavarian Water Act
• Bavarian Act on the Implementation of Wastewater Tax Act

INSTITUTIONAL SETTINGS AND GOVERNANCE SCHEMES

DECISION-MAKING BODY(-IES) ON WATER ISSUES

• Water law permits issued by:
 – district administrative authorities
 – with participation of public agencies, the public and the expert
   (usually the local Water Management Agency)

• The technical principles based on DWA, DVWK, StMUV and LfU

• Nationwide also International Commission for the Protection of the Rhine (ICPR) → coordination of implementation of Floods Directive and Water Framework Directive

ECONOMIC INSTRUMENTS

State economic instruments limited to subsidies for public water supply and wastewater disposal and charges for wastewater discharge

PARTICIPATION FROM CIVIL SOCIETY

• Water cooperatives (in rural and sparsely populated areas, district of Hof and Bayreuth)
• NGO's (e.g. Nature conservation organizations like LBV, BN and WWF)

EXPECTED OUTCOMES

• Implementing WEFE-Nexus approach for water basin management
• Mitigation of floods and droughts
• Improvement of water supply and protection

References:

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