Climate adaptation and urban water systems: Socio-economic assessment of blue-green infrastructure

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Introduction to AMAREX project

Research project "Adaptation of Stormwater Management to Extreme Weather Events (AMAREX)", funded by Federal Ministry of Education and Research (BMBF), Germany

Duration: Feb 2022 – Jan 2025

Project objectives:
- Investigation of different types of stormwater management concepts and blue-green infrastructure (BGI) for their effects with regard to flood, heat and drought prevention
- Development of a web platform for municipal stakeholders to serve as an information, communication, and decision-making tool
- Development of a method and tool for socio-economic assessment of local stormwater management concepts
- Work with selected pilot areas and stakeholders in Berlin and Cologne

Research objectives

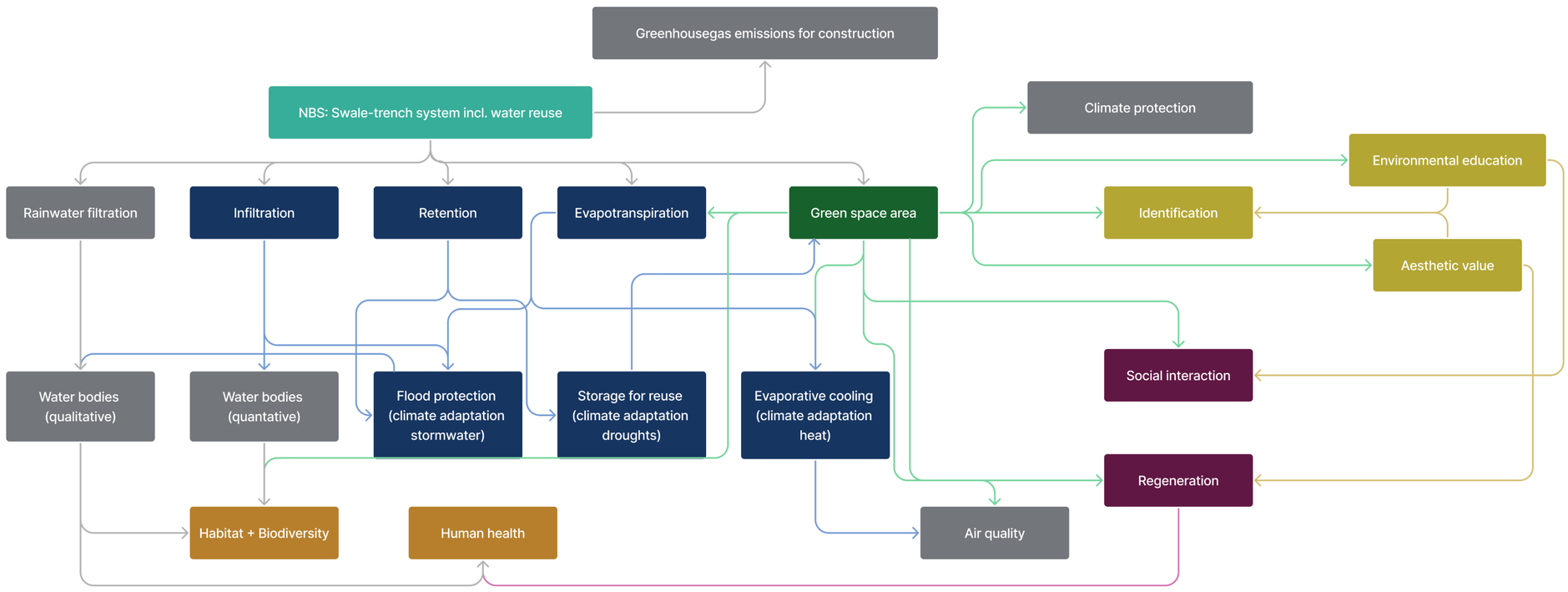
- How can an integrated socio-economic assessment methodology for blue-green infrastructure support the selection of measures in municipal planning practice?
- How can additional indirect benefits of BGI be reflected in the valuation?
- How can robust monetary valuations of BGI measures on local level be generated?

Approach for socio-economic assessment

- Development of impact chains for municipal stormwater management
- Multi-criteria analysis of local stormwater management options
- Economic assessment of options' effects
- Development of a tool for socio-economic assessment

Example: Impact map for nature-based solutions related to heavy rainfall and drought

- Impact map represents impacts and benefits of stormwater management concepts and green-blue infrastructure related to heavy rainfall and droughts
- It is based on a literature screening, which resulted in more than 40 impacts of green-blue infrastructure, which have been structured and synthesized
- The conceptional map was used to further evaluate impacts as part of a multi-criteria-analysis



Possible criteria to evaluate blue-green infrastructure and nature-based solutions

- Based on literature screening of more than 40 evaluation studies and tools
- In-depth analyses of 14 criteria sets and selection of 24 criteria, which will be used for multi-criteria analysis of BGI
- Evaluation will be based on AMAREX results, literature research and expert judgment

Impacts water management
- Rainwater retention
- Local flood production
- Rainwater filtration
- Evotranspiration
- Infiltration

Further ecological impacts
- Climate mitigation
- Air quality
- Noise protection
- Habitat quality & biodiversity
- Ecological connectivity

Social impacts
- Urban green & recreation
- Microclimate
- Land requirements

Economic criteria
- Investment costs
- Maintenance costs
- Innovation potential

Synergies / Trade-offs
- Synergies and conflicts with other policies
- Synergies and conflicts with other measures

Implementation oriented criteria
- Implementability, political support
- Acceptance
- Flexibility re climate scenarios
- Robustness

Contact and funding

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