Overview

IMPETUS WEST AFRICA

P5

Getting to Grips with Water Problems: The Problem Clusters of IMPETUS

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Problem clusters: The methodological approach

Objectives - why problem clusters?

- Water availability and vulnerability are key influencing factors of development
- West African countries have a relatively poor economic performance
- Economic performance is strongly dependent on agriculture
- Regional differences in economic development, demographic trends, societal framework conditions and natural resources, especially water, increase difficulties for development strategies

→ Complexity of the problems calls for an elaborated problem analysis of the multitude of influencing factors on different scales
→ Models help to develop applied problem-solutions

Methods

- Response indicators portray system dynamics in an integrated way
- Critical thresholds of response indicators allow for an assessment of the effectiveness of performance
- Analysis of the processes that directly and indirectly influence response indicators
- Status indicators portray the state of the system, both in a qualitative and quantitative way
- Scenarios are reflected in problem clusters via the boundary conditions
- Possible measures are quantified and tested in intervention scenarios
- Development of a toolbox of models in the different working groups: for each problem at least one numerical or expert model that can be directly applied

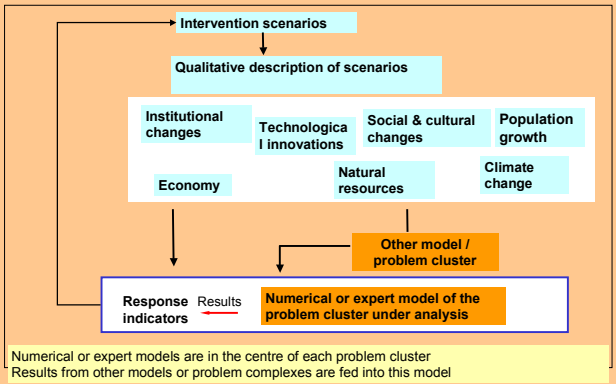
Problem clusters and scenarios

Problem clusters are important parts of scenario development as they form the quantitative part of the analysis.

Scenarios are boundary conditions of problem clusters.

Definition - what are problem clusters?

- are oriented at meta-problems that require a multi-disciplinary analysis to allow for drawing conclusions about possible developments
- problem structure is not only complex but also there is an urgent need for finding and implementing solutions in the nearer future
- are composed of many single thematic issues that reflect different disciplinary approaches involved in the project



Numerical or expert models are in the centre of each problem cluster
Results from other models or problem complexes are fed into this model

Results

Problem clusters allow for the quantitative assessment of response indicators and for the evaluation of the effectiveness of a certain decision / policy measure.

For a detailed presentation of results, please take a look at the other IMPETUS-posters in this exhibition.

Problem clusters in IMPETUS

Benin

Number	Sub-Project	Title	Status[1]
B1	A3 A4 A2 AB1	Modelling land use and land cover change in the OuÈmÈ catchment[3]	1
B2	A5	Population projections for the OuÈmÈ catchment[3]	1
B3	A4 A5	The Impact of Resources Pressure and Rainfall Variability on Land Use and Food Supply in Benin[2]	1
B4	A2 A4	Water availability and hydrological processes in the Upper OuÈmÈ catchment[2]	1
B5	A5 A4	Water policies and institutional change[3]	1
B6	A2 A3	Effects of land use change, climate change and plant management on soil degradation and crop yield in the Upper OuÈmÈ valley	2
B7	A4	Water demand of the agriculture, households and industry sectors under consideration of potential conflicts	2
B8	A4	Economic development and economic structure as well as their relevance for water resources	2-3
B9	A4	Water demand in urban areas and their dependence from population growth and access to water	1
B10	A3	Economic potentials of forest resources as a contribution to needs supply	2
B11	A1 A4	Seasonal precipitation forecast in Benin and applications in agricultural planning	2-3
B12	A5	Water and livelihood security[3]	1-2
B13	A1 AB1	The impact of land use change scenarios on future precipitation and evaporation for three Beninese region	2-3
B14	A1 A5	Risk assessment with regard to the occurrence of malaria and meningitis diseases under the influence of the present and a modified future climate	2
B15	A3 A2 A1	Possibilities to increase the yield by creating small scale reservoirs within the OuÈmÈ catchment	2-3
B16	A4	Biomass and, particularly, eco-volume determine the micro-climate in the OuÈmÈ watershed basin	2-3
B17	A4 A3	Land use and water demand of livestock farming in Benin	2
B18	A5 A2 A4	Microbiological and virological contamination of drinking water sources in the Upper OuÈmÈ catchment[3]	1-2
B19	A3 A2	Modelling the agricultural marginality of Benin	2
B20	A2 A3 A5	The potential of inland valleys for agricultural production in the Upper OuÈmÈ catchment	2

Morocco

Number	Sub-Project	Title	Status[1]
M1	B5 B2 B3	Land use strategies under conditions of limited water resources in the Central High Atlas[2]	1
M2	B2 B1 B3	Natural and anthropogenic influences on the dynamics of water resources in the Dr, a catchment[2]	1
M3	B4	Economic aspects of water management in the Dr, a region[3]	1-2
M4	B3 B2	Vegetation dynamics and its impacts on the hydrological cycle[3]	1-2
M5	B3 B2 B4 B5	Agronomic strategies at water scarcity in the Dr, a-Oases	2
M6	B2 B3 B5	Impacts of irrigation with motor pumps on the groundwater resources in the Dr, a-Oases	2
M7	B1 B2	Seasonal discharge forecasts	2-3
M8	B5	Population dynamics in the Dr, a catchment[3]	2
M9	B3 B4 B5	Politics of water and grassland use between traditional systems and state institutions	2-3
M10	B1 B2	Interanual precipitation variability and water management	1-2
M11	B2 B1	Assessment of risks and danger imposed by extreme rainfall: Flood events and soil erosion in the Dr, a catchment[3]	1
M12	B1 B2 B3 B4	Possible developments of rainfall and evapotranspiration in the middle Dr, a catchment	2-3
M13	B5 B2	Individual water use and its dependency on water quality and water availability	2-3
M14	B5 B4	The effects of tourism on water use and household budgets in the Ouarzazate basin	3

[1]Status 1 = important results available
Status 2 = results available until the end of the 2nd phase
Status 3 = results available during 3rd phase

[2]cf. presentation

[3]cf. poster

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