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The research plan will demonstrate the aim of the research, background and methodology as well as the research process in South Africa. At the end of the document a timeline is presented.

Aim of research stay

The project Clim-A-Net focuses on climate proofing of coastal regions and connected river basins, since they are considered highly vulnerable to climate change. Therefore, however, aspects vulnerability have to be identified and assessed. An important research gap is related to regional vulnerability analyses. Such approaches are necessary to understand regional risks and opportunities of climate change and the development of climate adaptation strategies. While exposure has to be measured with methods of natural sciences, sensitivity and adaptive capacity require a social science perspective. However, up till now there are barely any conceptualisations in this field. Gupta et al. (2010) provide one of the rare approaches to grasp adaptive capacity. This approach has been applied by a research team including the applying PhD student in a regional case study. It provided a vulnerability analysis for a region of the so called global north. The Metropolitan Region Bremen-Oldenburg in Germany provides some similar features to the eastern cape region. Both are coastal areas, several business sectors are important to both regions: automotive industry, nutrition, and tourism. Like other coastal areas they are considerably affected by climate change. Gradual change especially by sea level rise, warmer and wetter winters, and warmer and dryer summers will be accompanied by an increase in weather extremes such as storm surges, river floods, or summer droughts. In contrast, however, there some considerable disparities, economic, social, and geographical. Considerable after-effects of decades of apartheid and centuries of segregation in South Africa are have not been dispelled vet. Still. South Africa is not considers as 'developed' country. Economics development. Its GDP is considerably smaller than Germanys (GDP 7,255 vs. 39,857 US-\$ (UN 2012)). The main climatic problems of the metropolitan area Bremen-Oldenburg are river and sea floods. Hence, flood protection and water discharge are the most relevant tasks to be fulfilled. In contrast, the Eastern cape, especially the Keiskamma region has to cope with soil degradation and aridity, which require different strategies and instruments. Although this is a challenge for the approach, it also provides the opportunity for further advancements. The Adaptive Capacity Wheel covers a wide range of economic, social, political and also cultural aspects. However, if there are lacking facets, they can be easily included.

Research aims and questions

Within the research the following aspects will be addressed:

- a) Assessing sensitivity and adaptive capacity: Is there a sufficient level of adaptive capacity within regional and spatial planning systems? What needs to be done to increase it in the future?
- b) Mainstreaming Adaptation: Which role does climate adaptation play so far? Are there synergies or conflicts with other topics (e.g. economic development, poverty reduction)?
- c) Considering Transferability: Is the Adaptive Capacity Wheel useful in different settings, even though results are context specific?

Background and Methodology

The Gupta approach divides adaptive capacity in six categories (variety, learning capacity, room for autonomous change, leadership, resources, fair governance), develops subcategories and identifies indicators to evaluate them. To exemplify one of the adaptive capacity dimensions, room for autonomous change investigates the subcategories access to information, the ability to act according to a plan and the capacity to improvise. The six

"Gupta-factors" are supplemented by adaptation motivation and capacity confidence, since climate change adaption needs to be considered as a resolvable problem (Grothmann, 2005). Unlike Gupta et al. (2010) the aim is to provide qualitative results. Quantification of the adaptive capacity value is not intended.

A multi-method approach investigating relevant literature, analysing important documents, and interviewing experts increases reliability of the results. The literature review will cover scientific studies that have already been conducted to assess potential impacts of climate change in the eastern cape region. These studies will be systematically reviewed, especially with regard to results and conclusions on sensitivity and adaptive capacity. Protocols and transcripts, publications of planning authorities, etc. will be, where present, part of the document analysis. The interviews will cover actors and stakeholders who have knowledge about adaptation measures and potential climate change impacts in the planning sector. Furthermore there will be an exchange with local scientists who have profound knowledge of the context. The interviews will be semi structured interviews. They will last one to two hours be based on methods of the focused, problem centred and expert interview (Fowler & Mangione, 1990). By integrating different scientific disciplines as well as knowledge from the field, the approach is transdisciplinary.

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Figure 1: Adaptive Capacity Wheel, adopted from Garrelts et al. (2012), Gupta et al. (2010)

Case of Spatial Planning

Spatial planning faces special challenges, since it is an integrative task dealing with multiple climate change problems. On the one hand, it has to consider the increasing number of weather extremes: Amongst others, heat waves have to be considered within city town planning (city ventilation); river floods might require bigger flooding zones. Additionally, gradual changes need to be handled. This is especially important in coastal areas, where sea level rise might not be covered by traditional instruments. Furthermore, semi-arid and arid areas are threatened with continuing decline of precipitation. Hence, climate adaptation needs to be a core element of spatial planning in the future (ESPACE, 2007). In developing countries it is further expected to contribute to economic development and to deliver answers

to questions of poverty and social inequality and conciliate in cases of unclear land titles. Spatial Planning involves "all kinds of planning related to spatial aspects" (Streich, 2005) relevant for commerce, habitation, mobility, recreation and nature itself. The manifold interests have to be reconciled. Climate change demands for a time planning interval taking into account not only the current situation, but future developments as well. To consider climatic change as just another aspect of planning would be a to too narrow understanding. In fact climate adaptation needs to become a core function (ESPACE, 2007).

Research Process in South Africa

The first part of the stay will be dedicated to clarifying general questions of planning in South Africa. What are the substantial problems of planning. Which actors influence the (formal and informal) process? Who are the stakeholders? Therefore, experts from the NNMU will be interviewed. With that a first preliminary understanding of sensitivity and adaptive capacity will be acquired. Afterwards the Adaptive Capacity Wheel will be reviewed in terms of appropriateness and completeness and if necessary modified. In the second phase of the research data from the field will be collected and evaluated. The third phase of the research will centre data analysis an providing an adaptive capacity wheel for the Eastern Cape region. The analytical tool itself will be part of critical reflection. By that, the transferability of the method, as well as the comparability of the result will be estimated.

The research will be conducted with substantial support from Prof. Dr. Vincent Kakembo and Bernadette Snow. The exchange among scientists ensures mutual knowledge transfer.

Timeline

Month		2				3					
Week	1 2	3	4	5	6	7	8	9	10	11	12
Research Activity	Analyzing of structure of spatial planning Adjustment of Adaptive Capacity Wheel Indicators	2 3 4 nalyzing of Data Acquisition tructure of patial lanning djustment f Adaptive Capacity Vheel ndicators		on and I	Data An	alysis		Data a prelim Analyz Adjust Capac	inalysis, inary re zing trar ment of sity Whe	, review sults nsferabil Adaptiv el	of ity /e

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