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Boundary Work for Collaborative Water Resources Management

**Conceptual and Empirical Insights from a South African
Case Study**

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**Boundary Work for Collaborative Water Resources
Management: Conceptual and Empirical Insights from
a South African Case Study**

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SUMMARY

This study aims at advancing the scientific field of boundary work in the context of complex and contested water resources management problems with a focus on developing countries². Water resources management is often challenged by distinct barriers between multiple stakeholders from policy, science and society, based on diverging concepts, powers, interests, and responsibilities in local water resources management. These boundaries hamper integrated approaches for joint decision-making, management and research. It is one of the most challenging but most important requirements for the development of integrated solutions for holistic and sustainable water resources management to first acknowledge and second deal with and try to dissolve these barriers between different stakeholders.

The science of boundary work specifically focuses on analysing and addressing social, organisational, cultural or political barriers between different actors that hamper knowledge transfer, communication and collaborative decision-making and action. A framework to analyse boundaries and boundary work processes in complex and contested problems of natural resources management has been developed by Mollinga (Mollinga 2008a, 2008b, 2010a). He states that fruitful cooperation across these boundaries requires the active development of shared 'boundary concepts' of actors, the development and application of tuned 'boundary objects', as tools that support collaborative decision-making and action, and the shaping of 'boundary settings', as framework conditions that can support or hamper collaboration. This study aims to investigate, how this boundary work framework can add to systematically as-

² The conventional distinction between 'developing countries' and 'developed countries' reflects a biased thinking in perceiving the world. Further, there is no unique definition of 'development', and what implies 'development' is very different for different contexts. Whereas conventional thinking associates 'growth' with 'development', the researcher associates '(global) transformations towards sustainable societies' with the term 'development', which partially rather requires sufficiency than growth, and is required anywhere in the world. However, due the lack of an appropriate and impartial terminology for differentiation of nations, depending on their specific local, political, social, economic and environmental properties and challenges, the patter will be used in this study, being aware of the respective limitations.

sess and approach complex and conflictive problems of local water resources management and support improved collaboration of conflicting stakeholders.

Chapter 1 provides background information on the study, introduces into the research objectives, scientific research questions, research approach and the structure of the thesis.

Chapter 2 covers conceptual research on boundary work and the boundary work framework, (Mollinga 2008a, 2008b, 2010a). It develops extensions to the framework, by adapting it to the specific needs of water resources management and research, with a focus on developing countries. The amendments are generated by reflecting leading approaches in the field of natural resources management (i.e. Integrated Water Resources Management, Adaptive Management, the Ecosystem Approach) in the view of the framework. This is done by analysing how each approach addresses, defines or applies boundary concepts, objects and settings in water or natural resources management. Given the political dimension of water resources management, insights from a water governance perspective are further merged into the view of the framework. Based on the analyses and following Mollinga's rationale, the chapter clusters and proposes amended 'boundary concepts' to communicate about problems in water resources management, 'boundary objects' to facilitate communication and collaborative action and 'boundary settings' to understand limitations and limits to change towards sustainable water resources management. By further reflecting findings from transdisciplinary research through a boundary work perspective, the chapter concludes with a proposal, how to design boundary work processes from scratch. The conceptual research in Chapter 2 is purely based on intensive literature research of primary and secondary sources.

Chapter 3 contains a South African case study that aims at analysing reasons and obstacles for collaborative local water resources management in a tangible case through a boundary work perspective. South Africa is conceptually leading with regard to its sustainability oriented water policy and legislation and public participation towards equitable, sustainable and efficient water resources management is a high priority. Nevertheless, practical implementation faces enormous challenges, based on the extreme socio-economic and cultur-

al divides, as well as the major lack of capacities, that characterise the young democracy. The real-life situation under normal management circumstances proofed to be driven by strong fragmentation of stakeholders and management approaches, based on diverging concepts on problem definitions, management objectives and management principles. A second phenomenon that in general marked local water resources management, was the exclusion of the poor, the so called previously disadvantaged communities, from local water resources management. However, integration of specifically this stakeholder group was of utmost political importance in post-apartheid South Africa and also required by national legislation and policy. Exclusion could be assigned to the very high levels of inequality, poverty and unemployment that characterised not only the situation at the study site, but South Africa in general. It was further found that collaboration across stakeholders was inherently different, and had considerably improved under severe water stress, as experienced during the drought that affected the research area between 2009 – 2011. Decisions taken during emergency in terms of infrastructure developments, however, now constitute challenges for sustainable water supply in a mid- to long-term perspective. The purely qualitative research of this chapter covered data collection through interviews, group discussions, observations and collection of formal and informal background documentation. Data analysis was conducted with the support of software for qualitative data analysis, through deductive and inductive coding procedures, by applying methods from grounded theory.

Chapter 4 covers grounded analytical developments to the boundary work framework based on the findings of applying it in the empirical (and instrumental) case study. It was found that the framework was suitable to develop its analytical strength only after phenomena that characterised collaborative local water resources management, in terms of fragmentation, exclusion, and different dynamics of collaboration under pressure, had been identified. After developing an analytical superstructure in terms of abstracted phenomena, the framework enabled to understand reasons and obstacles for collaborative water resources management in terms of concepts, objects and settings. Diverging concepts mainly played out in three categories: concepts on problem statements, management objectives and management principles. It was found

that a principal requirement for effective communication and collaboration between stakeholders and relating to all these three categories was the need to develop a shared understanding of the meaning of commonly used 'words', thus the development of shared boundary concepts on 'terminology'. Settings of importance in the local case played out in five categories, namely external, organisational, individual, natural and technical settings. Grounded development of the framework further suggested changing the notion of boundary objects and to (newly) categorise them into: bridging agents, participatory processes, mechanisms and products. The analysis for this chapter was based on deductive and inductive coding procedures of empirical data by applying methods from grounded theory.

Chapter 5 provides final conclusions and recommendations for future research. South Africa's Gini coefficient is among the highest rankings worldwide and the nation is generally characterised by extreme socio-economic dichotomies and inequalities. This reality questioned integrated and sustainable water resources management, by touching matters of fulfilment of the basic needs of a great majority versus an explicit and high emphasis on the protection of water and other natural resources. It further questioned the 'equal chances' to participate in and shape decision making for everyone, as required by the national water resources management framework. Future research is needed that specifically addresses questions of sustainable resources management in (similar) developmental contexts, characterised by extreme inequalities, in the following fields:

Conceptual research is needed to analyse concrete contributions of the emerging field of boundary work science to the scientific fields of sustainability science, transition research and transition management. This further requires a stringent focus on developmental contexts and contexts characterised by extreme socio-economic inequalities.

To advance the scientific field of boundary work, further empirical case studies are needed at different scales, with different levels of interaction with and between stakeholders in varying (developmental) contexts. They should, as done in this intensive small-scale research, either focus on an in-depth study of a local case, or alternatively, if implemented at large scale, focus on design, im-

plementation and analysis of processes of transformative change, based on transdisciplinary research and adaptive management approaches. Again, for both types of studies there is an inherent need to focus future research on developmental contexts and on contexts characterised by extreme socio-economic dichotomies.

The specific local situation at the study site requires the development of true boundary concepts on the problems to be addressed, the objectives to be achieved and the management principles to be applied. Further, there exists the need for development of proper functioning boundary objects, in terms of bridging agents, processes, mechanisms and products that are specifically designed to acknowledge and redress poverty, unemployment and the distinct inequalities. Facilitating such a process asks for a legitimate bridging agent, who could moderate discussions and decision-making processes.

Future Research is further needed to translate and communicate the findings of this study through tailor – made boundary objects based on the core principle that science must be accessible without barriers to everyone (intellectually, legally and technically), also in developmental contexts, and contexts characterised by extreme inequalities.