Constructing a water-society-space trialectic for water governance in the uMngeni Catchment

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Introduction:

Water is the source of life. It flows through, and in to, the politics, social, economic and environmental dimensions of life. Access to water, both in terms of quantity and quality, has become a major global challenge. In some places there is too much water and in others far too little. It is also highly polluted in many countries, which impacts on human well-being and the environment. This leads to high costs in terms of cleaning water and addressing the health outcomes of polluted water. These challenges are compounded by the increasing demand for water as a result of population growth and urbanisation, water-intensive forms of growth, the need for improved sanitation globally, which remains water dependent, despite significant research efforts to shift this approach, the impact of climate change on water, increasing rainfall variability, and the increase in water related disasters, which are becoming more common and severe (Wesselink et al., 2017). As a result and "in response to these global challenges, water scientists are increasingly adopting an interdisciplinary or transdisciplinary approach in order to understand water problems, make predictions, and produce information on which society makes future decisions" (Wesselink et al., 2017, p 2). This requires research that combines the efforts of social and natural water scientists.

This report focuses on the connectivity and inter-dependency between water quality, water quantity and society (biophysical, social, economic and political dimensions), which shape water security outcomes in the uMngeni Catchment. It also reflects on the value of ecological infrastructure (EI) in changing water security outcomes, as a result of its relationship with these different elements, thereby supporting a more resilient and sustainable future for the catchment. The research adopts a transdisciplinary, action research and participatory approach. Collaboration between the research team, municipalities, the private sector and communities has formed part of the knowledge building process through the action research methodology adopted in each case study. This report describes and analyses the social, economic, environmental and political characteristics of the uMngeni Catchment and the connections and relations between them using two theoretical frameworks: socio-ecological

systems theory and socio-ecological relations theory. Both frameworks consider the relationships between society, economy, environment and governance. However, they do so from different epistemological and ontological perspectives and emerge from different research paradigms. They ask different research questions about what does the world look like (ontology), what can we know about the world (epistemology), how do we collect and analyse this knowledge (methodology) and what should we do with this knowledge, why have we collected it and how do we make it socially relevant (axiology) (Wesselink et al., 2017). Natural scientists have predominantly adopted a socio-ecological systems approach to understanding the connections between water and society. More recently, the International Association of Hydrological Sciences have supported the use of the concept of socio-hydrology as it recognises society-water relationships, acknowledging that "hydrological systems are fundamentally altered by social relations and processes" (Wesselink et al., 2017, p 2). Socio-hydrology is the research theme of the hydrological sciences community for the current decade (2013 to 2022) to enhance the value of hydrology to society. Socio-hydrology recognises that humans are altering hydrological systems and in turn, hydrological systems and water are shaping and changing how society functions, as water is becoming a constraining factor in sustainable development (Wesselink et al., 2017). Social scientists, drawing largely on the discipline of geography, which has a long established tradition of reflecting on society-environment relationships, are constructing water-society relations through the frame of the hydro-social cycle or the hydrosocial, which emerged as a concept in 2013. Hydro-social cycle thinking reflects that society and water are related, however it differs from a socio-ecological systems approach in that it focuses on the politics and power shaping the articulation of water and society relations. In other words, who has the power to shape water society relationships and how is this done, and what does this mean for political and material inequality in the water system (Wesselink, et al., 2017). Hydrosocial theory also reflects on the different constructions of water and the dialectical relations between water and society, which are assembled to produce particular society-water outcomes in different contexts (Linton and Budds, 2013).

This paper constructs a water-society-space trialectic to understand the multiple relations shaping water security in the uMngeni Catchment.

Project Description:

The project has been developed by social scientists and hydrologists in a transdisciplinary team to build up a case for investing in EI in the uMngeni Catchment. Research has been conducted on the biophysical and economic considerations of investing in EI. This report focuses of the multiple relations at the landscape scale to understand the social, economic, political, environmental and governance settings in to which EI will be embedded. It develops a trialectic, based on Lefebvre's (1991) ideas on spatial trialectics. This paper

presents the methodology adopted and outcomes of this research which has enabled the trialectic to be constructed.

Project History:

This research forms part of a five year Water Research Commission funded project (WRC2354) which is examining the value of EI in enhancing water security in the uMngeni Catchment. The project will be completed in August 2019 and so this paper presents the main results of this five year transdisciplinary project.

Partners and resources:

This project is being undertaken in collaboration with the WRC and through a parthernship between BEDs, UKZN, CWRR, UKZN, PRG, UKZN and INR.

Timelines:

This project was initiated in 2014 and will be completed in August 2019.

Relevance and Impact to eThekwini Municipality:

This research is critical to the Municipality as it addressed water security in the uMngeni Catchment which is essential to the social, economic, environmental and political future of the city and its broader region.