Exploring Scenarios for Urban Water Systems Using a Socio-Technical Model

Fjalar J. de Haan[1], Briony C. Ferguson[2], Ana Deletic[3], Rebekah R. Brown[4]

[1] Centre for Water Sensitive Cities, School of Geography and Environmental Science and Department of Civil Engineering, Monash University, Australia, fjalar.dehaan@monash.edu
[2] Centre for Water Sensitive Cities, School of Geography and Environmental, Monash University, Australia, briony.ferguson@monash.edu
[3] Centre for Water Sensitive Cities, Department of Civil Engineering, Monash University, Australia, ana.deletic@monash.edu
[4] Centre for Water Sensitive Cities, School of Geography and Environmental, Monash University, Australia, rebekah.brown@monash.edu

ABSTRACT

This paper reports on the ongoing work and research involved in the development of a socio-technical model of urban water systems. Socio-technical, means the model is not so much concerned with the technical or biophysical aspects of urban water systems, but rather with the social and institutional implications of the urban water infrastructure and vice versa. A socio-technical model, in the view purported in this paper, produces scenarios of different urban water servicing solutions gaining or losing influence in meeting water-related societal needs, like potable water, drainage, environmental health and amenity. The urban water system is parameterised with vectors of the relative influence of each servicing solution. The model is a software implementation of the Multi-Pattern Approach, a theory on societal systems, like urban water systems, and how these develop and go through transitions under various internal and external conditions. Acknowledging that social dynamics comes with severe and non reducible uncertainties, the model is set up to be exploratory, meaning that for any initial condition several possible future scenarios are produced. This paper gives a concise overview of the necessary theoretical background, the model architecture and some initial test results using a drainage example which are compared to established theory.

KEYWORDS

Scenario, socio-technical, exploratory modelling, transitions, Multi-Pattern Approach