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Risk governance in the water sensitive city: Practitioner perspectives on ownership, management and trust

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ABSTRACT

In the water sensitive city, a hybrid mix of centralised and decentralised water systems and sources will operate at a range of scales to provide sustainable fit-for-purpose water services that will safeguard environmental quality, intergenerational equity and landscape amenity. Governance of these systems is likely to differ from the traditional arrangement, involving multiple stakeholders who must work together to manage risk. Trust will be essential to effective governance. This study explored attitudes of Australian urban water practitioners towards ownership and management of different water systems that might comprise the water sensitive city, including who they would trust to manage the associated risk. Results support the *status quo*, in which risk management responsibilities lie with state and local government or corporatised water utilities. Although practitioners support ownership and management of lot-scale water systems by homeowners, they trust them only to manage the risks associated with rainwater tanks. These results can be interpreted as risk perceptions, which are influenced by trust and knowledge. Implementation of decentralised water systems should be accompanied by governance arrangements that include strategies to enhance trust between stakeholders and to facilitate the co-production of knowledge to inform shared decision-making.

1. Introduction

Cities of the future will require responsive, multifunctional infrastructure to provide the requisite resilience to respond to uncertain climate futures and rapid population growth. Urban water management, in particular, will require transformational change if it is to cope with these demands related to providing multiple water sources and treatment options at a variety of scales. Drawing on the concept of a 'water sensitive city' (Brown et al., 2009), urban water management will demand diversified risk sharing amongst multiple stakeholders, managing a hybrid mix of water systems and sources, operating at a range of scales to provide fit-for-purpose water, environmental protection of waterways, intergenerational equity and landscape amenity (Wong and Brown, 2009). Indeed, a 'water sensitive city' anticipates traditional government and non-traditional civil society actors collaborating and coordinating their activities in an effort to navigate a broader range of risks expressed in a complex, dynamic, multifaceted socio-institutional landscape (Renn et al., 2011; Rijke et al., 2012). Thus, conventional governance structures and processes that support traditional risk-based management approaches, reflect government requirements for control, stability, security and safety (Giddens, 1999), and emphasise public health and environmental risks (Pollard et al., 2004), will be significantly challenged. Indeed, future urban water governance is purported to involve a shift away from traditional hierarchical and well-institutionalised forms of governance run by dominant bureaucratic and administrative governments, towards more distributed, less formalised, hybrid governance approaches that rely on traditional and non-traditional actors adopting market- and network-based approaches (Bakker, 2002; van de Meene et al., 2011).

Risk governance is an important conceptualisation for urban water management where traditional risk management, in the Australian context, has been the responsibility of professional staff within centralised water authorities, operating at strategic, programmatic and operational levels (Pollard et al., 2004). For example, at the strategic level, risk management is often the

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responsibility of financial officers and the board. At this level, risk analysis is concerned with issues related to investment strategies and project assessments. At the programme level, strategies are translated into actions by executive management. Risks are typically associated with asset management, workforce planning and watershed management. The operational level involves implementation of these actions; here risks are managed on-site, involving compliance assessment and reliability analysis. Adopting alternative risk management strategies in support of more decentralised and hybrid water systems generates greater complexity in their management, particularly when a diversity of actors needs to be involved. The foundation of risk governance points to the idea that risk cannot be understood solely on the tradition of probability-based analysis, but rather involves understanding the way risk is perceived and dealt with by individuals, institutions and public and private actors (Dobbie and Brown, 2014a,b; Hammer et al., 2011; Renn, 2008; Renn et al., 2011). As highlighted by van Asselt and Renn (2011), risk governance is not just about complex networks, but provides a conceptual and normative framework for thinking about how to cope with uncertainty and complexity, and raises questions about the role of trust, communication and risk perceptions of existing managers.

Inclusive risk governance (Renn and Schweizer, 2009) is one approach to shared decision-making that could be adopted in sustainable urban water management. In this concept, water industry practitioners would no longer bear sole responsibility for risk management, which would become a shared task of governments, the economic sector, scientific communities and community representatives. Each stakeholder would bring his/her respective knowledge and a range of values to support "effective, efficient, fair and morally acceptable decisions about the risk" (Renn and Schweizer, 2009, p. 174). However, the governance arrangements, dynamics, structures, roles and responsibilities required to support this risk governance approach remain unclear (Renn et al., 2011). Such dynamics, structures and processes will need to reflect the context-specific mix of appropriate infrastructure and servicing arrangements. This mix will be influenced by context and political culture, including risk perceptions (Renn, 2008). For example, drawing on work by the US Environmental Protection Agency, Yu et al. (2011) suggest that urban water governance shifts towards greater decentralisation when environmental and public health risks decrease, the system is smaller in scale, less complex and less interconnected, and end-users are willing and able to operate and maintain the system (Fig. 1). Nevertheless, how that decentralised governance dynamic might operate remains uncertain (Yu et al., 2011).

In an effort to support broader uptake of more decentralised water systems, Willetts et al. (2007) designed a framework to guide risk and asset management that acknowledges the importance of context. Their framework operationalises four aspects critical to management of centralised systems but that cannot be easily managed in decentralised systems. Depending on the specific regulatory, policy, institutional and social context, a participatory process is developed in which the diverse group of stakeholders: analyses the existing situation; defines goals and/or performance standards; designs a range of appropriate responses; chooses the best response by balancing costs and risks; implements the response; and monitors and evaluates its effectiveness. Explicit in this process is the importance of communication. Implicit is the need for trust, predominantly trust of water professionals in the new decision-making structures and processes, and in the stakeholders with whom they are sharing risk management. Ostrom (2010) considers trust, cooperation and decentralised management approaches (elements of network governance) to be key considerations of social-ecological systems, an example of which is urban water management. However, such trust cannot be assumed. For example, Baggett et al. (2006) compared the trust that four different groups of stakeholders had in each other to protect their interests in an urban water management project. The authors assumed that this trust was essential for effective participatory planning, and their results suggested that it was absent to some degree. Water practitioners involved in regulation or management trusted their own colleagues more than they trusted lay customers or academic researchers. Indeed, attitudes related to a sense of fairness, trust and perceived control have been shown to influence risk perceptions, whereby the relationship of knowledge and trust are, for example, likely to differ between technical water practitioners and lay individuals (Dobbie and Brown, 2014a), underscoring the shift from simple to systemic risk (Renn et al., 2011; van Asselt and Renn, 2011).

A recent framework for understanding risk perceptions, put forth by Dobbie and Brown (2014a), reveals the complex and nuanced arena related to risk perceptions, and reinforces the important interconnected component of trust when constructing individual perceptions of risk. This framework highlights the need to be cognisant of the different knowledge, beliefs, values, and social and cultural identities that exist within the risk-based decision-making spectrum and posits that, by recognising and

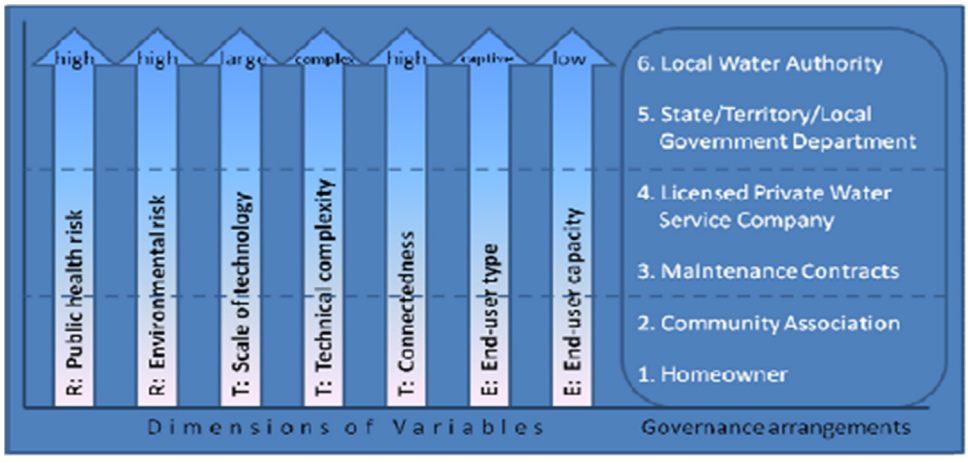

Fig. 1. Complex relationships between water system variables and governance arrangements for urban water systems. R, risk; T, technology (system); E, end-user. Taken from Yu et al. (2011).