Transformation or Maladaptation? Exploring the influence of desalination on Melbourne’s water resilience

Briony Ferguson*†1,2,3 and Rebekah Brown1,2,3

1Monash Water for Liveability (MWfL) – Australia
2Cooperative Research Centre for Water Sensitive Cities (CRC WSC) – Australia
3Monash University – Australia

Abstract

Recent urban water scholarship and practice has explored the type of socio-technical arrangements required to provide system-wide resilience to future challenges such as climatic shifts and variability, population growth and decline, ageing infrastructure and the degradation of aquatic ecosystems. There is an emerging view that traditional urban water systems, involving centralised and large-scale infrastructure and institutions, should undergo transformational change towards the integration of decentralised, flexible and modular features that make them highly adaptable and resilient. How such a transformation could be deliberately facilitated is only just starting to be investigated.

This paper aims to provide a deeper understanding of the system dynamics that are critical for enabling transformation in urban water sectors by examining the empirical case context of urban water servicing in Melbourne, Australia. The research draws on qualitative data from secondary documentation, in-depth interviews and focus groups with leading water practitioners and academics in the city. Melbourne’s water system has undergone transformational change in the last fifteen years, driven by a significant period of drought. At the drought’s peak, Melbourne’s water security was under threat and a large-scale centralised seawater desalination plant was commissioned and constructed. This decision was strongly criticised by many parts of the scientific and general community as a backwards step in terms of sustainability, while at the same time recognised for its value in providing climate resilience in the form of a rain-independent water source. Since then, the urban water agenda in Melbourne has shifted to supplying fit-for-purpose water from diverse water resources and providing liveability benefits such as landscape amenity from blue-green infrastructure. This new agenda requires adaptive, multi-scale and flexible technologies and Melbourne is now recognised as a world leader in integrated urban water servicing.

These recent transformations raise important questions for understanding urban water system dynamics. What influence has the desalination plant had in diminishing or enhancing the resilience of water servicing in Melbourne? Was the large-scale investment in a traditional centralised infrastructure solution a maladaptive response to the drought, setting back the city’s shift towards greater sustainability? Or was it a necessary step in securing adequate water supplies to give the sector freedom to innovate with non-traditional and untested alternative water servicing solutions such as recycled wastewater and harvested stormwater?

*Speaker
†Corresponding author: briony.ferguson@monash.edu
This paper explores these questions through the conceptual lenses offered by resilience scholarship, with focus on the relationship between the engineering resilience entrenched by the desalination plant and the transformation towards adaptive practice and system resilience observed at the broader scale.

**Keywords:** water management, resilience, system dynamics, transformation, engineering resilience, adaptive governance, urban resilience