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A transition scenario for leapfrogging to a sustainable urban water future in Port Vila, Vanuatu

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ABSTRACT

The ability of urban centres in developing countries to rapidly transition to sustainable practises will be critical for human health and environmental sustainability as the world progresses into the twenty-first century. Sustainability transitions in the urban water sector in developing countries have received limited scholarly attention, with very few studies demonstrating methodologies offering potential for promoting and enabling "leapfrog" transitions. This paper presents an adapted transition management process which demonstrates the importance of establishing a future vision and strategic agenda for promoting a leapfrogging trajectory. Utilising the case study of the urban water sector in Port Vila, Vanuatu, empirical evidence draws from transition management workshops, supported by in-depth interviews and mediated participation. Results suggest that the desire in Vanuatu is for the development of a sustainable urban water future, and that there is untapped latent energy which can be better utilised to assist in guiding the direction of change and promoting sustainable alternatives. The paper concludes by providing critical insights into enabling leapfrogging in other developing contexts highlighting the importance of targeted institutional capacity development, the role of purchaser–provider relationships between governments and international development banks, and the potential for visions to stimulate leapfrogging trajectories.

1. Introduction

Small urban centres in the developing South West Pacific face increasing pressures due to climate change, population growth and rapid urbanisation (World Water Assessment Programme, 2009). These urban centres are often equipped with poor performing urban water systems, continuing to deteriorate due to age and poor maintenance (Moglia et al., 2009). Scholarship of water governance advocates the need for changing water management paradigms and progressing towards sustainable urban water management (SUWM) as a method for addressing these complex urban water issues (Biswas, 2006; Khatri and Vairavamoorthy, 2007; Frantzeskaki et al., 2010). Literature suggests that the principles of SUWM will assist in addressing these persistent challenges through encouraging more holistic decision making, broader stakeholder participation and approaching urban water challenges as more than just engineering dominated technological challenges but with significant institutional, community and environmental considerations (Larsen and Gujer, 1997; Brown and Farrelly, 2009). To date there has been limited progress towards SUWM in developing countries in the Southwest Pacific, despite significant financial and expertise input from multinational development banks and international aid agencies.

The shift from engineered-dominated to sustainable urban water management paradigms can take different routes and involve different stages. Brown et al. (2009) map a socio-technological pathway of urban water systems in which the city evolves from an initial configuration fulfilling primary water needs such as a 'Water supply city', a 'Sewered City', and 'Drained city', to city-configurations with increased implementation of SUWM such as a 'Waterways city', 'Water cycle city' and a future desirable configuration of a 'Water sensitive city'. Brown et al. (2009) suggest that urban water management requires significant changes – or transitions – to develop a water sensitive city or simply, operate with sustainable urban water management principles. Next to Brown et al.'s (2009) framework of the different stages of an urban water management transition, there is a framework that deals with the pace of change in developing contexts: the leapfrogging transition approach (Perkins, 2003; Tukker, 2005; Binz et al., 2012). Binz et al. (2012, p.156) define leapfrogging as "a situation in which a newly industrialised country learns from the mistakes of developed countries and directly implements more sustainable systems of production and consumption, based on innovative and ecologically more efficient technology". While acknowledging the challenges ahead (Rock et al., 2009;

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Angel and Rock, 2009), we follow Binz et al. (2012), in suggesting that it is plausible for urban cities in developing countries to leapfrog, following a fast-paced transition trajectory that bypasses environmentally detrimental configurations, e.g. drained city, to implement more progressive practises associated with SUWM, e.g. the water cycle or water sensitive city.

To enable a shift in developing country contexts from a path-dependent linear development trajectory towards a leapfrogging trajectory, a transformative change in how urban water developments and infrastructure investments are framed, planned and implemented is required. This transformative change in developing contexts may possibly include an alteration to the purchaser–provider relationships between developing country governments, international development banks and donor aid agencies.

Port Vila is one developing urban centre that would benefit from an environmental leapfrog in its urban water management. It is a burgeoning urban centre of approximately 40,000, with an annual growth of 4%. Vanuatu, like many Pacific island states, faces pressures relating to limited resources and financial constraints, inability to benefit from economies of scale, limited opportunities for industry and economic growth, and environmental vulnerabilities (Moglia et al., 2009): The current urban water system in Port Vila's is a legacy of colonial rule. A piped water supply system serves the official Port Vila urban area, with some peri-urban regions dependant on informal water supply alternatives. The central business district and principle roads are serviced with a stormwater system comprising both pits and pipes and open concreted drains, with grassed ditches transporting stormwater beyond these areas, however, these are regularly blocked causing urban inundation and public nuisance. With the exception of a few small-scale wastewater treatment plants in hotels and resorts, household septic tanks (generally poorly maintained and rarely emptied) are the predominant forms of wastewater management in Port Vila, with extensive use of pit latrines in informal and peri-urban communities, leading to groundwater and soil contamination. Currently, on the whole, Port Vila would be considered to be a 'Water Supply City' with some areas reflecting both 'Sewered City' and 'Drained City' characteristics.

Current infrastructure predates state independence and reflects a history of poor urban planning, with Port Vila outgrowing its planned maximum population in the 1980's due to rapid migration into the capital (Storey, 1998). Since the 1980's drainage and wastewater management have remained inadequate for the population and tourism that Port Vila supports. This has resulted in public health concerns with high levels of diarrheal disease (ISF-UTS, 2011), and significant environmental degradation. Environmental degradation is potentially threatening the future growth of the tourism sector (extensive coral death throughout Port Vila harbour is likely caused by excess sediment and nutrients due to stormwater and wastewater contamination (Mosley and Aalbesberg, 2003)). Vanuatu's economy is heavily dependent on tourism (Scheyvens and Russell, 2013) and as thus, urban water and wastewater management has serious economic ramifications.

The past two decades have seen a myriad of recommendations for institutional restructuring, proposals to replicate foreign institutional practises, policy and strategy papers for urban water sector development, and multiple infrastructure proposals following conventional development pathways (Cleary, 2011 and ADB, 1994, 1998, 2010). Infrastructural proposals failed to gain adequate political ownership to commit to the required capital expenditure [e.g. ADB sanitation masterplan (ADB, 1998)] and institutional recommendations did not receive the political commitment to facilitate implementation [e.g. national water strategy (Fitchett, 2008)]. Concurrent to these ongoing (policy) failures, ad hoc yet rapid urban development has continued within Port Vila. Densification and urban expansion are accelerating urban water challenges. Effective measures that will decrease detrimental impacts of urban development while increasing resilience are required.

The past two decades demonstrate that the current foreign-driven model for promoting conventional infrastructure development and institutional reform has failed in gaining the momentum needed to generate long term lasting change towards more sustainable solutions and infrastructures. Rather, new infrastructure governance approaches are required to progress the urban water sector from a poorly performing and vulnerable service towards a system supporting resilience and orienting in sustainability. It is suggested that environmental leapfrogging transitions present an optimal development trajectory, rather than the traditional development trajectories previously recommended, and that innovative governance models are required.

There is very limited academic, or practise-based literature, looking at the way leapfrogging can be steered and facilitated. To address this important knowledge gap, this paper reports on a process of participatory engagement with policy frontrunners of Port Vila in unlocking their innovative ideas and tacit knowledge, to mobilise them into taking collective transformative action for leapfrogging to SUWM in Port Vila. In doing so, this paper seeks to answer the critical question of whether transition management can enable environmental leapfrogging to advance sustainable urban water management in developing country contexts.

First, this paper outlines an adapted transition management (TM) methodology applied into a developing country context (Loorbach, 2010) (Section 2). Second, it presents the outcomes of this TM process with a focus on a transition scenario and strategic agenda for Port Vila's urban water sector (Section 3). Third, the TM process outcomes are analysed to identify leapfrogging potential in the future actions of multiple actors, such as policy practitioners, NGOs, International aid organisations and the tourism sector (Section 4).

2. Research methodology

2.1. Transition management as a guide to a strategy development process

The research methodology utilised for the development of a transition process for urban water management in Port Vila was based on the traditional transition management process as outlined in literature and as presented in Fig. 1 (Loorbach and Rotmans, 2010; Frantzeskaki et al., 2012; Nevens et al., 2013).

Transition management (TM) is an innovative approach to governance that attempts to address sustainability challenges. It seeks not to control and manage complex societal problems, but to adjust and influence the direction of the search for solutions through enabling social learning (Loorbach, 2010; Frantzeskaki and Loorbach, 2010). The objectives of TM are to encourage multi-actor engagement, with a long term perspective, focused on strengthening emerging innovations as a means of achieving sustainable development. TM methodology is designed to facilitate a diverse range of stakeholders to articulate and define a complex problem that challenges the pursuit of sustainability in their local context. It equips them to develop a long term vision to guide strategic action, and to develop local experiments that will provide evidence on the benefits and lessons of radical action for sustainability (Rotmans and Loorbach, 2010).

TM has been criticised regarding whether the guidance and steering of societal and system changes can and should be pursued (Shove and Walker, 2007). Shove and Walker (2007) continue this line of critique raising questions regarding the role of politics and power in the development of long term visions and direction of change. However, through existing case studies, the TM process has proven to be an effective method for assisting in the strategy development and governance interventions that transcend complex challenges around urban water management (Frantzeskaki et al., 2014; Ferguson et al., 2013; van Eijndhoven et al., 2013).

Despite the potential benefits of TM in addressing the challenges of urban water management in developing contexts, a suitably adapted TM process has rarely been implemented (Sutherland et al., 2012).