5.2 Making incentives matter: understanding the effectiveness of incentives in stimulating community waterways practices

Summary

The project aims to assist Melbourne Water by providing two important sets of information. First, investigating three cases across Melbourne (e.g. Little Stringbark Creek, Dobsons Creek and an alternative, centralised scheme) we will explore the community's willingness to pay for and participate in catchment-scale schemes that provide multiple benefits, and the lifecycle cost data of a range of alternative water management options. Second, we will assemble data of physical/material conditions, community attributes and rules-in-use (e.g. regulations) and compare these with the networks of participants involved and the action situations that they hold (e.g. home, council, water corporation), to create an Institutional Analysis and Development framework summarising the patterns of interactions that yield better understandings

Research Theme

Community engagement

Timing

2015-2018

Project Team

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Deliverables

- Datasets of willingness-to-pay (option value) and lifecycle costs
- A framework quantifying factors driving participation in IWM against prerequisite values and socio-institutional variables.
- Submitted journal papers

Background

As part of the experiment at Little Stringybark Creek (LSC), Mt Evelyn, three variations of economic instrument were tested. The first, Stormwater Tender, was a uniform price reverse auction, where homeowners were invited to submit bids to install stormwater harvesting and retention systems on their property. Uniform-price auctions work on the theory that there is no incentive for "rent-seeking" (i.e. bidding a higher amount than the minimum the homeowner would accept to undertake the project). This is a powerful tool for revealing the private benefit from these works, allowing the public benefit to be calculated indirectly (Fletcher et al., 2010, Fletcher et al., 2011). The LSC project has since tested two simpler economic instruments, as well as testing funding incentives for construction of large-scale stormwater harvesting on both public and private (commercial and industrial) land. Combined, this dataset is the biggest test of economic incentives for community-based alternative water management that we know of in the world, having funded and constructed over 200 individual projects. Full costing data was collected for every project, allowing us to test questions related to (i) economies of scale, (ii) lifecycle costing and (iii) amount and value of water savings.

This information allows the full life cycle cost of innovation leading from knowledge generation through to implementation and monitoring and review to be estimated. The opportunity to do this may be unique because of the nature of the data collected, and 'institutional effort' that would be difficult to replicate at a larger scale.

This can be contrasted with the Dobsons Creek project that is being implemented by South East Water's plumbing business, Iota, where a simplified approach is used. Direct community engagement has been using a variety of methods to attract residential uptake of lot-scale technologies. Using economic data from the LSC project, Dobsons Creek is offering a fixed-price incentive to homeowners. We will use these two datasets to quantify the full cost of R&D in assessing and managing alternative water strategies, and compare these costs with more operationally-based approaches. Such comparisons and evaluations of the cost of community engagement in IUWM have not yet been undertaken and this work will provide

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important new insights. Similarly for LSC, the Dobsons Creek project actively involves the waterways manager (Melbourne Water) and the local drainage authority (Knox City Council) to capture, treat and use stormwater on private land and at key nodes within the public domain, managed by the council.

In addition to these cases, we will examine a large-scale alternative water supply facility to ascertain the community's, local government's and water authority's perceived costs and benefits of IUWM in a centralized system, which is complementary to the decentralized IUWM systems at LSC and Dobsons Creek.

The empirical work thus described will provide important and real-world-tested insight into (i) community willingness to pay for and participate in IUWM, (ii) community perceptions of and attitudes to waterways and use of water in the urban landscape and (iii) lifecycle cost data of a range of alternative water management options.
However, the data does not directly reveal the intangible value of these projects, including the social, cultural and environmental values that contribute to long-term social welfare. Intangible effects are those that are not measurable in monetary terms because they deal with 'assets' not traded in the market place (Markantonis et al., 2012). Frequently-cited categories of intangibles include health, environmental amenity, ecosystem services, cultural heritage and community cohesiveness. The orthodox approach to intangibles is useful within the context of a cost-benefit analysis; however, it is rarely undertaken due to resource constraints and contested methodology.

Importantly, there is a significant literature on the methods available for valuing intangible impacts of both natural phenomena and policy initiatives. The purpose of these methodologies is to estimate the Total Economic Value (TEV) of tangible and intangible assets (e.g. Alcamo et al., 2003; TEEB, 2009). The commonality of technological functions and institutional composition associated with the various land uses within the three cases will enable the empirical data to directly feed into an assessment framework for determining TEV. The empirical case data is linked to and compared with a comprehensive data set for metropolitan Melbourne to assess the scalability of the three cases.

When valuing the effects of interventions such as incentive schemes on intangibles, the two main methods are revealed preference and contingent valuation methods. However, such methods often reflect only currently recognised values, or the 'price of historical experience'. Future values, such as flood protection in a changed climate may be quite different. Other benefits, such as outdoor amenity contributing to health and wellbeing may be overlooked. If such values are elicited from respondents as in revealed preference studies, then the nature of how that elicitation is framed, past effects and psychological and cultural outlook of the respondent, can produce widely varying results.

A suitable framework for assessing complex sets of values at the institutional scale is Ostrom's Institutional Analysis and Development (IAD) Framework (Ostrom, 2005, Ostrom, 2007, Ostrom, 2011). This framework is used to arrange values within an institutional context using a framework, methodology and methods/tools hierarchy. Research at Victoria University (VU) is currently applying this framework for adaptation to rapid change (for example, climate change). The water sector, as one of the sectors most sensitive to climate change and a current focus of policy-based reform, is a prime candidate for a more in-

Methods

Firstly, we will use the financial data from LSC and Dobsons Creek to undertake a tangible-benefit-only valuation of catchment-scale stormwater harvesting, and compare this valuation with similar valuations for traditional water sources and for wastewater recycling. The purpose of this valuation is to provide an input into the Total Economic Valuation model. Two types of valuation can be assessed (i) is to test the costs of research in developing a research and innovation model and contrast this with operational costs and returns and (ii) develop a key set of metrics linking environmental function with specific values.
With this collection, we will develop a model that quantifies the role of perceptions of both risk and benefit by (i) the community and (ii) institutions in determining their decisions to participate directly in IUWM.

Then, we will compare circumscriptive data (including structured surveys controlling for experience with alternative water resource options) for the LSC, Dobsons Creek and Gisborne cases. The comparative data from the three catchments (and adjacent controls) will derive willingness to pay (WTP) and contribute to the TEV analysis. Analysis of the circumscriptive data will also control for land use and associated property rights and institutional responsibilities. This will support the verification