



Cities as water supply catchments - An economic evaluation

Overview

There are many characteristics that impact a person's willingness to pay for public goods. Willingness to pay for environmental services, such as stormwater quality improvement or cooler temperatures in suburbs, varies significantly across regions and households with different incomes. Insights on community preference and the value placed on various environmental services and their benefits are helping inform decisions on project investment and policy design.

This project aims to place an economic value on the various environmental (non-market) benefits of stormwater management such as greater water supply security, flood protection, more liveable landscapes and increased biodiversity. It also identifies the communities' willingness to pay for those benefits taking into account key socio-economic factors such as income and education, and psychological factors like risk perception, personal experiences and preconceptions.

Key outcomes

The project provides a monetary evaluation of non-market benefits of stormwater management in metropolitan areas in Australia. In particular, the project will:

- provide preliminary monetary values and preferences for stormwater harvesting and determine the willingness to pay for stormwater harvesting in a range of different "markets" and context such as if the community has recently experienced flooding
- explore how individuals' risk aversion influences their willingness to pay for different environmental services
- explain the variation of the willingness to pay for the benefits of stormwater management between different Australian states and cities
- support the development of business cases for water sensitive city projects and programs by allocating non-monetary values to a range of benefits for use in cost-benefit analyses.

This project will also deliver tested and validated methodologies for undertaking choice experiments and calculating willingness to pay.

Early insights into who is willing to pay?

The CRC for Water Sensitive Cities can now estimate people's willingness to pay for specific environmental services and their benefits and how this varies by income, over time and across regions. Figure 1 displays the predicted average contribution (costs ranged from \$0-30) based on several variables of interest. Income and education both increase average contributions, whereas older respondents contribute less.

The survey sampled households from four councils, two from Victoria and two from New South Wales, to examine how average contributions vary across geographic locations. The study showed that the level of contributions and the relationship between age and contributions vary across councils. For example, while the average contributions were found to be higher in council 1 compared to council 2, younger households contributed relatively more in council 2. This shows how both levels and trends can vary geographically.

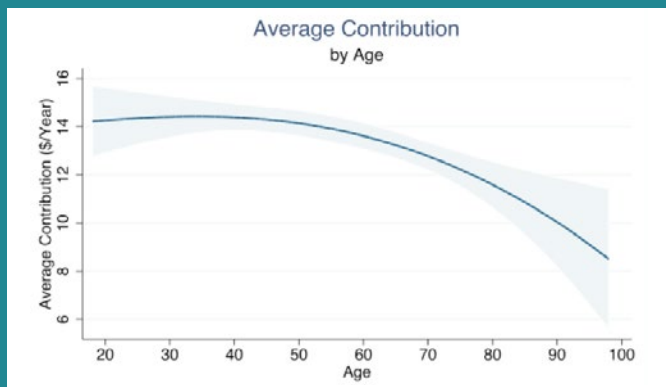
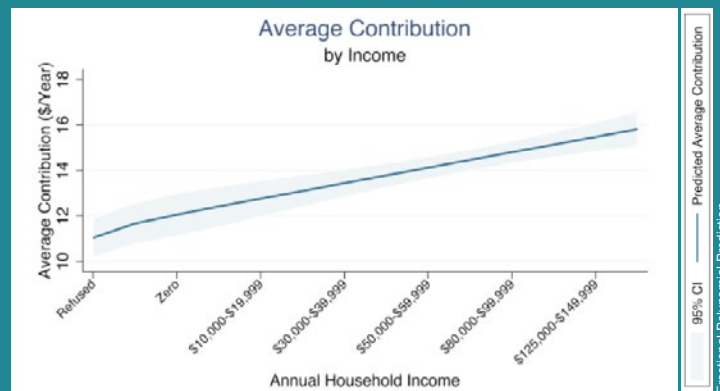


Figure 1. Variation of average contributions by age and income.





Project design

While many benefits of stormwater harvesting and management have already been realised in the field, it is sometimes difficult to observe preferences and attitudes of individuals toward stormwater management. In addition, a number of recent innovations relating to stormwater harvesting have not been implemented in practice, making it difficult to estimate values for market data.

The research project conducted a number of different survey types (choice and field experiments) across local councils in metropolitan areas of New South Wales and Victoria recognising that stormwater management is usually managed at a council level. The researchers looked at five benefits relating to best practice stormwater management:

- lifting water restrictions
- reducing the frequency of flash floods
- improving stream health
- improving recreation and amenities
- lowering summer temperatures.

These benefits were selected through a discussion with scientists and policy-makers from local councils and were tested in focus groups. Staff from Manningham and Moonee Valley Councils in Victoria and from Fairfield and Warringah Councils in New South Wales helped develop and test the survey.

A choice experiment is a survey that presents a set of alternative scenarios or choices from which respondents select their most preferred options. The choice experiments firstly elicited a specific value attributed to each of the benefits of stormwater management mentioned above. Then the surveys unearthed a preference for different sources of water supply, for example, stormwater harvesting versus recycled water. Choice experiments allow interviewers to compare individual willingness to pay for environmental services over time and across different geographic areas.

In the field experiments, 981 owner-occupied households in four councils across metropolitan areas in New South Wales and Victoria were interviewed and data on their income and demographic characteristics was collected. These councils are all comparable in terms of their socio-economic make-up, yet differ in terms of their history of heavy rainfall and flash flooding events.



Outlook

This project on economic evaluation of cities as water supply catchments links to Project A1.2 (Valuation of economic, social and ecological costs and benefits of strategies and systems for water sensitive cities, and on Project A1.3 (Economic incentives and instruments).

The combined outcomes of these projects will provide decision-makers with the knowledge and tools to make informed decisions about water infrastructure investment that strike the best balance between economic, social and environmental outcomes so that benefits to the broader community are maximised.



About the Cooperative Research Centre for Water Sensitive Cities

The Cooperative Research Centre for Water Sensitive Cities (CRCWSC) brings together interdisciplinary research expertise and thought-leadership from Australia and the world to address current urban water management challenges facing our cities and regions. In collaboration with over 80 research, government and industry partners, it develops and synthesises knowledge into powerful tools and influences key players aiming to achieve sustainable, resilient and liveable water sensitive cities.

Further information

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