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The 'meaning' behind household rainwater use: An Australian case study



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ABSTRACT

Suburban rainwater tanks have the potential to reduce household mains water consumption, but simply installing the technology does not mean rainwater is automatically incorporated into everyday practices. Exploring how rainwater is conceptualised in contrast to mains water, and the way it is used in household practices, provides insights into why rainwater tank households may not be using less mains water than households without tanks. Water saving strategies that promote rainwater tanks tend to focus on installation rather than how, why and where rainwater is substituted for mains water. While there is the assumption that rainwater tank households use less mains water, an investigation of rainwater practices have revealed influential social and cultural factors that extend far beyond installing a new technology. Drawing on a household water study involving 21 interviews and 1425 surveys in the Illawarra region, Australia, practice theory principles provided insight into how rainwater was conceptualised, revealing the 'meaning' of rainwater as an influential factor informing its everyday use. The historical, cultural and emotional meanings of rainwater contribute to shaping its use in everyday practices. Rainwater means different things to different people and it is this spectrum of meanings that inform the range of practices, and volumes of use. This study highlights opportunities for increased integration of rainwater into household practices, which may broaden the perceived uses and usefulness, reshaping its meaning over time.

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1. Introduction

Australia's variable rainfall coupled with increasing anthropological pressures on freshwater systems have encouraged governments to revisit the water saving opportunities offered by residential rainwater tanks (RWTs). In recent years this technology has been marketed to households as a way to maintain outdoor activities during water restrictions while contributing to community water saving efforts. Marketing strategies focus on the installation of RWTs rather than inquiring into how the technology is used

and conceptualised within an everyday context. Domestic RWTs are currently promoted as a water source alternative aimed at outdoor use. The impact of this market positioning is evident through the variable amount of internal connections across NSW (See: [12,14]), and the subsequent affect this is having on the overall mains water savings achieved by RWT households. As average outdoor water use is approximately 25% of total water consumption [24,25] there are significant opportunities for the remaining 75% of internal household water use to be supplied by RWTs. By incorporating an informed understanding of everyday practices into water savings strategies, RWTs may offer significant opportunities to reduce in-house mains water consumption.

While rainwater tanks may have the potential to reduce mains water consumption, the multiple meanings that drive rainwater practices need to be taken into

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consideration to ensure water savings are actualised. By bringing dormant sociocultural factors to the foreground of the discussion, this paper has explored why suburban rainwater tanks may not be reducing mains water consumption to any noticeable degree in comparison to non-rainwater tank households. Focussing on practices has revealed a handful of pertinent social influences that shape rainwater use in the home. This analysis emphasises that the RWT technology is only one part of the equation in successfully reducing household mains water consumption. Drawing on a component of the practice theory framework, this paper unpacks the *meaning* of rainwater in guiding decision making behind water practices. While the authors recognise practice theory puts equal emphasis on the role of materials and competence in the reproduction of practices, this paper focuses on the *meaning* component of the framework and its influence in household practices.

Findings are drawn from a mixed methods research design, which included a water consumption analysis, surveys data as well as qualitative interviews and participant observation. Household practices quickly emerged as the vehicle to explore the multiple dimensions of household water use, as these practices were the common language between researcher and participant. For this reason this paper will focus on the qualitative findings and the meaning associated with practices to analyse and interpret household rainwater use.

An exploration of the *meaning* behind rainwater use revealed three distinct, yet interconnected subcategories: historical, cultural and emotional meaning. The impact of these *meanings* have affected the breadth of indoor connections, the practices perceived as suitable for rainwater use, and where RWTs conceptually fit within a package of existing household water technologies. Analysing the ways historical, cultural and emotional meanings of resource consumption manifest in practice can help to inform strategic approaches to water efficiency in daily life.

There has been much debate as to the savings capacity of residential RWTs [2,5,27]. While acknowledging the multitude of behavioural and structural factors contributing to potable water substitutions, this research offers in-depth qualitative evidence on particular sociocultural variables that may be contributing to the high variability of reported mains water savings in RWT studies across Australia. Normalizing this source of water in suburban households and broadening its association with household practices may help to generate new historical meanings over time, new cultural norms, and work to overcome the emotional resistance of bringing rainwater into the home.

The findings of this paper offer a framework to facilitate a deeper exploration of the social and cultural 'meanings' that may shape household water use and strategies to reduce household water consumption.

2. Methodology

This paper is based on findings from research conducted in 2010–2011 that investigated the socio-cultural perceptions of RWTs by household residents in Wollongong and Shellharbour suburbs. Wollongong and Shellharbour are two Local Government Areas (LGAs) within the Illawarra

region, a coastal region directly south of the Sydney, Australia.

In re-examining qualitative data from the research, the authors were acutely aware of the role 'practices' played in determining residential water consumption. As a result of the ex-post analysis and an increasing awareness by the authors of the reference to practices in the interview data, a cross examination of the qualitative data was conducted through the theoretical framework of practice theory.

The original methodology adopted a mixed methods approach. Quantitative analysis was based on mains water consumption data supplied by Sydney Water (water utility) for 7125 households in the Wollongong and Shellharbour LGAs installing a RWT during the period of NSW water restrictions between 2005 and 2007. For each household, two years of consumption data immediately prior to installation was analysed and compared with two years of consumption data immediately after RWT installation. The average of this comparative analysis for the 7125 households was then compared to the average total community consumption records to determine the difference in mains water consumption for this study sample and the wider community. In addition to consumption data, 1465 surveys [7] were analysed exploring the range of perspectives and responses to sustainability in the Illawarra region.

The qualitative research design comprised of 21 in-depth interviews and home visits which afforded participant observation of household practices. The home visits and in-depth interviews were conducted between May–July 2010. The findings of the study revealed that a very small proportion of households who were harvesting rainwater had their tanks connected to both the toilet and washing machine (5%), despite rebates for each indoor connection. Sociocultural factors including a desire for water autonomy, independence and concerns regarding rainwater quality and cleanliness were found to influence indoor connections. Households with outdoor only connections were found to reduce their water consumption on average by 10%, and households with internal plumbing by 16%. (For further details see: [12]).¹ These consumption results raise the question, why did installing a rainwater tank have little impact on overall water savings for this 7125 sample?

While this paper draws on both qualitative and quantitative data to determine the historical, emotional and cultural meanings associated with water use, qualitative data in particular will be expanded on in this paper. Practice theory has been used to analyse household water practices as it provides a way to interpret bulk consumption data while recognizing the range of sociocultural influences that shape household water use. Simplifying water use practices to an individual/consumption binary fails to

¹ The quantitative inquiry analysed data from the *Tough Times? Green Times?* Survey (et al. 2009) to determine and statistical difference between the household practices of rainwater tank and non-rainwater tank owners. Of the 1465 surveys analysed, 426 households (29%) reported having a rainwater tank. This sample of rainwater tank households was compared to non-tank households to further explore the difference and similarities between practices, broader household consumption patterns, perspectives on environmental issues and socioeconomics.

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