

REVIEW OF ATTITUDES AND PREFERENCES FOR WATER EFFICIENCY IN HOMES

Dexter Robinson¹, Kemi Adeyeye², Della Madgwick³, Andrew Church⁴

¹D.P.Robinson@Brighton.ac.uk, ²O.Adeyeye@brighton.ac.uk,
³D.Madgwick@brighton.ac.uk, ⁴A.Church@brighton.ac.uk

Water Efficiency Lab, SET, University of Brighton, Brighton, UK

ABSTRACT

Governments now recognise that climate change and its consequences need to be addressed by changing people's attitudes, behaviour and every day practises. Social factors such as occupancy numbers and demographics, age of inhabitants, occupation of inhabitants, personal habits, perceptions and attitudes, lifestyle and values of the water user influences how water is consumed in a building. Water efficiency strategies in buildings should therefore aim to understand what people care about, and preserve the things they consider important. Therefore it is necessary to understand the knowledge, views and priorities of water consumption within a property before deploying water efficiency interventions.

This paper presents findings from two studies designed to further understand water use in domestic properties, specifically looking at habits, lifestyles and attitudes towards water consumption. The aim is to establish the how these have changed since the first survey. The quantitative survey methodology was utilised and the data from the 503 respondents was analysed using statistical analysis packages. 66% of the respondents were from the South East region of the UK and only the findings from these groups are presented in this paper. The study found increased metering in the region since the first survey and that the metering program has resulted in changes in attitudes and awareness. The findings also draw on a change in barriers to the uptake of water efficient technologies. Further findings demonstrate that water Company practises appear to contribute to the environmental knowledge of respondents. Findings from this study will inform the next stages of a doctoral study which aims to propose a methodology for designing and implementing customised water efficiency interventions in homes.

Keywords: Awareness, Attitudes, Domestic water use, Water efficiency.

INTRODUCTION

Water scarcity, aggravated by increasing water use, at more than twice the rate of population increase in the last century (Environment agency, 2011), affects all social and

economic sectors (UN-Water, 2007). Although there is no global water scarcity as such, an increasing number of regions are chronically short of water due to escalating demand and unpredictable environmental conditions.

The South East of England for instance has less water per capita than countries such as Egypt, which are considered to be the dry regions of the planet (Environment agency, 2008). The increasing frequency of drought has led to the Environment Agency (2008) to declare water resources under “considerable pressure”. Therefore, the UK is clearly part of the global water crisis rather than exempt from it. This ensures that water availability is a critical topic with all relevant agencies and companies.

Increases in water demand and climate change has moved many governments and public utilities to invest significantly in the development and the implementation of a range of water strategies (Correljé *et al.*, 2007; Stewart *et al.*, 2010; Chen *et al.*, 2005; Marsden and Pickering, 2006; Kenney *et al.*, 2008). Whilst water authorities attempt to secure future water supplies, they also recognise the need to manage water demand (Jorgensen 2009).

Clarke and Brown (2006) found that public water use awareness campaigns are often unsuccessful due to the fact that such campaigns fail to understand the factors that influence people’s water use, and what drives them to change or embrace new technology. This is because social factors such as occupancy numbers and demographics, age of inhabitants, occupation of inhabitants, personal habits, perceptions and attitudes, lifestyle and values of the water user influence how water is used in a building.

This study therefore sought to investigate and compare collective views on water consumption and efficiency in South East region of the United Kingdom.

STUDY CONTEXT

The study compares the results of two surveys. The first survey was conducted nationally with about 1000 respondents which were sampled randomly from a market survey company’s database. 546 respondents started the survey, of which 393 fully completed it. Data from the South East respondents only are presented in this paper.

The second study was conducted more recently across the South East with participants primarily located in Surrey and Sussex. The survey was distributed at community events, local product merchants and water companies; there were a total of 243 respondents.

METHODOLOGY

A quantitative approach using questionnaires was utilised for this study. This is due to the opportunity to include a wide range of participants.

Data from both surveys was inputted into a spreadsheet and analysed in MiniTab statistical analysis software. Although this study is an extension of a previous study comparing the rural and urban setting, the dataset is still limited to the South East region as well as the respondents that chose to participate.

FINDINGS

There are 503 respondents, used in this research from both surveys. The age of the respondents was represented in 4 age bands: ages under 25 (8%), 25-45 (45%), 46-65 (37%) and over 65 (10%). In the initial survey, there were a higher number of responses in the 25-45 age group (54%) whilst in the latter survey, the highest responding group was 36-65 (48%). Results from both surveys were divided into 7 regions categorised geographically with the UK. Two thirds (66%) of respondents were seen to be from the South East region, 19% from the north of England, 11% from the Midlands, 2% from Wales and South West and the remaining 3% from the East of England and Scotland.

The majority (59%) of people in both surveys live in 1-2 people households, 35% in 3-4 people households and 6% in households with 5 or more occupants. 71% of the respondents owned the dwelling whilst 26% rented and 2% residents. 1% of respondents lived in maisonettes whilst 19% lived in detached houses, 23% apartments or flats, 25% in terraced houses and the largest group 31% in semi-detached houses.

Metering

In both surveys, respondents were asked to identify if they had a water meter installed. In the previous study, more respondents did not have water meters, whilst this trend was reversed in the newer study. Data from both surveys indicate that the South East has higher meter penetration (53%) than north England (36%) and the Midlands (32%).

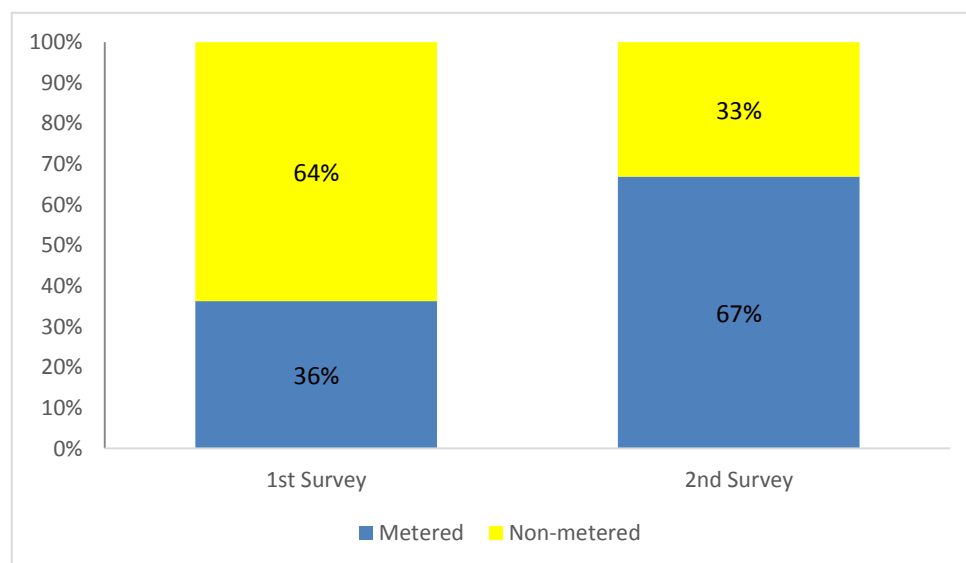


Figure 1 South East meter penetration

However, an interesting comparison of both surveys shown in

Figure 1 demonstrates a swing in meter penetration within the South East; the first survey found 36% of dwellings has water meters and this increased to 67% by the second survey.

Participants of the latter survey that have water meters were asked if this had an impact on their consumption. Figure 2 shows that 54% of respondents stated that this influenced their water use and 30% do not agree; this was found to be higher in the South East with 57% and 26% respectively.

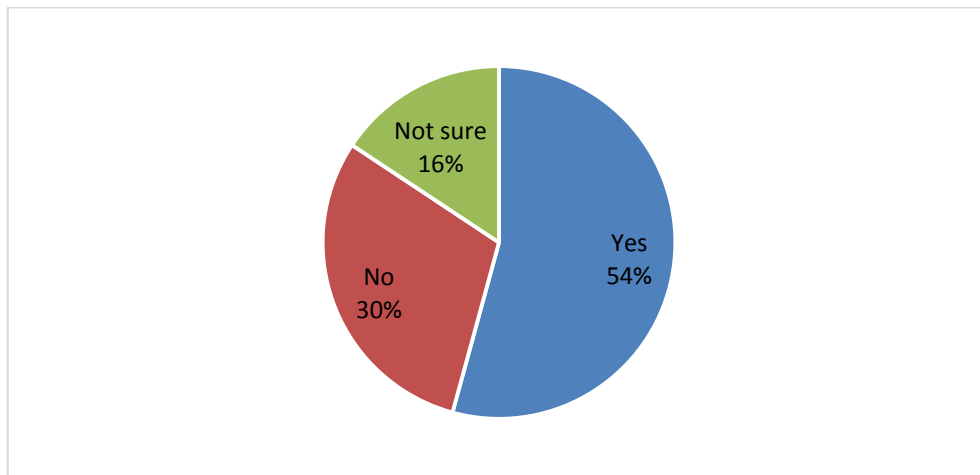


Figure 2 Influence of the water meter

Attitudes

In both surveys, the participants were asked to select their attitude to water efficiency. The surveys had different wording but broadly had 5 options (Uzzell 2009), they want to save water but need to know more; they have little concern for efficiency, would save water but can't due to constraints, such as financial, cultural or lifestyle, save water, using the water saving technologies or save water without the water saving technologies.

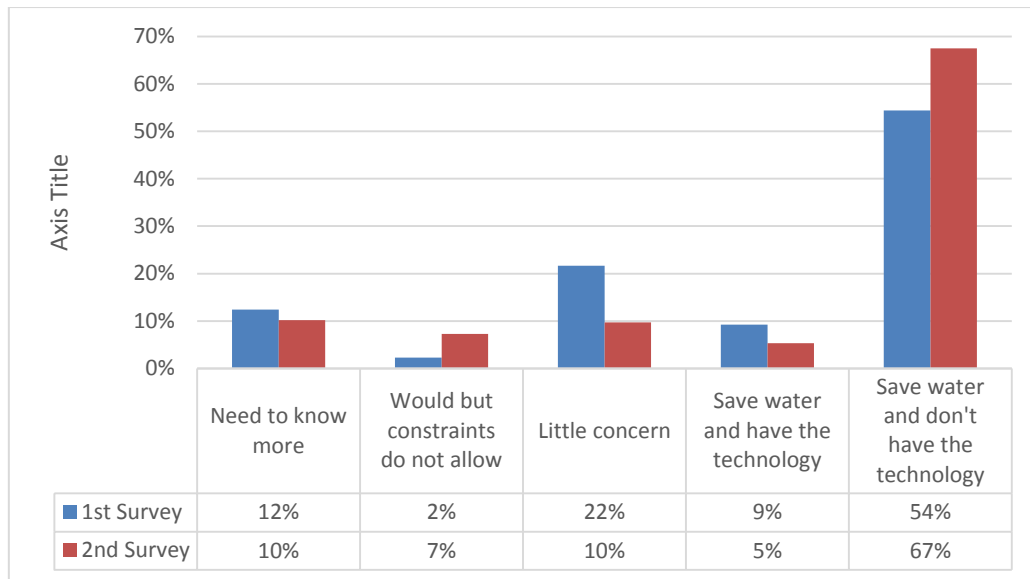


Figure 3 Comparison of attitudes

However, there was little statistical significance between the inclusion of a meter and the attitudinal responses ($P=0.038$ for the initial survey and $P=0.313$ for newer survey).

Awareness

In both surveys, the participants were asked for their awareness of several factors including water efficiency and related environmental issues. The awareness of environmental concerns in both studies was typically average to high. Although, there appears to be an increase in respondents stating that they have low awareness of environmental issues.

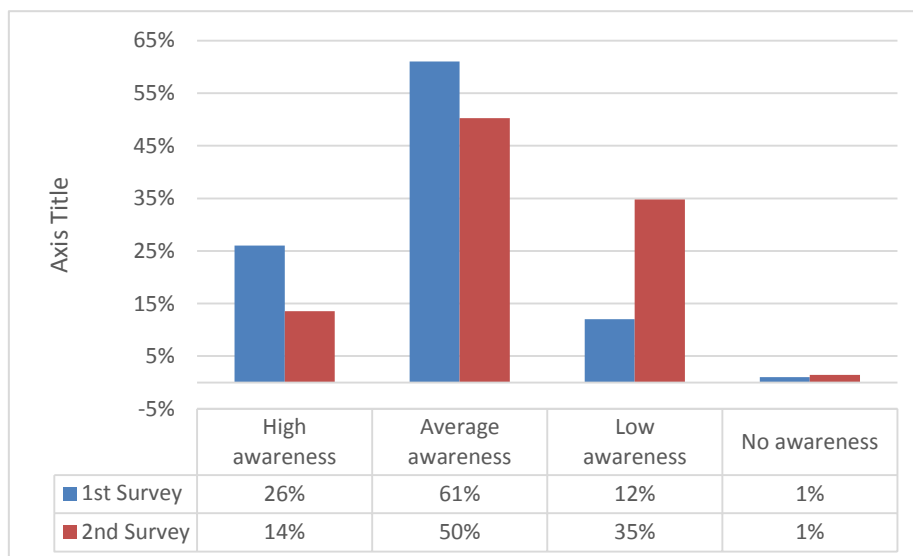


Figure 4 Awareness of environmental issues

Figure 5 shows the awareness of water efficiency. Almost 20% in both cases (19%, first and 21% second survey) had high awareness, 57% (57% initial and 58% latter) had average awareness whilst on average 20% (23% and 21%) had low awareness.

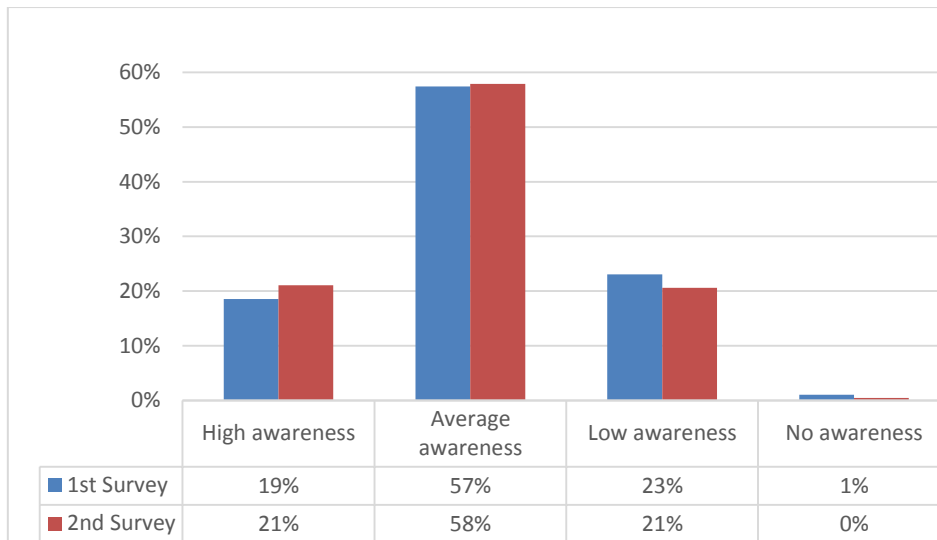


Figure 5 Awareness of water efficiency

Barriers to the uptake of water efficient technologies

In both studies, participants were asked to define barriers to their adoption of water efficient technologies. The age of the property, cost of installation, disruption and level of responsibility were provided as possible barriers. **Figure 6** shows that the age of the property and cost of installation, 5% and 16% change respectively, stayed fairly similar in both studies. There was a significant change in the disruption and level of responsibility; 36% and 60% respectively.

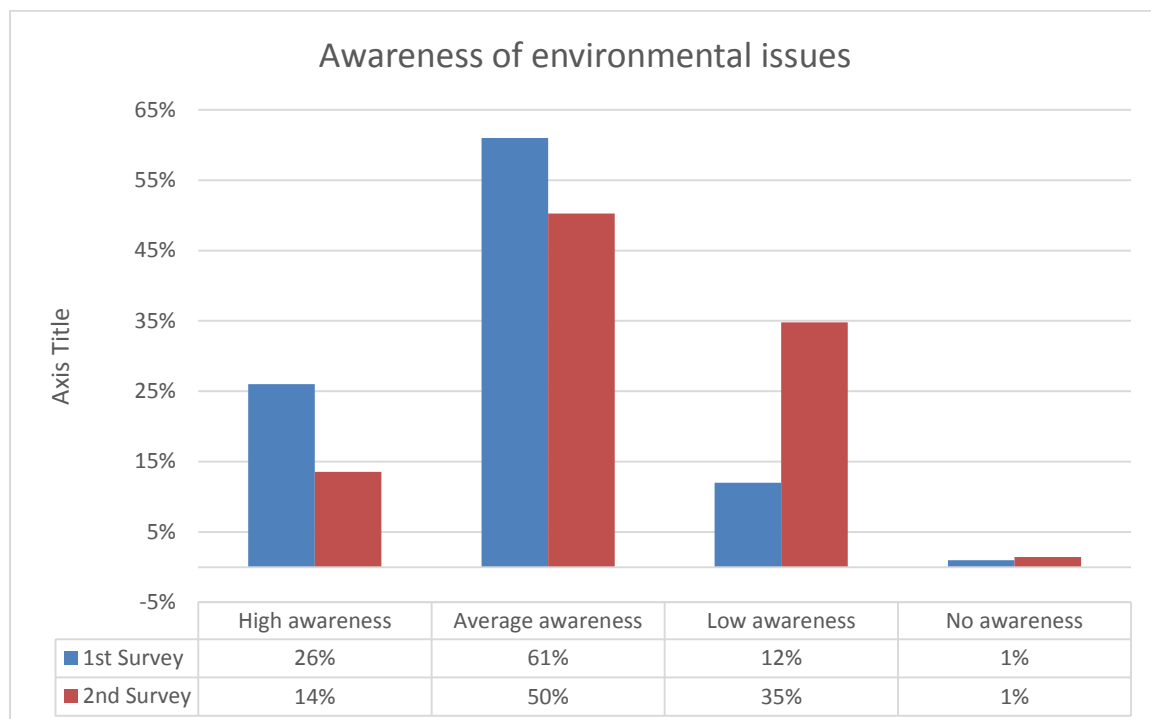


Figure 6 Barriers to the uptake of water efficient technologies

DISCUSSION

Both surveys represent the combined views of 503 participants across various age groups with a similar spread of ages in both surveys. The majority of the participants were from the South East region of the UK and there is some regional bias in the data and findings. The survey also represents a mixture of different properties, occupancy levels with more responses from those in low occupancy housing (59% in 1-2 person households). However, this bias is statistically prevalent in the UK (ONS 2011).

During the period between the two surveys, there was an increase in the percentage of properties where water meters were installed. This is related to the large scale metering programme being implemented across the region (OFWAT 2013). Unfortunately, no statistical test could be conducted to confirm this due to the bias in the dataset to the South East region. This trend however is seen when results from the South East region are isolated as Figure 1 illustrates.

Metering

The participants in the second study were also asked if they agreed that the installation of a meter had an impact on their consumption. There appears to be an overall trend to metering having an impact on consumption. This is probably because water meters are generally not installed in isolation, they are often supported with media campaigns and mail-outs occur at the same time.

Attitudes

The analysis of attitudes to water efficiency generally shows that respondents are willing or perceive themselves to already be water efficient. Notably, an increase in the percentage of participants considering themselves to be efficient in their use of water despite not having the most efficient technologies was observed in the data. There was also a reduction in the percentage with little awareness or concern for water efficiency, or those that express constraints due to religious, lifestyle or financial reasons.

These observations suggest an attitudinal or perception shift or change in what is socially acceptable for efficient water consumption. This change can be attributed to a variety of factors including the media campaigns and mail-outs that supported the implementation of the compulsory metering program. Even though it was found that the presence of a meter in itself appears to have little significance to participant's attitudes. It can therefore be alluded that metering in itself may not change the attitudes and the resulting behaviour but combining this with other measures such as knowledge and awareness programme has better impact, particularly when considered with the downward trend in water consumption - in 2008 the average water consumption per person per day was 150 litres (Environment Agency, 2008), recent data however found that per capita reduction of water consumption per person in 2013 was 145 litres (Climate change committee, 2012).

Awareness

In both surveys, there was an increase in awareness of environmental issues, whilst the awareness of water efficiency has maintained similar levels. This is probably related to media coverage of environmental issues or the changes in the commonly accepted meaning of environmental issues.

Barriers to the uptake of water efficient technologies

Four barriers to water efficient technologies were analysed; the age of property, cost of installation and disruption and responsibility levels. The age of the property and cost of installation increased but not significantly. However, responses pertaining to the level of disruption lifestyle and the function of the home as well as the level of responsibility to make decisions and to adopt water saving technologies also increased significantly.

An increase in the level of disruption could indicate that efficient water use has led to increases in disruption to lifestyle and quality of life. With further exploration of the data and comparisons between attitudes and the barrier to being water efficient, it was found (**Figure 7**) that a large percentage of participants that identified disruption to their lifestyle and property as a barrier also stated that they already save water despite not having water efficient technologies. This could indicate a link between the attitudes of participants and the perception of the need have water efficient technologies in order to save water.

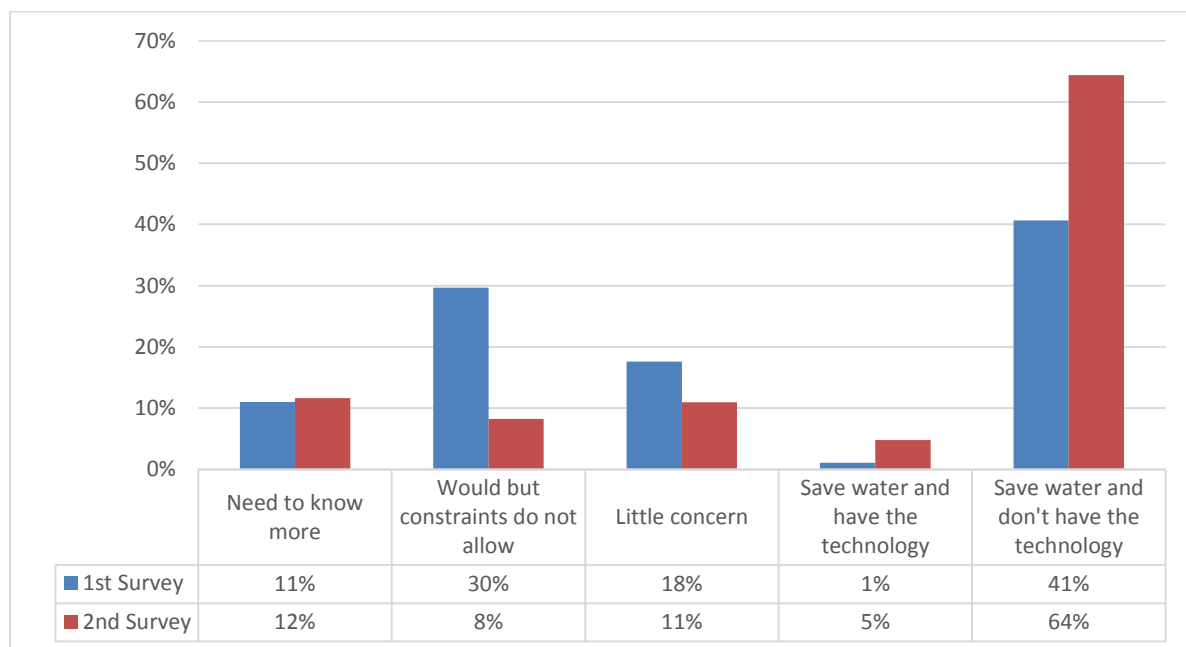


Figure 7 Cross-tabulation of awareness and perception of disruption in the implementation of water efficient technologies

Similarly, a change was observed in the perceived level of responsibility of the water user to use water efficiently. In the first survey, this was interpreted to be due to the

respondents being tenants and therefore not having the right or capacity to make changes to the building.

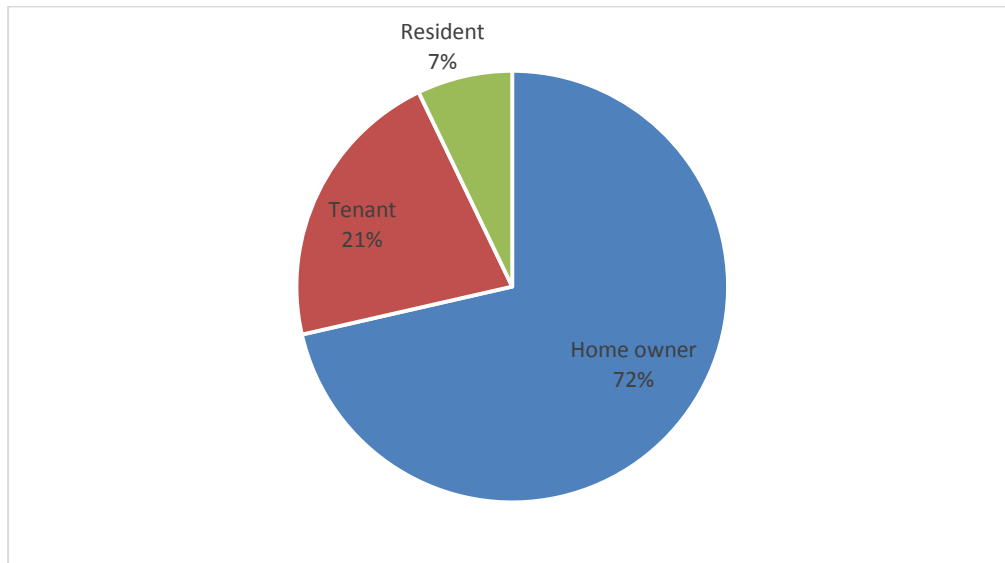


Figure 8 Breakdown of respondents who consider lack of responsibility to be a significant barrier

However, the latter survey had a higher percentage of tenants rather than owner-occupiers compared to the first survey, however, no correlation was found between tenants having reduced responsibility to make changes or adopt technology for water efficiency (Figure 8). Also, no significant relationship was found between ownership type and level of responsibility being a barrier $P=0.026$. Therefore, further studies is required into why some users consider it not their responsibility to make positive decisions, adopt technologies or make positive change when it comes to saving water.

CONCLUSION

The findings from two surveys conducted a year apart were presented using only the data from respondents based in the South East region of England. It was not possible to present the detailed findings from these studies in the limited scope of this paper. Therefore, the paper discusses the comparative change between the two studies in the context of water user awareness, attitudes, effect of metering and barriers to the adoption of water efficient technologies.

The findings of both limited studies show that the attitudes and awareness of the public is changing particularly in the South East as compulsory metering is implemented and permeates the region. However, it cannot be concluded that metering alone has led to the decrease in water consumption. This changing trend, confirming findings from other recent studies, is more likely as a result of metering combined with awareness and attitudinal interventions. Therefore, it is likely that this combination of the various strategies and water efficiency interventions has contributed to the downward trend in

water consumption in South East UK (Environment agency 2008; Climate change committee, 2012). It also appears that in the participants of these studies at least, there appears to be correlation between metering and consumer attitudes, awareness and the barriers that delimits them from taking action or adopting water saving technologies. The ensuing study will investigate these findings in a lot more depth which will hopefully proffer further insights and practical methods or strategies for water efficiency in the home.

REFERENCES

Chen, Y., Zhang, D., Sun, Y., Liu, X., Wang, N., Savenije, H.H.G., 2005. Water demand management: a case study of the Heihe River Basin in China. *Physics and Chemistry of the Earth, Parts A/B/C* 30, 408–419.

Climate Change Committee Adaptation Sub-Committee Progress Report, 2012, Climate change – is the UK preparing for flooding and water scarcity.

Clark, W.A., Finley, J.C., 2008. Household water conservation challenges in Blagoevgrad, Bulgaria: a descriptive study. *Water International* 33, 175–188.

Correljé, A., François, D., Verbeke, T., 2007. Integrating water management and principles of policy: towards an EU framework? *Journal of Cleaner Production* 15 (16), 1499e1506

Environment agency (2008) *Water resources in England and Wales – current state and future pressures*, Environment agency, Bristol.

Environment agency (2011), *Case for change- Current and future water availability*, Environment agency, Bristol.

Jorgensen, B (2009). Household water use behavior: An integrated model, *Journal of Environmental Management* Vol 50 pp 227-236

Kenney, D., Goemans, C., Klein, R., Lowery, J., Reidy, K., 2008. Residential water demand management: lessons from Aurora, Colorado. *Journal of American Water Resources Association* 44, 192–207.

Marsden, J. and Pickering, P. 2006. *Securing Australia's urban water supplies: opportunities and impediments. A discussion paper prepared for the Department of the Prime Minister and Cabinet, Marsden Jacob Associates, Camberwell.*

Stewart, Rodney A.(2010) 'Web-based knowledge management system: linking smart metering to the future of urban water planning', *Australian Planner*, 47: 2, 66 — 74

UN-Water. (2007). Coping with water scarcity, Challenge of the twenty-first century, World Water Day – 22nd March 2007, FAO, London. Available at: <http://www.fao.org/nr/water/docs/escarcity.pdf>

Uzzell D. (2009) 'The Futility of Resistance: Changing Attitudes to Waste'. London: London Technology Network (LTN) conference on Value from Waste: Generating Sustainable Bi-Products from Waste for Re-use