CAST BRIEFING 19 - October 2023

Managing Water Demand in a Changing Climate

Key points:

- People tend to support water-saving options that are voluntary and not financial, but some recognise that financial measures and restrictions are more likely to change behaviour.
- Support for financial measures is contingent on how fair people perceive the measures to be.
- The cost-of-living crisis is a motivator for people to reduce water usage and a reason that they think both incentives and disincentives would be effective.
- Many people see the intrinsic value of conserving water beyond financial/supply concerns. They recognise increased water stress as a reason to change behaviours.
- Most people think they are low water users, and this contributes to their willingness to support measures that penalise high water users (e.g., rising block tariffs).
- The ability of private water companies to engage customers in conserving water is limited by poor perceptions of the companies and their motivations.

Centre for **Climate Change** and **Social Transformations**

CAST is a global hub for understanding the systemic and society-wide transformations that are required to address climate change. Based at the University of Bath, our additional core partners are Cardiff University, the University of East Anglia, the University of York, the University of Manchester and the charity Climate Outreach.

Introduction

Climate change is expected to decrease available freshwater in countries across the globe, while simultaneously increasing water demand for drinking, cooling, and irrigation.[1] The first half of 2022 was the driest period in England since 1976[2] and such periods are expected to intensify and become more frequent.[3]

This will have a progressive impact on the availability of freshwater, with a potentially 'significant' shortfall in supply by as early as the 2040s'.[4] These changes may lead to water companies having to take more drastic action to manage water demand, particularly in areas that are already 'seriously water stressed' (e.g., East of England).[5]

This briefing paper presents results from a survey and a set of focus groups, which explored participant responses to potential future water management options. The work was part of a collaborative project between CAST and Anglian Water that aimed to better understand household water use and individual behaviour change.

Methodology

An online survey was completed by 1,212 Anglian Water customers in the Colchester area in September 2022. The survey sample consisted of 49% male and 51% female respondents, with 1% identifying as 'other'. 12% were aged 18-39, 30% were 40-59, 30% were 60-69, and 8% were 70 years of age or over. Most respondents lived alone (33%) or with one other adult (56%). 11% lived in a household occupied by 3 adults or more.

Four semi-structured focus groups were conducted in the Colchester area in October 2022. The focus groups consisted of six men and nine women. Three participants were aged 18-39, five were 40-59, six were 60-69 and there were three participants who were 70 years of age or above. Eight people lived alone, seven lived with one other person and two shared their home with two other people.

Support for Future Water Management Options

All participants were asked about the extent to which they would support or oppose a number of potential future water management options (see Table 1). Generally, people preferred options that are voluntary and not financial.

Survey participants were 'somewhat' or 'strongly' supportive of messaging (**61%**) and free devices (**57%**), with about half feeling the same way about subsidised devices (**52%**) and incentives (**49%**). There was some support for restrictions (**45%**), but less for rationing **(23%)**. Only a third of survey participants were supportive of rising block tariffs (**33%**), with even fewer supportive of seasonal or increased tariffs (**16%** and **7%**, respectively). **17%** of people would support friendly neighbourhood competitions (see Figure 1).

Focus group participants were also supportive of voluntary measures such as messaging (***'education, education, education!'***), and expressed some support for temporary usage bans that were '***short-term***' and '***reasonable***'. They were also willing to support financial measures if individual circumstances were considered and water companies did not profit from them (***'they have got to be fair***').

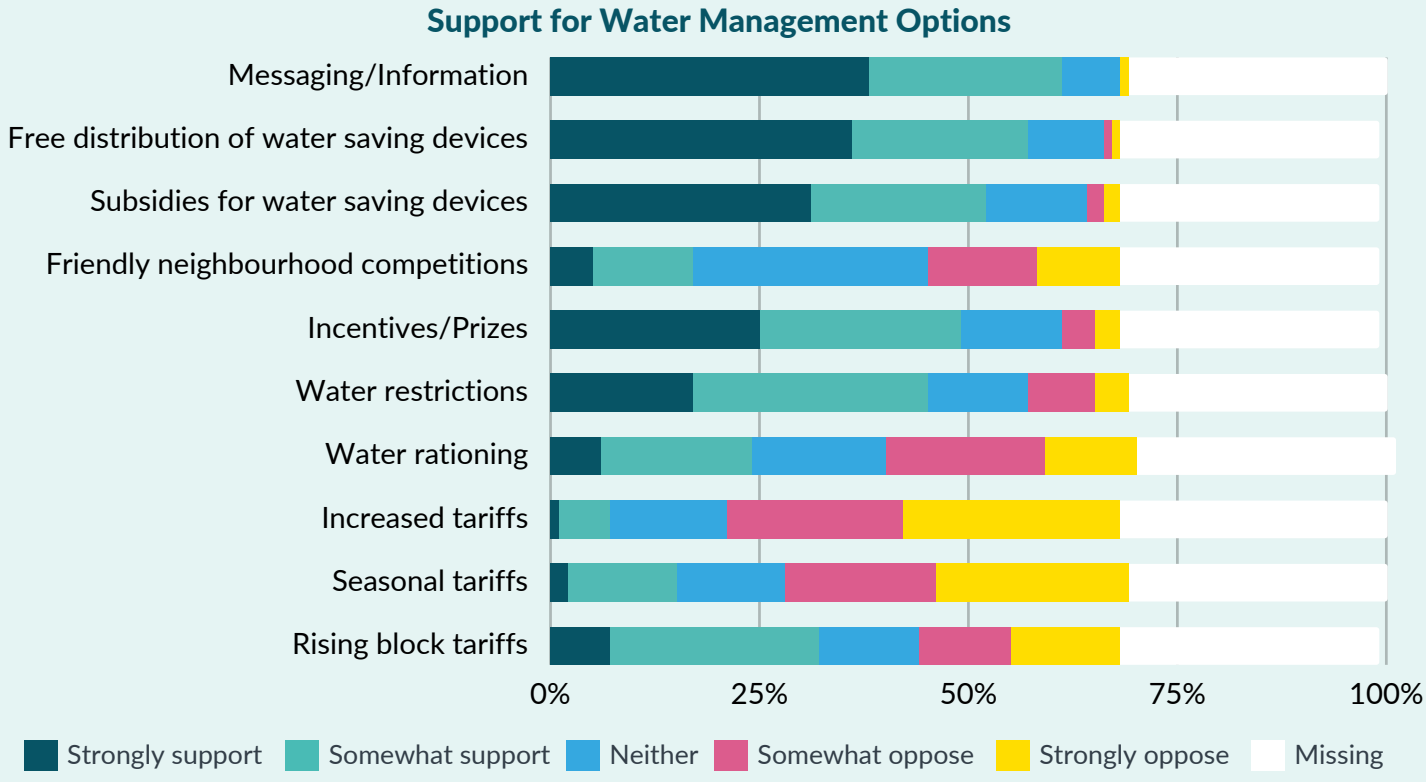

Figure 1: Support for Water Management Options

Results

Option	Description/Example
Messaging/information	Information about water levels, droughts, tips for saving water
Free devices/technology	Free distribution of water saving devices/technology (e.g., shower timers, water hippos) by water companies
Subsidies for devices/technology	Subsidies for water saving devices/technology (e.g., shower timers, water hippos) by water companies
Competitions	Friendly neighbourhood competitions (e.g., goals/targets and online scoreboards/rankings for water use via social media)
Incentives/prizes	5% off your water bill if you save over 15 litres per day over a certain period
Water restrictions	Hosepipe bans, rules around when and how water can be used
Water rationing	Limiting individual water use to 80/90/100 litres per day
Increased tariffs	The cost of all water would be higher
Seasonal tariffs	The cost of water would be higher during the summer and/or periods of low supply/drought
Rising block tariffs	The cost of water would increase as use increases (e.g., you would pay a low price per litre for water use up to 90 litres, a higher price for water use up to 110 litres and an even higher price for water use above 110 litres

Table 1: Water Management Options as Presented to Survey Participants

Effectiveness of Future Water Management Options

Participants were subsequently asked how effective they felt the presented measures would be (see Table 1). There were very few discernible differences in responses to this question.

About a third of survey participants rated free or subsidised devices, incentives and messaging as 'quite' or 'very' effective (**34%**; **32%**; **30%** and **32%**, respectively). There was slightly less confidence in financial measures: rising block tariffs were rated by **28%** of participants as 'quite' or 'very' effective, followed by increased tariffs (**26%**) and seasonal changes (**24%**). Just under a third (**30%**) of participants felt that restrictions would be effective, while **27%** were confident that rationing would make a difference. There was less confidence (**18%**) that friendly neighbourhood competitions would have any impact (see Figure 2).

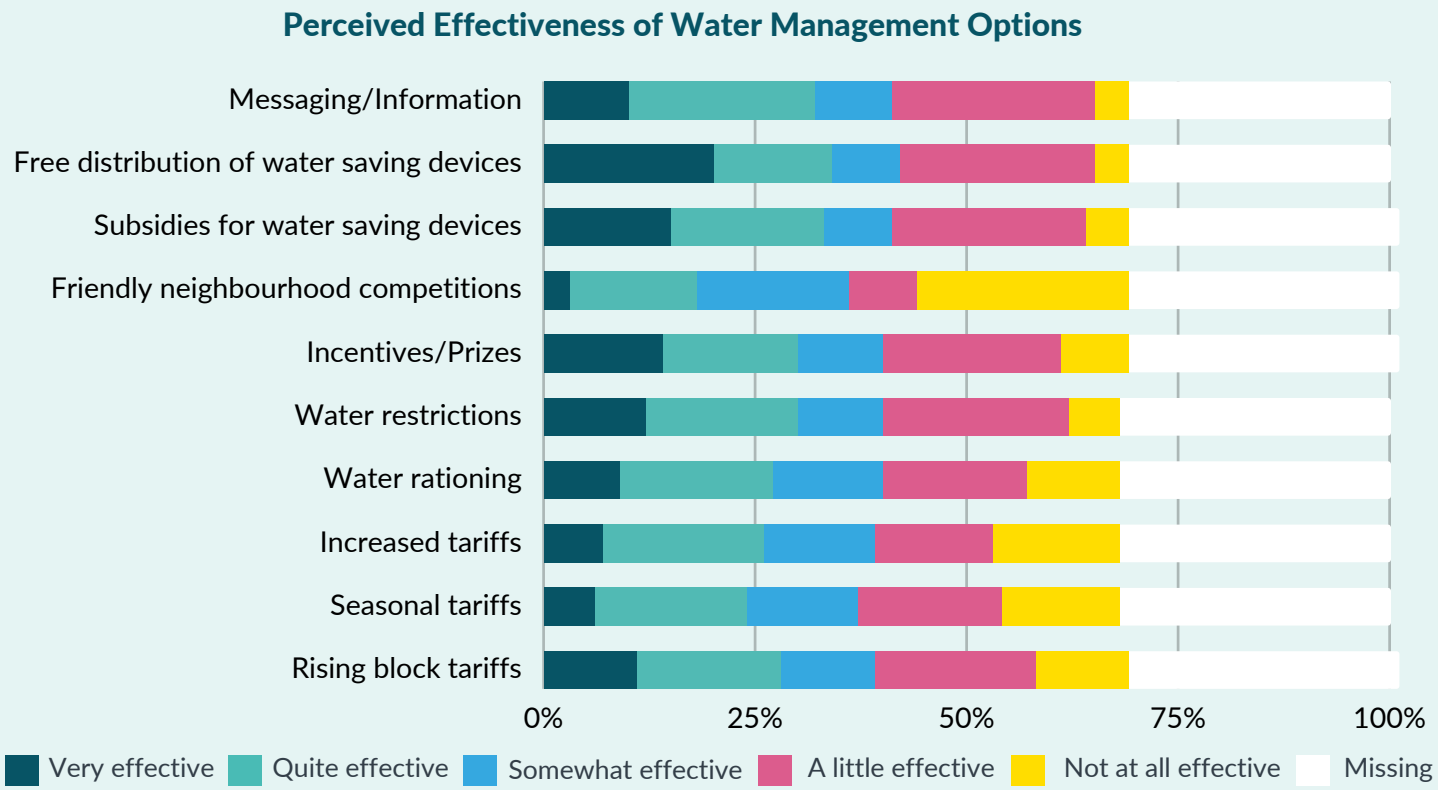

Figure 2: Perceived Effectiveness of Water Management Options

Focus group participants felt that education and information on how to save water was 'a good way forward' to change behaviour. When asked about restrictions, some felt that 'the majority would stick with them', while others argued that they were 'not enforceable' and would be ignored, especially by high water users. They expressed similar sentiments about financial measures. This option would be effective where 'purses are going to be tight' but would make little difference to the 'sorts of people' who could afford to buy a swimming pool in the first place.

Results

Survey participants were then asked to rank the three measures they felt would be the most effective. Here people recognised that financial instruments and restrictions are the most likely to change behaviour. Rising block tariffs were the most popular measure (20%), alongside the free distribution of water-saving devices (20%). This was followed by incentives (15%). Restrictions were similarly considered effective with (12%) selecting them as a top choice (see Figure 3).

Management Options in Order of Popularity/Example
Rising Block Tariffs (20%)
Free Distribution of Water Saving Devices (20%)
Incentives/Prizes (15%)
Restrictions (12%)
Messaging (9%)
Subsidies for Water Saving Devices (7%)
Increased Tariffs (6%)
Seasonal Tariffs (6%)
Rationing (5%)
Friendly Neighbourhood Competitions (less than 1%)

Figure 3: Management Options in Order of Popularity

Motivations for Responses

Finally, all participants were asked why they felt some measures would be more effective than others, and what would make them support particular options.

Participants who had selected financial measures (increased, seasonal or rising block tariffs) as the most effective argued that '***no one likes to pay more***' and that '***people cannot afford to pay more***'. There was a strong emphasis on the cost-of-living crisis: '***everyone is cost conscious, more so now than ever***'. Those who had selected restrictions argued that '***people only do things if they have to***.' In both cases, participants felt that these more coercive regulatory measures would '***focus people's minds***'; '**make people think**' or '***force awareness***'.

Several participants who had selected financial measures believed that they would not be affected by them: '***I suppose because I don't use that much [rising block tariffs] wouldn't really affect me***'. This self-perception of being an average or below average water user was shared by 91% of the survey and may underlie support for financial options. This self-perception was mostly incorrect with people vastly underestimating the amount of water they use on a daily basis.

Participants who had selected voluntary measures as the most effective felt that the free distribution of water saving devices or incentives would be '***encouraging***' and '***positive not punishing***'. The provision of information would work because '***messages will help people to see the problem***'.

Many participants see the intrinsic value of conserving water, with '***saving resources***' being the most common motivation (N=148) after cost (N=228). Participants variously described water as '***precious***', '***valuable***' and '***finite***'. This perception of water may also have influenced the extent to which people were willing to support measures that sought to protect it.

In addition, the survey was carried out after two periods of extreme heat and a prolonged drought. Participants were acutely aware of the potential for scarcity with focus group participants specifically citing it as a reason to support restrictive measures ('***I don't think people realise necessarily how bad it might get in the future…and that there will need to be big measures***'.)

Finally, where there was opposition to more coercive, regulatory measures, participants expressed some frustration about wider challenges such as leaks and sewage. Water management options were scrutinised in the context of the water company's perceived performance and priorities.

Recommendations

- Communication about different measures should be framed according to people's individual motivations (e.g., intrinsic value of water versus costs). A segmentation approach may be useful for this.

- More far-reaching regulatory measures such as restrictions should be tested or introduced during periods of water stress when people are more likely to recognise the necessity of their use.

- Given that people underestimate their own water use, the introduction of any complicated financial measures (e.g., seasonal or rising block tariffs) should be accompanied by an education campaign and the installation of smart meters.

- To increase support for financial measures, water companies should be clear about the design and application of different tariffs as well as the use and investment of any additional revenue.

- Increased trust in water companies may lessen opposition to regulatory measures. Clearer and more transparent communications are needed about the extent of problems (e.g., leaks), why they are difficult to solve, and how they are being addressed.

References:

- [1]Finley, S.L. and Basu, N.B., 2020. Curbing the summer surge: Permanent outdoor water use restrictions in humid and semiarid cities. *Water Resources Research* 55, 1-19.
- [2]MET Office 2022. Monthly England and Wales Precipitation. Available at: metoffice.gov.uk/hadobs/hadukp/data/monthly/HadEWP_monthly_totals.txt
- [3]Water UK, 2016. Water resources long term planning framework (2015-2065): Technical Report. Available at: Water-UK-WRLTPF_-Summary-Report_FINAL-PUBLISHED-min.pdf
- [4]Waterwise, 2017. Water Efficiency Strategy for the UK. June 2017. Available at: Waterwise-National-water-strategy-report.pdf
- [5]Environment Agency (EA), 2021. Water Stressed Areas – Final Classification 2021. Available at: Water stressed areas – 2021 classification - GOV.UK (www.gov.uk)

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