Water Security Awareness: A Playful Approach to Citizen Engagement

Introduction

Water security is a critical issue that ensures access to fresh water for survival and societal needs. Despite its importance, water security remains under-discussed in many countries, highlighting the need for increased public awareness and engagement (BSI, 2024).

Raising awareness through sharing knowledge is crucial but is not always enough (Simis et al., 2016). People's beliefs, experiences, and values all influence how they interpret information and engagement with any required behaviour change. People need time and may have many questions to parse new information through these biases.

By encouraging dialogue around water sustainability, we can help people connect the dots between water security challenges and their own lives (Ettinger & Painter, 2023). Such discussions can make space for individual and collective sensemaking. A time to reflect, interpret, ask questions, and share understanding.

Through the GREAT project (Games Realising Effective and Affective Transformation - https://www.greatproject.gg/) project, we explored playful ways to engage the public in discussions about water use online and connect individual use to the broader water system. The research used interactive and playful activities to help people reflect on their water consumption, understand supply and demand challenges, and suggest public behaviours to save a city from drought.

Overview of findings

Playful online activities helped participants feel more confident in understanding future challenges around water security. In some cases, they encouraged simple but meaningful shifts in behaviour, like turning off taps, taking shorter showers, and being more mindful of everyday water use. These activities created space for reflection and conversation between strangers, helping people converse about their household habits to broader sustainability goals. Discussions prompted consideration of supportive systems like SMART meters and water recycling. In this group, SMART meters were seen as empowering tools that could help people manage their water use more effectively.

However, limited knowledge in areas such as water recycling often held back deeper group discussions. This made it harder for participants to co-create priorities or express clear preferences. One strong theme that emerged was fairness: people felt that what counts as "fair" water use depends heavily on individual circumstances and context and should not be penalised for having different water needs.

Objectives

This work explores playful approaches to create discussion spaces that educate citizens about water security and sustainable water use. The primary goals were to:

1. Stimulate citizen awareness of water use.
2. Develop understanding of water supply and demand challenges.
3. Create a space for collective sensemaking on how to reduce citizen water use.
4. Examine the impact of taking part in these activities on individual water use.

What we did

19 people (female = 10, mean age = 46, min age = 22, max age = 71) took part in our research. In small groups (3-6), participants joined an online call. We used online video conferencing for these group discussions to maximise citizen reach, although understanding that online discussions can be more difficult to facilitate compared to face-to-face conversations. Participants then took part in three water sustainability activities (See **Activity Description** Section): A Water perception and use survey, data exploration of supply and demand challenges, and a dilemma game. These groups were then asked to take part in a reflection on their experience. One week later, they were surveyed again on their self-reported water use and perception of water supply in the UK. Full details of the methodology used can be found here: https://doi.org/10.34190/ecgbl.19.2.4083

Activity Description

All activities used an interactive presentation format called DiBL (Dilemma Based Learning - https://dibl.eu/). This allowed the groups to vote, input text, and receive rich media to guide activities (See Figure 1).

Activity 1: Water perception and use survey

Participants were surveyed on their water use in the bathroom, kitchen, and their perception of water supply in the UK. See Watson (2025b) for the full list of questions asked.

Activity 2: Data exploration of supply and demand challenges

Participants were given two graphs adapted from data collected by the National Audit Office (Davies, 2020, Figures 2 & 7). These graphs highlight the distribution of freshwater use in the UK and when supply will exceed demand if no adaptations occur. Participants were asked to create a title for a newspaper article that describes these graphs.

Activity 3: Playful dilemma game

In the third activity participants, were part of an organization tackling a city's drought water crisis (See Figure 1). Key to saving the city from water insecurity is reducing citizen water use. The group analysed data on population water usage and were then given the challenge to suggest citizen behaviour changes and supporting policies to halve bathroom water use. The dilemma was to balance water conservation with proposing acceptable changes. Success restored water security, while failure revealed consequences of inaction. See Watson (2025a) for details on this design and Watson (2025b) for screenshots of dilemma delivered through the platform.

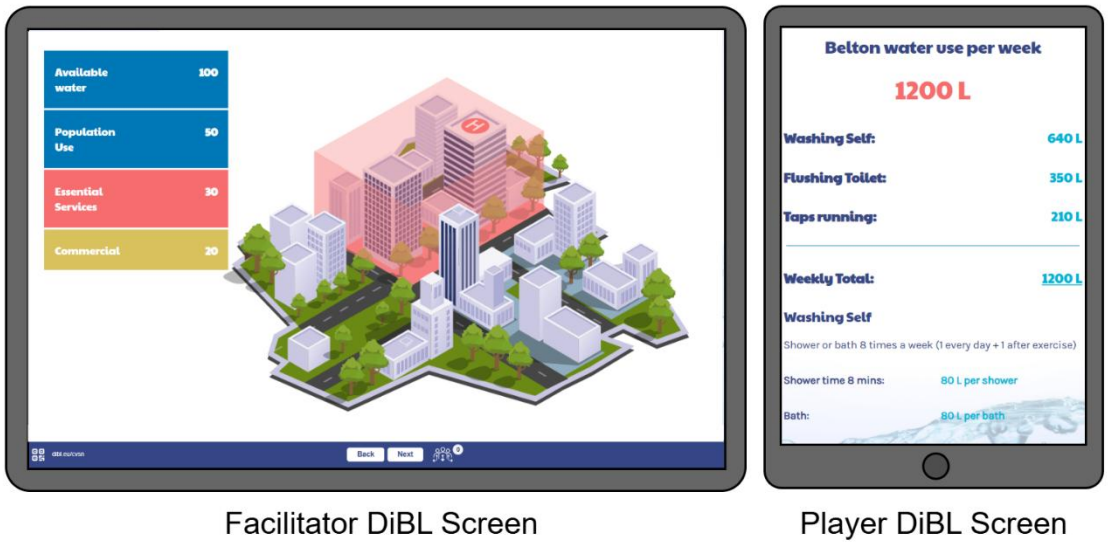

Figure 1. Image from Watson (2025a) showing the two screens that people taking part in the discussions had access to. On the left is the facilitator screen delivered through a video conferencing platform to direct the overall flow of activities. On the right is the player screen accessed through a web tab on any device to give further information on activities, access to vote, and input text in the main thread of the discussion.

One week later

A follow-up survey was conducted that asked the same questions as activity 1 to assess any changes in perceptions or behaviours.

What we looked at

We analysed discussions across all activities for vocalised signs of reflection, knowledge sharing, awareness of water supply and demand challenges, and where sensemaking for sustainable water use occurred. We compared the survey results from activity 1 and the follow-up survey to explore any impact from taking part in these playful activities on self-

reported water use, perceptions of water supply and demand challenges, and any perceived changes in water use.

Key Findings

Increased Reflection and Awareness: Survey results suggest a greater confidence in understanding own water footprint and water supply and demand challenges faced in the UK. (See Figure 2).

Greater Concern: Survey results suggest an increase in considering water use from taking part in these activities, but this did not translate to greater discussion of water use with others.

Behavioural Change: Some individuals reported a large reduction in shower use and tap running. Half of the participants reported no change in water use after taking part in these activities. This is not to say that they needed to change their water habits, though, as many participants described sustainable water habits within discussions. Half of the participants mentioned a reduction in water use through showers, leaving running taps, and general consideration of their water use. It is likely that taking part in these activities nudged easy wins but not changes that require significant energy.

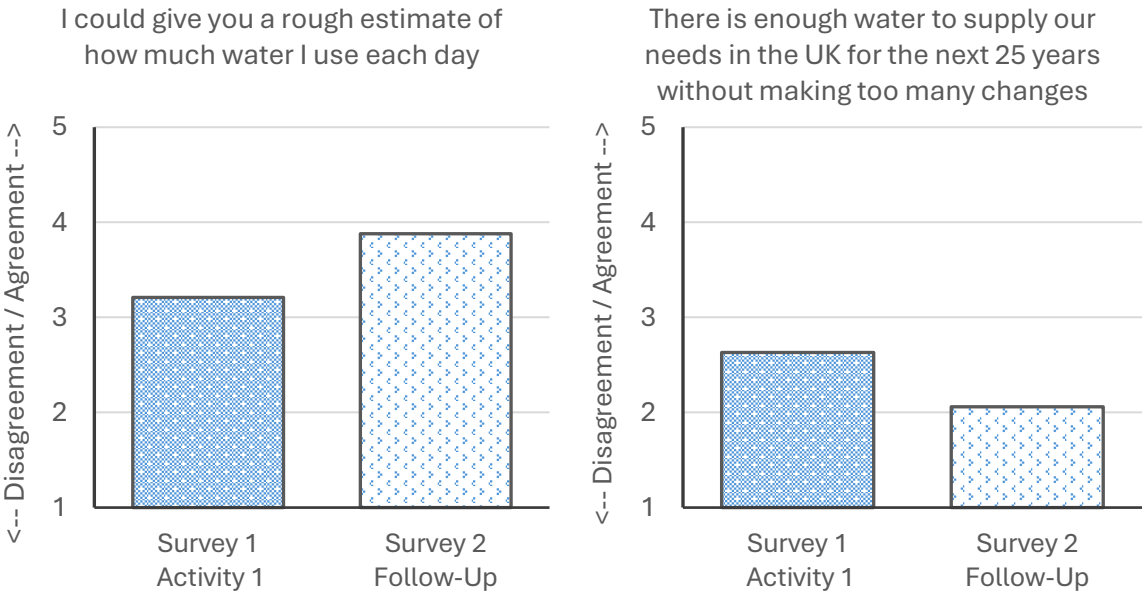

Figure 2. Bar charts adapted from Watson (2025a), showing the agreement response (1 = strongly disagree, 5 = strongly agree) to Likert questions from the survey administered in activity 1 and the follow-up survey one week after the activities. Participants showed greater confidence in estimating own water use and showed more agreement that changes are required to maintain water security.

Activity	Discussion Summary
1: Survey	Reflection on own water use occurred with inquisition on water volumes. Reflection was vocalised at a surface level with interest in how results might compare to known averages.
2: Data Exploration	Inquiry into what drives water distribution was common with an effort to interpret why sectors may be increasing in water use (data centres). Discussions were more easily framed at a system level. Concern about water supply was also present as well as acknowledgement that public water use is a significant “chunk” of freshwater reserves.
3: Save the City - Dilemma	Discussions focused on sensemaking of sustainable water use. What water habits could be reduced, and what supportive measures might help this. A wide-ranging discussion that drew from individuals’ water stories and knowledge. Reflection on own water use was also present as well as empathy to the needs of different demographics.

Table 1. Activity impact on discussion content

Sensemaking on Water Sustainability: Discussions about water sustainability focused on individual behaviour changes and supporting infrastructure (SMART metering, dynamic pricing, water awareness messaging), with some broader systemic critiques that water sustainability requires leadership from water companies for it to be fair to ask citizens to change their habits.

- Participants saw the effectiveness of reducing shower times. Approaches to messaging that encouraged less water use focused on additional benefits like better hair and skin condition with fewer showers, cost to the environment, and water use targets.
- While most participants considered water saving devices worthwhile, they believed such a change would be cost-prohibitive.
- It was noted in discussions that what is fair use for one demographic is not fair use for another. For example, a family’s water use is quite different from a retired couple. Any changes in behaviour or system to support less water use should not penalise another demographic.
- SMART metering was seen as a promising idea if it did not lead to punitive or micromanaged consequences. SMART metering was viewed as a positive tool to empower individuals with knowledge of their water use to then adjust their behaviour. Such data may help develop "water culture" and playful competition in reducing water waste.

- The concept of water re-use was viewed very positively but there was little knowledge of what this might look like in the home.

Effective Engagement: The playful activities appeared successful in fostering sustainability discussions among strangers online and helping people reflect on resource use. However, there was a technical overhead required to take part, which may put off individuals or limit their engagement. This at times needed technical support to continue with the sessions.

Implications

The research highlights several important implications for engaging citizens with water use and how this can inform supporting policies.

1. **Stimulate citizen awareness and reflection on water use:** The methods used in this work can support individual reflection on water resource use, share stories of water use, and relate to others' views. Early activities promoted general knowledge exchange of water use, and the dilemma game fostered a goal to use this knowledge in support of water security. Knowledge of own water footprint does appear to increase through these activities. However, the goals of what this footprint should look like to be considered sustainable are less clear through this method and so should be a focus of future work.

2. **Develop understanding of water supply and demand challenges:** Through the data exploration activity, we were able to educate and start a discussion on broader concepts like water supply challenges and water distribution within a city. It is likely that this activity helped increase agreement that changes are required across citizens and industry to support future water needs.

3. **Create a space for collective sensemaking on water sustainability:** The data exploration activity and dilemma game did foster inquiry and sharing personal water stories. The dilemma game was able to support discussions on how to reduce home water waste. The goal of reducing water when the scenario requires immediate action helped co-create ideas and discussion on what sustainable water use could be and what supporting policy / infrastructure may help achieve this from a citizen perspective. However, these discussions were also limited by the knowledge of those who took part and did not always lead to concrete actions that the group could implement. This suggests that, as a discussion space, a playful dilemma worked well but may require additional content or roles to encourage greater focus on actionable changes. People found the framing of water volumes in terms of bottles and wheelie bins much easier to understand than litres. In at least one individual, this framing made them understand how much water was wasted when leaving the tap on.

4. **Examine the impact of taking part in these activities on individual water use:** From taking part in these activities, participants reported more concern and attention to

their water use. Some behavioural impacts were reported in individuals with a purposeful reduction in water use. But this was not reported across the group. It is likely that the approach nudged easy wins within the home, like shower time reduction and turning off running taps.

5. **Engagement in an online environment:** Playful activities can create meaningful spaces for citizens to exchange ideas and preferences on water use. The approach was received positively to foster small group discussions online. Participants enjoyed the interactions between each other (sharing stories and ideas). Facilitation of these discussions is important, so all voices are heard and minimise social desirability biases and groupthink. Some participants had technical issues that could be solved on the day but highlight consideration to reducing these barriers as much as possible.

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