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## Freedoms Ebb and Flow: Boaters' Experiences of Water and Sanitation Insecurity on the Inland Waterways of England and Wales

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**ABSTRACT:** This article explores how boat dwellers on the inland waterways of England and Wales – 'Boaters' – experience water and sanitation services. Boating populations are not counted as customers of private water utilities, so they exist within the 'dwelling paradox' and are positioned at greater risk of water and sanitation insecurity. Interviews and auto-ethnography document a myriad of ways in which participants use these resources on different vessels and waterways. The Capability Approach emerges as an apt framework for representing nuanced journeys from water and sanitation access to perceived quality of life. Findings suggest that equitable services can be defined as those which enable Boaters to live in ways they value. This entails reckoning with diverse – and potentially divergent – definitions of a 'good life', supported by the personal freedoms to achieve it. We argue this research makes a strong case for centring lived experiences in service design, particularly in instances of disagreement on the constitution of adequate service levels. Co-creating knowledge with people living in the dwelling paradox reveals complex relationships with authority and exclusion. We extend this theory, and the principles of equitable service delivery, to emphasise the situated desires, choices, and freedoms of the populations in question.

**KEYWORDS:** Water and sanitation, dwelling paradox, Capability Approach, health, wellbeing, canals, rivers, itinerant dwelling, household water insecurity, United Kingdom

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### INTRODUCTION

*The people living on the water will find ways to survive. They will make it work. But (...) how good is their wellbeing while they survive?<sup>1</sup>*

Itinerant populations living on the waterways have always adapted their resource use around their lifestyle patterns. Many water points are located in locks, because historically this was the only chance a merchant boat would get to stop briefly and fill up, a design that perplexes many modern Boaters; "If you don't understand the history of the canals, it doesn't make sense".<sup>2</sup> Today there are over 35,000 boats on the 2,000 miles of inland waterways managed by the Canal and River Trust (CRT) in England and Wales (E&W) (Canal and River Trust, 2022), with growing numbers of people moving on board in search of

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<sup>1</sup> 11, 18 May 2022

<sup>2</sup> 18, 30 May 2022

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affordable housing.<sup>3</sup> Public attention to canals and rivers as dwelling and leisure spaces is increasing due to rising housing costs and Covid-19 lockdowns, creating pressure on those living on the water. The essential services that enable Boaters to live well are hence more important than ever. This research asks how Boaters today meet their water and sanitation needs and how these services affect their lives more widely. We focus on human diversity, looking at the plurality of Boaters' experiences as a way to explore the issue of water and sanitation insecurity in E&W.

### The water industry and the dwelling paradox

In recent years there has been a swell of public interest in the national water industry, following revelations concerning sector profit, drought, and sewage discharge (Buse and Bayliss, 2022). This has propelled disintegration of the belief in 'modern water' – the idea that clean, affordable water is available to everyone via trustworthy systems of provision (Meehan et al., 2020). Although modern water narratives are widespread in high-income countries (HICs) research refutes them, finding stark systemic inequities in areas of the United States, New Zealand, and Australia (Te Aho, 2010; Deitz and Meehan, 2019; Hartwig et al., 2022). These studies support wider theory which argues that active or passive exclusion from water and sanitation services can exist anywhere, regardless of a country's income level (Jepson and Vandewalle, 2016; Sultana and Loftus, 2020; Brown et al., 2023). There remains a dearth of research on service inequity in E&W, despite a systemic context characterised by power disparities. Strang (2016: 310) describes national water governance as "a rather alarming picture of water and power moving away from societies, upwards and outwards to a largely undemocratic, unaccountable and untouchable transnational and potentially 'despotic' regime".

Political economists have shown that, at the corporate level, the water industry in E&W prioritises profit and 'financial engineering' over the people who rely on services (Loftus et al., 2016; Bayliss, 2017). Thus, we argue that hidden dynamics in governance processes can be revealed by those who use services in alternative ways. Recent literature has brought attention to the situation of unhoused populations. Meehan et al. (2022) establish the concept of the 'dwelling paradox' (DP), revealing how those experiencing homelessness are often unable to meet their water and sanitation needs due to lacking a private and stable housed environment. Sylvester et al. (2023) question the institutional responsibilities for providing services to 'non-customer groups', broadly defined as people not living in 'standard' dwellings or living in dwellings with non-standard service connections. Such groups may include boat dwellers; Gypsy, Roma and Traveller (GRT) peoples; van or caravan dwellers; refugees and displaced persons; those living 'off-grid'; and those experiencing homelessness. How these populations access water and sanitation services in E&W is unregulated and widely unknown,<sup>4</sup> and in the case of GRT peoples often intersects with direct political discrimination, as highlighted in John (2022).

The DP theory has revealed how the state actively produces spaces of entrapment and water and sanitation insecurity for unhoused populations in many HICs (Meehan et al., 2023). Approaching the DP from the bottom up, this study sets out to investigate how such spaces are perceived by some of the people existing within them. Boaters on the inland waterways of E&W are a novel group on which to focus, with the nuances and diversity among them revealing new insights into what the DP means within their lifeworlds and what this says about the concept of equitable service provision.

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<sup>3</sup> This is a particular issue in London; Canal and River Trust figures state that boats without a home mooring on London's waterways numbered 2208 in 2019, up 246% from 638 in 2012 (CRT, 2019: np).

<sup>4</sup> The campaign group *Friends, Families & Travellers* drew attention to these issues in relation to Covid-19 lockdowns by providing guidance to assist Local Authorities in supporting these populations in March 2020: <https://www.gypsy-traveller.org/news/covid-19-guidance-for-supporting-people-living-on-traveller-sites-unauthorised-encampments-and-canal-boats/>

Figure 1. Accessing water as an itinerant boat dweller.



Note: Accessing water as an itinerant boat dweller involves navigating to canal-side taps, most of which are provided and maintained by Canal & River Trust, such as this one on the Regent's Canal in Angel, London. On this busy Sunday afternoon there was a queue of three boats waiting to fill their tanks, necessitating a likely wait of over two hours (depending on water pressure, number of boats, and the volume of their tanks).

### The contemporary canalscape

The population of focus and sub-groups within it are sometimes referred to as liveaboards, Boaters, or Bargee Travellers, the latter being a term for an ethnic group descended from nomadic working boat families (UK Parliament, 2019). Identification with these labels is complicated by the different ways in which people use their boats for dwelling and leisure, as well as by the demographic diversity that has resulted from more people moving afloat due to rising housing costs, particularly in London (Bowles, 2019). We use the most commonly used emic term, 'Boaters', whilst acknowledging the diverse ethnic backgrounds, livelihoods, and politics among a group that is diverse in terms of gender, age, class, socioeconomic positioning, and occupation.<sup>5</sup> The myriad different ways in which Boaters understand themselves as living 'off-grid' illustrate the kaleidoscope of differences among this group and inform the ways in which they may shift their priorities and make different choices in dynamic circumstances. As this research reveals, this has important implications for their attitudes to service provision and definitions of water and sanitation insecurity.

<sup>5</sup> Additionally, the term Boater is used under the grouping of Traveller in UK government policy making, as part of "a range of ethnic groups or people with nomadic ways of life who are not from a specific ethnicity" (UK Parliament, 2019).

There is a nascent body of social science literature on Boaters, largely centred on the London waterways and tackling community identity and participation through material practices (Bowles, 2016, 2017, 2019); gendered performances of competence and belonging (Roberts, 2019); and reflections on the housing crisis and the desirability of 'nomadic' mobility (Scovazzi, 2016). Strikingly, in several cases this research was undertaken by anthropologists residing on boats themselves (in addition to Bowles, Roberts, and Scovazzi, see Malkogeorgou, 2019). Research on mobile tourism has examined the different attitudes and practices adopted by boat owners and dwellers versus holiday hirers (Kaaristo, 2018: 262), revealing 'codes of conduct' around mundane aspects of boat life – toilet, shower, and laundry facilities (Kaaristo, 2018: 146). Kaaristo and Visentin (2023) consider the presence and absence of water in the inland waterways using affordance theory, in the UK and Italy. Elsewhere, Bowles (2019) has analysed Boaters as an 'alternative' group with a fraught relationship to the navigation authority, the CRT.<sup>6</sup> Bowles (2021: 29) argues that this "longstanding series of conflicts with the authority tasked with managing and maintaining the waterways" informs intra-community relations among Boaters, extending the idea to remark on this antagonistic relationship as a foundational element of the 'community' itself, as "a large part of what binds them together".

Figure 2. Additions to official signage illustrating diverse Boater frustrations – with each other, and with the CRT – on the Kennet & Avon Canal.



Note: It is generally accepted that each boat should vacate the water point as soon as its tank has been filled.

Community is a contested concept, and one that can cloak dissimilar associations and attachments (Clark, 1973). This is equally the case on the waterways and among Boaters. An important factor in the relationality between different Boaters is what attracted them to the lifestyle. To some, this was its off-grid and alternative nature, whereas to others it is seen as an essential form of affordable housing (Shepherd, 2016; Sterrit, 2022). Most Boaters' lifestyles are characterised by mobility practised in the contemporary canalscape, historically rooted in the industrial geography of 18th century Britain (Wallace

<sup>6</sup> The Canal and River Trust is a charitable trust which in 2012 took on responsibility for the waterways in England and Wales from its predecessor, British Waterways.

and Wright, 2022). For the purposes of this article, it is important to recognise that relationships with mobility – mediated through both the physical canal environments and the CRT's regulatory environment – enable or restrict Boaters' freedoms, most obviously in terms of moorings, but also in terms of basic resources. Kaaristo and Rhoden discuss both water and toilet facilities as key among the 'mundane' considerations that dictate the mobility of both a boat and its occupants, observing that "water, therefore, serves as a temporal structuring device both for the mobility of the boat as well as the Boaters on board" (2017: 90). On most of the canal system in E&W, Boaters' access to utilities is wholly mediated by the CRT.<sup>7</sup>

By engaging with these complexities, this paper explores how Boaters meet their basic needs using existing water and sanitation services, including the range of issues they face, the strategies they employ, and analyses the implications for their lives more widely. This produces an extension of the DP theory in a novel context and from the bottom up. Situating it on the inland waterways of E&W provides new insights into how it operates structurally, as well as what this means in reality for people dwelling in the liminal spaces between political resistance, autonomy, and exclusion. This article begins by outlining the use of Sen's Capability Approach (CA) as the analytical framework underpinning our ethnographic research, followed by a methodological reflection centred on the authors' 'insider-outsider' dynamic. Our findings are then described sequentially, taking the theoretical journey of the CA from service availability (resources) to experiences of access (conversion factors) and wider life implications (capabilities). These stages and their components are outlined in Figure 3. Conclusions are drawn regarding what equitable services could entail for this distinct population, as well as for other groups who may find themselves confronted with the realities of life within the DP.

### **THE CAPABILITY APPROACH: AN ETHNOGRAPHIC ANALYTICAL FRAMEWORK**

The CA has become foundational in the field of international development as a means of assessing people's health, wellbeing, and overall quality of life (Sen, 1974, 1979, 1985). Integral to this approach is a person's freedom to choose what a 'good life' means and looks like to them. Sen's theory is growing in popularity as an analytical framework for researchers interested in evaluating quality of life and systems change grounded in people's lived experiences (Kimhur, 2020; Van der Boor et al., 2020). Given the ethnographic nature of this study, the experiential emphasis of the CA made it an appropriate framework for analysing our findings and pinpointing the journey from resource availability to access, use, and wider life impacts.

With the CA framing our study, we were also able to generate broader insights into the field of water and sanitation capabilities research, building on the existing literature. Water as an essential resource for supporting human capabilities is established by Mehta (2014). Jepson et al. (2017) extend this concept by theorising water security as a network of hydro-social relationships which support or restrict human capabilities. Wutich et al. (2017) support this development, arguing that definitions of household water insecurity should include human rights and capabilities. Sanitation was first conceptualised as an essential resource for human capabilities by Barrington et al. (2017). Later, an empirical study conducted in Maputo, Mozambique assessed sanitation interventions from the perspective of the CA, finding that people's quality of life was affected to different degrees based on their capacities to 'convert' sanitation resources into capabilities (Ross et al., 2021). Most recently, an instrument to measure quality of life as derived from sanitation was proposed by Ross et al. (2022).

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<sup>7</sup> This is in spite of the fact that there are dozens of navigation authorities in the UK, significantly including the Environment Agency (responsible for the River Thames, River Medway, and the rivers of East Anglia), the Broads Authority (Norfolk and Suffolk Broads and adjacent waters), and the Canal and River Trust (most canals and some rivers, such as the Severn, Trent, and Ouse). For a map outlining these, please see: <https://waterways.org.uk/waterways/using-the-waterways/waterways-directory>

We considered this approach an apt framework for analysing themes arising from interviews and auto-ethnography. Although Boaters' experiences varied greatly at the individual level, the impacts of water and sanitation access were far reaching in the lives of all participants. Services enabled or restricted people's wider wellbeing and capacity to live in ways that they desired and valued. During the second round of data analysis, interview transcripts were coded using thematic analysis based on the CA, with the authors seeking to group experiences without losing the individual stories behind them. The use of full quotes and consistent threads of feelings and attitudes were central to this synthesis process.

Capabilities are defined as the 'real opportunities available to a person' or 'freedoms to achieve' (Sen, 1985). Essentially opportunities, and the freedom to take them, allow people to choose how to live and achieve their desired quality of life. Sen did not define specific capabilities, leaving this open to interpretation and to contextual relevance (van der Boor et al., 2020). Nussbaum (2011) has produced the most well-established set of ten core capabilities for human life. We base our analysis on Nussbaum's definitions, discussing the specific effects of access to water and sanitation services on certain capabilities in the last section. This is the culmination of the article, which is arranged in such a way as to guide the reader through the capabilities journey, as illustrated in Figure 3.

## RESEARCH METHODOLOGY

### Practice and proximity

This article draws on broader knowledge from an ongoing research project on experiences, rights, responsibilities, and participatory action among Boaters in relation to essential services.<sup>8</sup> This paper is confined in scope to Boaters' lived experiences of water and sanitation, based primarily on semi-structured interviews. In terms of the presence and positioning of 'service providers' (such as the CRT and water and sewerage companies), we limit our present discussion to observations of these actors raised by our interlocutors (chiefly concerning their suspicions that those responsible are deliberately denying or degrading service provision). The complexity of the issue of rights to, and responsibility for, these services forms part of our ongoing research project but falls beyond the scope of this article.

One of the authors has lived on a narrowboat for the past seven years, and the research design was therefore informed by extensive participant observation and auto-ethnographic knowledge. Throughout this paper, we have included images taken during 'fieldboating' (Kaaristo and Visentin, 2023) across the waterways of London and South West England, with descriptive captions reflecting on the experience of accessing essential services as a live-aboard Boater. This serves to holistically illustrate the issues at hand, whilst further reflecting on researcher positionality.

The research team comprised one Boater and one non-Boater, leading to an iterative process of reflecting on this 'insider-outsider' pairing and subsequent perspectives on the research. In the planning and interpretation of the research activities, the insider perspective was prioritised and was crucial for creating research that would be relevant to the Boating population. One aspect of this was the awareness of the growing interest in researching the Boating community and being wary of increasing perceptions of surveillance of or data extraction from participants. Another aspect of this 'insider-outsider' perspective was the dynamics that emerged during interviews. For example, with the non-Boater researcher, participants often assumed no prior knowledge of 'boat life' and so took care to delineate practical and material details of boat systems and daily practices. This resulted in an interview style with more distance between researcher and interviewee, which for the most part seemed positive, enabling people to speak with authority and separation from the interviewer.

The 'insider' researcher adopts an auto-ethnographic approach to their work in order to situate themselves in debates surrounding canals as dwelling spaces – a reflexive analysis which complements

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<sup>8</sup> For more information: [www.waterdweller.com](http://www.waterdweller.com)

participant observation to uncover the situated, embodied, material, practical, and emotional aspects of these issues. With an ongoing commitment to this community of practice and way of life and a desire for Boaters' concerns to have a balanced hearing, they each approached this research with the intention of building relational knowledge *with* Boaters rather than of extracting knowledge or 'data' *from* them. Although reckoning with this embedded status is not without its difficulties (see Scovazzi, 2016, for a thorough discussion of positionality as a Boater-researcher), working through an iterative insider-outsider dialogue as a research team has allowed us to avoid the key issue of partiality whilst benefiting from a level of access, immediacy, and understanding.

### Relational knowledge-building

Semi-structured interviews were conducted between May and July, 2022, with 17 Boaters who signed up to participate through online channels. The recruitment process was limited by the exclusion of people without an online presence and those who might not naturally put themselves forward. Interviews were conducted remotely due to Covid-19 precautions, although this was also a restriction for people who did not have the technology to participate in this way. The researchers believe that vulnerable or low-income Boaters are underrepresented in the participant group. These are often the Boaters with the most complex needs and most challenging circumstances, although "looks can be deceiving (...) and it is not true to say that all boats that look scruffy on the outside are thus on the inside. Nor can it be said that vulnerable people with health needs cannot be found living on 'shiny' boats" (Worrall, 2019). This may have impacted the severity and extent of the effects of water and sanitation resources' upon core capabilities in this study.

Participants' demographics and intersectional identities were of interest to the researchers, but an exploratory approach was taken allowing participants to reveal how personal characteristics interacted with their water and sanitation needs, if they wished. In most cases, demographic-related factors came out naturally in the conversations, but a final broad question was asked at the end of each interview to prompt the interviewee to consciously think about any factors they would like to disclose.

Demographics and Boater type (referring to the many types of both boats and Boaters on the waterways and how they choose to live and cruise) were not specified in the recruitment process, as the researchers wanted to incorporate a range of perspectives. For the purposes of participation, we defined 'Boater' in the broadest possible sense, but we asked participants to self-identify within a range of categories (e.g. liveaboard, leisure, home mooring or not) related to how they use their vessel and their access to services. Boaters who identified as liveaboard (living full-time on their vessel), continuous cruisers formed the majority of those interviewed. This arguably reflects their level of interest in the topic of essential services and their motivation to discuss this as an issue that has an immediate impact on their lifestyle.

The activity defined as "continuous cruising" is protected by legislation (British Waterways Act 1995),<sup>9</sup> which makes provision for boat owners without a home mooring to navigate the inland waterways, "provided they do not stay more than 14 continuous days in any one place" (NBTA, 2012). The interpretation and enforcement of the powers outlined in this Act by British Waterways, and subsequently the CRT, has been the subject of intense debate among waterways campaigning groups and individual Boaters. In particular, opinions differ on what constitutes moving on a continuous progressive journey, in terms of how many miles must be covered in a licence period and the interpretation of the word 'place'. For some licence holders this ambiguity around governance and access contributes to a sense of anxiety, felt by many Boaters, concerning the future of the waterways as dwelling spaces.

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<sup>9</sup> British Waterways Act 1995 Chapter i Section 17 (3) (c) (ii) states that it is necessary, in order to licence a boat, that "the applicant for the relevant consent satisfies the Board that the vessel to which the application relates will be used bona fide for navigation throughout the period for which the consent is valid without remaining continuously in any one place for more than 14 days or such longer period as is reasonable in the circumstances" (*British Waterways Act 1995*).

This issue can be compounded by an individual's generalised distrust towards institutions, as noted in previous Local Authority-led research. For instance, a report by Bath & North East Somerset Council was presented with the caveat that, "one problem we have encountered in our dialogue with Boat Dwellers is their suspicion of officialdom, based on bad experiences in the past" (BANES Council, 2013: 3). It also manifests in accusations that the CRT are trying to price itinerant boaters without a home mooring off the waterways, seen for example in responses to the recent announcements about above-inflation increases to licence fees for five years from April 2024, coupled with a surcharge for boats that continuously cruise (CRT, 2023). The campaign group National Barge Travellers Association (NBTA) have described this move as "a thinly veiled objective to price itinerant boaters off the water" (NBTA, 2023). For significant sub-sections of the boating population, relations with the CRT are marked by suspicion and mistrust, which renders communication around the provision, maintenance, and future of essential services difficult. The CRT's 2021 Annual Boater Satisfaction Survey documented "a fall in the Overall Satisfaction KPI from 60% in 2020 to 54% in 2021" as part of a "significant long-term trend of falling overall satisfaction and a trend of rising dissatisfaction" (2021).

As we will go on to explore, these anxieties become imbricated with concerns around the potential loss of services such as water and sanitation and the impact this would have on the viability of a life afloat. As Malkogeorgou (2019: 216) writes in a recent ethnographic description of continuous cruising in London: "Most of the debate among boaters – and between boaters and [the CRT] – is focused on access to bins, Elsans and water points, the state of the locks, the banks and mooring spaces, or the lack of space". Relational knowledge building necessitates an understanding of the contextual reality of accessing essential water and sanitation services. These complex threads of trust, provision, and communication are not only crucial background for the non-Boater reader, but also help to elicit the deeper meaning of the presence of, absence of, or changes to service points. The following section describes how some Boaters directly experience and use services as resources that give them the 'means to achieve'.

## **WATER AND SANITATION RESOURCES**

Human health and wellbeing are determined by the availability of essential resources for life. This is the starting point of the CA. For Boaters, water and sanitation take a variety of forms but in all cases are key to quality of life, both objectively and subjectively. In the following ethnography we learn from those dwelling on the inland waterways about the important nuances of systemic exclusion within this space, created by the DP, and the diversity of both their attitudes and actions in response to it. We use the sequential structure of the CA to communicate our findings, visualised below in Figure 3.

This section begins with a description of water and sanitation resources, which we theorise to be a combination of boat technologies and waterways services. This brief detour into the practicalities of service availability underpins the following two sections, where we explore lived experiences of access (how boaters 'convert' these resources) in order to analyse the wider life implications (in terms of capabilities or 'freedoms to achieve'). Thus we move beyond a flattened picture of all boaters as marginalised consumers, assumed to want or need constant access. Rather, a capabilities framing helps to balance this with an understanding of the divergent desires and requirements of a diverse population.

### **Water**

Most boats have a large water tank on board. Boaters told us of tanks made of steel, stainless steel, or plastic, with older steel tanks often causing water discolouration due to rust. Tank sizing varied between interviewees, ranging from 175 to 700 litres. Some canal boats contain an integral water tank in the bow, with one interviewee describing how their tank sits at the back of the boat, creating substantial imbalance.



Figure 3. *Top line*: the Capability Approach (CA) as theorised by Sen, conceptualising how resources are converted into human capabilities. *Bottom line*: the analytical framework for this study, based on the CA. This line also shows how the results and discussion sections are arranged in this article.

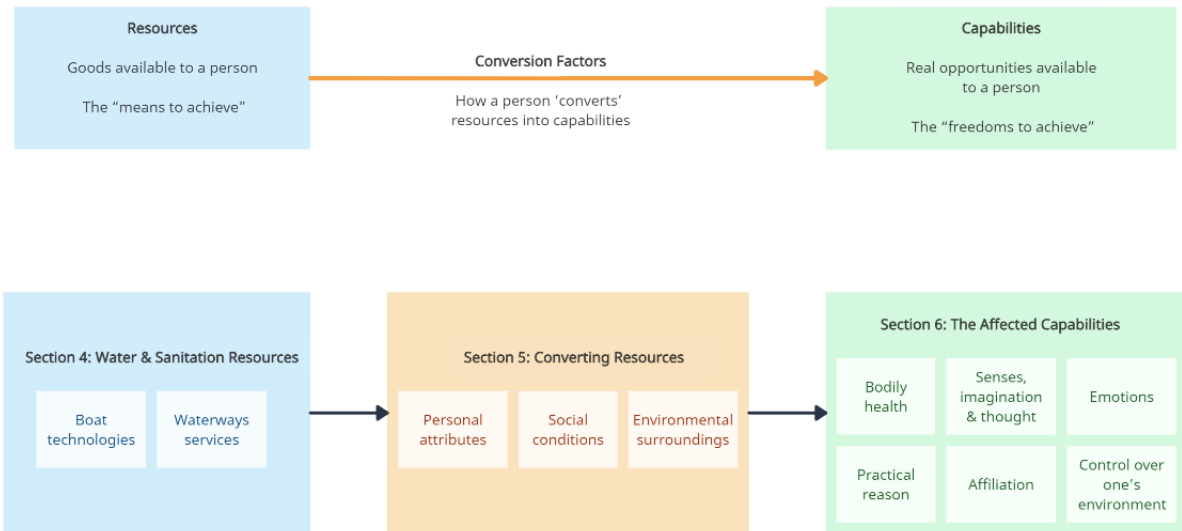


Figure 4. A2’s integral steel water tank, painted with potable paint.



Note: The expanded foam tape around the opening was added in an attempt to keep out dust and debris (and occasional worms and spiders). Although it’s good to be able to keep an eye on things and access the area for maintenance, I’m not able to adopt the 'out of sight, out of mind' attitude of many of my fellow Boaters. As a result, I keep a separate supply of drinking water, despite having gone to the trouble and expense of having the tank sandblasted and recoated two years ago.

Four interviewees reported keeping back-up containers of 20 or 40 litres, some of which were rolling barrel types for easier transport along the towpaths. Length of time taken to fill the tank up varied from tens of minutes to hours, depending on tank size and water pressure at the tap. When taking into account travel time, most interviewees explained that a trip to fill up would take between two and three hours

on average.<sup>10</sup> In terms of tank quality, some worried that dirt and insects or worms would enter the tank during filling, and some reported grit build-up at the bottom. Three interviewees described how their tanks were hard to clean, given the time it takes and the difficulty of accessing integral tanks. A couple explained that they would drain the tank regularly to ensure that the water was fresh. The majority of interviewees sourced drinking water from their tanks, with some using Aquatabs or Milton sterilising tablets as treatment.<sup>11</sup> Three interviewees did not drink tank water, instead drinking from separate storage containers that they filled up at water points. A couple bought bottled water, either out of preference or necessity.

Figure 5. The 5L bottle is a popular canal accessory.



Note: I use my 5L bottles for drinking water, as I prefer not to drink from the integral water tank. They are rinsed and refilled roughly every two weeks and kept in service for several years.

The interviewee buying bottled drinking water out of necessity did so because they fill up their tank with canal water using a self-built, multi-stage filtration system. Although only one participant in our study was currently using such a system, it became apparent through multiple conversations that this practice is increasingly common among Boaters. The participant recounted their story of being unable to move

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<sup>10</sup> On the WHO JMP service ladder, this would equate to "limited" service: "Drinking water from an improved source for which collection time exceeds 30 minutes for a round trip including queuing" (<https://washdata.org/monitoring/drinking-water>). The authors note that this is technically in contradiction to the SDG goals, to which the UK has signed on.

<sup>11</sup> International data on water quality shows that deterioration is substantial between water source and storage (Shields et al., 2015). Although this hasn't been studied in the specific context of Boaters in England & Wales, it could suggest that water in canal boat tanks may not meet drinking water standards.

their boat during Covid-19 lockdowns and how the nearest water point became very unhygienic due to cross contamination with an adjacent Elsan toilet disposal point. Before the lockdowns their partner would collect water manually, but they became anxious about going out and uncomfortable using the water point because of the unhygienic conditions, particularly as they are disabled. After researching online and meeting other Boaters who had built their own systems, the interviewee explained: "I decided enough was enough really, and I created a water filtration system from scratch".<sup>12</sup>

With two children also living on board, this system provides the family with a sufficient quantity of water to fulfil their needs, except for drinking. However, the interviewee expressed an underlying concern about water quality and safety: "There's still this thing in the back of your mind that you're testing for a lot of stuff but you might not be testing for the one thing that's damaging you".<sup>13</sup> This situation reveals how a family that outwardly appears to have sufficient access to water is nonetheless experiencing consistent low-level of anxiety beneath the surface.

This range of experiences demonstrates Boater agency (different responses to the level of, lack of, or standard of service provision – chiefly the popularity of self-provisioning). Even when services are lacking, people find workarounds. Some are happier to do this than rely on a service they cannot control.

Figure 6. An Elsan station on the River Avon near Swineford.



Note: A particular hygiene concern is that of people using the wrong hoses, particularly as sanitation facilities (Elsan disposals and pump out machines) and drinking water provisions are often found adjacent to one another. I've heard several Boaters tell stories of watching in horror as people hiring boats for their holidays innocently fill their freshwater tanks using the hoses provided for rinsing out toilet waste tanks.

<sup>12</sup> I13, 27 May 2022

<sup>13</sup> I13, 27 May 2022

## Sanitation

There are multiple types of toilet sanitation systems on boats, the most common being pump out, cassette, and separating systems (more commonly called composting or waterless toilets). Pump out systems involve an integral tank where waste is collected (often from a more 'traditional' flush toilet on the boat). Periodically, the boat must be moved to access a pump out machine, where a pipe is connected for waste removal. These machines are either privately maintained (and charged accordingly) at marinas and boatyards or provided by the navigation authority. CRT machines use cards priced at £20 each, which generally require a postal address to order and receive. These cards are often sold at a premium if Boaters are able to find physical locations in which to buy them. Further, they often jam in the machines and do not work correctly. Cassette toilets have smaller containers that can be ejected from the toilet and manually emptied into Elsan points.

Four participants were using separating systems – waterless toilets with large boxes on the boat roof for the storage and processing of solid waste. They reported finding it hard to dispose of the composted waste, with all of them using family or friends' gardens rather than an official service, as none are currently available outside London.<sup>14</sup> Motivation for composting was that it is more hygienic in terms of disposal (avoiding the inevitable splashback from the Elsan points) and better for the environment when compared to other systems. Those who separated urine sometimes disposed of it in Elsanpoints, with some disposing of it in bushes on the towpath or in the canal when services were hard to find: "Occasionally we put urine in the canal, which I'm quite ashamed to say out loud. I don't know if I should do that. We've kind of been in denial about whether that's good or bad".<sup>15</sup>

Participants using traditional pump out or cassette systems noted higher levels of disgust when disposing of sludge. On average, a cassette would last about two days, so most agreed that three cassettes was the ideal number, lasting a week before they would have to empty.<sup>16</sup> Pump out systems could be equally problematic in terms of maintenance, finding disposal points, and using them. A couple of interviewees expressed concern that pump out facilities owned by the navigation authority were becoming less common, and they were increasingly having to turn to expensive (though often better maintained) marina facilities.

For laundry, multiple interviewees explained that they had twin tub or 'camping' washing machines on board, which only use small quantities of water. One reported adding a boiled kettle to their machine, as these systems usually run off cold water. An issue with washing clothes on the boat was space and heat for drying and the risk of damp. One interviewee explained how they would sometimes hang a washing line in the trees by the towpath, but how this felt strange to do in a public place. Others used laundrettes, but this was often described as inconvenient without a car and without facilities located near the canals. One interviewee said they thought that a few laundrettes had caught onto the fact that Boaters were using them and started offering delivery services: "It's just so much easier and one thing I don't have to deal with, but I'm pretty sure the last time I did he charged me £40 (...) but yeah, it's so expensive".<sup>17</sup>

Another participant explained that they did their washing at work. Most people relied on friends and family as a supplement to on board systems and laundrettes. Common issues with this related to the time it would take to wash and dry and the inconvenience this caused.

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<sup>14</sup> In London, Circular Revolution is the main 'service provider' for disposing of composted toilet waste. The organisation recently partnered with University College London to conduct research on how to expand services and make them more accessible within a complex regulatory environment set by the Environment Agency. <https://www.circularrevolution.org/>

<sup>15</sup> I11, 18 May 2022

<sup>16</sup> It is a common complaint that one cannot buy extra cassettes for most models, and therefore Boaters have to wastefully buy several whole toilet units in order to build up a set of spare cassettes.

<sup>17</sup> I6, 20th May 2022

Figure 7. Hackney Wick pump out, Lee Navigation, East London. Out of service more often than not.



Figure 8. Laundrettes are big news!



Anxieties about service withdrawal and inflexibility are evident in many participants' recounts of sanitation services. Available services on the waterways are often supplemented by those beyond the waterways, either in the public or private sphere (for instance, buying bottled water to drink, using taps beyond the canal, or accessing toilets and showers at work, cafes, or the gym). This blurring between 'formal' and 'informal' provision is evident in the international literature, where many people supplement or rely on creative, unofficial ways of accessing services. This common reality reveals institutional failures to provide full and appropriate services, as well as the shortcomings of numbers-based targets employed without contextual understanding (Norvixoxo et al., 2022).

## Hygiene

For bathing, most interviewees had facilities for showering with hot water on board, and the majority reported taking 'navy showers' - where you turn the water off when lathering soap and shampoo. In every instance this was motivated by water saving. One interviewee wished that they could have a relaxing shower from time to time, and another explained that they don't wash their hair so often; "I wash my hair like once or twice a week. Partly because it doesn't need it, but also partly because I don't want to waste water".<sup>18</sup> Yet another was proud of how little water they needed to use: "They say seven to ten gallons of water [are] used in a shower. Well, you'd be jolly lucky with ours if we've used four litres".<sup>19</sup>

One interviewee said that they used navigation authority shower blocks whenever they passed these facilities in order to save water on board. Some people supplemented this by showering at work and the gym, both to save water and to have a more satisfying washing experience. A limitation of having a warm shower for a couple of interviewees was the waterways policy of not running your engine before 8 a.m., which became a problem for those wanting to shower before work. Another participant explained how they would rather have a bath for their young son to wash, but that limited space was an issue.

In terms of environmental hygiene, how and when people cleaned their boats varied. Some found it important to regularly clean the outside, which was usually done with canal water or a hosepipe when filling up at a water point. Greywater tended to be used for cleaning the inside of the boat and for watering plants. Most interviewees would wash dishes once or twice a day, as it is the general attitude among Boaters that it saves water to wash everything at once rather than do small washes throughout the day. One interviewee explained how her routine was to empty her pump out toilet, then clean the bathroom, and then take a shower, so that she felt clean after completing those tasks.

This section has outlined the fundamental water and sanitation resources available to Boaters, as well as some of the ways in which Boaters respond to these combinations of waterways services and boat technologies. This provides a foundation for understanding the place of resources in relation to their wider impacts upon Boaters' lives. In the following section, we build on this to explore the significance of personal, social, and environmental factors in converting these resources into capabilities or 'freedoms' to achieve a desired quality of life.

## CONVERTING RESOURCES

Some interviewees reported having modified their boat's original sanitation or water systems, while others explained that they would like to upgrade their boat technologies but were restricted by time, money, or expertise. The CA recognises that resources are used in a variety of ways, denoting this process as 'converting' them into capabilities. Various factors contribute to this conversion process, grouped into three spheres of life: individual personhood, societal 'rules', and surrounding environments. The availability of a particular water point or sanitation station may be restricted in one or multiple spheres,

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<sup>18</sup> I11, 18 May 2022

<sup>19</sup> I4, 13 May 2022

creating advantages and disadvantages for particular people. Participants' experiences around using or converting resources are discussed below.

### The personal

Physical attributes were important personal factors that also had implications for social factors. For a couple of interviewees, these were physical disabilities which had a strong influence on their daily life:

My partner is seventy-four now. He is mobility disabled (...) [and] I am de-facto his carer (...). So running out of water and having to go five or six hours somewhere else to get water, you know, it's a big deal. It's a big deal. There's no other way to put it. It's a big deal.<sup>20</sup>

In cases of physical disabilities and neurodivergence, the partner who acted as a carer faced excess pressure to take responsibility for and carry out the water and sanitation tasks on board. There is a CRT policy for supporting Boaters with disabilities, but both interviewees who had gone through the process of registering their disability with the navigation authority described it as overly complex and bureaucratic. One recounted that, although they were in receipt of support from the local council, the navigation authority, and social services, no institution had sufficient understanding of what they were experiencing and the holistic support they needed:

When social workers come 'round they kind of, because the boat looks nice, they kind of assume that everything's in order, and you try to explain to them the difficulties as well, but they don't understand those difficulties (...) so they're sort of brushed under the carpet.<sup>21</sup>

Figure 9. Service station provided by Wessex Water/CRT on the River Avon near Swineford.



Note: Some service stations – such as this one – can be particularly challenging to access: steep, slippery (to the point of requiring signage!) and overgrown, and in this case only open from spring to autumn.

<sup>20</sup> I16, 5 July 2022

<sup>21</sup> I13, 27 May 2022

For most other interviewees, physical attributes around strength and height were important and interrelated with gender, age, and (dis)ability. From the 'insider' researcher's observations (for instance, taking part in discussions in several Facebook groups for women Boaters) the outdated narrative that women are unable to carry out physical and technical tasks on board can be pervasive on the waterways, though it is something that many female Boaters reject. Roberts (2019) revealed similar themes, with participants describing feelings of dismissal or discomfort around their assumed lack of competence with gender-normatively associated tasks and expertise, such as diesel engine maintenance. No participants in this study noted gender identity as a restriction in and of itself. If physical tasks were considered challenging, this would be related to multiple intersectional factors. The main gender-related concern, which was raised in a number of conversations, was the safety and perceived safety of female Boaters. Walking along dark towpaths to empty cassettes and approaching urban service points where groups of people were congregated are two situations in which lone women felt unsafe.

That's happened to me where there's been a gang or something sitting on the lock gates and I'm just gonna come back later (...). Maybe you do come back later or maybe you don't because something else has come up. So [there is] something about it being in public and that just makes [the experience] all the more fragile.<sup>22</sup>

These situations resonate with the international water and sanitation literature, where the experiences of women and children around facilities have been found to be precarious in multiple contexts (O'Reilly, 2016; Tallman et al., 2023). Instances of violence against women and gender-based violence around water and sanitation services have been linked to the vulnerability of intimate hygiene practices combined with the public location of shared facilities and their distance from home (Sommer et al., 2015; Fisher et al., 2018). In this research, safety has been identified as a more prevalent concern than women's ability to perform physical or technical tasks.

Multiple participants explicitly or implicitly revealed the opinion that personal attributes were what determined how much people struggled with water and sanitation tasks and the extent to which these issues impacted their lives more widely. Being frugal, organised, and planning ahead were considered by some to be the reasons they did not personally struggle with the potential negative impacts of access to services that may affect others, taking the view: "I'm pretty clued up and, you know, fairly able to deal with things".<sup>23</sup>

A couple of these interviewees conceded that other factors might play a part too, such as their flexible work schedules and insider knowledge about which facilities were best and how to access resources like pump out cards. One suggested a social factor that might also be important: "I don't know how much of a safety net there is if you're struggling, other than just other Boaters who are around".<sup>24</sup> Although many maintained that, as water and sanitation tasks were simply a part of life on board, the main course of action was to improve personal organisation and planning skills.

Therefore, perceptions of how other Boaters experience water and sanitation on board are informed by individual experiences, often assuming that these will be broadly similar. Such findings reveal that personal conversion factors affect Boaters' experiences of services in diverse ways and show that this diversity might not be obvious to Boaters individually.

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<sup>22</sup> I1, 25 May 2022

<sup>23</sup> I3, 24 May 2022

<sup>24</sup> I3, 24 May 2022



Figure 10. Widebeam boat with extra water tanks.



Note: Some Boaters may be perceived to have more financial and material resources: For instance, I noticed this widebeam boat that seemed to be almost brand new and that had extra water tanks in the bow. However, these (assumed) extra financial resources are not yet matched by the experiential knowledge to anticipate that the water will go green with algae if left exposed to the sun, or that such large heavy tanks will adjust the trim of the boat and be tricky to empty in order to make use of the stored water.

### The social

An important consideration that precedes the question of access to services is the reasons why people move on board in the first place. Although this was not an explicit question in the interviews, some participants offered this information as context for their experiences and attitudes. The theme emerged that those who chose to become a Boater predominantly because they wanted to experience the lifestyle generally had a more positive attitude towards the condition and availability of services than those who moved on board due to financial reasons. (These are the two biggest reasons people move onto canal boats, followed by connecting to an off-grid lifestyle, alternative community, inland water heritage, and low carbon footprint [Sterrit, 2022].)

In this study, the attitude of those who intentionally and freely chose the Boater lifestyle can be broadly summarised by the following quote: "It's a means to continue travelling. It's a means to move. I feel very lucky that the technology is there to live a very comfortable lifestyle in comparison to how boat families would have had it in the 19<sup>th</sup> and early 20<sup>th</sup> centuries".<sup>25</sup>

Those who lived on board primarily for affordable accommodation often had different attitudes, expectations, and needs regarding service provision. One interviewee who has lived on boats off and on for 30 years was concerned about the trend in people turning to the waterways for a means to live affordably: "Housing is so unaffordable (...), but people are living on the water now and I don't think [they're] understanding it".<sup>26</sup>

Another participant explained this tension in the following way:

<sup>25</sup> I12, 24 May 2022

<sup>26</sup> I8, 30 May 2022

Maybe in an ideal world these facilities would all be available every hundred yards or so. But if that was the case (...) boating would be a little less fun. But that's one extreme. The other extreme, I think, is very unhealthy. It's not good from a mental health point of view. You know, unnecessary jeopardy causes unnecessary anxiety.<sup>27</sup>

This reveals how one person's fun, dynamic challenges can constitute another person's "unnecessary jeopardy". Most interviewees had multiple reasons for living on board, and thus a more complex attitude towards services. A middle ground perspective could be expressed as: "It does feel, in its own way, freeing (...) You just have what you need and you're aware of what you use (...) [but] there's been some days where I just can't actually manage any of it".<sup>28</sup>

### The environmental

The environmental conversion factors that emerged were mainly related to the condition, frequency, and accessibility of service points, as well as to seasonal variations in weather and conditions. Most interviewees had experience with broken service points, and the reported speed with which they were repaired varied greatly from very promptly to a matter of weeks, months, or even remaining permanently out of use. The main problem with unusable facilities was the time taken to cruise to find alternative sources.

Figure 11. A sign at a CRT service point on the Kennet and Avon canal.



Note: Distances between service points can be measured in the hours it takes to cruise between the points (including working out 'lock miles' by adding the distance in miles to the number of locks that must be navigated, before dividing by three to ascertain the number of hours the journey should take). Longer narrowboats may also have to find the nearest 'winding hole' in order to turn around and return to a service point, making journeys even longer.

Some interviewees were concerned that these issues were becoming more frequent, forcing people to turn to paid services at marinas. One explained that they used pump out services at marinas almost

<sup>27</sup> I14 1 June 2022

<sup>28</sup> I1, 25 May 2022

exclusively, because they were consistently more readily available than navigation authority owned ones. People who used Elsan disposal points often commented that they could be unhygienic to use: "It's the worst thing I've ever had to deal with. The Elsans were horrendous. Just seeing other people's turds was just (...) They were disgusting, broken. The hose that hangs off – I don't even know what that's for. Just – eugh".<sup>29</sup>

Despite the strength of disgust expressed by several respondents on this point, a couple of interviewees considered Elsans to be fine to use in general. Both the frequency and condition of different types of facilities often depended on location. Within cities, more service points tended to be available but with a higher number of people using them, so blockages and hygiene issues were more common. In rural areas, issues tended to relate to broken facilities or large gaps in between service points.

Figure 12. Broken tap on a mooring pontoon in Bristol Floating Harbour (left); a repaired tap on the Kennet and Avon canal (right)



Note: Service point maintenance issues are highly visible in the fact that so many taps on the system have been repeatedly fixed and adapted with found materials, rendering them idiosyncratic to use and potentially presenting accessibility issues.

Water points specifically varied in terms of pressure, which had knock-on effects for the time taken to fill up a boat tank and resulted in sometimes lengthy queues. This was often made worse by hire boats in the summer (rental operators encourage hirers to fill up most days, so as not to run out of water due to their mains water-adapted usage habits.). Some taps could be difficult to use, requiring tools to open, as shown in Figure 12. But, in general, water points were less of a problem for people than sanitation: "Occasionally, yeah, at popular points there's like one water tap and there might be – we might be the third boat along. But we just kind of wait it out".<sup>30</sup>

<sup>29</sup> 17, 17th May 2022

<sup>30</sup> 15, 18 May 2022

Figure 13. Water provision on the visitor moorings in Bath (Kennet and Avon Canal).



Note: The water pressure at this tap was so low that it wasn't sufficient to make my 'expandable' hose stretch to reach the tank at the bow of my 60ft narrowboat. We left having filled up a few 5L bottles, but with an almost empty tank. Also of note here is the somewhat confusing 'no mooring' signage and the addition of a plastic bag, perhaps as part of an attempted amateur repair.

Boaters also described various seasonal impacts. In the winter, the presence of water is noted in different, unwanted places with some describing condensation issues leading to damp, mould, and health problems. In the summer, people drink more water and take more showers, as some boats can get very hot from the sun: "I remember having, like, flannels all over me when it was (...) really hot the first summer on my boat, because I just couldn't cope (...) yeah, if you're not moored under trees it's literally like being inside an oven".<sup>31</sup>

Overall, a myriad of conversion factors were found to affect participants' use of water and sanitation resources. The number and severity of these factors determined the extent to which a person struggled to fulfil their needs. How easily and fully one could meet their needs affected quality of life more widely (though not necessarily or exclusively negatively), influencing their wellbeing and capabilities in nuanced ways, which are discussed in the following section.

## CAPABILITIES

The preceding sections tell the primary story of our ethnographic data, describing the availability of water and sanitation resources and the ways in which they are used by different people. In this section, we draw out the implications of our data analysis through the CA framework, demonstrating particular effects using services has on participants' capabilities.

<sup>31</sup> 19, 20 May 2022

Capabilities are defined as the real opportunities available to a person, based on their use of available resources (Sen, 1985). They can also be understood as the 'freedoms to achieve' a subjectively good life. The ideal method of defining specific capabilities is a grounded approach in a particular context (van der Boor et al., 2020), however we chose to conduct our analysis using the most well-established generalised definitions, as deduced by Nussbaum (2011). We recognise the limitations of general categories, but we feel meaningful insight can be gained through using them in this study given its exploratory and formative nature.

Nussbaum (2011) defines ten core capabilities, outlined in Table 1. Our findings identify that at least six of these capabilities are affected by access to water and sanitation resources in this context. These are shown in italics and discussed individually in the following section. This discussion reflects our data, which shows most effects described by interlocutors to be negative. However, we also find positive experiences of water and sanitation services that are supportive of certain capabilities. For example, one participant reflected that they felt 'lucky' to be able to live in relative comfort while travelling on the waterways.<sup>32</sup> This Boater experienced service provision that facilitated the freedom of an itinerant lifestyle, causing them to feel more in *control over their environment* and supported in their *emotional* wellbeing.

Table 1. The ten core capabilities as defined in Nussbaum (2011). They support individuals' ability to live in ways that they choose, enabling health, wellbeing, and personal freedoms.

	Human capability
1	Life
2	<i>Bodily health</i>
3	Bodily integrity
4	<i>Senses, imagination, and thought</i>
5	<i>Emotions</i>
6	<i>Practical reason</i>
7	<i>Affiliation</i>
8	Other species
9	Play
10	<i>Control over one's environment</i>

### The affected capabilities

*Bodily health* is found to be influenced in subtle ways in this research. The sample population did not generally lack access to basic water and sanitation to the extent that it substantially affected their bodily health. The only case in which this was apparent was a participant whose child once had an infection due to a suspected hygiene issue that arose from being limited to showering rather than bathing on board the family's boat. Other situations included: 'holding on' to go to the toilet at work, greatly reducing frequency of showering to save water, and feeling unable to exercise because of hygiene restrictions caused by a lack of sufficient water on board. These do not have 'provable' effects on bodily health, but

<sup>32</sup> I12, 24 May 2022

their potential long-term impacts can be inferred. Mental health is also related to these situations, though this is more clearly incorporated into other capabilities.

Participants' *emotions* were repeatedly found to be affected by water and sanitation. The predominant emotion was a scarcity mentality that caused people to alter their natural hygiene behaviours, which contributed to tensions within interpersonal relationships and restricted overall emotional peace and wellbeing. Multiple people stated that they felt anxious or worried about running out of water, as well as a sense of disgust during emptying and maintaining toilets. One interviewee described the "constant pressure" of water and sanitation tasks, with another explaining how this pressure affected their wider life in terms of the energy available to work and exercise. However, other participants felt neutral or positive about the constant responsibility of water and sanitation tasks, suggesting that whether this is seen as pressure or a satisfying routine (or even a source of pride in practising a low-impact lifestyle) depends on the person's wider situation and attitude. One interviewee who was a professional in the mental health field commented:

The CRT disposal points have been consistently diabolical on the K&A [Kennet & Avon]. I actually raised this with CRT (...) It occurred to me that it's an area where the ability to maintain decent sanitation is going to cause a high degree of anxiety amongst users. Especially users who are in any way vulnerable. Even more especially with boat users who might lack capacity.<sup>33</sup>

Another interviewee recalled when they began continuously cruising and had to move to fill up with water regularly: "When we started cruising, I was like, 'Wow, this is, this is actually really big'. Like I said, I couldn't move because I had the baby, so my partner had to do it (...) I think that impacted our mental health massively".<sup>34</sup>

A different participant explained how they and their partner were considering moving onto land, in part because they would have more time to play music and pursue other hobbies. This was something they considered would be more possible without the pressure of water and sanitation tasks. In this case, the capability of *sense, imagination, and thought* was restricted.

The capability of *affiliation* is defined by Nussbaum as being able to

(A) recognize and show concern for other human beings (...) to be able to imagine the situation of another (...) [and] (B) having the social bases of self-respect and nonhumiliation; being able to be treated as a dignified being whose worth is equal to that of others. (2011: 34)

Part A was affected in cases where some participants felt they were more able to cope with water and sanitation tasks than other Boaters. They were frustrated when others would block disposal points by putting unsuitable material (such as wet wipes) down them, and those who chose to compost when there wasn't yet an official system of disposal available (leading to a glut of Boaters 'bagging and binning' their solid waste). This demonstrates the effect of this perception on the freedom to "imagine the situation of another". Additionally, the concept of dignity is challenged in cases where interviewees expressed discomfort at carrying out personal activities in a public space, including drying clothes and transporting toilet waste. A couple also explained how, during Covid-19 lockdowns, increased numbers of people walking on the towpaths left them feeling anxious to go out and unhappy at the cleanliness of the towpath, service points, and nearby green spaces.

The condition of *practical reason* was found to be affected in many cases when interviewees' movements and cruising patterns were affected by water and sanitation needs. "Engaging in critical reflection about the planning of one's life" (Nussbaum, 2011: 34) appears to be often hindered by the availability and location of service points. Similarly, *control over one's environment* is affected by the lack

<sup>33</sup> I14, 1 June 2022

<sup>34</sup> I2 16 May 2022

of influence boaters have over water and sanitation services, both politically and materially. Politically, it was apparent in many interviews that people felt they had little control over the provision of services on canals. For some, this translated to a fear that services were gradually being closed in order to force them to use private services. This is by extension perceived as a threat to the lifestyle and future viability of continuous cruising as liveaboard Boaters, and connected to the teleological drive towards fixity and the chargeable mooring model that some Boaters accuse the CRT of prioritising in their governance and maintenance strategies. Materially, some interviewees wished to have different boat technologies, but due to cost, time, and expertise they could not achieve these changes.

The effects of water and sanitation on these six core capabilities reveal some of the ways in which essential services are foundational to Boaters' freedoms to achieve the types of lifestyles they value. Untangling these facets of life is helpful for showing some of the specific ways in which infrastructure interacts with the end users. We find that these interactions are deeply situated in the subjective lifeworlds of individuals, often causing them to be difficult to understand from the 'outside'.

### **CONCLUSIONS – FREEDOMS AFLOAT?**

This article evidences six core human capabilities (as described by Nussbaum) that are affected by access to water and sanitation services on the inland waterways of E&W. Journeying from resources to conversion factors to capabilities, we trace the ways in which essential services are used by different Boaters as integral parts of their lifestyles. This study shows that access to – and capacity to convert – resources can impact physical and mental health, positively as well as negatively. Restriction is not necessarily or solely perceived as a negative (some participants considered this an element of the 'lifestyle' that Boaters sign up for when living 'off grid', while others expressed pride in, and derived satisfaction from, living a low-impact lifestyle). Nonetheless, for some, restricted or denied services constituted a significant negative factor with wide-reaching implications for their lives. We contribute to and extend the existing body of literature that applies Sen's CA to water and sanitation by investigating it in a novel context, through an ethnographic lens.

This study foregrounds differences in the Boater population across a complex spectrum from marginalised to disengaged. We emphasise the diversity among Boaters, documenting a wide range of ways in which resources are used to support plural and at times opposing interpretations of 'freedom'. This finding is particularly relevant to ongoing research with itinerant populations or travelling peoples whose access to service provision is partial and/or contested. It highlights that assumptions cannot be made from the 'outside' about the kinds of service that these groups (and others) may desire. Furthermore, it acts as a reminder of the complex strands of association existing within a community or population group. We identify one of these key strands within Boating populations as the motivation for moving on board which, in our study, strongly affected the level of service that people expect and desire.

Itinerant groups are just one of the many who find themselves living within the DP. This study is the first ethnography in E&W to document the experiences of one such group. The very existence of this paradox is at odds with the principles of equitable service provision, non-discrimination, and fundamental human rights. As well as theory contribution, this research is timely for those dwelling on the water, as the numbers of Boaters continues to increase. Some participants expressed concern that without adaptation of services to meet this pressure, new inequities and public health issues may emerge. As the main navigation authority responsible for the canal system in E&W, the CRT also recognises this trajectory and has recently responded by pledging a new minimum standard for service provision throughout the

network.<sup>35</sup> The extent to which navigation authorities are responsible for providing services, and how this interacts with their statutory mandates to maintain the navigations under their control are questions requiring further research.

Without the affordances of household water company customers, Boaters in E&W fall through the cracks of institutional responsibility for service provision. This leaves many to rely on themselves to keep on top of their water and sanitation needs, which for some can be impossible:

[Some of] the kinds of people that end up living on boats tend to be finding themselves a bit marginalised anyway, and so then when you exclude them from services, exclude them from water provision, you're further marginalising them.<sup>36</sup>

This sentiment of marginalisation within the DP is important to emphasise when people find that it represents their lived experience and works to facilitate the fulfilment of their rights. However, our research shows that it is simplistic to classify all Boaters as marginalised or excluded from services, even though they live within the DP. People enter this lifestyle for different reasons and with different priorities, in many cases connected to their personal choices and freedoms. Some may view the waterways as spaces of informality, alterity, and distance from authority; seeking an escape from the housing crisis; or searching for alternative communities and low-impact lifestyles. Methodologically, this paper suggests potential ways to build relational knowledge of a constituency that is somewhat invisible to utilities providers, particularly one that has its own complex internal dynamics and divergent relationships with expressions of authority.

This speaks to the wider implications of this research for theorising the concept of equitable service provision and the principles for co-creating them. Definitions of 'safely managed' services must reflect the needs and desires of the population in question, and top-down approaches tend to be packaged with 'outsider' assumptions. In our study, auto-ethnographic knowledge and use of the CA as an analytical framework enabled our emphasis on the perspectives of individual Boaters. We recommend more studies on water and sanitation equity take a similar approach, focusing on the principle of radically centring the people who use, and rely upon, these essential services.

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<sup>35</sup> A recent CRT blog post publicized the new "Customer Service Facility Policy Statement setting out the essential boater customer service facilities (CSF) the Trust will provide". The maximum cruising time to access essential services is one day's cruising for water, waste disposal, and Elsan points, and two days' cruising for pump outs. <https://canalrivertrust.org.uk/boating/boating-news-and-views/boating-blogs-and-features/customer-services-facilities-policy>

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