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Insights from the everyday: Implications of reframing the governance of water supply and demand from 'people' to 'practice'

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Abstract

While the emerging shift to 'people oriented' water management could be applauded, existing conceptual and methodological approaches limit understandings of consumer behaviour and linked social, cultural and infrastructural changes. Using the example of water demand throughout, 'people oriented' approaches are shown to deny complexity and homogenise ideas of the consumer and supply systems. The way in which this is enacted in current, dominant forms of water management and water demand is discussed. New and more responsive conceptual and methodological approaches are needed to address the existing and future uncertainties facing water sectors worldwide. 'Practice oriented' approaches are explored and shown to open up understandings of current diversities and complexities of demand and the patterns of these demands across

populations. Such a conceptual and methodological reorientation reflects a need - potentially counter intuitively for those in the water industry – to *let go of the focus on water* and to instead focus on the *services such resources provide in everyday lives* and how these services could be more sustainably provisioned. Such an approach will assist in understanding current demand profiles, potentially improve the forecasting of future trajectories of change, and open up new routes for intervention to both water demand and water supply systems at various scales. Through the example of water demand, the implications of moving to a practice-oriented approach for the governance of water systems more generally are considered.

Introduction

Historically, problems in the water industry – such as expanding service capacity, complying with environmental limits, or addressing infrastructural issues such as sewerage blockages – have been ‘solved’ by engineering or technological solutions. Over the last few decades the assumption that technological fixes can solely be relied upon has been undone. This is reflected in, for example, the increased popularity of the ‘twin track’ approach to water supply and demand management worldwide; the requirement for active public involvement in water management such as in the European Water Framework Directive; and the emerging understanding that climate change adaptation for water resources necessarily involves ‘people’ not just bigger supply systems¹⁻³. Such shifts towards more ‘people oriented’ forms of water management have been useful and important, not least because such approaches offer the potential to address water challenges at lower financial and environmental cost. However, while this shift in goal to ‘people oriented’ water management could be viewed as progressive, the implicit models of social change utilised by water companies and other utilities to address these goals limits behaviour change and system wide outcomes.

In this Opinion Article I argue the need for the water industry to reframe the governance of water supply and demand, and - through the example of water demand management - highlight the utility of a ‘practice oriented’ approach to the governance of social change. A shift in approach is needed as there is a lack of critical reflection within the water industry on the ability of current ‘people oriented’ approaches to capture the complexities of demand and how it changes, and reluctance within the industry to develop new approaches that might address such complexities. For example, by focusing on ‘people’ it is more difficult for current water demand and forecasting methodologies to spot and track changes to water consumption over temporal and spatial scales⁴. Changes to end use consumption patterns can be observed through different types of metering, and are currently correlated with certain ‘person centred variables’ such as household ownership of technology to explain such changes. Such calculations cannot reflect the broader societal trends around, for example, cleanliness, that shape laundry and personal washing, and how this increases water consumption across populations.

There needs to be greater reflection and understanding of the diversity of reasons that people currently *do* practices that use water, the societal trends that underpin them, and how these practices might change over time in unexpected and chaotic ways that will influence water consumption. For example people wash themselves and do laundry in order to fulfil ‘needs’ for cleanliness, freshness, comfort of bodies and homes and clothes⁵. The combination of cultural expectations of performing these practices, the technologies and gadgets needed to achieve these practices, and the skill of knowing how (for example how to use a washing machine) interact and

change over time. It is the change(s) to these practices that then shape water and energy consumption. A lack of understanding of these elements undermines efforts for resource planning and projecting the trajectories of water consumption, as well as intervening in these trajectories. The discussion of current dominant 'people oriented' approaches to water demand management forms the first section of this article. In the second section I reflect upon opportunities for, and implications of, reframing from 'thinkings to doings' and from 'people to practice'. In the third section I then reflect upon what this means for broader processes of water governance.

DOMINANT APPROACHES TO UNDERSTANDING AND MODELING HOUSEHOLD WATER DEMAND

Current conceptualisations of demand are associated with a set of problematic characterisations and assumptions. Specifically in the policy and research context of water in the Global North - behaviour and resultant water demand is characterised in these particular ways. 'People' are characterised as *rational* (that is, they can easily change their behaviour related to resource use); they are also *irrational* (their behaviour deviates from the rational course of action as a result of issues such as insufficient information or lack of skills/capability); they are *resource focused* (they make resource use decisions based on the environment such as knowledge of water supplies or energy consumption/carbon emissions); they are *economically focused* (they make resource use decisions based on economics and costs of water and energy or other products); they are *technologically focused* (they are interested, engaged and savvy with technologies); and they are *responsive* (to technology, to cost, to information provision, to what other people pay or consume).

Such narrow rationalisations of human behaviour, which are largely derived from behavioural psychology and neo-classical economic theory, are rolled out in water and energy demand programs across the world^{6 7}. This is despite it being shown in primary research studies and research reviews, that such understandings have limited correlation to everyday practices that consume water^{8 9}. These ways of framing water demand produce a particular narrow enactment of the water consumer. These approaches underpin research and business investment for water efficiency programs, broader water demand management programs, and supply/demand forecasting worldwide. As Sofoulis neatly puts it, the industry is locked in a (retarding) quest for the average water consumer and does so in a way that skirts complexity within business models and practices¹⁰. As well as homogenising the water consumer, another way that the industry skirts complexity is by failing to reflect the reciprocal influence that supply systems have on everyday actions^{11 12 13 14}. That is, supply systems and related infrastructures and technologies - from the household to the city - shape expectations about service levels, and mediate end-use demand in non-linear ways. This is discussed in more detail in the final section on governing water.

These narrow ways of knowing the consumer are then linked to the modeling of current and future demand, which is then used to plan for future water infrastructure. For example, current ways of forecasting water demand are based on measurements from micro-component studies¹ which measure the Ownership of, Volume of water consumed by, and Frequency of use of, particular technologies (OVF¹⁵). This approach reveals little regarding the actual activities that people

¹ Also known as water end use studies in Australia.

undertake when they consume water in their homes. For example, while volume of water and frequency of use can be revealed for household basin water consumption, most water companies have little understanding of what the basin is being used for. A basin can be used multiple times a day for washing hands, hand washing clothes, washing children, shaving faces and bodies, ritual religious washing and/or for the preparation of food. These micro-component studies often include a category of 'miscellaneous' water use to account for this lack of understanding, and represent them as uncertainties¹⁶. To develop understandings of current patterns and future changes, this micro-component data is then combined with data on population and economic growth, network performance (e.g., leakage reduction), household technologies and infrastructural advances, household demographic changes, and assumed behavioural changes linked to increased environmental awareness or water pricing^{17 18}.

None of these current methods gets us close to what people *do* with water in the home, or reflects how the 'doing' of water use changes overall resource consumption across populations or time. It may also be useful to combine such micro-component data with studies reflecting diversities and patterns in practices across a population, that is combine OVF with 'practice oriented' data. Current approaches to water demand also underestimate uncertainties about future trajectories of demand. When forecasting the impact of future changes (such as climate change) on demand, the demand sensitivities reflected are quite low. For example, in studies in the UK, the impact of climate change on household demand ranges from 0.5% to 1.8% which is largely due to the assumption that a changing climate will influence (increase) garden watering, and the impact on non-household demand as between no change and 2.8% increase^{18 19 20}. Such a discussion doesn't consider the uncertainties of the way that garden and household lifestyles can and will change related to everyday practices. There is uncertainty as to whether gardening and household lifestyles will head in the direction of greater resilience and sustainability in the context of a changing climate such as through increased water recycling and adoption of sustainable household technologies, cultures or practices^{21 22 23}. There is uncertainty as to whether reductions of demand in conditions of crisis will bounce back after periods of drought and water scarcity²⁴. There is uncertainty as to whether even in the context of climate change the cultures of water – and by this I mean the practices that underpin water use – will become increasingly resource intensive. There are some indications that this cultural shift is already happening in the UK for example with the rise of more than daily personal cleanliness practices²⁵.

These are the true future uncertainties of water use and water demand which dominant approaches - with their particular tacit assumptions about ways of modelling trajectories of change and ways to intervene - currently fail to reflect upon²⁶. These conceptual framings and methodological processes do not consider innovations that may chaotically disrupt such expected pathways such as changes to what is considered 'level of service' to household consumers. The true complexities of the way that water demand co-develops, and is symbiotic, with the development of technology, climatic factors, and social and cultural change is little considered or even intentionally ignored¹⁸. There are other ways of understanding what people do with water, but it requires a substantial reorientation of approach. It is to these issues that I now turn.

EMERGING APPROACHES TO UNDERSTANDING DEMAND: FROM 'THINKING' TO 'DOINGS', FROM 'PEOPLE' TO 'PRACTICES'

A central part of the argument for practice approaches concerns their value in exposing the complexities of demand; another is their utility in providing alternative conceptual and methodological frameworks for research, policy and business practice that reflects that complexity and uncertainty^{27 28}. This section provides insight into the reorientation(s) promoted in the social sciences as an alternative way of thinking about i) current water use and patterns of resource demand, ii) developing new approaches to understanding future trajectories, and iii) ways to influence future trajectories of water use. I also argue that such approaches will have relevance for a range of ways of thinking about water management and water governance, as will be explored in the third section. For now it is important to reflect that conceptually these approaches promote changing the focus from *what people think about* the environment/resource, to focusing on *what people are actually doing* when they consume particular resources in their everyday lives. Methodologically it involves a reorientation in the unit of analysis, namely *from people to practices*²⁷. Such a conceptual and methodological reorientation reflects a need - potentially counter intuitively for those in the water industry - to *let go of the focus on water* and to instead focus on the *services such resources provide in everyday lives* and how these services could be more sustainably provisioned².

A reorientation to 'doing' and 'practice' assumes that: people are *service focused* (interested in cleanliness, freshness, comfort of bodies and homes and clothes, and different meanings of the garden)⁵; people are *doing day-to-day lives* (resources are used as a response to peoples' trivial, routine and habitual daily lives of travelling, eating, and looking after others, the self, the garden, the home)²⁹; *life course matters* (resource consumption changes in relation to a person's life stage/course and the life course of those around them - babies, toddlers, teenagers, commuters, retirees, elderly)³⁰; people are *doing shared social conventions* (patterns of resource use reflect shared cultural conventions, and these change and shift over time influencing end use consumption e.g., ideas and practices of cleanliness)³¹; *technology is used in unexpected ways* (technology influences behaviour but not in the ways expected and it co-evolves and increases expectations, for example, of cleanliness)^{32 33}; and that *infrastructure matters* (demand co-evolves with supply systems and constant supply, change the supply you change the demand and vice versa)³⁴. Equally, practices can occur simultaneously to one another either in terms of the time or place in which they are conducted, can have similar features to one another, or be implemented in a way that reflects shared social and cultural meanings (this is known as *bundling* of practices).

It is only by focusing on the complexity of everyday lives, and the services that water provides in peoples' lives, that water use practices can be seen to bundle and interconnect in different combinations. A practice-oriented approach enables knowledge of these processes of bundling which can be developed into quite distinct and observable patterns of the practice(s) at the population level. For example, our research showed that 70% of people in the UK now wash their bodies at least daily, and most people do this by showering²⁵. Our research shows that at a

² Focusing on services and how they are provisioned raises a significant but necessary question to the way things are currently configured. How can such services be provisioned in a less resource intensive way? How can the need for such services also be reconfigured? To think about these questions is a radical but a more fundamentally impactful way that the water and allied industries can think about water and embedded energy sustainability.

population level in the UK low frequency washing is slowly dying out with the older generations; people have baths and flannel washes in addition to, rather than as an alternative to, showering; and that baths in particular are taken more for relaxation rather than cleanliness purposes²⁵. There can be diversity even within a practice, for example, showering can be practiced for a variety of reasons – to wake up, to ease aches and pains, to get ready to go out – not just a singular pursuit of cleanliness.

Micro-component studies aggregate understandings of water use into one number to reflect what the averaged consumer does. The water sector markets to their customers as an average water user^{10 35} and attempt to amorously persuade people to change their behaviour by appealing to their environmental values or desire to save money by moderating water use in (preferably) all practices at the same time. Homogenising the performance of practice – and the variety and diversity of these patterns across a population – means that water companies are unable to identify, explore or target interventions to specific groups, for example, people engaged with particularly high water use practices.

The alternative suggested is an approach that disaggregates practices into their component parts. For example, water use in the bathroom could be composed of showering, bathing, flannel washing, shaving of legs and body, brushing of teeth, washing of clothes, and care of others (children, the elderly). Such an approach also shows how these component parts might actually fit (bundle) together across a population. For example, in one of our studies on water use patterns across the South and South East of England we identified two significant trends amongst younger populations – the first was a group who washed themselves in *and* outside of the home more than once daily⁹. The second was a group who were particularly attentive to cleanliness and presentation, and were also likely to wash more than once daily. These groups were significantly different from one another with the first more likely young and male, the second more likely young and female and with children. Despite their practices taking place in different locations, both groups reflect a new generation of self-care practices (more than daily personal washing), and a reflection of societal norms of increased focus on personal cleanliness and self-presentation.

A notion of intervention to water use behaviours is likely to be very different for these distinct patterns of practices. Equally such an approach can also offer opportunities to reflect on which inadvertently sustainable practices³⁶ such as low frequency forms of washing and bathing (echoing practices of the previous generations) are slowly becoming fossilised or dying out and how to prevent such a demise²⁷. Arguably, understanding the nature and diversity of practices across a population can lead to more nuanced and sophisticated approaches to forecasting and intervention than approaches that focus on what people think about water^{27 37}.

As discussed above, achieving a greater understanding of the patterns of practices across populations occurs when people are taken out of the picture, and the unit of analysis is reoriented to that of 'practice'. This doesn't just require a different conceptual approach, but a different range of methodologies. It might be possible to use existing time use survey, and other population level, data to reflect upon trends in practice across populations, and to develop variables that 'proxy' practices^{4, 38}. However, the reuse of secondary data might be limited and it might be necessary to develop, integrate and analyse large scale surveys that focus on the performance of practice across a population³⁹. This could also lead to the development of cluster methodologies to provide a form of

segmentation of these practices across a population^{9,25}. Such methodologies in themselves become an intervention²⁷ - refocusing the tools and methods available to the water industry to an analysis of 'practice', as well as identifying other ways of tracking and capturing change to water use over time (e.g., trajectories of showering), and potential locations for intervention (e.g., for high frequency showering).

Finding more sophisticated ways of tracking, and intervening in, trajectories of consumption is significant as while behaviour is responsive to top-down intervention in the short term, demand patterns often bounce back over the long term²⁴. This is because demand is constructed by supply systems, by technological innovation, as well as by industries that shape the idea of the good life or the clean life. The focus on 'practice' also highlights the need to reflect on broader issues within the whole water network and system at multiple scales. That is, a reorientation from 'people' to 'practice' highlights the reciprocity between 'context' and 'practice', and implies that sustainable transitions at a population level requires a different vision than that of the current twin track approach to supply and demand. A new vision is needed - one that considers different ways of provisioning the existing services that water provides in everyday lives; that reflects more diverse configurations of water infrastructures and water institutions; and that considers how to intervene in shaping the construct of the 'services' needed in daily life. This reorientation from 'people' to 'practice' reflects a broader set of issues about the governance of water and water systems more generally^{24,40}.

REFRAMING THE GOVERNANCE OF WATER: IMPLICATIONS OF THE SHIFT TOWARDS A 'PRACTICE ORIENTED' APPROACH

The previous sections have highlighted the importance of developing a new conceptual approach to understanding the everyday practices that consume water; the need to develop alternative methodologies to capture, track and potentially model water futures; and some insight into how to intervene in everyday practice in ways that reflect existing patterns and diversities in practice. Such an approach views water demand as co-evolving with infrastructures and technology, societal meanings and images (for example of cleanliness), and the recruitment into or disappearance of different practical skills⁴¹. This approach also sees that demand is not just created or determined by technology or water companies but distributed across a whole range of diverse and distributed actors⁴². This approach pushes the discussion of intervention beyond individuals to meso and macro level actions needed to enact, for example, different ways of doing cleanliness, or gardening, or clothes care that are more sustainable. As such, a reorientation to 'practice' also reorients the governance of water demand. That is, the 'governing' of water is not, and cannot be, something that is done solely by water industry actors. It advocates a more joined up way of conceptualising the governance of water.

This has a number of significant implications. Specifically in relation to water demand, if demand is created and maintained in a distributed way then the notion of intervention also needs to be distributed in terms of who has responsibility for problem definition and action. Understanding that demand is complex, and that intervention does not fall solely under the discretion of water companies, requires a different model to understanding the governance of water demand, and the types of cooperation needed to stage 'interventions'. In the UK, water companies currently can only intervene legitimately in non-essential use bans which is characterised by the restriction of outdoor

water use such as hosepipes⁴³. But the scope and scale of water company influence on water demand is limited, as they are not the only organisations that define and set targets for practices that use water in and outside of the home, nor are they the sole providers of the products and infrastructures that enable these practices. When they do try intervene outside this scope – for example by discussing showering and shaving of legs and water wasted – they tend to fall under significant public and media scrutiny^{44 45 46}. However other companies such as those involved in setting ideas about cleanliness linked to their products and advertising do have the legitimacy to intervene in such ways. For example, Soap and Glory – a UK based cosmetics company - have successful campaigns such as ‘The 2 Minute Rinse™’ based on reducing water wastage in the bathroom specifically related to the use of their products^{47 48}.

While it is important not to fall in the neoliberal trap of assuming that all environmental action and intervention should take place inside the market, equally these are not entirely irrelevant actors in shaping sustainable water consumption. Producers of water and related products and infrastructures have roles to play in setting new norms and meanings related to the performance of everyday practices (such as above). At a level of infrastructure and systems of provision, such companies also provide opportunities for reconfiguration of service provision in different, and potentially more sustainable, directions. Beyond private enterprise, other forms of collaborative and collective action are also possible when considering water efficiency initiatives⁴⁹. An interesting example of this is the Royal Horticultural Society (RHS) Chelsea Flower Show climate change garden exhibition by four water companies in the South of England in 2012⁵⁰, and the 2050 Garden at Chelsea in 2008⁵¹.

This conceptual reorientation also implies the need for complete reconfiguration of water systems in ways that influence end use practices, and the overall sustainability of the water system. This links concepts of resilience and adaptation with water demand and supply, and suggests the need for new forms of governance of water systems. It is well understood from social sciences such as sociology, geography and science technology studies that invisible, consistent supply infrastructures shape the development of habituated, routine and unconscious everyday household practices and by association a particular notion of the consumer^{11 34 52 14}. This is potentially even more pronounced in water industries such as the UK which operate from a particular neoliberal ideology and governing structure^{53 54} which is regulated in a way that ensures the constant, reliable, uninterrupted supply of water infrastructures to peoples’ homes.

The ways in which households are connected to different fit for purpose qualities of water infrastructures are meaningful in that interruptions to the way that resources are supplied reconfigures practice. That is, habitual and ritualised everyday practices underpinning water consumption are shaped by these water, and related, infrastructural systems. Encouragingly, there are new inter- and trans-disciplinary ways of working to address issues of water demand and infrastructural developments emerging between ‘hard’ and ‘social’ science⁵⁵, in a rethinking of engineering approaches to urban water infrastructures⁵⁶, and through innovative experimental approaches to architecture and design^{57 40}. It is arguably also important to consider such interdisciplinary approaches to everyday practice, urban transitions and urban design to the rapid political, social, and regional transformations occurring in the Global South, not just to the resource issues within the Global North³².

Conclusion

In this Opinion article, I have reflected on the development of new conceptual and methodological perspectives that will enable the water industry – and related stakeholders - to reflect more fully on the complexities underpinning water consumption, and water governance. I believe this is necessary as current ‘people centred’ approaches have reached their limits. Changing to a ‘practice oriented’ approach involves focusing on the services that water provides across populations, the way that these services are provisioned, and possible alternatives at population and infrastructural levels. This is seen to be necessary, as appealing to environmental and fiscal motivations of people has been shown to be limited, with people consuming water habitually and unconsciously as part of doing their day-to-day lives. Other important considerations in reorienting the understanding of water demand and shaping trajectories of water consumption is that life course matters, that infrastructure matters, that people are doing shared social conventions, and that technology is and will be used in unexpected ways.

Pushing this further I have suggested that a way forward for the industry would be to change the unit of analysis completely, and move from ‘people’ to ‘practices’ as a way to understand current and emerging diversities and patterns in water use. This does not mean that we ‘do away’ with people completely – indeed people ‘carry’ practices and it is through the analysis of what people do with water at different scales (from the household to population level) that we can observe how practices change over time^{9 58}. As such, and specifically related to water demand, such a change of focus has implications for i) understanding current demand diversities ii) forecasting future demand patterns, iii) suggesting specific locations and scales of intervention, iv) suggesting the range of actors who can, and potentially should, be involved in the more sustainable governing of water demand. A reorientation to ‘practice’ has implications for the governance of water more generally such as the configuration of water use systems; the inclusion of a greater range of actors in water efficiency programs⁴²; and the introduction of new end use technologies or systems of service provision that redefine the nature of the practice (e.g., waterless washing machines, or the rise in centralised sustainable laundry service systems)⁵⁹.

A practice oriented approach facilitates the development of particular lines of enquiry about resource use, especially links between mundane, hidden, and taken for granted everyday practices, and broader socio-cultural and infrastructural systems. As such, although the application of practice theory to the area of water governance has mainly been through the exploration of ‘water demand’ there is also potential for it to be developed and used in other areas of water management that currently rely on behavioural approaches to change. For example, a major current concern for the water industry in the UK is ‘fatbergs’ in sewage systems, from oil and other waste products being discarded down drains and toilets⁶⁰. This is largely because the toilet and sink is often used as a garbage disposal system. Although yet to be developed into practical solutions, the conceptual frameworks linking everyday waste practices with the contamination of urban infrastructures exists⁶¹. Equally, such an approach connects to and supports the development of alternative water infrastructures and technologies that make the water system more visible – for example SUDS (Sustainable Urban Drainage)⁶² and water sensitive cities^{63 64}. There is also an increasing recognition of the need to change agricultural practices for greater climate resilience and water sustainability, and that changing food economies - with changing notions of food health, consumption patterns and food waste^{65 66} – will also have an influence on global water availability and sustainability.

In conclusion, in this Opinion Article I have called on those working on issues that either directly or indirectly intersect with understandings of water resource use to consider the complexity of ‘users’ and ‘demand’, and to focus on the services that water provides, and how this could be differently provisioned. On behalf of a growing number of practice-oriented researchers, this article is also an invitation to collaborate with social and cultural researchers⁶⁷, who can help to develop and/or implement practice-centred policy, research frameworks, and methodologies. Embracing such conceptual and methodological complexities - such as that represented by a practice-oriented approach – will allow those concerned with water consumption, conservation and governance to understand, forecast, and intervene in more sophisticated, and nuanced, ways.

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