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HEALTHY ENGAGEMENT: EVALUATING MODELS OF PROVIDERS AND USERS FOR CITIES OF THE FUTURE

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ABSTRACT

There is growing recognition within the water industry that new relationships are required that go beyond the provision of safe and healthy drinking water. Drawing on three studies of Australian water providers and users, as well as existing water research concerning 'hydrosocial contracts' and 'transition models', this study analyses the power relations, behavioural assumptions and impacts on water conservation emerging from different relationships. The paper discusses three types of relationship models: historical, rationalistic and integrated, focussing in particular on their roles in addressing or hindering the industry's transition towards 'cities of the future'. The paper calls for greater emphasis on the relationships embedded into water systems and management structures, and highlights a need for further HASS sector knowledge to understand the social and cultural dynamics within existing relationship models.

INTRODUCTION

The links between water provision and health encompass far more than ensuring people's access to safe and hygienic drinking water. This paper is particularly concerned with water management and the social dimensions of health, which includes the 'health' of the relations between water users and the systems and institutions of water provision and management. Just as there are different types of social relationships (parent/child, teacher/student, peer/peer cooperation, rivalry, etc.), so too are there different provider-user relationships and modes of engagement. This paper proposes that how water utilities frame their relationships with water consumers affects how people use and save water. Our key point is that the effectiveness of community engagement strategies—and by extension the water industry's broader contributions to public health, community well-being and social sustainability—can be enhanced by paying closer attention to the underlying expectations and assumptions embedded in different, sometimes conflicting, models of provider-user relationships. We discuss a range of historical, rationalistic and integrated provider-user relationship models in the water sector, considering power relations,

behavioural assumptions and levels of responsibility built in to each model, the engagement strategies they facilitate, and how they might help or hinder transitions to healthy cities.

HEALTH, ENGAGEMENT AND THE HYDROSOCIAL CONTRACT

The water sector's origins, both in Australia and internationally, are closely aligned with the public health sector, through which the water industry justifiably lays claim to a proud history of delivering public health benefits by providing cheap, high quality potable water to growing urban populations. However, unlike the health sector, the water sector remained committed to microbiological definitions of its public health contributions throughout the 20th century. Only very recently has the Australian water industry started to think about the social dimensions of water sustainability, or explore how water and waterways management might enhance the liveability of cities and the environmental and social amenities that support healthy communities (for example, the *Cities of the Future* initiative).

Some aspects of these lags and shifts in approaches to water governance are gathered under the notion of the 'hydrosocial contract' elaborated by South African researchers Turton and Meissner (2000) and applied in the Australian context by Rebekah Brown, Nina Keath and Tony Wong, who define it as:

the pervading values and often implicit agreements between communities, governments and business on how water should be managed. This contract is shaped by the dominant cultural perspective and historically embedded urban water values, expressed through institutional arrangements and regulatory frameworks, and physically represented through water systems infrastructure (Brown et al 2009, 848).

This is a useful definition, though it misses out the key elements in which we are most interested: the models of humans (especially water users) that pervade these cultural perspectives, institutions, regulations and infrastructures; and the assumed distributions of knowledge, power and responsibility in the relationships.

In Turton and Meissner's (2000, 5) model, the first form of modern hydrosocial contract arose when growing urban settlements had exhausted local supplies and turned to governments to secure water from ever more distant sources by performing 'hydraulic miracles' and feats of 'heroic engineering'. Water authorities evolved as 'discursive elites' (*ibid*, 5) that lacked 'any form of alternative authority against which state-initiated actions can be checked or balanced' (*ibid*, 13) Aligned with and protected by governments, these large organisations became 'formalised behemoths of unquestioned authority and expertise' (Dovers 2008, 90) with little engagement in other knowledge sectors or with the public.

As conventional supply side solutions reached their limits, and demand management became necessary, concerns for sustainability triggered the transition to a different hydrosocial contract. In this shift, which in South Africa gained impetus from the 1994 democratic elections,

The discursive elite changed with economists, environmentalists and social scientists all challenging the hegemonic status of engineers, thus leading to a new form of discourse and ending the purely supply-sided phase of water resource management. Government shrank, and less became better (Turton and Meissner 2000, 19).

As government shrank, other players emerged: on the one hand, civil society groups (NGOs) 'became a permanent part of the hydropolitical landscape'; on the other hand the 'privatization of water utilities' created water businesses with different interests from governments (Turton and Meissner 2000, 19-20). This new hydrosocial contract is worked out in multilateral negotiations between various interests. Turton and Meissner liken the difference between historical and recent forms of hydrosocial contract to the classical political distinction between the top-down social contract under sovereign rule advocated by Thomas Hobbes, where people ceded their responsibilities to a powerful state 'Leviathan', versus John Locke's version of a multi-stakeholder system where government depends on consent and is tempered by the power of civil society (Turton and Meissner 2000, 18 -19).

In their history and typology of water governance in Australia, Brown et al. (2009) propose a six-phase model of transitions through different 'city states'. In the first three of these, supply, sewerage and drainage, the infrastructures and roles of water authorities expand within a top-down (Hobbesian) hydrosocial contract. This is contested with the emergence of environmental concerns in the 'waterways city', while sustainability is pursued in the 'water cycle city,' where a (Lockean) hydrosocial contract emerges in the 'co-management of the water cycle between business, communities and the government' (Brown et al.

2009, 853). A future 'water-sensitive city' would include many decentralised water facilities integrated with other services. Intergenerational equity, ecological integrity, and resilience to climate change are sought through a new form of hydrosocial contract that is 'adaptive and continually evolving, underpinned by a flexible institutional regime' (Brown et al. 2009, 854).

Turton and Meissner (2000) identify the different kinds of subjects and power relationships involved in two kinds of hydrosocial contract, whereas Brown et al.'s (2009, 851) model of transitions through a 'nested continuum' of evolving and accumulating concerns is helpful for picturing how elements from different phases can co-exist and contradict each other. Both accounts are relevant to our concerns with the models of people and modes of engagement associated with different provider-user relationships. We suggest that confusion between different models of users and providers can produce mismatches between overt objectives of water conservation programs and pathways for achieving them, undermine the success of engagement strategies, and spoil prospects for successful co-management.

THE RESEARCH

This paper synthesises findings from three qualitative studies of water users and providers (managers) by the authors, both researchers in the Humanities Arts and Social Science (HASS) sector. During 2006-2009, Strengers' doctoral research identified transitional provider-user relationships in a qualitative research project on residential smart metering water (and energy) demand management programs in the states of Victoria, New South Wales and Queensland (Strengers 2009). The project involved 65 households (122 individuals) and 32 stakeholders related to the delivery of smart metering demand management programs. Data collection was via in-situ interviews, household tours and household diaries. Stakeholder data were collected via qualitative interviews. All data were transcribed and analysed with the help of NVivo software (see also Strengers 2009).

Over eighteen months in 2005-2007, and completely independent of Strengers' research, Sofoulis and her colleagues conducted a study of user models in a partnership project with the Sydney Water Corporation in New South Wales. This study gathered the views of 48 Sydney householders, 28 of whom completed water diaries intended to elicit the diverse cultural understandings and meanings of water. These were compared and contrasted these with views of water industry professionals. Sofoulis et al. (2007) identified a range of user models that could hinder or assist efforts to build engaged water-saving communities, reaching similar conclusions to Strengers, and emphasising the need for demand

management programs to address cultures, communities and social networks (Sofoulis and Williams 2008). The third study is a component of a National Water Commission Fellowship project conducted by Sofoulis in 2010, in which 39 water industry professionals and researchers participated in interviews or small group discussions exploring experiences, problems and contributions of social and cultural research in urban water management (Sofoulis 2010).

To distinguish between these three sources of illustrative quotes, those from Strengers' research are attributed to 'S1'; Sofoulis' Sydney Water research is called 'S2' and her NWC water managers study is 'S3'. Additionally, quotes are distinguished by the participant's role within the research (e.g. 'householder,' 'stakeholder' or 'water manager')

PROVIDER-USER RELATIONSHIPS

In the following discussion, we categorise provider-user relationships into three main types: historical, rationalist and integrated. Each section discusses the characteristics of the relationships within each model (especially the distribution of power, knowledge and responsibility), the strategies that emerge from it, and actual or likely impacts on water management and consumption. Relationship models and the strategies that emerge from them are summarised in Table 1.

Like Brown et al. (2009), we found that historical forms of provider-user relationship coexist alongside models of users and providers from recent and emergent forms of hydrosocial contracts. Historic models can undermine intended outcomes of demand management programs by overlooking the multiple meanings and values of water to contemporary users, and under-recognising people's willingness to take a more active role.

Historical models

Historical relationships between providers and users of water do not mark the beginning of humans' relationship with water, but rather of users' relationship with an external authority designated to manage it. Historical relationships with water in Australia take a Hobbesian form, whereby a state-aligned engineering elite maintains control over water supply and management. The earlier version of this historical model positions water consumers as citizens within a governed population that benefits from the state's water provision, whereas the corporate version positions the water user as a 'customer' who pays for their demand which is matched by supply under a service agreement (see Table 1).

We classify the corporate customer model as an historical form due to its similar distributions of

power, knowledge and responsibility. Both citizen consumer and customer relationships depend on confidence in the ability of water technocracies to tame and control nature and command human skills to deliver required demand. Whether as beneficiary of the state or customer of a water company, the user is positioned as having 'rights' to abundant water supply and very few responsibilities besides paying the bill. Almost all knowledge of water supplies, infrastructures, and details of consumption patterns rests with providers and is largely inaccessible to users, often treated as 'commercial in confidence'.

As several writers have noted, getting connected to Big Water (Sofoulis 2005) means getting disconnected 'from natural and social processes' (Kaika 2005, 5). One impact on users of this removal of responsibility for water collection, transport, use and disposal is 'a crucial material and perceptual disconnection between domestic water use and its ecological consequences' (Strang 2004, 197). In studies S1 and S2, some householders articulated how the unfailing supply itself produced a sense of disconnection and non-involvement: '*You turn on a tap and a lot of people think, oh there's water there, why worry about it?*' (S1, householder). Some felt entirely disconnected from water management issues: '*I would have to have some knowledge of what actually was happening before I could make a comment. I really have no idea*' (S1, householder).

This degree of disengagement contrasts strongly with the sense of connection with water expressed by urban dwellers with background rural experience:

Growing up in the country living off rainwater tanks, my Dad was always reminding us to watch our water use. Even as a young child I knew the seriousness of drought, the blessing of rain, and the inconvenience of having to live under strict water rations (S2, householder).

Both S1 and S2 found a disparity between the corporation's preoccupation with the idea of customers, and its relative insignificance to users. The customer role is experienced as intermittent, passive and non-existent outside bill-paying:

'Well, my responsibility is to pay' (S1, householder).

'[My] relationship with Sydney Water is very one way. They supply it, we pay for it. (S2, householder).

The historical provider-user model undergirds the strong view of many householders that it was the government's role to manage and maintain water supply systems, and some had lost confidence in that: '*I just think our government should have done something years ago. They're just hopeless and*

they don't have any kind of insight to the future' (S1, householder).

The users' ignorance and disconnection from water supply and management, their reliance on governments to solve water problems, and their sense of distance from water providers stem from historical provider-user relationships that are problematic for conservation efforts because they assign users a role where their responsibility (and right) is to consume what is provided through the water system, rather than to assist in its co-management. Because the historic roles of citizen consumers and customers are so minimal, they give rise to very limited strategies for water conservation or adaptation. Enforced restrictions during water shortages are a typical strategy, where the state exercises its power to manage water by telling citizens how *not* to use it, and punishing them with fines for disobeying. Overall, the historical models of the provider-user relation seem more likely to retard the transition to water-sensitive future cities than to facilitate it, as the power and status they accord water experts to define the parameters and options for controlling water supplies are not readily relinquished; likewise, most users are unprepared to give up the benefit of a seemingly endless supply of water on tap.

Rationalist models

With the realisation that water supply systems are not infinitely abundant, relationship models have recently emerged that counter the historical passivity of users by positioning responsibility for conservation and water management at the individual or household level. Rationalist relationship models currently dominate provider-user relationships and form the basis of demand management programs utilising information and education, such as eco-feedback delivered through a smart meter, or 'green consumer' campaigns that encourage people to acquire more efficient appliances. These models attempt to alter the distribution of information about water consumption within the framework of a traditional 'them-us' relationship that maintains the provider's role as the 'authority' on water issues, and positions users as knowledge-deficient but basically rational individuals.

Within these models, engineers maintain control over the supply side by bureaucratically and artificially splitting demand from supply—an approach which socio-technical researchers warn against (Van Vliet et al. 2005), because situating all responsibility for demand onto the side of consumers renders invisible the extent to which water demand is produced by water systems and institutions themselves (for example, water-based sewage management).

The typical assumption is that the rational user will respond for monetary and technical efficiency

reasons, while the responsible consumer will make 'the "environment" their preferred brand' (Shove 2003, p.6):

'Most people respond with their pocket unless they're really into conservation' (S1, smart metering manufacturer).

A tacit hope of these models is that information will help users become 'micro-resource managers' (Strengers 2011). As one professional put it:

'The economic[ally] rational and technologically rational people that are driving all of this have an untested assumption that everyone else is economically and technologically rational too' (S1, consultant).

Premised on the disciplines of cognitive and behavioural psychology and the conventional economics model of the human as *homo economicus*, whose consumption choices are arrived at through a calculative cost-benefit rationality, these rationalist models focus on providing users with data and information to assist them in making cost-reflective decisions about their consumption:

'The idea would be that people don't know how much water they use, when they use it, where they use it, and smart meters would enable them to figure that out or gain that knowledge and so it would hopefully lead to them saying, well, we can cut our consumption by doing XYZ, and changing their behaviour accordingly' (S1, water policy analyst).

Some householders enthusiastically agree, like the S2 water diarist who thought data from smart meters could '*help people set targets and take more control of their water use, rather than merely 'obeying' water restrictions*'. However, others expressed smart system fatigue: '*That's how I drive a car but it's not how I'd live at home. I look at monitors all day, I'm not going to come home and look at this one as well*' (S1, householder).

Our studies found limited evidence to suggest that users permanently change their behaviours in response to the provision of information or personalised consumption data from their utility. Instead of rationalist models of consumption, we found household water practices to be deeply situated within social and cultural understandings of water embedded within understandings of hygiene, presentability, smell, sweat and other meanings: '*[I shower] so I don't smell ... In our society we've got used to nobody smelling. That's something we've got used to in Western society*' (S1, householder).

This is not to suggest that water users in our studies were not saving water: they clearly were. Rather, their motivation for saving water often linked to a renewed connection with water, a sense of co-responsibility to ensuring future water supply

and complying with new social norms (such as four minute showers), or a deeper cultural connection with water (found in the integrated models discussed below).

Assuming rationalist motivations also risks insulting the many people who want to conserve water for its intrinsic values, and for reasons of social and environmental sustainability. In the Sydney Water study, not one of the 23 diarists who answered a question about motivations to save water cited financial reasons as the sole factor, though 5 gave a combination of sustainability and financial reasons, and most focussed on sustainability and social reasons (such as 'doing my bit' and intergenerational equity).

Our studies of householders also found some resistance to an approach to conservation premised on the repositioning of responsibility onto the individual user:

'In past years when there wasn't enough water, it was considered to be a problem of supply, very much a government problem. These days there's a particular spindle [sic.] on it which means that it's a problem of demand and consumer usage. I don't think it's either one or the other; I think the pendulum has swung from being all one way to almost all the other way' (S1, householder).

'Is Sydney Water taking responsibility for the water shortage or is it quick to blame the consumer demand for the water shortage?' (S2, householder).

Some householders felt that: *'the government has to be more proactive with industry and agriculture'* (S1, householder), and one reported a common view that *'a lot of people I speak to are quite resentful, because there seems to be a lot of restrictions on households, but no restrictions on industry which would be using most of the water anyway'* (S1, householder).

However, others embraced this emphasis: *'I think it is individually everyone's responsibility'* (S1, householder).

Rationalist and historical approaches are better at punishment than reward and their top-down character (an historical hangover) provides few pathways for responding to those users who have for whatever reason changed their ways:

There is quite a large group of the community that are really saying, we've changed the way we value water and you're not reflecting that. You're not reflecting that in the projects that you do, [...] in the communications that you do, in the stories you put out, in the way you engage with us, in the prices that you give us...' (S3, research manager).

These rationalist models of provider-user relations could be labelled 'transitional' because they are a mix of forms: although water providers enjoy much the same powers and control over supply as in historical model, a small redistribution of knowledge is associated with a major shift in the user's role, from having hardly any responsibilities to being positioned as almost entirely responsible for consumption. The household user is reconceptualised as 'a chip off the old behemoth' - a micro-resource manager with the information, power and knowledge to make decisions to rationally, efficiently and economically control and limit water use in their domestic domain.

One problem with these mixed models is the contradiction between older and newer versions of the hydrosocial contract. Awareness of the inconsistent expectations associated with the conflicting user models can make householders quite cynical:

[T]here is arguably a conflict in what Sydney Water Corporation does: having conservation of water as a priority yet at the same time having an apparent interest in consumers using more water so Sydney Water can charge more for increased water usage, thereby raising Sydney Water's revenue' (S2, householder).

Overall, these findings indicate that the relatively new provider-user model in rationalist approaches to demand management contains residues of past models that may work against conservation efforts. The extra increment of knowledge that users gain from smart metering, for example, does not translate into much power outside the home. While creating better informed users is arguably an important step in the direction of co-management, rationalist models do not necessarily offer users any new infrastructures or extend their role into participatory planning or decision-making, and they devalue and ignore users' existing forms of practical knowledge about water in favour of quantitative data. The assumption that water consumption is a product of rational economic and technical calculation has little basis in the physical, social and cultural realities of domestic water use practices, which are largely shaped by particular life histories, social norms, cultural values and pre-existing infrastructures. The prospect of change at those levels is not addressed in rational and green consumer models, which generally aim to preserve pre-existing lifestyles and infrastructures by promoting efficiency solutions, and whose highly individualistic focus may serve to discourage co-operative forms of user engagement (Shove 2003, Sofoulis and Williams 2008, Strengers 2011).

Integrated models

'We're no longer the kingpins. We're important influences but we're not the sole central authority for delivering water supply' (S3, senior water manager).

'So the industry's changing, the industry's recognizing that it's got to shift from an engineering and technical approach to a much broader approach that recognizes engineering and technical efficiency but also recognizes what the human dynamic is, what the human impact is, and the interaction with people in terms of managing those impacts' (S3, senior policy analyst).

The above quotes from the most recent study (S3) signal transitions underway towards integrated models of users and providers. Turton and Meissner (2000) might recognize integrated models as Lockean or perhaps even post-Lockean forms of hydrosocial contract, where, the formerly aloof and unchallenged water authorities lose some of their power to environmental agencies, competing water entities, and civil society's demands for more participation in water decision-making.

'[I]t's a contested area. There's a lot of interest groups. [...] Pity help people [water managers] who don't take into account the views of their community and the social trends going forward because you'll just never get a project up' (S3, senior water manager).

The integrated models presented in the lower section of Table 1 represent promising avenues for healthier provider-user relationships that overcome the non-responsibility of users built in to historical models, avoid the emphasis on data provision and guilt invoked by rationalist models, and potentially capture the socio-technical and cultural dynamics of water use lacking in both. In particular, our research identifies three complementary and overlapping varieties of integrated provider-user relationships: (1) cultural communities and networks, where users align with a group to achieve shared water management goals; (2) users and providers both have roles as co-evolutionary and potentially cooperative agents within a hydro-socio-technical system, and users can meaningfully participate in urban design and planning; and (3) users are co-providers and co-managers of the water supply and demand, and consumers and providers are mutually involved in managing decentralised water facilities (water tanks, greywater systems, etc.).

These models attempt to bridge the historical disconnection between supply and demand that prevails in rationalist models. Rather than viewing users as either passive recipients or responsible users of water, integrated models seek to strike a

balance between the responsibilities embedded into provider-user relationships. One sustainability manager (S3) explained how her organisation—which had been very focussed on *'drivers of consumption'* in its approach to demand management—has shifted to *'looking at the whole process, the entire life cycle'* of water beyond the household. This is evidence of the willingness of the water providers to take a broader view of consumption practices than what it has been getting from market research, and to pay more attention to water use in the whole urban landscape rather than sticking with what Stephen Dovers (2008, 83) calls *'the hectoring focus on behavioural change'* and efforts to manipulate the attitudes of the person operating the tap.

Integrated models entail significant changes to the roles of providers and users. For example, the water industry's *Cities of the Future* initiative, spearheaded by Rob Skinner of Melbourne Water, is an international effort to develop a template for the integrated management of urban water. It expresses the water industry's new openness to collaborate more intensively with other urban sectors (energy, transport, urban design, etc), and to address issues of social sustainability and urban liveability through various forms of engagement with users and communities. While concurring with Brown et al. (2009, 853) that the hydrosocial contracts of the water cycle city and water sensitive city are currently more evident as rhetoric than as normative practices in Australia, we welcome conceptual work to redefine the domain of urban water management in such a decisive break from the limiting historical models, and with a grasp of environmental, technical and social complexities inconceivable in the rationalist models.

Our studies found evidence of householders' willingness to embrace and take a more active and responsible role around water management and use, in line with these integrated relationship models. For example, a community network approach to water conservation was entertained by one water diarist who often discussed gardening with neighbours and who speculated that *'a neighbourhood plan to reduce water usage would probably be widely accepted in the street'* (S2, householder). Some expressed readiness to take on a co-provider role:

'I am comfortable with being a consumer of water. I have to be in order to live. I would like to be also a "collector" of water, given the means for it and the times we live' (S2, householder).

Users are more knowledgeable in this emergent hydrosocial contract. As Brown et al. (*ibid*, 854) outline it, the civil dimension (the *'social capital'*) of the water sensitive city would emanate from *'a sophisticated and engaged community supportive of a sustainable lifestyle and would extend to the*

professionals and practitioners in the water sector, in relation to their capacity for innovation and sustainable management of the city's water resources'.

Integrated models offer a wider range of engagement options than those possible in the traditional top-down linear communication chain found in mass media campaigns, water utility websites and advertising promotions of 'green consumer' choices and efficiency solutions. For example, engagement might be encouraged through design of city landscapes or transport routes, such as the cycle path located next to a waterway, or green buildings with recycled water and vertical gardens. User engagement might also take place through community or household provision and operation of a water supply or recycling system.

CONCLUSION

The paper highlights the need for water managers to employ a broader range of HASS sector knowledge and methods to critically examine the ways in which they view, treat and 'manage' water users to support better engagement and maintain the multiple uses of water in an era of unpredictable supply. We conclude that both traditional and transitional provider-user relationships which position the user as a passive recipient of water, a customer or client, a micro-resource manager, or a responsible consumer, are unlikely to facilitate the engagement necessary. Instead, we argue that integrated provider-user relationships that engage users as active agents in dynamically evolving socio-technical systems, or as co-providers of water supply systems and practices, may release new energies and elicit new and surprising results.

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Table 1: User models for water demand

Model	Role of the user	Role of the provider	Relationship with water utility	Type of engagement
Historical models				
Citizen-consumers	Beneficiaries of state services; 'average users', electors, tax payers, rate payers	Provider of large infrastructures. Authority on water. Predict and provide for growing demand.	Citizen beneficiary and state benefactor	Users engaged through appeals to the 'common good' from the state. Users may be consulted in planning.
Customer	Customers in the water market, which shapes demand. Users feel relatively powerless.	Match supply and demand. Company may compete for customers.	Corporation provides, customer buys.	Users engaged through the market.
Rationalist models				
Rational consumer	Lacks information to make efficient and cost-effective decisions. Expected to become rational micro-resource managers.	Provide users with resource management consumption data. Supervisor and advocate of small changes in usage patterns.	Micro manager and macro manager.	Users engaged through consumption data.
Responsible consumer	Moral and responsible citizens who will make the environment their preferred 'brand'.	Provide environmental products, services, devices. Agent, advocate of efficiency.	Environmentally responsible managers and consumers.	Users engaged through moral messages and efficient products.
Integrated models				
Cultural communities and networks	Members of diverse cultural communities and networks of water-conserving practices.	Build household responsibility through local and social groups. Background support to change practices.	Communities and households can align with sustainability objectives without direct engagement with providers.	Users engaged through their community and network.
Co-evolutionary agents	Elements in a socio-technical system of infrastructures and institutions.	Water planning integrated with urban water, energy and transport planning.	Users and utilities are part of sociotechnical system.	Users engaged through the socio-technical landscape (e.g. waterways, infrastructure).
Co-providers & co-managers	Users are co-providers of their water systems and co-managers of their demand.	Water users and the water industry both providers, meeting and managing demand.	Users and utilities are co-providers and co-managers of the water system.	Users supported as partners in co-provision and co-management of demand.