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Author(s): Sharp, L.

Title: Water Demand Management in England and Wales: constructions of the domestic water-user

Publication year: 2006

Journal title: Journal of Environmental Management and Planning

eISSN: 1360-0559

Publisher: Taylor & Francis Group

Citation: Sharp, L. (2006). Water Demand Management in England and Wales: constructions of the domestic water-user. *Journal of Environmental Management and Planning*. Vol. 49, No. 6, pp. 869-889.

Link to original online article:

<http://www.informaworld.com/smpp/content~content=a758385307~db=all~order=page>

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Water Demand Management in England and Wales: constructions of the domestic water-user

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Keywords: Water, demand management, construction, water-users, commodity, community resource, citizen

Acknowledgements:

The research for this paper has been carried out within the Water Cycle Management for New Developments (WaND) consortium (<http://www.wand.uk.net/>), funded as part of the UK Engineering and Physical Sciences Research Council (EPSRC) Sustainable Urban Environments Programme.

One part of the research reported in the paper was carried out by Christine Sefton (Sefton and Sharp, 2005). This paper has also benefited from discussions with Christine Sefton, Kwok-Fu Sam Wong, David Luckin, Richard Ashley, Louise Hurley, Will Medd and Adrian Cashman.

Domestic Water Demand Management in England and Wales: constructions of the domestic water-user

Abstract

Measures to manage demand include implicit and explicit messages about domestic water-users which have important potential impacts on their perceptions and practices. Drawing on recent literature, this paper identifies three different 'dimensions' along which demand management measures' constructions of the water-user may vary: these relate to whether the water user is passive or active, whether they are motivated by individual or common needs, and whether they perceive water as a right or a commodity. Demand management measures currently used in England and Wales are then discussed and analysed. The paper concludes by highlighting the importance of communications associated with demand management, and in particular, notes the need to consider the cumulative impact of messages and their interactions with people's existing understandings.

1. Introduction

Even in the stereotypically wet countries of England and Wales, water demand management has been a subject of increasing attention over recent years (for example, Environment Agency, 2001; OFWAT 2001; DEFRA 2002; IPPR, 2005). Growing concentrations of increasingly water-hungry populations, combined with predictions of climate change, have brought fears of a looming water crises, and a re-examination of some assumptions about water availability and provision. Following somewhat behind 'water scarce' countries such as Australia, English and Welsh water companies and government have begun to take steps to implement demand management. With over 40% of abstracted water used to meet domestic demand (EA, 2001), the domestic household seems an appropriate focus for some of these steps.

Jeffrey and Greary provide a useful review of academic contributions to the management of domestic demand (2005). They catalogue multiple studies which provide evidence about how different factors influence water demand – for example, they show that household size and number of children and young people in a household provide an influence on the level of water demand. They go on to assess the effectiveness of different water conservation measures including economic and regulatory instruments, the provision of new technology, and education.

While the studies reviewed by Jeffrey and Greary have much to contribute to guiding demand management, they can be criticised in three important ways. First, the studies are individualistic in their focus. In particular, consumption of water is posited as a matter of individual household choice, with public behavioural responses to a particular instrument or technology presented as dependent variables, (related to age, gender, education, etcetera), with unexplained variations attributed to ‘social context’ (Southerton, Chappells and Van Vliet, 2004). Second, this focus on quantities of water used by households obscures the perceptions of the individuals involved, who may give little thought to their total water use, but instead think about the practices (e.g. showering, clothes washing) through which water is consumed (Shove, 2003). Finally, the policy-makers’ process of demand management is presented as a matter of choice between different instruments which influence consumers’ decisions, ignoring the important and complex relationships between the consumers and producers of water. Thus the studies presented in Jeffrey and Greary frame the policy-makers’ choice as whether to have demand management and what measures to have, rather than how to develop a culture in which demand is managed.

Spaargaren has been one of a number of theorists pioneering a perspective on sustainable consumption that requires a move away from a focus on merely the individual consumer and their decisions (Spaargaren and Van Vliet, 2000; Spaargaren, 2004). Drawn from the sociology of technology tradition, his ‘social practices model’ suggests that consumers’ practices arise from a combination of their lifestyle preferences and the systems of provision available to them. Practices are the specific activities carried out by the individual consumer, for example, car washing, and food preparation. According to this approach, it is the nature and extent of these practices which should be the focus of water demand management efforts. Of the two sets of factors influencing these practices, lifestyle preferences are recognised as affected by social norms, and the practical time-space possibilities available to the individual. In contrast, the systems of provision are constrained by the

rules about provision, and the 'path dependency' created by the existing infrastructure (Spaargaren, 2004). For example, showering is made possible through systems of provision such as water and electricity in the home, as well as the increasing availability of sophisticated shower technology, over which the individual consumer has no active control. The rise in the popularity of showering, however, requires additional consideration given to changing lifestyle norms about cleanliness, as well as the perceived speed and convenience of showering over bathing which it has partly replaced (Southerton, Warde and Hand, 2004).

Spaagaren and the social practices theorists provide an important alternative way to understand public resource consumption as mediated by practices. Here, my aim is to extend the social practices model beyond the explanation of 'consumption', in order to theorise about different demand management policies. In particular, I am interested in the way demand management policies involve assumptions about the domestic consumer (or 'water-user') which form implicit and explicit messages in any communications about the policy.

Any given demand management measures – for example, a price increase – implies a particular understanding of the water-user – in this case, that the water-user is a purchaser of water and that he or she will react to the price increase through reduced use. Moreover, the way the price increase is discussed in the media and presented in communications from government and from the water service provider will also imply and thus re-produce assumptions about the water-user as a water purchaser. Such messages are important because water-users are not passive recipients of messages; at both a conscious and unconscious level they will react to messages they receive. Water-users' reactions to a particular message will be complex, depending on their particular understandings and personal context. For example, the idea that the water-user is a purchaser of water emphasises their independent choices over how much water they use, and when and how they use it. Some water-users may react to this message exactly as demand managers expect, and reduce their demand accordingly. Some, however, may feel frustrated by the implication that they can choose to use less water when they may not perceive themselves as having any choice to use less, as all their current uses they may consider essential. Others might also feel frustrated by the message because they perceive water as commonly owned and not for purchase. Yet others might embrace the idea of water as a commodity and purchase high-water use prestige goods like a Jacuzzi which becomes a symbol of their wealth. Whichever their specific reaction, each demand management measure communicated

will leave a legacy of understanding which will be present as and when further demand management measures are introduced. The key argument is therefore that these implicit and explicit messages are important. When combined, the messages from different demand management measures will create a culture which could facilitate or hinder the effectiveness of subsequent measures.

The aim of this paper, therefore, is to look at the package of demand management measures used in England and Wales at present and to unpack what specific messages are being communicated to people using water in domestic settings. The academic contribution is the development of a framework through which the messages associated with different demand management measures can be classified. Through unpacking the communicative work of demand management policies, I also hope to open up the possibility of alternative measures to aid the management of demand in the future.

Constructing the water-user

What possible assumptions could demand management measures make about the water-user? This section draws on the literature to highlight three different ways in which the assumptions about the water-user made by different demand management measures could vary.

First, demand management measures seek to influence practices in the two different ways identified from the social practices model by Spaargaren and Van Vliet discussed above (2000). Some interventions are directly intended to (try to) influence the lifestyle norms around water use practices – these types of intervention seek to recruit the water-user as an active participant who consciously and purposively undertakes new or changed practices to reduce the demand for potable water (Guy, Marvin and Moss, 2001). For example, requesting citizens to take shorter showers is asking them to take an active role in reducing their water use. Similarly, specific technologies, for example, the provision of rainwater tanks for toilet flushing, require active choice and maintenance by the consumer. In contrast, some measures influence the systems of provision, and thus change the amount of water used by a particular practice without changing the users' choices in relation to that practice. A smaller toilet cistern, or a reduction in pressure, for example, will reduce water usage with relatively little impact on consumer practices. Likewise, encouraging the manufacture of water efficient washing machines requires little change in consumers' daily practices (though it may require a one-off change

in behaviour when making a purchasing decision). These latter interventions can be seen as positioning the consumer as a more passive recipient of water services.

A second dimension in which assumptions about the water-user varies arises from Strang's ethnographic research with people living in the basin of the UK's River Stour (2004). She takes a normative perspective arguing that people want to manage water communally:

'Water is still central – literally and metaphorically – to ideas about individual being and identity, social inclusion and concepts of 'community', rights to health and wealth, and access to power, agency and life itself' (248)

An example of water demand management interventions which are aimed at influencing communal consumption is the provision of local reservoir levels as part of weather forecasts. The contrast with this perspective is the idea that water is consumed and managed individually – as implied by the metering of an individual household. Strang argues that people's continuing idea that water *should be* a communal resource means that they react negatively to others' appropriation and 'ownership' of it as a commodity which they have to consume individually:

'a large proportion of people are abidingly unhappy about their loss of collective control over water resources' (251-2)

A third dimension along which assumptions about the water-user may vary can be identified from Bakker's work on the privatisation of the UK water industry.

'Commercialisation implied the re-scripting of consumers as customers rather than citizens, a deliberate de-politicisation of water regulation through the creation of arms length regulators, and a shift from social equity to economic equity in water pricing, and hence consideration of willingness but not ability to pay' (Bakker, 2003: 371)

As a citizen, therefore, the water-user had a right to water, to which they should make a contribution according to their ability to pay (which in the UK was calculated according the value of their property). As a customer, water-users can buy different quantities of the commodity, water, according to their willingness to pay. Page warns us, however, against seeing this transformation as 'singular, momentous, irreversible and universal', (Page, 2005: 295) highlighting how the history of water

provision in particular localities has seen continual shifts and gradations between more commercial and political ways of seeing water.

These three dimensions of the water-user are represented in Figure I. It should be stressed that the dimensions are continuums rather than dualities. Moreover, the different poles of any one dimension are not mutually exclusive. For example, water-users may be portrayed as both customers and citizens in relation to water at the same time, and perhaps even by the same initiative.

The above discussion raises two questions which will be explored through this paper. First how do the dimensions help to understand and interpret the messages conveyed by current demand management measures in England and Wales? Second, how do the dimensions relate? In particular, is there a pattern where particular types of initiatives are associated with 'extreme positions' along two or more dimensions?

Method

The discussion below focuses on the four principal sets of demand management measures used in England and Wales, these are: Planning and Building regulations; Regulation of Water Companies; Water Metering; and Water Efficiency. Information sources in relation to each set of demand management measures vary, and include Government documents, company documents and company web sites. Table I summarises the main information source in relation to each set of demand management measures considered.

The systematic analysis of all water company web sites involved accessing the web sites, copying the text available on the required subject into a table, and subsequent analysis by themes. The programme of research described was iterative, starting with the water efficiency research during 2004. The initial research design of this research in 2004 followed a dual track approach in which analysis of web sites was conducted alongside analysis of paper information. Difficulties in obtaining paper information, alongside assurances from some water companies that the material on the web was similar if not identical in content to their paper information, led us to concentrate just on the web analysis. The subsequent analysis of the promotion of metering therefore drew exclusively on web data.

2. Measures to manage domestic demand in England and Wales

Influencing demand through planning and building regulations

The location of new homes is a crucial driver of future domestic water demand. Broad brush development decisions are made by the Government on the basis of anticipated housing need, and translated into regional spatial strategies. Current planning guidance requires that the Environment Agency is consulted about such strategies. It also indicates that the environment, and the capacity of existing infrastructure – including water infrastructure – are valid ‘material considerations’ in the formation of such plans, (ODPM, 2000: Paragraph 5). Of course, the precise interpretation and balance between these and other material considerations such as economic growth and housing need will depend on the strength through which competing arguments are made, and the interpretations and decisions of Government planning inspectors. Similar considerations are required at a local level when planning authorities making decisions about Local Development Frameworks. Recent controversy about the water demands of the proposed developments in the Thames Gateway certainly suggest that water supply capacity has had limited input into development decisions. Overall, it appears that while there is space to include issues about water supply in planning decisions, the system has not worked to this effect in the past.

Apart from restricting the extent of development, further impact on domestic water demand can be achieved through ensuring the efficient use of water in household appliances. Since 1999 the Water Supply (Water Fittings) Regulations have reduced the maximum amounts of water used in new washing machines and toilets (Stationary Office, 1999). While useful, these requirements have no impact on showers, another significant and growing use of water. Moreover, they do not address the increased use of appliances, which also adds significantly to the growth in demand (Shove, 2003). Finally, that there is currently no provision for appliances to be rated in terms of their water efficiency.

An attempt to embed stricter requirements in terms of water fittings and fixtures for new housing is the recent provision in the Sustainable and Secure Buildings Act for minimum sustainability requirements to be included in UK Building Regulations. Alongside this, the Government are developing a ‘Code for Sustainable Building’ (CSB) (ODPM, DTI, DEFRA, 2004), which will enable new buildings to be rated according to the extent to which they include sustainable features such as energy and water efficiency.

The minimum level of the CSB will be the required level of energy and water efficiency in building regulations, and the latter will be 'ratcheted up' through time such that successively higher levels of the CSB will be the building regulations in the future (ODPM, 2005). These plans enable 'certainty' to be introduced for the building industry, while also ensuring improved standards through time. However, the standardised nature of the proposed code leaves little room for local shortages – such as water – to be taken into account. Moreover, because these requirements apply to new buildings only, it will take many years for them to have an appreciable affect on overall water use.

Balancing supply with demand through regulation of water companies

Water companies' supply is guaranteed in terms of licenses they hold from the Environment Agency to abstract water from rivers and aquifers. A river quality grading system indicates which ecosystems are considered vulnerable and are unavailable for further abstraction. In certain locations, therefore, the future availability of further water supplies is very restricted. It follows that, unless demand is managed, future water supplies are going to be transported over longer distances, at considerable financial and environmental cost.

The medium term balance of supply and demand is achieved through the interaction between water companies and the regulators. The Environment Agency's main concern is with the quality of the environment – defined in terms of the extent to which the defined water quality objectives can be met. Their judgement over the quality of a river or aquifer from which a water company wishes to extract will influence their willingness to grant new licences. In contrast, OFWAT's remit is to look after the interests of the customer through imposing a competitive framework to compare the performance of water companies in different areas. OFWAT generally expects companies to achieve a standard of 'security of supply' which does not impose a hosepipe ban in any area more than once every ten years (OFWAT, 2004a). Every five years companies prepare resource plans which include anticipated demand, demand management measures to be used, and resources to be accessed. The regulators judge whether the demand management measures are sufficient before they offer permission (in terms of prices or access) to develop new resources. For example, OFWAT explain that, 'costs of developing new supplies will only be included in price limits where we are satisfied that leakage is at an economic level and demand is properly managed' (2004a: 1). Similarly, in their environmental regulatory role, the Environment Agency's assessment of water company plans in 2004 commented

that many were “dominated by resource development” and “we expect these companies to carry out more work to demonstrate whether demand management measures could deliver the same benefit as new resources” (EA, 2004). These judgements about what constitutes sufficient and appropriate demand management are subjective, and will depend on the regulators’ expectations and understandings about what demand management *could* deliver.

One specific element of ‘demand management’ regulated by OFWAT is that of leakage control. The concept of the ‘economic level of leakage’ is used to select which leaks are appropriately fixed and which are left; in short, leaks should be fixed if the costs of detecting and fixing them are less than other means of balancing demand and supply.

Metering

In the past UK citizens have paid for water through a tariff related to their nominal house value, and this system still applies to 74% of households. Currently a process of transition towards a volumetric payment system is underway. The transition, running at approximately 2% of households in England and Wales per year, occurs largely through households opting for payment by meter (OFWAT, 2004a: 44 & 72). In the British context, it is this volumetric payment system which is meant when the term ‘metering’ is used, though it might more accurately be called ‘metered charging’. Companies have been obliged to offer free water meter installation, and associated switch to metered charging, to all customers since 2001. Many companies also operate ‘selective metering’ in which some customers – with particularly water inefficient devices like swimming pools, or those moving home to an area in which there is supply shortage - are obliged to change to metered charging. OFWAT anticipate substantial increases in the proportion of households with water meters over the period 2005-10 due to more use of selective metering (OFWAT, 2004b).

For the regulators and Government, metering is one of the main means through which domestic demand can be managed in the UK (EA, 2001: 8; DEFRA, 2002: 51). OFWAT state that ‘metering should play a central role in encouraging customers to be more efficient in their use of water’ (2004b: 58). The Environment Agency claim that metering has a proven track record (Stationary Office, 2004: 8), and is particularly effective at reducing peak demand (EA, 2004: 4). The consumer watchdog has also suggested that metering should be more widely promoted to achieve demand management, though they argue that its benefits still need to be more thoroughly researched (CCW, 2005,

paragraph 7). Some water companies are similarly enthusiastic about the promotion of water meters as the main way to manage demand: Sutton and East Surrey water for example describe metering as 'the only real prospect of managing demand' (2004: 23). Other water companies, however, are concerned that the structure of price limits do not fully compensate them for the extra costs of serving metered customers (Bournemouth and West Hampshire Water, 2004; Cambridge Water, 2004; Severn Trent Water, 2004). The costs of installing and reading meters mean that neither OFWAT nor the water companies advocate universal metering (OFWAT, 2004b; Water UK, 2005). The UK Government and the Environment Agency are also cautious about the social consequences of universal metering, which puts relatively higher charges on poorer consumers, some of whom may be unable to pay (EA, 2001; DEFRA, 2002; Stationary Office, 2004). Overall, key players are unanimous that metered charging would reduce domestic demand. However, either because of its costs or because of its social consequences, they are cautious about suggesting that metered charging should be imposed universally.

It is difficult to measure the precise impact of metering on water used, not least because, by definition, those households switching to metered charging have not been metered in the period immediately preceding their switch. In an empirical study based on the Water Companies own monitoring information, Baker and Toft estimate that metered charging causes a decrease in domestic optants' water use of, on average, between 2% and 14%, depending on the charging regime (Baker and Toft, 2003). They contrast this estimate with reductions of between 10% and 15% reported in the literature from occasions when metering has been compulsorily imposed. More generally, the logic that customers will use less water if they are paying by meter is supported in the literature (Jeffrey and Geary, 2005; Baker and Toft, 2003). Jeffrey and Geary, however, state cautiously, 'different groups of water-users clearly respond to economic instruments in different ways at different times' (2005: 311) while Achttienribbe suggests that domestic customers are less responsive to changes in changes in price than commercial customers (1998).

A further important unknown concerns the mechanisms driving any changes in water-user behaviour on change to metered charging. Baker and Toft (2003) calculate 'price elasticity of demand', an approach which assumes that charge levels control water use behaviour, implying that metered customers reduce their water use because they can save money through so doing. At an average of just £275 per year, however, water bills take up a small percentage of most household incomes and

achieving reductions in these costs may not be important to all consumers (OFWAT, 2005). Moreover, as Medd and Shove, (2005), point out, practices of water use are often habitual, deeply embedded in culture and difficult to change; for example, washing habits are associated with social acceptability and may not be judged an appropriate area for economy. Additionally, the bill-payer may have limited control over the water use of other household members. Thus, even when there is an economically motivated will to change, changes in behaviour may not always be achieved. There is also the possibility of that some water-users will respond in way which is the reverse of that commonly anticipated. Strang's (2004) interviewees saw metering as a further step in the alienation from ownership of water. From this perspective, paying for water may further absolve the water-user from any sense of responsibility for the resource consumed. At its logical extreme, this viewpoint could lead to high water use practices – enjoying a Jacuzzi or a swimming pool, for example, - becoming not just pleasurable in themselves, but 'prestige goods' symbolizing success and largesse. Finally, even where metering has impacted on water use, care should be taken in assuming that the effect is purely economic. Von Vugt (1999) compared the motivation for reducing water use of compulsorily metered households from the Isle of Wight with non-metered households from 'mainland' Hampshire during a period of drought in 1995. He found that metering impacted on behaviour because it provided information which could inform choices about water use, rather than because of the economic costs involved. The possibility of such an 'information effect' impacting on optant households highlights the importance of location and accessibility of the water meter as well as the extent to which water bills enables comparisons with past consumption.

The uncertainties about how metering impacts on customers' behaviour have little impact on the way water metering is promoted by UK water companies. As Table II indicates, messages like , "switching to a meter could save you money", were given by more than 60% of company web sites as a reason for changing to a meter. A further 30% of sites just provide statistics about water use and bills so that readers can calculate potential effects of metered charging on their bills for themselves. In either case, there is an assumed economic motivation for the consumer. Alternative potential motivations for switching to a meter were also found on some sites: a third of sites noted that it might help the environment and a quarter argued that meters enabled the water-user to pay in a fair way (or similar). It is notable, however, that these non-economic motivations were never presented as the only reasons for installing a water meter. No web sites mention the potential informational benefits of having a meter and how this might enable customers to reduce their water use. Finally, as noted previously, if

these messages were merely those found on water company web sites it is probable that they would be of limited effect, however, it is to be expected that similar if not identical messages are contained in company literature, such as that distributed with bills.

A final factor to note is that all bill paying water-users (not just those who will be metered in the immediate future) are subject to company publicity about metering when they receive their bills. Given Strang's (2004) findings with respect to customer alienation, we can assume that some water-users will be suspicious of such promotions: 'if I was really going to save money through installing a meter', the customer may reason, 'then surely the company would lose money – and why would they promote that?' Such suspicion about the water companies' promotion of water metering could decrease the uptake of meters. More generally, the publicity about metering is likely to reinforce non-metered customers' impressions that water is a commodity, and one which – given that they are lucky enough to still consume it through a fixed charge – they may choose to enjoy to its full extent. There is therefore a possibility that commodity-oriented publicity about metering actually promotes increased water use in the non-metered customer.

Water Efficiency

Since 1996 water companies have been obliged to promote the efficient use of water to their customers. OFWAT requires that companies exhibit a 'minimum level of activity': companies must make cistern displacement devices available to customers (these are devices which reduce the amount of water in a toilet cistern, such as the well known 'hippo'), they must also offer self-audit kits so that individuals can assess their own water usage, and additionally, distribute water efficiency information (OFWAT, 2001). Over and above these measures companies are expected to select what water efficiency activities they carry out on an economic basis, 'where the cost of saving water by promoting and adopting a water efficiency measure is less than the cost of delivering additional water' (OFWAT, 2004a: 58). Companies report on their water efficiency activity in terms of the amount of money invested and the water saved in their annual report to OFWAT. As the organisation with financial muscle over the water companies, this rather short term and instrumental approach to water efficiency is likely to limit the extent to which water companies innovate or invest in this area.

The Environment Agency endorses water efficiency, stating: "water efficiency should be actively promoted" (EA, 2001: 6), and offer an annual water efficiency prize to the water company displaying

the most innovative work in this area. Even the EA seems cautious in deciding what such active promotion should consist of, however: in comments on companies' 2004 resource plans, a general commentary is offered with respect to the quality of leakage reduction and metering but no comparable commentary is provided with respect to the promotion of water efficiency (EA, 2004). Finally, the Environment Agency have suggested that water efficiency may not be best delivered by the water companies,

"Water efficiency needs active promotion and the co-operation of many different groups. We think that the best way to achieve this is through an independent organisation specifically funded for this purpose." (2001: 8).

Another critical stance with respect to the overall framework for water efficiency was shown by the House of Commons Committee on the Environment, Farming and Rural Affairs (Stationary Office, 2004). They comment that 'there does not yet seem to be a widespread perception that water is a valuable resource to be used carefully' (8), recommending that, 'with the Office of the Deputy Prime Minister, Defra develop specific proposals to develop and promote products and services that increase household water efficiency (9)'.

Discussion of the content of water efficiency messages can be split into three parts: how people are contacted, what they are asked to do, and how the companies attempt to motivate them to do it. The following discussion draws on Sefton and Sharp (2005) to consider these factors in turn.

The water companies' annual reports to OFWAT give an indication of what means are used for promoting water efficiency. It appears that most companies provide leaflets or company newsletters which give information about water efficient behaviour to all customers. All also have information about water saving behaviour on their web sites. Some also distribute water audit packs and cistern displacement devices to every household in their area, others distribute the same on request. Further means of achieving contact with the public noted on June returns included water conservation presentations including 'gardening road-shows', guided tours around operational premises, attendance at local events, work with schools and publicity campaigns through the media. Some companies also indicate that they have conducted targeted campaigns depending on the particular needs within different parts of their area. For example, Southern Water has promoted water efficient gardening in Sussex North due to issues with high peak summer demand (Southern Water, 2004).

In terms of what new or different behaviours are requested from customers, 21 of the 23 company web sites (91%) promote the use of water butts (including some free water butt provision), 20 (88%) cistern displacement devices, 17 (74%) self audits or similar and 7 (30%) provide information on water efficient products like washing machines. Other suggested activities included turning taps off while cleaning teeth, turning showers off whilst soaping, using buckets of water to wash and rinse car, not flushing the toilet on every occasion it is used, purchase of low flow shower heads, and timing garden watering to minimise evaporation. In general, the advice given is clear and 'do-able'. However, many of the web sites described the required changes as 'simple', which, if Medd and Shove's research is correct, may not coincide with customer experience (Shove, 2003; Medd and Shove, 2005). It is also notable that in most cases the self-audit kits are the same tables that are offered to customers investigating the possibility of changing to metered charging.

Water company web sites indicate that a range of strategies are used to motivate customers to take up water saving behaviour. Many water companies suggest that water should be saved in order to prevent environmental crisis. Some frame this in local terms; for example, Portsmouth Water claim, "even though water resources in Hampshire and West Sussex are usually replenished by winter rainfall, if we abstract too much water for public water supplies, we may risk damaging our water environment". A more common strategy is to discuss a global crisis, often in vivid and sensationalist language. For example, one company claimed "if we continue to degrade our environment we shall cause irreparable damage to our own health and that of the planet on which all life depends". It is well documented that such environmental 'fear' messages risk eliciting readers' denial about the veracity of the message or questions about the motivations of the source organisation (Oskamp, 2000; Macnaghten, 2003). Another classic communication error that some companies fell into is the use of expert validation which the readers may or may not share (Wynne, 1996), for example: "the British Government and international scientists agree that the trend in this part of Britain is towards a Mediterranean-style climate." (An additional issue with this message is that the promise of a Mediterranean climate could motivate British people to accelerate global warming!) A strategy of validating messages through fitting in with local understanding may be more successful, as in this example from Welsh Water: "The rivers & wildlife of Wales are adapted to this relatively wet climate & it is our task to deliver supplies to our customers whilst preserving the natural environment". A minority of companies attempt to motivate water saving through showing that it is already happening, for example, South West Water argues, "more and more people are getting waterwise and finding

ways of saving this vital commodity". More frequently, messages show how high water use is normal, for example stating that "we all waste water" or arguing "Its AMAZING how much water you can save..!" Such arguments inadvertently suggest that any attempts the reader makes to save water will be in vain in the context of wider water wastage (Bator and Cialdini, 2000). Finally, exhortations to save the environment were frequently accompanied by claims that doing so will save the reader money. While some companies explicitly acknowledged that this was true only for those who were metered, others did not. Such failure to acknowledge the payment system used by the majority of customers raises the possibility that readers will feel ignored, or will assume that the messages do not apply to them. In conclusion, the use of fear based messages, expert validation, messages exclusively aimed at the metered customer, and the potential for creating the impression that everyone wastes water, all suggest that these messages have been designed with limited reference to communications professionals. It is questionable whether such messages have the potential to motivate changes in customer behaviour.

Over and above customer reactions to the specific persuasive words, customer views of their water company are liable to affect their reaction to all aspects of the water efficiency messages. As the Strang has shown, many water-users are suspicious about water companies, who they view as having appropriated a public resource (2004). Non-metered customers may read exhortations to save water as just a means of saving the water company money. And metered customers may also be suspicious about the companies' motives, reasoning, 'why should an organisation tell me how to save water when they also make money from selling it?' These factors about the credibility of the water company compromise the extent to which all water saving messages emanating from water companies – however well designed – could achieve the desired effect.

Overall, it appears that companies employ varied strategies to try to stimulate water efficiency behaviours through websites and leaflets, as well as specific activities. On the basis of an analysis of water company web sites, it appears the companies provide a range of practical information about how water can be saved in the home which would be useful to a water-user already motivated to reduce their water usage. The messages seeking to motivate the more ambivalent customer are much more mixed in quality, however, and show limited use of communications expertise. It is hard not to conclude that they are produced as a required response to water companies' duty to promote water efficiency, rather than as a genuine attempt to support customers in using less water.

As a final point on the discussion of domestic water efficiency, it is worth raising the topic of water restrictions. In England and Wales 'water restrictions' work on a black and white basis, either an area has a hosepipe ban or it does not. As noted previously, OFWAT generally expects companies to achieve a standard of 'security of supply' which does not impose a hosepipe ban in any area more than once every ten years (OFWAT, 2004a). This way of understanding water restrictions emphasises their negative impact on customers, but disregards their communicative potential to educate the public about water efficiency. Indeed, such is negative understanding of hosepipe bans in England and Wales that Severn Trent are reported to have decided 'never again' following negative public comment on their hosepipe ban in 1995 (Johnson and Handmer, 2002). A contrast can be made with the infrastructure for water restrictions in Australia. Despite a wide variety of institutional systems for managing urban water across Australia, there is nationwide understanding about the existence of four different levels of 'water restriction'. Level 1 restrictions limit the hours when sprinklers can be used and serve as a warning that more severe restrictions associated with levels 2 (hosepipe ban), 3 and 4 are a possibility. Movement from one level to another is triggered if reservoir levels dip below pre-defined parameters associated with the time of year (Savewater, 2005). These different levels of water restrictions enable a much more sophisticated process of communicating with the public about local water resource issues than is currently available in England and Wales. The pre-set criteria also position water scarcity as an issue to be managed communally, for which the public have some responsibility, rather than the responsibility of a specific company.

3. Analysis

Water demand management in England and Wales

How can these different demand management initiatives be understood in relation to the dimensions of the water-user highlighted in section 2?

The initiatives discussed combine a range of different positions along the continuum which constructs the water-user as on the one hand an active manager of water, and at the other extreme, a passive recipient of water services. Developing building and appliance regulations are centralised processes which are carried out in a technical frame with virtually no public involvement – and therefore in which the water-user is very passive. The water-user is also relatively passive in the regulation of water

companies, where their interests are represented by OFWAT and the Community Council for Water, and in the regulation of development, where the normal public participation processes for land-use planning apply. The promotion of metering and the labelling of appliances seek slightly more active involvement from the public; here, the initiatives are seeking one-off active decisions by the public to achieve reduced demand in the future. Towards the other more 'active' extreme, metering, meter promotion, and the promotion of water efficiency all appeal to the water-user as if they are fully in control of their own consumption processes and can change those patterns at will. Similarly, while water regulations require the water-user to change behaviour under particular drought conditions, accordance with hosepipe bans are to a large extent dependent on water-users' active choice to follow the rules.

The consumer-community member continuum refers to the assumptions about what will motivate changes in behaviour. Individual self-interest is used to promote metering and (sometimes) water efficiency. At the other extreme, planning and building regulations, appeals to environmental interests for water efficiency, and the use of water restrictions, all construct the water-user as a member of a community which shares water resources. Some promotion of water efficiency refers to both motivations and thus potentially operates in a 'middle ground' on this continuum.

The customer-citizen continuum encompasses contrasting perspectives about what is a 'fair' way to distribute water. There are some initiatives which are hard to classify along this continuum because they do not comment specifically on payment systems: this applies particularly to planning and building regulations, but also to some of the water efficiency promotion. There are also many aspects of water services infrastructure in the UK which maintain a 'citizen right' perspective. In particular, the majority payment system through a means-related fee operates irrespective of consumption.

Likewise, people's 'right to water' is highlighted by rules requiring that water companies offer water services to all households irrespective of location, as well as those outlawing disconnections for non-payment. In contrast, the promotion of metering and some of the material promoting water efficiency stress the commoditised nature of water and develop ideas of the water-user as a customer: for example, the way water metering is promoted by the Environment Agency and OFWAT as the principal tool in achieving change in domestic water use. In this respect, the 'citizen' aspects of infrastructure are perceived as necessary for social fairness whereas the 'customer' based initiatives are presented as the way to promote environmental responsibility and demand management. An

interesting exception to this pattern relates to the promotion of water metering as a 'fair way' to pay for water. The use of the term 'fair' suggests notions of social justice rather than just fairness to the individual. This example also demonstrates the slightly fuzzy line between this customer-citizen continuum and the consumer-community member continuum discussed in the previous paragraph: 'fair' might be argued to hint at community responsibility to care for the environment as well as rights to water through a reasonable payment structure.

Finally, it is worth noting that there is more 'communicative work' achieved by some initiatives than others. By definition, the more 'active' initiatives in which the public are exhorted to change their lifestyle, inevitably require more communication than the more passive ones. Moreover, of the two types of 'active' initiative discussed, it is clear that the central institutional and communicative emphasis is on water metering rather than water efficiency.

A crude 'rating' of how the different initiatives can be classified in terms of the three different dimensions is shown on Figure II. As the Table demonstrates, there is a strong contrast between the classification for the use of regulations to control planning, building and water companies, and that for the use of water metering. While the former initiatives frame the water-user as passive, community members and citizens, the latter frame them as active, individual consumers and customers. The former initiatives can be seen as finding the space for demand management within a traditional 'welfare state' approach to water provision; the latter are newer initiatives associated with a more market oriented perspective. These two types of initiatives can be characterised as 'welfare based' and 'market based' initiatives respectively. The promotion of water efficiency shows some variation from this pattern: while similar to water metering in framing the water-user as 'active', some water efficiency promotion stresses the communal nature of water resources.

It is important to note that the described pattern is that formed by the way that domestic demand management initiatives are presented, developed and communicated by the English and Welsh infrastructure. In another country and another institutional context similar initiatives could be communicated differently. For example, in some countries planning and building regulations may be specifically debated in relation to their impact on water resources – bringing the initiative to at least the middle of the active-passive spectrum. Likewise, metered charging might be presented and developed as the 'fair' way to pay for water, (perhaps with a rising block tariff, so high users pay more

per unit of water used), moving this initiative towards the citizen end of the consumer-citizen continuum.

The analysis demonstrates some of the limitations in the promotion of domestic demand management in England and Wales. The dominant communication with the water-user is market-based about metering. While this approach may encourage some consumers to decrease their water demand by some proportion, the assumption of an economically rational consumer means that alternative ways of engaging the water-user as citizen and communal steward of resources are not utilised. Most other demand management measures are welfare based, which are discrete from the promotion of metering and operate relatively independently. The extent to which these limit demand is constrained by what the regulatory agencies believe to be 'possible'; while couched in the technical languages of ecology or economics, both regulatory agencies make judgements about what the public will 'put up with' with respect to prices, services and local ecological quality which may or may not be correct. A few water efficiency initiatives which work outside this pattern, seeing the water-user as both active and a community member and citizen; except in times of drought, these are less visible to the consumer than the promotion of metering. During periods of shortage water restrictions and media coverage highlight the need for domestic demand management, in order to protect the communal resource, bringing more citizen and communal ideas about the water-user to the fore. In the light of previous understandings developed through other messages that they are customers and can choose their own consumption, it is to be expected that water-users will only identify with such community needs to a limited extent. The case of the Yorkshire drought in 1995 provides an extreme example when there was very little public response to appeals for public water savings (Bakker, 2000).

These issues begin to point to the possibility of an alternative package of domestic demand management initiatives. Rather than focusing on the individual as a purchaser and consumer of water, a package of 'communitarian initiatives' could draw on water-users' sense of communal responsibility and citizenship to encourage active management of domestic demand. For example, metering (and not necessarily metered charging) could be promoted as a way for households to monitor and influence their water use. Regulatory agencies could engage in more extended dialogue about whether and what constraints on water use are appropriate. Discussion of local reservoir levels could be a useful way of helping water-users localise and visualise water issues during periods of scarcity. Water efficiency promotion – currently constrained by the dominant discussion about water

as a commodity – could provide the means for households to participate in a wider process of managing regional water resources. Unlike the current discrete operation of metering and water regulation under the current water management arrangements, these ‘communitarian’ initiatives would necessarily be interdependent: water-users’ willingness to engage in water saving in the home could only be achieved if they perceive that government, water companies, and commercial users of water are also managing water resources. The key point here is that the effectiveness of such initiatives can only be judged in relation to a package of initiatives working in a co-ordinated manner with consistent communications.

Figure III summarises the outcomes of this discussion. The investigation of demand management initiatives in England and Wales demonstrates two distinct ‘ideal types’ of initiatives: welfare based regulation construct the water-user as a passive citizen consuming a communal resource, while market based initiatives highlight his or her active management of a commodity which they consume individually. In England and Wales these initiatives operate independently of each other, and are arguably limited in their effectiveness. A package of communitarian initiatives – which construct the water-user as active citizen contributing to the management of communal resources - might be an alternative way to promote domestic demand management which could have more chance of success.

Conclusion

This paper has argued that the management of domestic demand needs to start to recognise how water-users are people who engage with and react to communications in policy measures. Such engagement cannot be reduced to individuals’ reactions to a discrete initiative; rather, it is important to consider how people’s understandings are developed in reaction to the cumulative impact of different initiatives. This recognition highlights the need to view demand management as a package of initiatives which have a combined and cumulative impact through the implicit and explicit messages they convey to the water-user.

Drawing on the literature about water management, the paper has identified a number of ways that the implicit and explicit messages about water-users could vary between demand management initiatives. These three ‘dimensions of the water-user’ have been used to analyse the initiatives currently in use in England and Wales. The analysis suggests a sharp contrast between the messages conveyed by current initiatives, which fit the ideal types of ‘market based’ and ‘regulatory welfare based’ initiatives

respectively. The analysis highlighted the potential for an alternative package of initiatives conveying messages about a more communal way of managing water, which might be more effective in achieving the active engagement of the water-user in reducing their water demand. Over and above this specific implication for policy in England and Wales, the analysis points to the need for policy makers to be aware of the communicative implications of their activities, and to consider the cumulative effect of different communications.

In research terms, this paper has built upon the social practices model to open up ways of considering the communicative work carried out different demand management initiatives. It therefore raises many new questions. Can the dimensions of the water-user be developed and refined through its application to other countries? Does evidence support the concluding supposition, that a package of communitarian initiatives might have more chance of promoting domestic demand management? How does the model stand up empirically – if we talk to water-users about their reactions to different communications, are the assumptions made in the analysis appropriate? How, theoretically, can we understand the accumulation of different messages and the processes of individuals developing changing understandings of water use? Moreover, does the communicative emphasis transfer from the water sector to other areas of environmental management: transport or energy, for example? All these interesting and valid questions have in common a perspective which views the public as real people who actively engage with and react to policy measures.

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Table I: Sources of information used in relation to demand management measures discussed

	<i>Main sources of information</i>	<i>Analysis</i>
<i>Planning and Building regulations</i>	Government documents including PPGs and PPSs.	Policy literature review.
<i>Regulation of water companies</i>	Documents from regulators.	Policy literature review.
<i>Water Metering</i>	Water company 'June returns' (annual reports) to OFWAT available from OFWAT web site. Water company web sites. All accessed during 2005.	Systematic analysis of comments on water demand management in overview 'June Returns' to OFWAT. Systematic analysis of web sites for reasons given to consumers for using a meter.
<i>Water efficiency</i>	Water company web sites accessed during Spring and summer 2004.	Systematic analysis of sites for a) reasons given for promoting water efficiency and b) information provided to support water efficiency.

Table II: Reasons for switching to a water meter on company web sites

Source: Study of UK water company web sites conducted by the author in June 2005.

Reason for switching	No. of 23 sites noting reason			Example – quotation
	Total	First	only	
Tariff information mentions saving money	14	10	7	“Switching to a meter could save you money. The first step to help you decide whether a water meter is right for you is to work out how much water your household uses in a year.”
Help the environment	8	3	0	“Paying for what you use also means that less water is wasted which helps conserve valuable water resources. And that’s good news for the environment.”
Information on tariffs- no persuasive words	7	7	7	“You may prefer to pay for the water you actually use. If so, we will install a meter at your property as long as the work is practical, free of charge. “
Fair way to pay	5	3	0	“We all pay for our gas and electricity according to the amount we use and you can now have a water meter installed to pay for your water supply in the same way. Just as it is accepted as a fair method of charging for other utilities, we think it is also the fairest method of charging for your water. If you do not have a water meter you may be paying more than you need to.”

Figure I: Dimensions of the water-user

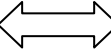
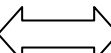
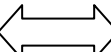
<p>Passive non-manager: The water-user is a passive recipient of water services.</p>		<p>Active manager: The water-user actively manages their own water demand.</p>
<p>Individual consumer: The water-user is an individual consumer of a commodity which they can use as they wish</p>		<p>Community member: The water-user is part of a community and they have responsibility to help manage society's consumption of water, a communal resource.</p>
<p>Customer: The water-user pays for the commodity of water in a commercial transaction, in return for which they have a right to expect particular levels of service.</p>		<p>Citizen: The political system meets individuals' human rights to water, deciding who should contribute to the costs of providing it according to ability to pay.</p>

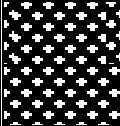
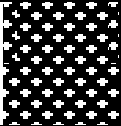
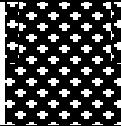
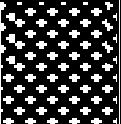
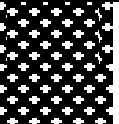
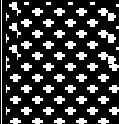
Figure II

Classification of initiatives discussed along the three dimensions of the water-user

	Passive to Active	Individual consumer (left) to Community Member (rht)	Customer to Citizen
Planning & building regulations	Dark shading		Dark shading
Regulation of water companies	Dark shading		Dark shading
Water metering		Dark shading	Dark shading
Water Efficiency promotion		Light shading	Light shading

KEY: Dark shading: initiative (row) clearly frames consumer as classified (column); Light shading: some influence in this area; No shading: no apparent impact.

Figure III: Three 'ideal types' of demand management initiatives

Initiatives	Passive to Active	Individual consumer (left) to Community Member (rht)	Customer to Citizen
Welfare based regulation			
Market based initiatives			
Communitarian initiatives	