



Evidence

The social science of encouraging
water efficiency

Report: SC060040/R1

Resource efficiency programme
Evidence Directorate

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Miranda Kavanagh
Director of Evidence

Executive summary

The aim of this two-year collaborative project was to provide evidence and understanding of the effectiveness of different approaches in changing people's behaviour in using water in the home. These approaches were informed by current social scientific thinking and marketing practice.

The project involved two phases. Phase one included a literature review that identified insights from the social sciences and marketing/communication professions on encouraging water efficiency and identification of potential pilot projects. The review findings were organised using the 4Es framework (enable, encourage, engage, exemplify) presented in the UK sustainable development strategy, *Securing the Future*.

Phase two sought to test what works through piloting and evaluating interventions in two projects:

- Natural England's Living River project, River Avon catchment area;
- Wessex Water's retrofitting project in Bath with a local housing association.

Different social and technical intervention methods to encourage water efficiency in households were trialled including doorstepping, literature distribution, community engagement, device fitting and social approaches. Various quantitative and qualitative research techniques were used to monitor and evaluate the water efficiency values, attitudes and behaviours of the study populations. These included surveys, in-depth interviews, focus groups and monitoring of water consumption by water companies in the study areas.

Key findings

- People value water and agree that saving water is important. But water tends to be taken for granted in daily life and participants in the trials did not make strong links between water use and environmental values.
- People genuinely believe that they are using water effectively and doing all they can to 'save' water.
- People are aware that they can save water through routine actions in or around the home, but most people do not know how much water they are using or wasting. Consequently they do not know how much they could be saving.
- People do not recognise that the water systems in their home may use water inefficiently and know very little about the various water saving devices available.
- Metering is perceived as a stimulus to saving water as it may reduce bills. Some people without meters fear their bills will increase if they obtain one.
- There is a perception that the 'problem' is mismanagement of water resources, not one of availability or demand.
- People are suspicious of water companies and do not trust their motives.
- People do not believe that their contribution to saving water will make a difference or is worth the effort. Water companies need to show that they are committed to saving water too.

- Doorstepping and community engagement can be effective in reaching a target audience, but local factors are significant in the success or otherwise of these two invention methods.
- Messages and interventions need to be taken to people rather than relying on them being proactive.
- Almost all residents asked were happy with the water saving device (a dual flush retrofit system) installed in the Bath trial.
- Measuring the actual impact of interventions on water consumption proved difficult.

Key recommendations

- Interventions or advice on water efficiency need to be delivered proactively. Most people believe they are already doing all they can to save water and are therefore unlikely to seek information or advice.
- Providing examples of common domestic situations or ‘people like us’ may help people see where they can use less water. High usage was assumed to be related to large household size such as families with children. Targeted examples of how different size households can be water efficient may help increase uptake of water efficiency messages as they are less likely to be ignored by smaller households.
- Designers of campaigns and interventions to promote water efficiency should remember that motivations for saving water are complicated and go beyond a perception of immediate water scarcity and cost. Social norms may be important.
- Using ‘water scarcity’ to persuade people to use less water is unlikely to work unless there is perceived to be a shortage of water in the local environment.
- Messages and interventions should be deployed reactively at times of water stress, if possible, as they are likely to have a longer lasting impact.
- Messages or interventions aimed at water savings through washing practices have the potential for significant water savings, but need careful design to overcome negative associations with poor hygiene.
- Interventions and awareness raising around water saving devices could increase uptake and deliver considerable water savings, as awareness and uptake are currently very low.
- Activities to promote water meters should include clear information about the relative costs and potential for savings.
- Water bills should provide actual consumption data plus aspirational or average figures, together with ‘reward’ measures to prevent low users increasing usage. This approach may help create a ‘social norm’ for water efficiency behaviours.
- Water companies need to demonstrate very clearly to householders that they are taking responsibility for water efficiency and practising it themselves. Linked to this, there is a need for messages to reassure the public that strategic planning is being carried out and that cost-effective solutions are being sought to manage water effectively.

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1 Introduction

This report describes the findings of a research project on the social science of encouraging water efficiency. The aim of the project was to undertake desktop and action-based research on ways in which householders might be encouraged to be more water efficient in the home.

Two projects were chosen to trial approaches to water efficiency. These projects, which are described in more detail in Section 4, were:

- Natural England's Living River project in the River Avon catchment area;
- Wessex Water's housing association retrofitting project at Twerton, Bath.

1.1 Project background

A central issue in the Environment Agency's science programme is to understand existing resource use patterns by households and businesses, and to identify opportunities for more sustainable practices.

Water efficiency is vital to the work of the Environment Agency and has been chosen as one way to explore the potential for changing behaviours to deliver environmental objectives. Thus, the purpose of this research project was to make a positive contribution to one of the Environment Agency's corporate strategy objectives, to encourage consumers to use water efficiently.

The project was commissioned by the Environment Agency with input from the Consumer Council for Water (CCWater), the consumer body for water customers. The Consumer Council for Water has a remit to understand and change the way people think about the way they use water, making them aware of what they can do to change. The Consumer Council for Water also has an interest in conducting research on these issues.

This project was intended, in part, to carry forward some of the recommendations arising from previous research by the Consumer Council for Water and to test out some intervention methods on the ground (CCWater 2006a,b).

1.2 Project aims and objectives

The project's overall aim was to provide evidence and understanding – informed by current social scientific thinking and marketing practice – on how successful new approaches could be in changing the behaviour of household water consumers.

The specific objectives were:

- to identify insights from the social sciences that could improve current approaches to encouraging water efficiency, and resource efficiency in general, in households;
- to identify practices from the marketing and communication professions with the potential to improve current approaches to encouraging water efficiency, and resource efficiency in general, in households;

- to organise a workshop with representatives of other government bodies and non-governmental organisations (NGOs) to discuss how such approaches could be taken forward in pilot studies;
- to test what approaches work through running and evaluating a number of pilot initiatives that apply the insights from the social sciences and marketing;
- to identify the opportunities to incorporate the findings from the social sciences, marketing practices and pilot studies into the Environment Agency's policy, regulation, guidance and influencing activities.

1.3 Project structure

The project was divided into two phases. The first phase reviewed the social science of resource use, social marketing and resource use. The second phase aimed to pilot interventions drawing on learning from the review. Phase 1 ran from March to June 2007 and phase 2 from June 2007 to January 2009.

The project was carried out by a consortium made up of the following organisations:

- Resource Futures: consultancy specialising in sustainable waste management and behavioural change campaigns;
- The Social Marketing Practice: consultancy specialising in consumer behaviour change, lifestyle trends and social marketing with a focus on environmental and sustainable development policy;
- Alex Inman Consulting: consultancy specialising in community engagement, social research and public participation processes;
- Mike Read Associates: consultancy specialising in sustainable resource management and responsible trade;
- Waterwise: NGO that aims to decrease water consumption and build an evidence base for large-scale water efficiency programmes;
- Cranfield University (Centre for Water Science);
- University of Bradford.

2 Literature review

The literature review aimed to identify:

- insights from the social sciences that could improve current approaches to encouraging water efficiency (and resource efficiency in general) in households;
- practices from the marketing and communication professions with potential to improve current approaches to encouraging water efficiency (and resource efficiency in general) in households.

The review, which conducted by The Social Marketing Practice with staff from Bradford and Cranfield Universities, summarised 33 sources of literature in relation to sustainable resource use in the UK and internationally. A detailed analysis of these sources is presented in Appendix 1.

To organise the research findings, the model presented in Defra's *Securing the Future* for influencing behaviour was used as the analytical framework (Figure 2.1). The framework (also known as the 4Es) defines an approach that focuses on the need to **enable**, **encourage** and **engage** people and communities towards sustainability and recognises the need to lead by example (or **exemplify**). This model is designed to ensure the presence of all the factors necessary to change behaviour.

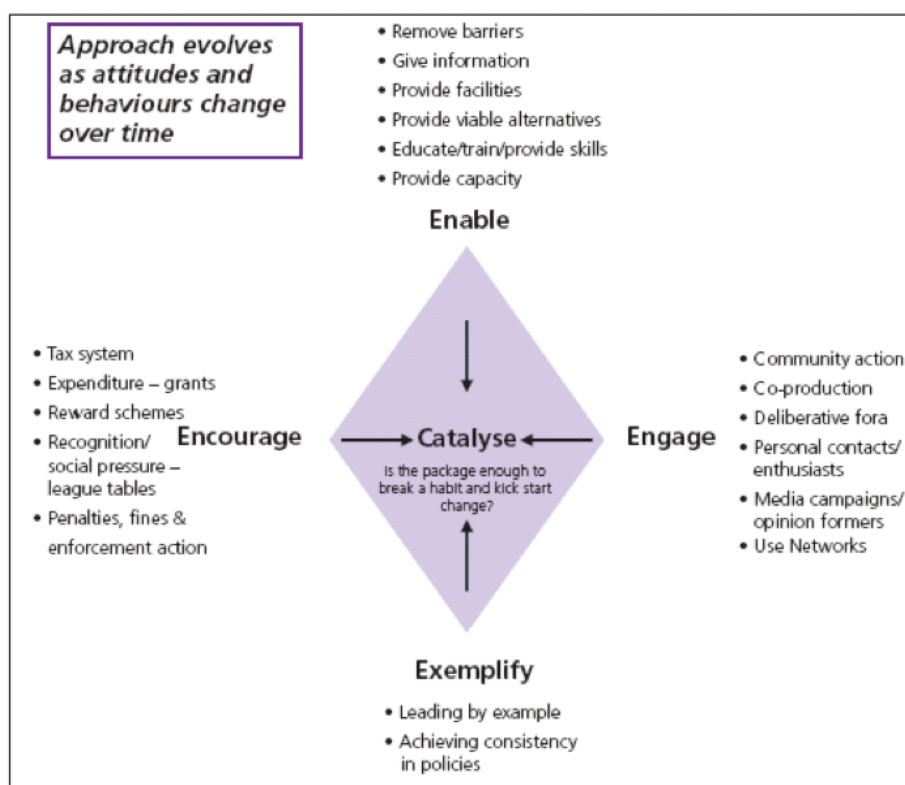


Figure 2.1 Defra's approach to pro-environmental behaviour change as attitudes and behaviours change over time using the 4Es model.

Source: Defra (2005)

2.1 Recommendations for behaviour change interventions

The review findings resulted in the following recommendations for the pilot projects. The recommendations are grouped according to the 4Es framework plus an additional category of strategic design.

2.1.1 Strategic design

- **Work in partnership** taking a whole system approach to influence behaviour at all levels of society from communities to business and government.
- **Develop a behavioural goal** to ensure focus on specific water use behaviour and target audience.
- **Invest in up-front scoping, planning and research** to identify partners and how to work with them:
 - Develop insight into the target audience.
 - Ensure realistic objectives.
 - Use a relevant mix of tools.
 - Consider cross-social goals, scale up and durability.
- **Plan to monitor, evaluate and pilot** to understand and evaluate what works and what does not, thus providing reliable feedback to refine the intervention, inform policy and encourage continued participation.
- **Plan to empower ownership of solutions** to encourage active participation (e.g. through action research/learning) and involve people in intervention design.

2.1.2 Enable

- **Take a community-based approach** – work with social networks, local businesses, local authorities, schools and established community-based initiatives.
- **Use information strategically** – provide vivid, personalised information in a number of ways so that people know what they can do, how to do it, and how their actions help.
- **Develop resources, skills and capacity** – ensure skilled, empathetic people are available to support and facilitate change, and have the necessary resources.
- **Remove barriers to participation** through gathering insight to the target audience and taking a whole system approach – barriers to uptake of a new behaviour can be external to the individual (e.g. infrastructure) or internal (e.g. psychological).

- **Provide support and facilitation** to individual participants and community-based partners in as many relevant ways as possible, to empower ownership of solutions and encourage continued participation.

2.1.3 Engage

- **Develop a segmentation model to allow targeted engagement.** Through understanding salient beliefs, social networks, interests and propensity to behave in certain ways, key influencers on similar groups of individuals can be identified and communications meaningful to these groups can be targeted.
- **Develop a communications strategy.** Construct simple, specific, attractive, accessible messages that are meaningful to the target audience, have a central theme, are constructed to motivate by addressing and overcoming barriers and are adjusted over time to provide feedback. Deliver messages in a number of ways, e.g. through face-to-face interaction, the media, public events, project partners, schools, role models, virtual and real social networks.
- **Identify and work through key influencers.** Behaviour change message bearers need to be trusted members of the community. Identify social networks and trusted intermediaries to engage with householders.
- **Seek personal commitment.** Once individuals are engaged, obtaining their specific commitment to a small, easy activity will increase their propensity to carry out that activity and commit to future, more challenging activities. Commitment should be visible.

2.1.4 Encourage

- **Incentivise desired behaviour** among individuals, water utilities, business, local authorities and community-based partners. For one-off behaviours, individuals can be encouraged through direct financial incentives. For repeat behaviours, consider community incentives, pledges leading to equipment for schools, etc.
- **Provide feedback to participants.** People need to see how they are doing and how their local action affects the bigger picture. Fostering personal efficacy as part of collective efficacy builds self-confidence and motivates continued involvement.
- **Developing a holistic community approach** based on shared responsibility will help to shift social values and develop water saving behaviour as the norm.

2.1.5 Exemplify

- **Foster shared responsibility through a whole system approach.** People need to know that they are not expected to act alone – that government, local authorities, business and water utilities are all playing their part to conserve water.

- **Demonstrate and celebrate change** through a range of methods such as:
 - water companies showing progress in respect of leakage reduction;
 - media coverage of successes and case studies;
 - reproduction of successful projects;
 - community events celebrating success.

2.2 Application of findings to water efficiency projects

The literature review recommended that projects aiming to increase water efficiency should address as many of the above themes as possible to ensure success. The review suggested that the exemplifying themes are particularly important for water efficiency. Householders need to see that they are not the only ones being asked to take action and that they are part of something bigger. This is particularly true for water companies.

Practical tasks for each of the recommendations in Section 2.1 were provided as a toolbox for use at the design stage of pilot projects. Recommended core approaches for the pilot projects were as follows.

2.2.1 Community-based social marketing

A community-based social marketing (CBSM) approach involves barriers and benefits research that will provide consumer insight. CBSM design will take into account working with community-based partners or intermediaries to help develop social norms.

Setting a behavioural goal and segmenting the target audience is key to engagement, motivating people over time and utilising techniques such as prompts, pledges and feedback to encourage change. The review identified that it will be crucial for partners to exemplify what they are doing to reduce water consumption along with householders.

Application: This project design was selected for application in the village of Downton as part of the Avon Living River pilot project (see Section 0).

2.2.2 Participative co-design

This is a powerful method of increasing partnership stakeholding and participation, particularly with the target audience whose behaviour is addressed. Involving the target audience in the design of the initiative builds in insight and ownership, empowering stakeholders and participants alike.

Application: The engagement work conducted in Downton utilised aspects of participative co-design.

2.2.3 Partnership engagement including exemplifying

Partnerships are invaluable for enabling and engaging behaviour change. They can provide accessibility to householders through existing networks and develop long-term

durability through differing funding streams and cross-social goals. However, significant investment is required both in developing relationships at the outset and involvement at the design stage of the intervention. Partnership needs to be reinforced by exemplifying behaviour – in particular those participating as partners and the regional water companies – to encourage householders to act.

Application: Although both pilot projects did involve working with partners, the extent to which the partners could be seen to be exemplifying was limited.

2.2.4 Whole town approach

Developing a high density or critical mass to an intervention in a local community, town or region is a common theme in many successful interventions, in particular where the concept of shared responsibility is applied – bringing together business, the community and public sector focusing on a common goal. The fostering of partnerships and interconnected networks is a fundamental precursor to success and, if the environmental goal can be linked to a social goal of local relevance, the intervention becomes even more powerful.

Application: This approach was initially intended to be tested through a partnership with the Three Valleys water company. However, the project was shelved when sufficient funding was not secured.

3 Overview of monitoring and evaluation methodology

A number of qualitative and quantitative research techniques (Table 3.1) were used to monitor and evaluate changes in water efficiency behaviours of the study populations as a result of planned interventions.

Table 3.1 Research techniques.

Type of data	Technique
Quantitative	<ul style="list-style-type: none">• Survey of attitudes and self-reported behaviours (before and after interventions)• Monitoring of water consumption by water companies in the study areas (before, during and after interventions)
Qualitative	<ul style="list-style-type: none">• Participant observation• In-depth interviews• Focus groups

The quantitative data aimed to provide a measure of attitudes and behaviours before and after interventions aimed at changing water efficiency behaviours had been undertaken. Both self-reported (survey) and independent/objective (water consumption data) methods were used; these data would in theory allow a change in attitudes or behaviours due to an intervention to be detected and measured/quantified.

The qualitative data aimed to provide a more in depth exploration of how and why people think and behave the way they do in relation to water, potentially revealing factors influencing attitudes and behaviours, and barriers and opportunities to changing these. There was an additional element of action research as participants in some focus groups were asked about the type and delivery of interventions that would influence their water efficiency behaviours.

3.1 Survey of water efficiency attitudes and behaviours

The main method used to detect claimed changes in attitudes and behaviours among the target audiences for both pilot projects was an attitudinal survey.

3.1.1 Committed water saver metric

To allow the impact of the pilot project interventions to be evaluated, a metric was developed to measure 'degree of commitment to saving water'. The notion of such a metric was adopted and adapted from the attitudinal measures relating to 'commitment' used by the waste management industry.

A 'committed water saver' metric was defined along similar lines to that of the 'committed recycler' developed by the Waste and Resources Action Programme (WRAP) which uses a number of different metrics to measure people's propensity to

recycle, prevent food waste or compost at home. The metric was based on the 'committed recycler' metric and takes into account answers from respondents to three key questions:

- the importance they attach to a particular action;
- whether or not they take this action even though it requires additional effort;
- the frequency with which they actually undertake the activity themselves.

The Venn diagram shown in Figure 3.1 demonstrates the combination of answers to these questions that yields 'committed water saver' status.

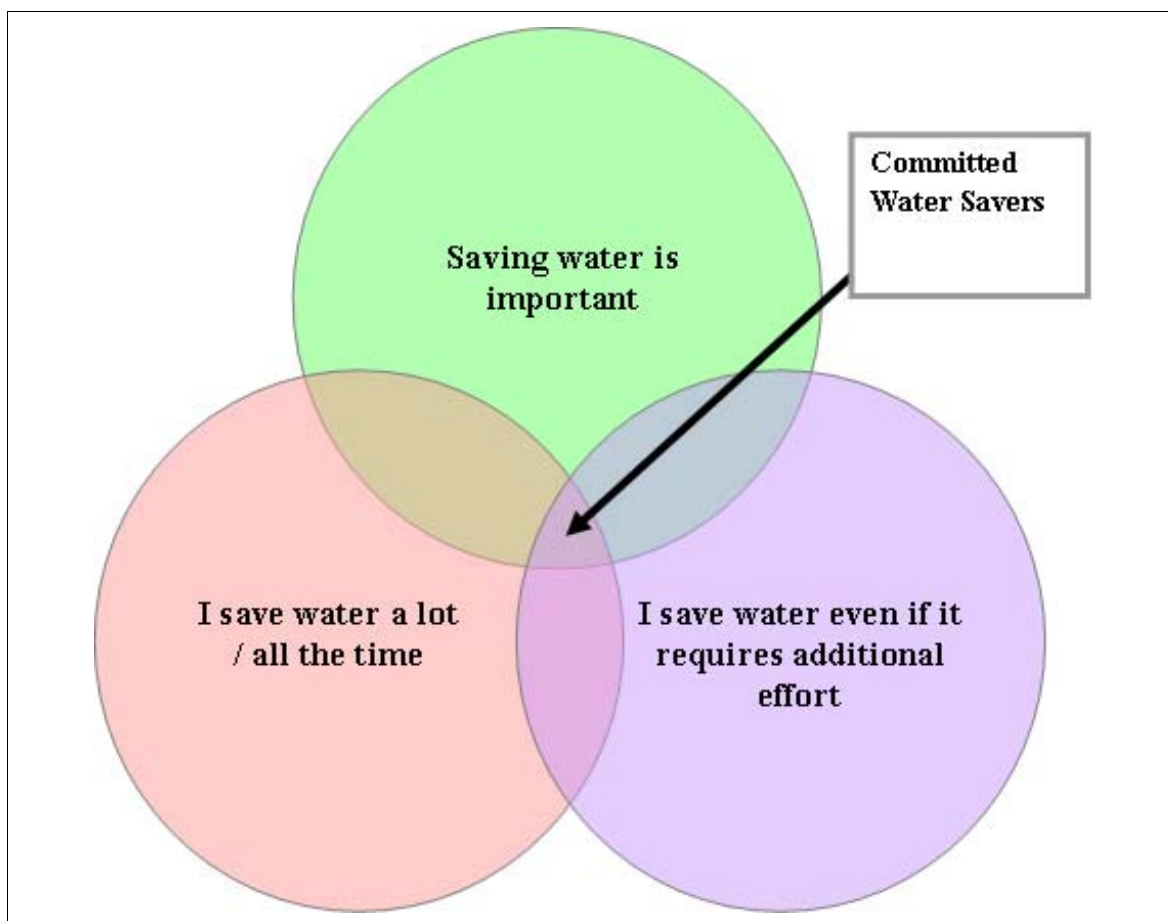


Figure 3.1 Venn diagram illustrating committed water saver metric.

Owing to difficulties with the administration of the pre-intervention survey at the doorstep and feedback that the survey was too long and repeated itself, the survey was adjusted so that the first two questions were asked directly but the final answer (I save water a lot / all the time) was calculated on the basis of a combination of answers about five different water saving actions.

(The initial intention had been to ask a single question, but when carrying out the survey, it was found that respondents felt they were being asked the same question when they got to a subsequent, more detailed assessment of how frequently they carried out a range of different water saving activities. As a result, it was decided to aggregate answers received in response to the detail assessment to obtain a single answer to frequency of action taken.)

3.2 Water consumption data

Although a questionnaire survey is useful to obtain people's reflections on what they think and claim to do, observations of actual behaviour can provide an objective measure of behaviour change following an intervention. The project team was therefore keen to obtain and analysis water consumption data to determine whether the interventions had resulted in lower levels of water consumption.

Wessex Water had already intended to fit meters and loggers to blocks of flats as part of its Twerton pilot project. This was not the case for the Avon Living River project, so data already being collected by the relevant water companies to monitor consumption on an area level basis would need to be used. The data available, demand management area (DMA) data, are aggregated across all consumers in the area, including commercial properties and agriculture, and therefore have severe limitations for the purpose of this research project.

3.3 Qualitative data collection

In addition to the quantitative research described above, the project team also undertook qualitative research in the form of in-depth interviews (conducted in September/October 2008) and focus groups (November/December 2008).

3.3.1 In-depth interviews

Thirteen in-depth interviews were undertaken with people living in the pilot project areas. The interviews covered the following aspects.

- first impressions on hearing the word 'water';
- descriptions of the main ways in which householders used water at home;
- descriptions of what people consider to be 'high', 'medium' and 'low' water consumption;
- an assessment by respondents of whether they were 'high', 'medium' or 'low' water users;
- claimed water saving behaviours and what motivated such behaviour, any perceived enablers for such behaviour, and any perceived (or unconsciously reported) barriers to adopting water efficiency in the home;
- views about whether or not the respondent's household could be more water efficient;
- an assessment of how important saving water is relative to other pro-environmental behaviours.

The interviews were conducted face-to-face and by telephone. Each interview was recorded and transcribed for analysis. The findings are presented along with those of the focus groups in Section 5.1.

3.3.2 Focus groups

This research consisted of six focus groups – two in Downton and Twerton respectively and one each in Tisbury and Wilton (see Section 4 for further information). The groups

consisted of local residents (mixed gender and age groups) and were designed to achieve the following objectives:

- to further explore and complement issues emanating from the quantitative benchmarking surveys;
- to help determine the relative efficacy of different intervention strategies;
- to understand the current public knowledge base and perceptions of the water supply/demand balance problem;
- to explore behaviour change motivations and barriers.

Focus group participants were selected using a variety of methods. They represented a broad selection of socio-economic backgrounds and also demonstrated a variety of positions relating to reported water consumption levels (high/medium/low), environmental consciousness and pro-environmental behaviour.

The focus groups were structured around the use of a topic guide to develop insights into knowledge, attitudes, beliefs and social norms. The topic guide concentrated on the following key question areas:

- How do people define a high/medium/low water user? How do they define themselves on this scale?
- Which activities do people associate with greatest levels of water usage?
- Do people think there is too little or too much water locally/in the UK? If too little water, what are the factors most to blame for water stress: climate change/lack of rainfall; domestic use; leakage, business use, agriculture; other? Who should be sorting out the problem?
- What, if anything, would make people reduce their consumption of water? Which interventions might work best?
- What are the barriers to change? How might these be circumvented?
- For those people in receipt of, or aware of, the pilot project interventions, how did they perceive these? What did they like, what did they not like?

Recordings were taken at each focus group and a summary of key points was made during each session. A summary report of key findings was provided by the facilitator. The recordings were then transcribed and coded to provide more detailed analysis. The findings from the focus groups have been combined with those of the in-depth interviews and are presented in Section 5.

4 Description of pilot project interventions

4.1 Pilot project selection

A workshop was held in June 2007 with representatives from the water industry to discuss potential interventions and pilot projects. An initial assessment of all nominations for pilot projects was carried out by the project team using an assessment matrix (reproduced in Appendix 2). A shortlist of six potential projects chosen from the top 10 ranked projects was produced and two final pilot projects were selected. Table 4.1 gives descriptions of the proposed design of these two projects as provided during the nomination process.

Table 4.1 Description of selected pilot project from nomination forms.

Project name	Project description
Natural England's Living River Project, River Avon catchment area	<p>The project seeks to improve the understanding among its target audiences of water conservation issues, particularly in relation to the River Avon in Wiltshire/Hampshire. The aim is to generate a reduction in water demand in the River Avon catchment. The project will:</p> <ul style="list-style-type: none">(a) develop an interactive water exhibit to show people the effect water use has on wildlife in the river;(b) reach 100 per cent of households in the main urban centres of the catchment (several thousand homes) with information on water conservation;(c) provide talks on water conservation to groups across the catchment.
Wessex Water's Housing Association retrofitting project, Twerton, Bath	<p>The project would like to receive the team's assistance with demographic information, developing baseline information and survey work. Project monitoring is likely to look at indicators such as sales of water efficiency gadgets and changes in attitude (as detected via attitude surveys).</p> <p>The project is a trial which involves working with a local Housing Association in Bath to examine the benefits of retrofitting different water efficiency devices and water efficiency promotion. The project will involve 256 flats (16 properties in each of 16 blocks of flats) and it is likely that a control would be possible (either in the same area or of similar type elsewhere in the city). The interventions are yet to be finalised and could include behaviour-only messaging (by comparison to retrofitting of devices).</p>

Both pilot projects aimed to test interventions to increase water efficiency among households in the target population (Table 4.2). These interventions included both social and technical interventions and a control group was used in both cases. A more detailed description of each pilot project's design is provided below.

Table 4.2 Summary of pilot projects.

Pilot project	Location	Intervention method
Avon Living River project	Wilton	Doorstepping and literature distribution
	Downton	Community engagement
Twerton Wessex Water Efficiency Trial	Twerton	Device fitting
	Twerton	Social approaches: doorstepping and community event

4.2 Pilot project 1: Avon Living River

Avon Living River is a £1 million project that aims to increase awareness and appreciation of the River Avon and its tributaries from the headwaters in the Wiltshire Downs to the sea at Christchurch. The project is supported by Natural England, Salisbury District Council, Salisbury International Arts Festival, Hampshire and Isle of Wight Wildlife Trust, Wiltshire Wildlife Trust, Hampshire County Council, Wessex Water and the Environment Agency. The project started in October 2006 and is scheduled to end in July 2010.

One of the project's objectives is to communicate with residents in the Avon catchment to encourage water efficient behaviour. This objective was a good match for the social science research requirements of this research project and hence interventions were developed for implementation in the Avon catchment which could be monitored for their effectiveness. Two main types of intervention were tested (Table 4.3).

Table 4.3 Intervention types tested in the Avon Living River project.

Type	Description
1	A programme of doorstepping and literature circulation
2	A participatory process involving community-based activities, talks and resources (e.g. 'Living River' interactive catchment exhibit)

The following study areas were chosen for the pilot project:

- Wilton (intervention 1) ;
- Downton (intervention 2);
- Pewsey (control area).

Initially a third intervention of literature circulation (in the form of a leaflet drop to all households) was proposed for the villages of Tisbury and Fovant but this was not carried out due to resource constraints. The study area of Tisbury and Fovant was retained to form an alternative control.

The study areas were chosen on the basis of comparable socio-demographics based on a combination of census data assessments and local knowledge from Living River staff. Each village also had a river flowing through it, which was fundamental to the interests of the Living River project. Subsequent analysis of ACORN data by area did suggest some socio-demographic differences, which were taken into account when deciding the survey sampling strategy (see Section 4.4). There are roughly 1,000–1,500 households in each of the four study areas.

4.2.1 Doorstepping in Wilton

Door-to-door promotional canvassing visits were the chosen intervention method for the 1,665 households in the village of Wilton (and neighbouring Bulbridge). This form of intervention was chosen as a comparator for the community-based engagement approach recommended by the literature review and piloted in Downton (see Section 4.2.2).

This method of engagement is now well-established in the waste industry and it was felt that testing the application of doorstepping to water efficiency messaging provided an interesting alternative approach (or possibly 'halfway house') to the full community engagement process being trialled in Downton

4.2.2 Community engagement in Downton

The chosen intervention method for the village of Downton was to adopt a community-based approach. The main aspects and principles for engagement adopted, as defined by the findings of the literature review, were:

- work with community-based partners or intermediaries;
- set behavioural goal(s);
- motivate people over time;
- utilise techniques such as prompts, pledges and feedback to encourage change;
- ensure that partners are seen to 'exemplify';
- involve the target audience in the design of the initiative.

The key community groups, organisations or individuals currently active in the area were identified and contact was made with people from these groups, as well as the local Parish Council, both local schools, and the three village churches to inform them of the project and invite participation in a meeting to discuss the project further.

4.2.3 Community-based meetings and event

A series of meetings were held with community members to discuss how a community-based project might be conducted. These culminated in a village-based event planned and organised by a group of local people which came to be known unofficially as the Downton 'water wise' group. Responsibility for organising these meetings was shared between the project team. Living River contributed a budget for refreshments at each meeting. The group itself took responsibility for co-ordinating a local event on water efficiency to which the project team and other intermediaries (e.g. the local water company) provided input and assistance. A summary of the process is given below.

Meeting 1 – Initial scoping meeting, June 2008

An introduction to water efficiency issues and the Living River project was given to participants. The group supported the idea of doing something about water efficiency locally and potential activities were identified. Feedback on a planned leaflet suggested the message needed to be more motivational.

Participants recognised that some 'key' people from the village were missing. The need to obtain information from, and engage with, the water company that supplies Downton was also identified.

Meeting 2 – First planning meeting, July 2008

A representative from the relevant water company (Bournemouth & West Hampshire Water) attended and provided information about consumption in Downton and what might be done to encourage greater efficiency. He confirmed that:

- leakage in the village was very low;
- the pipe network was in good order (especially compared with elsewhere in the country);
- water flows were monitored daily and action taken immediately if leaks are detected.

He also confirmed that the company actively advocates metering and gave some details about how else the company tries to encourage water efficiency (e.g. by distributing 'Save-a-Flush' sachets¹). This presence assured the group that the company was genuinely interested in water efficiency and was itself 'exemplifying' such behaviour.

A number of key people attended who had been identified as influential in the community at the first meeting.

Initial results from the survey, specific to Downton, were presented to participants. The group was also shown a number water saving devices including shower timers, water efficient shower heads, tap inserts and cistern inserts.

The group identified the following behaviours as the best means to improve water efficiency in Downton:

- Flush the **toilet** less frequently.
- Turn off the **tap** while brushing teeth and washing hands.
- Use **appliances** on full loads (and buy the most water efficient models).
- **Shower** for shorter time (and fit water efficient shower heads).

Participants then discussed:

- methods for delivering these behaviour change messages;
- having a public display about water efficiency;
- giving feedback to residents about their performance;
- how to encourage greater adoption of the desired behaviours.

Meeting 3 – Second planning meeting, September 2008

Participants were asked for views on how to conduct doorstepping work in Wilton.

¹ http://www.waterwise.org.uk/reducing_water_wastage_in_the_uk/house_and_garden/toilet_flushing.html

More in-depth information on people's attitudes and behaviours in relation to water was provided to the group following further analysis of the survey results. The meeting considered these findings and discussed them in light of the planned launch event, now called 'Aquafest'.

Meeting 4 – Pre-launch planning meeting, October 2008

The group met to report on progress and finalise plans. Thought was also given to reviewing the day at a meeting scheduled for after the event.

Event – Aquafest, October 2008

Members of the group ran an event which they promoted locally as Aquafest. Held in the hall of a local primary school, Aquafest consisted of:

- stalls and displays;
- interactive activities;
- a water efficiency slide show running in the background;
- musical performances;
- an award ceremony;
- a brief talk by a TV celebrity.

Each activity had water saving messages. The stalls and displays included:

- an information stand by Bournemouth & West Hampshire Water where people could pick up leaflets or talk to staff about water efficiency, metering and other water-related matters;
- a stand where children could watch and try for themselves a water quality testing kit;
- a dual flush toilet demonstration staffed by a salesman selling toilet retrofitting gadgets to enable dual flushing;
- a tabletop sale of water efficient plants;
- an exhibition of the photographs and posters which had been entered into the two competitions run in local Downton schools during the lead up to Aquafest.

The interactive activities included:

- pledging cards (on which residents could make a pledge to save water);
- a quiz about water (for which the prize was a water butt);
- colouring-in sheets featuring water saving messages;
- hook-a-duck games.

Two musical performances had been produced. One featured primary school children and a second performance was by a group of older children from the Downton Drama Group.

Meeting 5 – Post-launch evaluation and future plans meeting – November 2008

The group met to evaluate the success of their activities to date and to consider future plans. Their feedback about Aquafest was obtained (see Section 6). Ideas for further ways to engage and enable water efficiency were also discussed.

Associated activities

A number of additional activities were undertaken both before and after Aquafest. These included:

- talks by a representative of Bournemouth & West Hampshire Water at the primary school;
- distribution of flyers to promote Aquafest and water saving messages;
- public relations activity to publicise the event in local newspapers, church newsletters and on the Downton village website;
- distribution after the event of the project's water saving leaflet (see Appendix 3) by members of the group. Distribution included:
 - posting them door-to-door;
 - handing them out at local venues (e.g. the pub);
 - sending them out with the church newsletter;
 - displaying them in prominent local places.

4.3 Pilot project 2: Twerton Wessex Water Efficiency Trial

The second pilot intervention took place in the Bath area in co-operation with Wessex Water where a mix of both social approaches and technical interventions were used. Wessex Water was planning a water efficiency trial with Somer Community Housing Trust (SCHT) in the Twerton area of Bath to deliver and test the effectiveness of different water efficiency interventions (see Appendix 3 for further details).

Nineteen blocks of flats were identified for the trial in Twerton and a further five blocks in the Moorfields area (two miles east of Twerton) on the western side of Bath. The blocks each have 10–18 flats made up of studios, one-bed and two-bed flats. The number of residents in each block varies between 11 and 38. Ninety per cent of the flats are social housing properties managed by Somer Community Housing Trust and 10 per cent are owned by their occupiers as leaseholders. All the blocks are similar in age, layout and size with similar fittings throughout.

The aim was to test both social and technical interventions as follows:

- technical interventions only – installing water saving devices (dual flush toilet systems and tap inserts);
- non-technical interventions only – involving community engagement and education activities;
- combination of both technical and non-technical interventions.

Blocks of flats were allocated to each intervention type. The allocation of the interventions is described in table 4.4 below.

Table 4.4 Allocation of blocks of flats to invention types.

Group	Code	Intervention type
1	D	Devices only
2	DE	Devices and engagement
3	E	Engagement only
4	CT	Control – Twerton
5	CM	Control – Moorfields

4.3.1 Device fitting in Twerton

The original intention was to install a range of water efficient devices to gauge the savings possible from a ‘basket’ of measures. Before the trial started, visits were made to some of the flats with a SCHAT tradesman to confirm which measures were appropriate for the flats. The results are summarised in Table 4.5.

Table 4.5 Device suitability for flats.

Device	Assessment of suitability	Included in trial?
Low flow shower head	Only a small number of the flats have showers and these are electric showers, which are not suitable for low flow shower heads.	No
Aerating tap inserts	The taps in the flats are all different styles and sizes and some have oval outlets. A variety of tap inserts were trialled but none were found to be suitable.	No
Dual flush retrofit	The toilets are mainly nine-litre cisterns and therefore suitable for dual flush retrofit devices.	Yes
Save-a-Flush	The toilets are suitable for Save-a-Flush devices.	Yes
Washers to fix leaking taps	Some taps were suitable for washer replacements, others may need complete replacement.	Yes

Source: *Water efficiency trial 2008–2009*, Wessex Water, 2009 (Appendix 3)

It was decided that more robust conclusions could be drawn from the monitoring results if dual flush retrofit devices were the only devices used. The ecoBETA® dual flush device² was chosen following advice from Waterwise as these have proven to be quick and straightforward to install in other trials.

² http://www.waterwise.org.uk/reducing_water_wastage_in_the_uk/house_and_garden/toilet_flushing.html

Existing SCHAT contract plumbers were used to install the devices and a training session was held to give them an overview of the project and details of their role, and to provide training in ecoBETA installation.

The devices were installed in October 2008. The plumbers explained to residents that they were fitting devices for SCHAT to save water and, where residents agreed, an ecoBETA was fitted where possible; if not, a Save-a-Flush cistern displacement device was fitted. Plumbers also fixed dripping taps where found.

Records were kept detailing:

- which properties had been visited;
- whether any taps had been fixed;
- whether an ecoBETA had been fitted;
- any comments made by the resident.

4.3.2 Social approaches in Twerton

The engagement interventions were led by Resource Futures. A wide range of activities for water efficiency promotion were considered including pub quizzes, a tour of a water treatment works, children's education days and a travelling information centre.

The final selection of activities was based on:

- an assessment by SCHAT that residents would be receptive to them;
- an assessment by Wessex Water that they could be realistically be undertaken by water companies in the future.

The chosen methods were comparable to those delivered in the Living River pilot, namely door-to-door canvassing and a local water saving event. However, there was no separation – as in the Living River project – between these two activities; all residents receiving a social engagement approach were canvassed and invited to attend the water saving day.

4.3.3 Door-to-door promotional canvassing

Canvassing was carried out at the beginning of October 2008. The same methodology adopted for doorstepping in Wilton (see Section 4.2.1) was adopted but with modifications including:

- a local canvassing team was used with more female members of staff;
- canvassers informed residents of the Water Saving Day, encouraged them to attend and gave them a promotional flyer;
- more 'giveaways' were available, provided by Wessex Water, including shower timers and fridge magnets. Save-a-Flush devices were provided in blocks receiving engagement interventions only. Pledge cards were handed out with the chance to win an 'eco kettle' as an incentive. The Wessex Water report reproduced in Appendix 3 includes a copy of the pledge card.

4.3.4 Water Saving Day

The Water Saving Day was promoted to all households in the social engagement blocks by word of mouth, flyers and posters in the blocks receiving 'engagement' interventions.

The event was held at Twerton village hall, half a mile from the blocks. The hall was set up with:

- information areas;
- a water use calculator;
- information on getting a water meter;
- a face painter;
- a Wessex Water education adviser;
- 'giveaways' including tea towels, washing up bowls, watering cans and information booklets (see Appendix 3).

4.3.5 Uptake rates in Twerton

Uptake rates for the interventions in Twerton were high; 45 per cent of the flats targeted for device interventions had ecoBETA dual flush devices retrofitted and 50 per cent of householders in the flats targeted for engagement activities participated in discussions about water efficiency in their home.

These uptake rates are higher than have been found in other industry studies (Waterwise 2008, Appendix 3). This may be because residents have more positive attitudes to people calling at their door as security gates reduce the number of door-to-door sales people (as noted by Resource Futures researchers, see Section 6.1.2). It may also be that householders in social housing are used to tradesmen visiting their homes and so were particularly amenable to the interventions.

In contrast, the uptake for the Water Saving Day organised as part of the educational interventions was very low with only two attendees from 156 invitations to the event. This suggests that the water saving day did not appeal to people strongly enough to attend. In contrast the relatively high uptake rates in the Twerton pilot suggests that people are most receptive to water efficiency messages if they are presented to them and require minimal effort to receive.

4.4 Survey of attitudes and behaviours

A survey of participants was carried out in both study areas before and after the interventions. The aim was to:

- compare survey results before and after the interventions being trialled;
- detect changes in attitudes, awareness and self-reported behaviours.

Both the target and the control populations were surveyed.

The pre-intervention survey was carried out door-to-door in all the villages in the Avon study area over a period of four weeks in March/April 2008. The pre-intervention survey in Twerton took place door-to-door over five days in May 2008. The post-intervention

survey was carried out in both areas over the period February to March 2009. A total of 73 residents were surveyed in the Twerton study area.

The questionnaire used during the survey incorporated questions aimed at eliciting respondents' attitudes, values and reported behaviour with regard to water efficiency. A copy of the questionnaire is available in Appendix 4. Changes were made to the design of the second questionnaire before it was re-administered in 2009. The delivery method was also changed from door-to-door in phase 1 to postal in phase 2.

To establish comparability between the four selected areas in the Avon pilot, the project team determined the socio-demographic profile of each area using ACORN data. The results suggested that, although the areas were similar in many respects, there were some differences. In order to control for these differences and to enable direct comparison between the different project areas in the pilot with a view to standardising the type of respondents surveyed across all four areas, sampling quotas for a number of different ACORN categories were defined (Table 4.6).

Table 4.6 Sampling quota for Avon Pilot project.

Target ACORN category	Target ACORN group	Target quota for number of surveys
1	B ¹	175
3	J	35
3	I	10
5	N	80

Notes: ¹ Acceptable alternatives were identified as ACORN groups A and C.

No such sampling strategy was adopted in the Twerton area survey as the number of potential respondents was already extremely limited. Furthermore, it was felt that there would be broadly similar socio-demographics between the different blocks of flats, all of which are social housing.

5 Project findings

This section provides an assessment of the barriers and opportunities for getting householders to improve their water efficiency as identified during the surveys, interviews and focus groups. It also presents an evaluation of the interventions that were undertaken during the pilots, using both quantitative data (from the surveys and water consumption monitoring) and qualitative feedback from the target population and observations by the research team.

5.1 Qualitative data: people's perception of water and water use

This section presents the key findings related to how people perceive water and how this can inform those targeting behaviour change in relation to water use.

The qualitative data below are aggregated findings from the following sources:

- in-depth interviews undertaken with people living in the pilot project areas (how many/locations, etc.);
- six focus groups in Downton, Twerton, Tisbury and Wilton.

The questions and themes used to develop insights into knowledge, attitudes, beliefs and social norms are summarised in Table 5.1; more detail on the methodology is given in Section 3. The most important findings are summarised in Table 5.2.

Table 5.1 Summary of questions and themes from in-depth interviews and focus groups.

Source	Questions and themes
In-depth interviews	<ul style="list-style-type: none"> • First impressions on hearing the word ‘water’. • Descriptions of the main ways in which householders use water at home. • Descriptions of what people consider to be ‘high’, ‘medium’ and ‘low’ water consumption. • An assessment by respondents of whether they were ‘high’, ‘medium’ or ‘low’ water users. • Claimed water saving behaviours and what motivated such behaviour, any perceived enablers for such behaviour, and any perceived (or unconsciously reported) barriers to adopting water efficiency in the home. • Views about whether or not the respondent’s household could be more water efficient. • An assessment of how important saving water is relative to other pro-environmental behaviours.
Focus groups	
Objectives	<ul style="list-style-type: none"> • To explore in more depth some of the issues and results from the quantitative surveys. • To help determine the relative efficacy of different intervention strategies. • To understand the current public knowledge base and perceptions of the water supply/demand balance problem. • To explore behaviour change motivations and barriers.
Key question areas	<ul style="list-style-type: none"> • How do people define a high/medium/low water user? How do they define themselves on this scale? • Which activities do people associate with greatest levels of water usage? • Do people think there is too little or too much water locally/in the UK? If too little water, what are the factors most to blame for water stress: climate change/lack of rainfall; domestic use; leakage, business use, agriculture; other? Who should be sorting out the problem? • What, if anything, would make people reduce their consumption of water? Which interventions might work best? • What are the barriers to change? How might these be circumvented? • For those people in receipt of, or aware about, the pilot project interventions, how did they perceive these? What did they like, what did they not like?

Table 5.2 Summary of key findings from the qualitative data.

Issue	Finding
Perceptions of water as a resource (see Section 5.1.1)	<ul style="list-style-type: none">• Many participants recognised water's life-giving qualities and see it as both an environmental asset and a domestic resource.• Some recognised that water undergoes processing before it becomes a domestic resource.• Although water is valued, it is also taken for granted in daily life.• The belief that the water cycle is a 'closed loop' leads some to think that it is not possible to waste water.• Living through water shortages gives people vivid memories, which can act both as a trigger and an ongoing stimulus to save water.
Behaviour related to water use and water saving (see Section 5.1.2)	<ul style="list-style-type: none">• High levels of water consumption are associated with other household characteristics and behaviours that may be seen as legitimate.• There is a perception that some water users consume a lot of water because they have paid for it, and therefore it is theirs to do with as they please.• People genuinely believe that they are using water effectively and doing all they can to 'save' water.• People are aware that they can save water through routine actions in or around the home.• If people do not know how much water they are using, or wasting, they don't know how much they could be saving.
Technical barriers and opportunities to saving water (see Section 5.1.3)	<ul style="list-style-type: none">• If people do not know how much water they are using, or wasting, they don't know how much they could be saving.• People know very little about water saving devices and they are far removed from people's everyday lives.• People do not recognise that the water systems in their home may use water inefficiently.
Metering (see Section 5.1.4)	<ul style="list-style-type: none">• Metering is perceived as a stimulus to saving water, as people may be motivated by saving money.• People are afraid that their bills will rise if they obtain a water meter.
Water companies – issue of trust and role in motivating water saving behaviour (see Section 5.1.5)	<ul style="list-style-type: none">• People are suspicious of water companies and do not trust their motives.• There is a perception that the 'problem' is mismanagement of water resources, not one of supply or demand.• People don't believe that their contribution to saving water will make a difference or is worth the effort. Water companies need to show that they are committed to saving water too.

5.1.1 Perceptions of water as a resource

Many water users recognise water's life-giving qualities and they see it both as an environmental asset and a household resource.

Many of the first associations made by participants at the start of the in-depth interviews were of water in natural settings. The other primary association was with household water using activities.

There is also an appreciation among some that water undergoes processing before it becomes a household resource.

It is recognised by some that the water that reaches us in our homes is resource intensive in other ways (e.g. energy use) and therefore wasting water is also a waste of those other resources.

Although people value water in their day-to-day lives, people also take water for granted. The belief that the water cycle is a 'closed loop' leads some to think that it is not possible to waste water, as it is 'recycled' back in to the environment..

Reasons for this tended to be contextual, e.g. expectations of constant supply.

"You turn the tap on, it's raining and you know it keeps coming. It's not something that is just going to run out."

For some respondents, it seemed illogical that water could be wasted given the 'closed loop' nature of the water cycle:

"Is water actually wasted? Doesn't it just go round and round?"

"If I leave my tap running when I clean my teeth, the water goes down the plug hole, along the pipes, all the way back to the sewage farm or whatever. How is that wasteful? Because I'm recycling it."

Participants in the study areas did not perceive an immediately obvious need to save water.

Participants did not perceive an obvious driver for saving water in their areas apart from saving money where water is metered and despite valuing water as an environmental asset. Participants recognised this as a barrier to saving water:

"You've always got the barrier of water because people think ... 'we're an island, we're surrounded by water, it falls out of the sky'."

Participants did not identify a general shortage of water other than in areas that had previously experienced water stress:

"I mean, I know that in the London area, in the M25 area, that there are problems there with shortages ... I've not heard of shortages in the West Country."

People with experience of visiting or living in other countries can be cynical about water resource issues in the UK, although personal experience of water shortages can also motivate lasting water efficient behaviours (see below):

“I’ve lived in the Middle East where it rains one month a year and there was never a problem so no, I don’t think there’s a problem here.”

Living through water shortages gives people vivid memories, and these can act as both a trigger and an ongoing stimulus to save water.

Several participants drew on personal experiences of water shortages to explain their behaviour or attitudes to water. For many, these experiences were primarily of living overseas in drier countries, although some were from times of water shortage here in the UK:

“During the war sometimes, in Bristol for instance, the water got cut off because of the Blitz, and then you had to go out with buckets to the tank. So you rationed it yourself.”

Participants who had experienced water shortages and were more water efficient as a result suggested that others could similarly be made aware of the value of water. There was also a strong view that a shortage of water would be obvious for all to see and inevitably lead to action:

“Switch it off one day a week in a different part of the country.”

“Prove to me as it were, that there is a shortage and then I will do something about it.”

Evidence from elsewhere suggests that believing there is a need to save water is key to getting people to act. In the water saving city of Zaragoza, for example, significant water shortages were experienced before a successful campaign was run to get people to be more water efficient (Fundación Ecología y Desarrollo 2005). This project also suggests that people will change their behaviour accordingly when they experience water-stressed situations (e.g. during supply cuts or in water-stressed countries).

The results suggest that using ‘water scarcity’ to persuade people to reduce demand is unlikely to work unless water users perceive there to be a lack of water in their local environment. However, the results from the survey suggest that people are motivated to save water even if they do not perceive there to be a problem of water scarcity in their local environment.

5.1.2 Behaviour related to water use and water saving

This section gives examples of how water usage levels are perceived – relating both to the consumption of others and to personal water saving behaviour.

People associate high consumption levels with specific household characteristics, such as large family size, and behaviours, many of which are felt to be legitimate.

During the in-depth interviews and focus groups, participants were asked to describe what they would consider to be ‘high’, ‘medium’ and ‘low’ water usage. On the whole, most were unable to do so against any form of normative scale and instead tended to

define usage levels qualitatively. Thus, high usage was often described, for example, by reference to the type and frequency of a water using activity:

Cleaning / washing

Participants made a strong connection between high consumption and personal cleanliness as evidenced by comments that high users were:

“people who have baths all the time” ... “very clean probably”.

Some participants associated low water consumption levels with poor personal hygiene:

“Living dirty. An indication isn’t it? That they are probably not sufficiently hygienic enough to look after themselves properly.”

Participants who assessed their own consumption levels as low felt that they would be judged as unhygienic:

“I’m a low water user ... sounds really dirty, doesn’t it?”

And felt obliged to counteract potential such criticism:

“I use very little, but I do keep clean.”

Furthermore, references to times or places in which water is or has been less intensively used also attracted words or phrases with negative connotations, such as *“backward countries”* and *“old-fashioned times”*.

High consumption was associated with:

- outdoor activities such as car washing or gardening: *“They probably use the hosepipe for outside water or something.”*
- toilet flushing: *“People who pull the flush, you know, every time they pee, it’s a complete waste of time.”*
- household size and composition, including family size and the presence of children: *“I mean if they’ve got a lot of children, and the washing machine is always on, so therefore they use a lot of water that way. And maybe they waste a lot as well.”*

Low usage was associated with smaller household sizes, absence from the home (i.e. being at work), less frequent washing and/or absence of gardens or cars:

“I would assume that that is probably down to maybe a single person or a couple without a garden at all plus maybe being without even a car at all. They would simply be using it for drinking purposes and obviously bathing purposes. So, again, they wouldn’t need to be using the washing machine as much as other people with a family.”

Generally speaking, water usage was not strongly linked to attitude or disposition. There were very few instances in which people showed that they felt a person’s underlying values would affect how they behaved, both in terms of high and low consumption:

“somebody who doesn’t respect the water may be ... or the effort taken to ‘clean’ it.”

“green party, people that care, people that have got time to take an interest.”

“people ... that are into nature and the elements.”

There is a suspicion that some water users consume a lot of water because they feel justified in doing so as, having paid for it, it is theirs to do with as they please.

Participants were conscious that a sense of ownership of a resource may imply a right to use that resource as they wished – although none claimed to personally hold this view:

“They would think, well, you know we’re paying for it, it’s costing us a lot, so why shouldn’t we use it as much as we want to. Well, if it wasn’t quite so expensive, then maybe they would think twice, and think well perhaps we’ll save it then.”

“There is still a very firm attitude about [I’ve paid my bill] therefore I can do whatever I like.”

This finding matches that of other research which found that metering might:

“put some people in the right frame of mind [but] put others in the wrong frame of mind, allowing them to think that as they pay for it, it is therefore up to them how they use it” (CCWater 2006b, vi).

This finding is particularly relevant to water users with high consumption patterns who are not on a meter. It is also likely to apply more to affluent households on meters than to lower socio-economic groups with meters.

People genuinely believe that they are using water effectively and doing all they can to ‘save’ water.

Everyone we spoke to during the qualitative research was able to evidence some kind of water saving behaviour. These ranged from “*common sense*” activities to more creative/obscure actions that included reheating the contents of hot water bottles, ‘reusing’ leftover water from the bedside table to water house plants, using bath water or basinsfuls of grey water to wash rugs or clothes, and using dirty dish water to mop the floor.

This finding was strongly supported by the survey results. When respondents were asked for the barriers to saving water, the most frequent answer by far was that people feel they are ‘doing all I can already’.

People are aware that they can save water through routine actions in or around the home.

Plenty of examples were obtained during the research of how people go about saving water in the home such as:

- doing bulk loads of washing up or clothes washing;
- turning off taps when brushing teeth;
- turning off taps and fixing leaks;
- limiting flushing of toilets;

- using buckets of water when washing the car rather than a hosepipe;
- only topping up the kettle sufficiently for the purpose.

Despite the stated perception that there is no immediate need to save water, people reported carrying out these water saving behaviours anyway – an observation which applied to those with meters and those without.

This is a useful and encouraging finding as it suggests that, even in the absence of obvious drivers for water efficiency, people are nevertheless willing and able to carry out water saving actions. However, the nature and frequency of these actions may vary and will doubtless be influenced to some degree by the perception of need.

Displacement of activity from car washing at home to visiting a car wash is perceived to be a ‘saving’ action. Displacement of water use from home to work was also mentioned a few times in relation to toilet flushing. Generally speaking, however, this was not regarded as a core water saving behaviour.

The substitution of showering for bathing was not frequently mentioned as a water saving activity. This may be a characteristic of the target populations, many of whom were either elderly (in the Avon pilot catchment) or living in social housing where showers were often not provided (in the Twerton pilot project). This is an interesting finding especially given the contribution which personal washing makes to overall household water consumption patterns (Figure 5.1).

People are generally well aware of some of the routine actions they can take in the home to reduce water consumption, but there may be resistance to some other behaviours such as those related to washing. When asked, very few individuals thought they could be more efficient in their use of water.

If people believe they are doing all they can and do not perceive an immediate need to become more efficient, then they are unlikely to seek information, advice or technological fixes that will help them to become more water efficient.

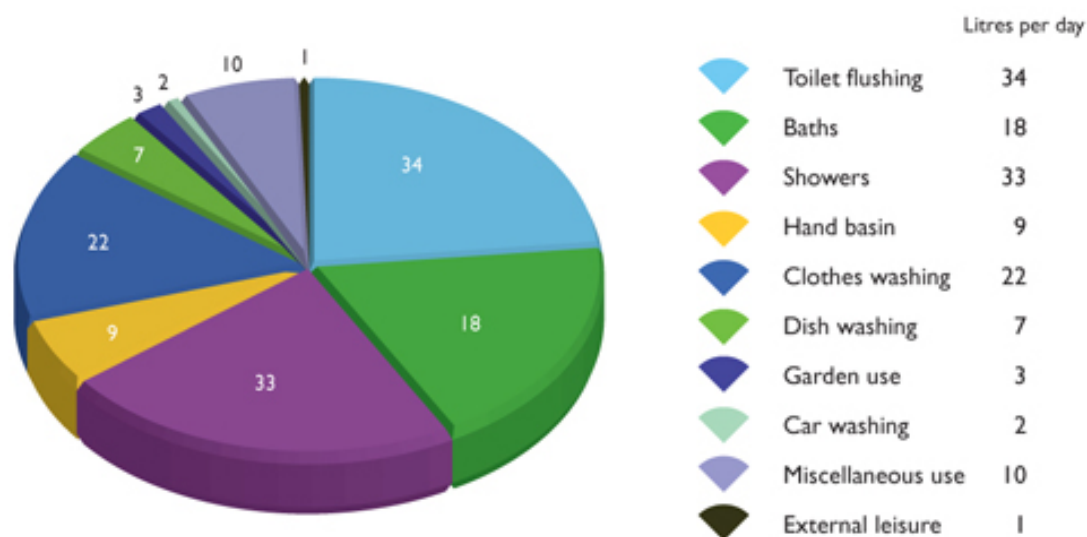


Figure 5.1 Breakdown of average daily water use in the home.

Source: Wessex Water (online)

5.1.3 Technical barriers and opportunities to saving water

Many water consumers have low awareness of the amount of water they are using.

If people do not know how much water they are using, or wasting, they don't know how much they could be saving.

Other research has found mixed results. One study concluded that 'most people tend to underestimate the amount of water they use' (Future Foundation 2006). Another found good general awareness of how much water most activities consume, with the exception of dishwashers (assumed to use the same as a washing machine when in fact the latter uses three times more water) and toilets (perceived to use more water than in reality) (CCWater 2006a).

People's assessments of how much water others use tended to rely not on quantitative figures but on qualitative descriptions of activity or household type. Quite a few participants felt unable to describe and assess their own water consumption:

"I simply don't know. I have never received any information on this."

Some did make an attempt, and a few were able to give quantities or had obtained an independent assessment of their consumption. One person had access to accurate readings after a meter was fitted and had used an online tool to assess her household consumption, but was surprised to find that her uninformed assessment had been wrong:

"I was a little shocked because I thought we would be light users."

People do not recognise that the water systems in their home may use water inefficiently.

Generally water was not perceived to be wasted other than in circumstances when it is being left to run and not being used (by both householders and water companies), or when opportunities were being missed to harvest rain water. In both cases, the waste that is occurring is highly visible. Similarly, people's uses of water in terms of the activities described previously are all highly visible, making it easy to spot where inefficiencies may be occurring. But when it comes to household taps, toilets, showerheads or appliances, the degree to which these may be 'wasting' water is far less obvious except, perhaps, for toilets. Most of the people who participated in this study were unaware of the potential for enhanced efficiencies from fitting devices in the home other than those achieved with dual flushes or displacement devices.

There were few references to water saving devices in the responses, but when people did speak about them in relation to toilets they did not use technical jargon such as 'dual flush' or 'displacement devices' or even brand names such as 'Save-a-Flush' or 'hippos' very much. They preferred terms like "*bag things*", "*toilet thingy*", "*eco bag*" or "*bricks*" for the displacement devices and, for dual flush, descriptions of either form ("*the blue tube thing*" for ecoBETAs) or function as illustrated by this colourful comment: "*new loo systems, they've got the two button things so you have a short flush and a large flush*".

It is highly likely that this lack of vocabulary is a sign of how little people know about water saving devices and how far removed they are from people's everyday lives.

A general observation from this study is that most people do not recognise that the systems that use water in the home could themselves be more efficient. The fact that

no one made reference to the need for improvements to the design or presence of water-using devices in the home suggested that most people are not aware that these systems *could*, nor indeed that they strongly believed that they *should*, be made to operate more effectively. No one mentioned the need to improve the delivery of water through taps or showers by, for example, restricting flow rates or increasing aeration. This is not surprising given that people do not consider their own direct water use.

People tended to focus on grey water recycling and rain water harvesting when they did speak about technological solutions. A few had installed rainwater collection systems, which they saw as 'saving' water by providing a substitute for tap water:

"All of the water that I use for the garden comes from rain water which is gathered in tanks from the guttering. So there is, you know, no water used in the garden."

Motivations for installing rain water butts are not necessarily always related to a desire to save water but rather the quality of the water and its effect on plants:

"For one thing, it's very much better for the garden. There's nothing like rain water. Ordinary tap water is never the same."

People do not associate high water consumption levels or wasting of water with a lack of water efficient technology in the home; nor do they particularly perceive the water delivery mechanisms in their homes to be inefficient. This situation is likely largely the result of ignorance over how much water a household device currently uses relative to the most efficient version of that device, as well as a general lack of awareness about the availability of water efficiency devices in the marketplace.

5.1.4 Metering

People were both positive and negative about metering as a means of encouraging water efficient behaviour.

People perceive metering as a stimulus to saving water.

People recognised that metering can act as a stimulus to bring about reductions in water consumption. This was true both of those who had a meter and of those who did not. People also felt that the benefits of having a meter needed to be communicated.

Participants felt that the power of meters to generate water saving behaviour lies in the dual functions achieved through metering of:

- informing households how much water they are actually using;
- creating a financial incentive to save by charging households according to how much they consume.

There appears to be an appetite for more information on water consumption in the home in the manner now being made available by some energy companies to monitor electricity consumption:

"It would be quite handy to have a little monitor in your house, a little meter which is linked to the meter out in the road, that's actually showing you ..."

"sort of a flow meter ... [like] a little rev count in a car"

Some people can and do perceive metering as an appropriate way to achieve water efficiency, especially if it means that they will be in a position to save money as well.

But others are fearful, and any promotion of metering needs to be accompanied by messages that address the fear and scepticism people feel about obtaining a meter.

People are afraid that their bills will rise if they obtain a water meter.

Overwhelmingly, the emotion associated with installation of a meter was one of fear, both of the unknown and of the risk that you could end up paying more for water, either because current charging was more favourable or because water companies could increase charges once the meter is installed:

“I would have one but it would be in the back of my mind if it was going to cost me more. If I had to have one then I would.”

People did recognise, however, that this fear could be misplaced:

“I remember in Westbury village when they were going to put water meters in every house. Everyone went mad, but they did it. Most people I ever got to know didn’t mind.”

Indeed, those with positive experiences of water meters and the savings they achieved were keen advocates:

“Our neighbours have got a water meter because they saw that we had one and asked us about it so ... And we told them that it was fantastic and we saved – it took them about eight months to get one installed ... but they did.”

The assumed financial costs and benefits of metering can both motivate and dissuade people from installing water meters.

The research revealed several findings which imply that people are generally concerned about the financial aspect of water usage.

Metered participants are motivated by saving money and they believe that information campaigns about saving water should focus on this financial saving to encourage the desired behaviour. People also want to be financially rewarded for their water saving behaviour. Furthermore, people believe that water saving technology is expensive so financial incentives and subsidies to adopt such technologies would be welcomed.

“Why don’t the water companies give one feedback ... you are a heavy user or you are a light user, well done. We’re going to charge you less.”

“... subsidise water efficient technology, making it the less expensive option rather than the most expensive.”

5.1.5 Water companies – issue of trust and role in motivating water saving behaviour

There is a lack of trust in the motives of water companies and a belief that they are driven only by profit. Some people also seem to question whether the responsibility for saving water should lie with the individual or water companies.

The findings show that, in order to motivate individuals to save water, water companies need to ‘exemplify’ water saving behaviour by showing that major efforts are being made on a higher level to use water efficiently.

People are suspicious of water companies and do not trust their motives.

People feel they are being overcharged and perceive water companies to be profit-driven and profit-making. They consider water companies to have a conflict of interest in relation to increasing supply or fixing leaks:

“Many companies, like water companies, who whilst they provide a service do have to make a profit because they’ve got shareholders.”

In relation to leakage, views included:

“It’s like all these leaks they’ve got. They couldn’t care less, because we’re paying for them. ... Not until somebody comes along as says ‘Come on’ and then they grudgingly give out a little bit of money and do a repair here and a repair there ... ‘Aren’t we lovely! Aren’t we good! Carry on boys ... let’s make more money again’.”

This finding reiterates the need – identified in the literature review for this project and the 4Es framework in *Securing the Future* (Defra 2005) – for water companies to be seen to be ‘exemplifying’ water saving behaviour. It also underlines a public scepticism about profit-making organisations being responsible for management of what is seen as an ‘essential’ service or resource.

People also believe that the ‘problem’ is not one of supply or demand per se, but of mismanagement.

A lot of people do not believe that there is a shortage of water in the UK, but that the resource is in some way ‘mismanaged’ leading to a supply/demand imbalance:

“What strikes me is the lack of management of the water we have. Everything is okay when we have plenty but we don’t make adequate provision in lean periods.”

On this point, there was particular confusion – and some cynicism – about why water as a resource cannot be more evenly distributed:

“If the people up North have plenty of water [and] those in the South East have no water; distribute it – share.”

The feeling that water has been mismanaged results in people being reluctant to take responsibility for a problem that they do not regard to be of their making:

“You’re here to ask us whether we’re wasting water but what about the water companies?”

“If it’s [water] getting lost between my house and there’s [a sewage farm] ... that’s not my problem, and don’t penalise me.”

This finding is linked to a number of others and is influenced by the public perception of water companies. It is also linked to the extent to which residents are aware or not of how water is managed in the UK and what water companies do in terms of securing supply and managing demand. It suggests a need for messages to reassure the public that:

- strategic planning is being undertaken;
- cost-effective solutions are being sought.

People don't believe that their personal contribution to saving water will make a difference or is worth the effort. Water companies need to show that they are committed to saving water to encourage individual water saving behaviour.

This is especially true for unmetered properties where users are unlikely to see any direct financial reward through savings on their water bills but is equally relevant to, and strongly influenced by, those with a cynical attitude towards water companies who feel that their own household's consumption is insignificant in comparison to issues such as leakage:

"I'm not sure if we use less water, any cost savings by the water companies will be passed on to us. Why can't we share the benefits of using less?"

"I think general efforts to conserve water are important. I have no idea how effective they all are but they'd have to be fairly insignificant savings compared to the water company's losses due to leaking pipes."

As with the last two findings, this illustrates the need for householders to be reassured that others (especially water companies) are taking responsibility for water efficiency and practising it themselves. It also suggests that campaigns about water efficiency should not focus on 'do your bit' messaging, as this is likely to be met with scepticism and resistance.

5.2 Quantitative data: survey results and demand management data information on attitudes and behaviours

5.2.1 Survey strategy

A survey of participants was carried out before and after interventions in both the pilot project areas. The surveys provided useful information about attitudes and awareness in the study populations, but were not an appropriate evaluation tool for measuring changes resulting from the interventions due to the small-scale of these interventions. The survey was not sensitive enough to detect statistically significant changes at this scale.

The results from the first survey are summarised in Section 5.2.3. Key messages were:

- Virtually all participants agreed that saving water is important.
- Most people surveyed did not identify a lack of awareness of water efficiency or actions they can take as a barrier to saving water. The difficulty of taking action was also not perceived to be a barrier.
- For most people, the biggest barrier to saving water is the belief that they are doing all they can already and don't know what more they can do.
- Awareness of the current use of water was mixed, which may be related to the proportion of metered/unmetered properties although this was not tested with this data.

- There is a low uptake of water saving devices in the home. Water butts/rainwater harvesting were the most popular 'devices' in the Avon area (where most residents have gardens).

5.2.2 Survey population

A total of 1,037 residents were surveyed in the Avon catchment area in the four village locations (Wilton, Downton, Pewsey and Tisbury & Fovant) selected as potential study areas. The survey was carried out in March and April 2008 over a period of four weeks.

Comparisons between the two study populations are difficult given the much smaller sample size for the survey in Twerton, but there are some interesting similarities and differences between the two areas.

Of those surveyed in Avon:

- about half (48 per cent) have a water meter and about half (49 per cent) do not;
- 95 per cent have a garden and 5 per cent do not;
- 49 per cent live in detached homes, 29 per cent in semi-detached homes, 18 per cent in terraced properties and 4 per cent in flats or apartments;
- 72 per cent are home owners.

All of the flats in the Twerton study areas were targeted.

- 73 of the 372 residents took part in the survey (20 per cent);
- 14 per cent have a water meter and 82 per cent do not;
- 89 per cent do not have a garden;
- all respondents lived in flats or apartments;
- 86 per cent rent their accommodation.

5.2.3 Attitudes towards water efficiency

Virtually all participants agreed that saving water is important.

In Avon:

- 99 per cent of respondents agreed strongly (75.3 per cent) or tended to agree (23.2 per cent) with the statement that 'everyone needs to do what they can to save water';
- 94 per cent agreed that saving water was very (56 per cent) or fairly (38 per cent) important to them;
- Almost two-thirds (58 per cent) report saving water even if it requires extra effort and a further 38 per cent if no extra effort is required – a total of 96 per cent.

In Twerton:

- 88 per cent agreed strongly (47 per cent) or tended to agree (41 per cent) that everyone needs to do what they can to reduce the waste of water;

- 88 per cent reported that saving water was very (45 per cent) or fairly (43 per cent) important to them;
- 37 per cent save water if it requires extra effort and 45 per cent if it requires no extra effort – a total of 82 per cent; 16 per cent do not save water (2 per cent had other responses).

5.2.4 Barriers to saving water

Most people surveyed did not identify a lack of awareness of water efficiency or actions they can take as a barrier to saving water. The difficulty of taking action was also not perceived to be a barrier. For most people the biggest barrier to saving water is the belief that they are doing all they can already and don't know what more they can do.

- In Avon, 84 per cent disagreed strongly with the statement 'I don't really understand why saving water is an important issue around here' compared with 6 per cent who agreed strongly. In Twerton, 74 per cent disagreed or disagreed strongly; 19 per cent agreed or agreed strongly.
- In Avon, 80 per cent disagreed strongly with the statement 'I am completely confused about what actions I can take to save water' compared with 7 per cent who agreed strongly. In Twerton, 62 per cent disagreed or disagreed strongly; 9 per cent agreed or agreed strongly.
- In Avon, 83 per cent agreed strongly that the statement 'I don't understand why people waste water – it's really easy to use it sensibly'. In Twerton, 75 per cent agreed and 16 per cent disagreed.
- In Avon, participants were asked unprompted about barriers to saving water:
 - 44 per cent said they do all they can already and didn't know what more they could do to save water (by far the most common response);
 - 16 per cent did not identify any barriers;
 - 10 per cent said they didn't know.

All other reasons including cost, lack of information, lack of time, feeling it was someone else's responsibility, etc. had very low responses.

- In Twerton the responses to this issue were as follows:
 - 60 per cent said they do all they can already and didn't know what more they could do to save water (by far the most common response);
 - 8 per cent said they had never thought about saving water;
 - 8 per cent said they didn't know;
 - 8 per cent said health and hygiene reasons.

Other factors had low responses.

Awareness of current use of water was mixed, which may be related to the proportion of metered/unmetered properties although it is not possible to test this due to data limitations of this research.

- In Avon, 42 per cent agreed or strongly agreed that they didn't know how much water they used or how much they might be wasting; 45 per cent

disagreed or strongly disagreed. The proportion of properties with a meter was very similar to those without.

- In Twerton, 66 per cent agreed or agreed strongly; 18 per cent disagreed or disagreed strongly. Again this may be related to metering, as 14 per cent reported having a meter, and 82 per cent did not.

It is not possible to prove this link as the data have not been analysed to test this theory.

5.2.5 Frequency of water-saving purchasing behaviour

There is a low uptake of certain types of water saving device in the home. Water butts/rainwater harvesting were the most popular 'devices' in the Avon area (where 95 per cent of participants reported having a garden).

In Avon, 40 per cent of people surveyed had made changes to their home in the last three years in order to save water. Of the changes made:

- 42 per cent had fitted a water butt or rainwater harvesting equipment;
- 22 per cent had installed a water meter;
- 10 per cent had put in a dual flush toilet or cistern;
- 7 per cent had fitted a water saving device;
- 7 per cent had bought a water saving appliance;
- very few had fitted water saving shower heads (2 per cent) or tap inserts that reduce flow (1 per cent).

For the entire sample, this translates as:

- 24 per cent fitting a water butt/rainwater harvesting;
- 12 per cent fitting a meter;
- 6 per cent putting in a dual flush toilet;
- 4 per cent fitting a water saving device to a toilet;
- 4 per cent buying a water saving appliance;
- 1 per cent fitting water-saving shower heads;
- 0.6 per cent fitting flow-reducing tap inserts.

Reasons for adopting water efficiency measures at home were given by 400 of the 1,036 respondents (39 per cent):

- 50 per cent stated it was because 'it is better for the environment';
- 46 per cent were motivated by a sense of responsibility;
- 44 per cent were motivated by saving money.

In Twerton, 11 out of 73 respondents (18 per cent) had made changes in the last three years to save water:

- three had fitted a water saving device to a toilet;

- one had fitted a water meter;
- one had fitted a water saving shower head;
- one had fitted tap inserts;
- one had bought water saving appliances;
- one had fitted water butt/rainwater harvesting.

For the entire sample, this translates as:

- 1.4 per cent fitting a water butt/rainwater harvesting;
- 1.4 per cent fitting a meter;
- 4.1 per cent fitting a water saving device to a toilet;
- 1.4 per cent buying a water saving appliance;
- 1.4 per cent fitting water saving shower heads.

The reasons for doing so were as follows:

- 36 per cent had done so because 'it is better for the environment';
- 9 per cent had been motivated by a sense of responsibility;
- 55 per cent had been motivated by saving money.

5.2.6 Frequency of routine water saving actions

In Avon, the following responses were reported:

- 83 per cent always turn the tap off when they do the dishes;
- 75 per cent turn off the tap when they brush their teeth and 13 per cent never do;
- 72 per cent always use appliances on full load only;
- 43 per cent always shower rather than taking a bath and 8 per cent reported never do;
- 47 per cent always take shorter showers and 11 per cent never do;
- 92 per cent claimed to always fix leaks or drips;
- 53 per cent always water their gardens with watering cans not a hose (10 per cent never do);
- 36 per cent always wash their car with a bucket not a hose (15 per cent never do).

In Twerton, the following responses were reported:

- 62 per cent always turn off the tap when brushing their teeth (13 per cent never do);
- 87 per cent turn off the tap when doing dishes (3 per cent never do);
- 69 per cent always use appliances on full load only (5 per cent never do).

There was a relatively high number of no replies to questions about average number of toilet flushes in Avon (13 per cent of all respondents overall) and survey teams reported a substantial reluctance among respondents to answer a question about toilet flushing on the grounds that it was either inappropriate and/or they did not wish to divulge the information.

5.3 Changes in actual water consumption

Attempts to measure actual changes in water consumption as a result of interventions were made in both the Avon Living River and Twerton pilot projects. More detailed information was collected for the Twerton study area.

5.3.1 Water consumption in Twerton study area

The blocks of flats were split into four groups:

- device installation;
- engagement (education) visits;
- device and engagement;
- control (no interventions).

Water use in each block was monitored before and after the interventions using meters and data loggers programmed to record flow at five-minute intervals.

Twelve out of the thirteen blocks where interventions took place used less water following the interventions, but the change in consumption varied widely from -14 to +4 per cent. Three out of eight blocks in the control group showed reductions in water use over the same period, with overall changes varying between -14 and +12 per cent. These findings might suggest the interventions were effective in reducing demand, but the sample size is too small and the variations too large to draw valid conclusions.

All the blocks fitted with ecoBETAs as part of the device intervention show a reduction in water use (average of six per cent). This compares well with the ten per cent reduction associated with the installation of water meters (ESRC 2008).

The four blocks receiving engagement visits also showed a reduction in consumption, with three of the four recording changes of -2 to -5 per cent. The fourth block recorded a large reduction of -14 per cent, which appears to be an outlier in the dataset. Across all intervention and control blocks, the change in consumption varied from a 12 per cent increase to a 15 per cent decrease.

The average water consumption per person during the baseline monitoring period varied between 98 and 194 litres per person per day (l/p/d). This compares with the Wessex Water regional average of 150 l/p/d for unmetered customers. These figures were calculated using occupancy rates provided by SCHAT, which may be inaccurate.

Conclusions

Although some potentially interesting trends were observed in the Twerton area, significant 'noise' and anomalies were present in the data, limiting the validity and reliability of the findings. The methods used to measure water consumption were probably not appropriate for small-scale behaviour change interventions. Technical and

installation difficulties with the water consumption loggers meant that some of the blocks monitored had very short baseline monitoring periods and there were periods of missing data. The inadequate baseline data are a key limitation in understanding patterns in water use.

6 Learning for future interventions

This section presents recommendations and learning based on the pilot projects for the design of future projects and behaviour-change interventions. This learning includes feedback from both participants and researchers on the different types of engagement and intervention.

6.1 Participants post-intervention feedback

Qualitative feedback was obtained from a sample of the target populations following the interventions. The methods for collecting this feedback varied in different areas (Table 6.1). A summary of the post-intervention feedback is given in Table 6.2.

Table 6.1 Methods for collecting feedback.

Pilot project	Location	Intervention method	Feedback method
Avon Living River project	Wilton	Doorstepping and literature distribution	Focus groups (post-intervention)
	Downton	Community engagement	Focus groups (post-intervention) Collective evaluation of Aquafest by Downton water wise group Short questionnaire to Downton water wise group
Twerton Wessex Water Efficiency Trial	Twerton	Device fitting	Properties revisited by plumber who had installed devices
	Twerton	Social approaches	Focus groups

Table 6.2 Summary of post-intervention feedback

Type of intervention	Feedback
Device fitting (Twerton)	<ul style="list-style-type: none"> • Almost all residents asked were happy with the water saving devices that had been installed.
Doorstepping (Avon – Wilton; Twerton)	<ul style="list-style-type: none"> • Reactions to door-to-door canvassing as an engagement technique were mixed. • Residents in the Twerton pilot generally showed greater acceptance of the technique and appreciation of the visit than those in Wilton. • Residents in both pilot study areas are visited by door-to-door salespeople whose motives they distrust, approach they dislike and services they reject. • People’s assessments of how the doorstep

Type of intervention	Feedback
Community engagement (Downton): Aquafest event	<p>conversations had impacted their behaviour also varied.</p> <ul style="list-style-type: none"> • There were mixed responses to 'giveaways' offered during the doorstepping. • Involvement of schoolchildren was seen as key to the success of the event. • There was considerable interest in the devices and water saving technologies on display. • Other activities added to the success of the day. • Involvement in the project increased knowledge of water-related issues and enthusiasm for saving water, and resulted in changes to water-related behaviour among most of the respondents.
Community engagement (Downton): participation in community group	<ul style="list-style-type: none"> • Involvement in the project increased knowledge of water-related issues and enthusiasm for saving water, and resulted in changes to water-related behaviour amongst most of the respondents. • Most of the respondents reported having had little or no impact on friends, families or neighbours. • There were mixed opinions from respondents in the group as to the impact of their collective work in changing behaviour in their community. • Feedback on the community-based approach was more positive.

6.1.1 Reactions to the device fitting intervention

Almost all residents asked were happy with the water saving devices that had been installed.

In February 2009, one of the plumbers made a return visit to the flats in the Twerton pilot project and spoke to residents of 54 of the 70 flats where devices had been installed. All but three people were happy with the devices, with several commenting they are a really good idea. All the residents reported that they use the short flush. One resident commented that it was inconvenient to hold the handle down for a long flush.

6.1.2 Reactions to doorstepping

Feedback from the focus groups held in Wilton

Reactions to door-to-door canvassing as an engagement technique were mixed. Some people simply did not like the concept and some would have preferred to have an arranged time for the visit. Others were more positive about the experience.

"To be honest, having people at your door is a real interruption."

“... I thought it was quite refreshing to have somebody knock on the door who wasn't trying to sell me something.”

Residents in the Twerton pilot generally showed greater acceptance of the technique and appreciation of the visit than those in Wilton.

“She gave me a lot of information.”

“She really sort of made me think ... raised the awareness even more so.”

Residents in both pilot study areas are frequently visited by door-to-door salespeople whose motives they distrust, approach they dislike and services they reject.

Negative experiences of door-to-door selling may reduce the effectiveness of doorstepping as an intervention method. In Wilton, residents had previously also had contact with Environment Agency staff involved in local water monitoring. In both areas, residents noted the difference between sales people and the manner/approach of the project's doorstepping and surveying teams:

“A salesperson's got a vested interest whereas somebody that's doing a survey actually appreciates that they're infringing on ... your time.”

“And also both times they showed you the survey as well.”

People's assessments of how the doorstep conversations had impacted their behaviour also varied.

Residents in Twerton reported a stronger sense of having been influenced by the visit than those in Wilton, as well as showing more acceptance of doorstepping as an approach. This may be because they experience fewer door-to-door sales visits:

“I remember the information about the amount of water you use to clean your teeth. This was really useful.”

“I would not have said that water saving was as important until I realised when I spoke to that lad ... now I think it is.”

“I make sure I don't run the water when I brush my teeth. He got my wheels in motion if you know what I mean.”

“To be honest I didn't really understand until I talked to the lad ... I didn't think it was such a big thing. But then when I realised they clean it all and put it all back. That's quite shocking. Once I knew that it opened my mind a little bit.”

Others in both Twerton and Wilton indicated that the visit had little impact on them and/or that they had allowed doorstep conversations (both during canvassing but also during the pre-intervention surveying) to take place more out of pity than a desire to talk about the subject:

“It didn't make a big impact at the time I must say.”

There were mixed responses to 'giveaways' offered during the doorstepping.

One person reported that the fridge magnets bearing water saving messages were a good idea:

"I see it every day on the fridge".

The shower timers that the Twerton canvassing team distributed were used, but not always for very long. Also, some people were given shower timers when they didn't have a shower so they were used for other activities (e.g. boiling eggs):

"She did give me a little shower timer which probably fell off my shower door so I haven't, I think, I used it more than about twice. It lasted about three days."

6.1.3 Reactions to community engagement

An evaluation of the Aquafest event was undertaken by the organisers at a meeting of the Downton water wise group in November 2008. The views they expressed are summarised below.

- **Involvement of schoolchildren was seen as key to the success of the event.** Attendance in the early part of the day was excellent, with estimates of 250 attending (approximately 10 per cent of the village), but disappointing later on in the day after the main children's events were over. Many schoolchildren had attended and brought their parents along with them and it was felt that getting messages through to parents via their children works well. The 'water testing table' was very popular with children.
- **There was considerable interest in the devices and water saving technologies on display.** Save-a-Flushes were very popular, with an estimated 50 distributed. There was a lot of interest in a demonstration toilet showing how much water could be saved with a cistern device.
- **Other activities added to the success of the day.** Musical and drama performances on the day were well-received, well done and felt to have made the whole event more lively.
- **Some logistical/planning issues were raised** including the need for better signage at the event.
- **The name 'Aquafest' was thought to sound like an event for children,** which may have kept some older residents away, or may have sounded like the name of a company trying to market something.

Good media coverage of the event was obtained in the *Salisbury Journal* and the *Avon Advertiser* (free local paper). A celebrity attended (and opened?) the event, which helped generate press coverage after the event, but this had not really been used to increase attendance before hand.

Just over 20 pledge cards were completed at the event, less than 10 per cent of the estimated total number attending.

Individual feedback from the organising group was sought to evaluate the impact of their involvement on their own behaviour and on those around them. Ten people responded to the survey; a summary of their responses is given below.

Involvement in the project increased knowledge of water-related issues and enthusiasm for saving water and resulted in changes to water-related behaviour among most of the respondents.

- Eight out of the ten respondents said that their knowledge of water-related issues had increased as a result of being involved in the project.
- Six of the ten reported greater enthusiasm for saving water.
- Six of the ten said that they had personally taken on additional actions to prevent water from being wasted such as:
 - turning taps off when brushing teeth;
 - fitting a device to their cistern;
 - using a bucket to wash the car;
 - making sure appliances were used on full loads.

Those that didn't take action (four out of ten) felt that they were behaving 'the same as I was' in saving water. The general reason for this was that, although they may have felt slightly more aware of water use around the home, they had not felt the need to change personal habits as a result.

Five of the ten had made a change to their toilets. Of these, one person had fitted a 'toilet brick' but removed it when she felt the flush was not effective, and one had decided to install a dual flush toilet into their home. This person also reported having asked the water company to install a meter.

Most of the respondents reported having had little or no impact on friends, families or neighbours.

In terms of the group's impact on the behaviour of others, most were unwilling and/or unable to give an estimate as to the proportion of people in their village who they believe are now conscious of not wasting water. One participant reported actively putting water saving on her organisation's agenda and trying to influence her peers. The reluctance to encourage others to save water seemed partly down to the fact that some felt their social network was already 'water conscious' and partly owing to a desire to avoid being seen as a nag:

"Apart from urging people to attend Aquafest and giving out some leaflets in the pub to those who didn't come to it, I haven't done much. People might be getting a bit fed up with me going on about green issues all the time!"

Perceptions that water efficiency is not a priority or not necessary were used as reasons for not engaging with others, supporting the findings from the qualitative research (see Section 5). These perceptions are potentially a barrier both to individual behaviour change and to influencing through peers/community networks:

"[I have] always tried to encourage people to save water, but feel that as Downton is regularly flooded, it isn't at the forefront of people's minds."

There were mixed opinions from respondents in the group as to the impact of their collective work in changing behaviour in their community.

Even though they been heavily involved in the event, some felt that there was not 'much point' in water efficiency as a topic or were doubtful that any real change had been achieved. Others were more positive:

"Everyone was very nice and helpful, but I'm unsure as to the outcome of what we did or whether it will be carried through."

Feedback on the community-based approach was more positive.

Respondents felt motivated by face-to-face meetings and contact with the researchers:

"Very positive approach doing face-to-face meetings and involving themselves directly in the community. Makes people want to get involved."

"Sally's leadership was strong. Would have liked Resource Futures to stay longer. Thought the community focus was good."

6.1.4 Observations by Resource Futures (researcher)

A summary of observations from the Resource Futures researchers is provided below.

It is worth noting that the interventions in Twerton had higher than expected update rates, with 45 per cent of the targeted flats having an ecoBETA installed and 50 per cent of the targeted engagement flats receiving advice and information from the canvassers. This may be due to the fact that residents have more positive experiences of door-to-door visits as they are used to tradesmen and housing officers calling round; also security gates may prevent unwelcome sales visits.

Community-based engagement pilot: Avon (Downton)

- The pilot benefited from tapping into a cohesive local community. Key people were easily accessed and identified through contact details on the village website; those who attended the first meeting also identified other key 'movers and shakers' within their community. Those who became involved in the group showed willingness and dedication to participate in the research and to undertake a community-led intervention. Community members were drawn from organisations including the parish council, churches, schools and local horticultural, Women's Institute and drama groups. Certain groups (including plumbers) were hard to access.
- The community group possessed the skills, knowledge and experience to organise community events and had access to resources such as a school hall.
- The group did not question whether or not water efficiency was a topic worth communicating about and almost everyone involved was happy communicating with local residents about the need to save water – despite the focus group finding that people do not perceive this to be a high priority. The fact that the group decided to act on the topic brought to them by the research team suggests that they felt a sufficient degree of confidence that

they could deliver a quality communication or event (perhaps despite the content of the message?).

- One group member who was not convinced that water efficiency was a worthwhile topic was nevertheless heavily involved in supporting the community event. This suggests that:
 - people can and do get engaged for reasons other than a strong belief in the purpose of an initiative;
 - other social and personal motivations are at work.
- The active involvement in this project of a representative from the water company, who was both affable and willing to make available information as well as resources to support the project (despite no initial involvement in setting it up), contributed significantly to a shared sense of responsibility and provided the opportunity – as highlighted in the literature review – for exemplifying behaviour. This definitely had a positive effect on the dynamics of the group and is likely to have contributed to the willingness evidenced among the community members to get involved.
- The water information day was a success as it was held in the school and involved the children who then got their parents to come along – though some residents thought the event was just for children (also the case in Twerton).

Community engagement and water event: Twerton

- The indoor event (water information day) in Twerton was heavily advertised but was poorly attended despite advertised giveaways, free refreshments and activities for children.
- The residents of Twerton were approached to try and initiate a working group or water champions group with no response. This may reflect a lack of existing community groups or individuals with experience and resources in organising groups and events.
- Having ‘control’ blocks in close proximity to ‘intervention’ blocks caused concern about the potential for leakage of information between blocks and restricted the potential for promotion and communication. This also excluded working with schools or nursery groups to avoid spread of information between blocks.
- Residents are interested in water efficiency and are keen to talk and learn about it. However, the low turn-out for the water saving day demonstrates that messages and interventions need be taken to residents rather than relying on residents being proactive.

Doorstepping: Avon (Wilton), Twerton

- Participants in Wilton were less receptive to doorstepping than in Twerton, which may be because Twerton residents seem to have fewer callers at their door due in part to security doors on the blocks of flats. Contact rates in Twerton were much higher than expected given that social housing can be notoriously difficult for achieving good contact.

- People were keen to accept giveaways on the doorstep, but not at all keen to go to an event to pick up giveaways.

Water saving devices: Twerton

- Uptake of ecoBETAs from Twerton residents was higher than expected.
- Householders were satisfied with dual flush device: Only three out of the 54 people spoken to following installation had removed the device. All the other respondents said they were using the short flush.
- Background research is needed to ensure devices are appropriate for the housing; shower devices could not be fitted in Twerton as the water pressure was generally too high for them to work and most residents did not have a shower.

Monitoring of water consumption (meters and loggers, water company information)

- Metering of blocks of flats proved logistically very difficult and the loggers were problematic. The lack of baseline data delayed interventions and reduced the usefulness of monitoring water consumption.

Focus groups

- In general, people attending focus groups went away feeling positive about the actions they are taking. The focus groups themselves may have acted as an intervention in raising awareness of issues. Some participants may have advocated messages to friends and family in the short term.
- Most residents are poorly informed about what the water companies are doing about fixing leaks or their policies on switching customers on to water meters.
- A surprising number of residents did not cite toilet flushing as a major (or indeed the major) use of water in the home.

Pledge cards

- In general, pledge cards were not a success and had little response in both study areas, even when strongly incentivised (Twerton).

7 Conclusions

A number of conclusions can be drawn from the findings of this research project regarding how people currently think, feel and act in relation to water. These conclusions are presented below, followed by a consideration of the learning points that arose from the pilot projects which might usefully inform future intervention work.

7.1 Perceptions, attitudes and values

Some overall conclusions emerge from considering the qualitative and quantitative data together.

People value water and agree that it is important to save water.

The qualitative research suggests that people value water and consider it to be an important resource. However, they may need to be prompted, reminded or given the opportunity to reflect on the value that they instinctively attach to water and the role that water plays in their daily lives. This could help to encourage water efficient behaviours. This finding was supported by the survey, which found that virtually all participants agreed or agreed strongly that saving water is important.

People do not make strong links between water usage and environmental values.

The qualitative research found that people did not make strong links between water usage and environmental values, and do not see a contradiction between valuing water highly and high consumption. This may be because most people believe they are doing all they can to use water efficiently (discussed below) and perceive lower usage to have negative consequences such as poor hygiene.

If people believe that they are doing what they can for the environment in terms of water usage and that any further reduction in use would be damaging in some way, attempts to appeal to environmental values are unlikely to influence water use behaviours.

Consumption levels are assumed to be more a function of household size and demographics than ‘wanton wastefulness’.

In many cases, high household water consumption levels were noted as being justifiable because they were deemed to be the result of large household size and/or demographics (e.g. families with children). Conversely, low water consumption was often associated with small household size. In some cases, low water consumption levels were also taken to be an indicator of poor hygiene.

Therefore, encouraging reductions in water use – particularly in relation to washing functions and especially just for the sake of achieving reduced water use levels – is likely to face heavy resistance and unlikely to succeed in lowering water consumption.

Motivations for saving water are complex; a lack of perceived water scarcity may be a barrier to saving water.

The qualitative and quantitative data showed some differences in views on water scarcity. The qualitative results suggested that participants did not perceive an immediate need to save water in their areas and identified this as a barrier to water efficiency. The survey found that most participants disagreed with the statement that saving water was not an important issue ‘around here’. It may be that participants in the qualitative research felt more at ease (and therefore able to respond more honestly) or

gave a more considered response than those who were surveyed and responding to questions with less time for reflection.

If the qualitative findings are correct, using 'water scarcity' to persuade people to use less water is unlikely to work unless those people perceive a lack of water in their local environment. The qualitative research also found that people have a suspicion of water companies and considered problems of water scarcity to be due to poor resource management. A lack of obvious visual or other environmental cues of water shortages in people's immediate surroundings may contribute to this suspicion.

Participants reported carrying out water saving behaviours even when they stated the perception that there is no immediate need to save water. This suggests a more complex range of motivations and drivers for water efficiency, which may include perceived social norms. This applied to both those with meters and without – also suggesting drivers beyond saving money.

Although they value water, people tend to take water for granted in their day-to-day lives.

While people might attach value to water as a resource, this does not necessarily mean that they use it sparingly or that they will not be wasteful with it. Indeed, the value attached is probably largely utilitarian in nature, in which case value will drive consumption, not reduce it. This may also be due to the fact that much water wastage is 'invisible' in the home.

Direct experience of water shortages is a powerful and ongoing motivator for water efficiency.

Although such experiences cannot be created, this may be an important finding in terms of timing. Messages and interventions may have a longer lasting impact if they can be implemented reactively at times of water stress.

Links between water use and energy costs are not well understood.

The qualitative research found some confusion and lack of awareness of links between energy use and domestic water supply in terms of the energy and other costs associated with processing water, including its environmental impacts.

Making links between water use and other resources may strengthen arguments for water efficiency or, alternatively, they may add to existing confusion. It should not be assumed that links such as the energy cost of providing domestic water are obvious or clearly understood.

7.2 Patterns of water use and water saving behaviours

The 'easy wins' in terms of water saving may have already been claimed.

Most people report always turning taps off and using appliances on full loads. The potential for further savings is considerable, but the behaviours and practices may be more difficult to influence and engage with. Devices and technology may have a role to play in overcoming some of the barriers, but awareness of these is very low.

Both the qualitative and quantitative research found that many people believe they are doing all they can to save water and could not improve their water efficiency. This is likely to reflect high awareness and uptake of the 'easy and comfortable' behaviours, combined with low awareness of water saving devices and inefficient appliances.

The range of water saving behaviours people report always performing is limited.

Both the qualitative and quantitative data showed that people are well aware of some of the routine actions they can take in the home to reduce water use. For the majority of people, however, the behaviours they always perform are limited to turning off the tap while brushing teeth or washing up, and using appliances only for full loads.

The patterns of water use and water saving behaviour reflect knowledge and awareness, the degree of comfort with those behaviours and the visibility of water usage.

For example, leaving a tap running while washing up is a very visible waste of water; there is very high knowledge and awareness of this and there are no negative associations with not running the tap. In contrast, the amount of water used when a toilet is flushed is not obvious and any wastage is not apparent; awareness and knowledge of water saving devices is low and there is some discomfort in discussing toilet use.

Lower numbers of those surveyed reported taking shorter showers or showering instead of bathing, and these activities were not frequently mentioned during the qualitative research. This may be related to other findings from the qualitative research, which found that people associated high water use with personal cleanliness and low water use with poor hygiene. Due to this perception there may be a reluctance to adopt (or admit to) water saving behaviours related to washing.

People do not recognise that the water systems in their home may use water inefficiently and there is a general lack of awareness about the range of water efficiency devices available in the marketplace.

People do not associate high water consumption levels or wasting of water with a lack of water efficient technology in the home, nor do they particularly perceive the water delivery mechanisms in their homes to be particularly inefficient. Levels of knowledge are generally very low about how much water different household devices use and the possibilities of improved efficiencies.

The survey found low uptake of water saving devices in the home; for example only 4 per cent of participants across both study areas had fitted a water saving device to a toilet and only 1 per cent had fitted water saving shower heads (Avon and Twerton) or flow-reducing tap inserts (Avon only).

The qualitative research found low awareness and appreciation of the potential of water saving devices/appliances and water efficient delivery mechanisms. Participants used non-technical and opaque language to describe water saving devices for toilets; this may be a lack of knowledge but, combined with the low uptake, may also reflect discomfort about discussing toilet use. A relatively high number of those surveyed (13 per cent of respondents) did not reply to a question about average number of toilet flushes and survey teams reported reluctance to answer the question as participants either felt it was inappropriate or they did not want to provide the information.

It is encouraging then that almost all of the residents in Twerton who had a water saving device for toilets fitted (an ecoBETA) were happy with it. The fact that a plumber fitted the device and then made a return visit may have been important in overcoming reluctance to accept such a device, as participants could avoid potential discomfort in fitting the device themselves and they may have been reassured that their toilet would continue to function properly as the device had been fitted by a professional. The discomfort related to toilet use and water saving is also removed as no changes to behaviour are needed as it is a technological intervention and the device is fitted by a (professional) third party. The limited water consumption data suggest an average reduction in water use of 7 per cent for flats fitted with an ecoBETA. This is a

considerable saving and comparable to the 10 per cent reduction seen for properties moving to a water meter (ESRC 2008).

There is considerable potential for domestic water savings. The findings suggest implications for the design and strategy of engagement on water efficiency.

- People are well aware of, and carrying out, some of the routine actions they can take in the home to reduce water use, especially those where water is very visibly being wasted (e.g. running taps). Further messages or interventions on these areas are unlikely to bring significant improvements in water efficiency.
- There is less awareness and less engagement with actions related to washing (i.e. showers), which may be due to a perceived link between low water use and poor hygiene. There is potential for greater water savings related to washing practices, but any messages or interventions would need careful design to overcome this negative association.
- Water saving devices and behaviours relating to toilets may be seen as embarrassing and inappropriate for discussion. However, if fitted professionally, devices can be well received and discomfort is removed as no changes to behaviour are needed and do not need to be consciously thought about. Considerable water savings can also be made.
- There is very low uptake and awareness of other water saving devices such as tap and shower head inserts. Interventions and awareness raising could increase uptake, contributing to water savings, although these interventions were not tested in this research.
- People are unlikely to seek information or advice on water efficiency as most believe they are already doing all they can. Interventions or advice needs to be delivered proactively.

7.3 Metering and pricing of water

Some people do not know how much water they are using, or wasting; so they don't know how much they could be saving.

Roughly half (48 per cent) of those surveyed in Avon had a water meter and 14 per cent in Twerton. Awareness of current water use may be linked to whether or not a meter is present.

The qualitative research found that people recognised that paying directly for amount of water used may lead some to believe they have the right to use as much as they want.

Installing a water meter produces an average reduction in water use of approximately 10 per cent, but it is not known where this saving comes from, i.e. what changes in behaviour occur (ESRC 2008).

If people do not have information on their usage and the scope for improvement, they are unlikely to seek to reduce their water consumption and, if asked, they are likely to consider that they already use water efficiently. This reiterates the importance of direct, personal feedback as highlighted during the literature review (Appendix 1).

The information provided in a water bill is an important tool; it should include actual consumption data and aspirational or average consumption, with appropriate measures to avoid efficient users increasing consumption. Participants were also unable to

quantitatively describe 'high' and 'low' water usage, so additional information about average water use may also be useful.

People who have some experience of meters (whether directly or indirectly) are aware that having a meter can act as a stimulus and driver for water efficiency. Those without meters fear they will result in higher bills.

Participants in the qualitative research did perceive metering as an appropriate way to achieve water efficiency, especially if it means that they will also be in a position to save money. But there was also considerable anxiety about the potential for bills to rise as a result of having a meter.

Any activities to promote water meters need to provide clear information about the relative costs, especially given that widespread adoption of metering could raise bills for some people (ESRC 2008).

Financial incentives may be one way to stimulate water efficiency.

Financial mechanisms that reward lower consumption levels and enable uptake of water efficiency devices should be considered, although people's perceptions of the fairness of financial mechanisms varied. Penalising high consumption is seen as problematic. This was evident in the survey results, when people strongly disagreed with the statement that the only thing that would make them reduce consumption would be a sudden and rapid price increase. This may be due to people being unwilling to endorse price increases. This was found repeatedly during the research and was particularly strong when people spoke of their fears about metering.

7.4 Exemplifying behaviour

Water companies need to exemplify water efficiency behaviours and be seen as 'doing their bit'.

The qualitative research found that people are suspicious of water companies and do not trust their motives; the literature review also found that exemplifying behaviour is particularly important for water efficiency. This may also be one reason for the strong and repeated finding that people believe they are doing all they can to save water.

If people believe that water companies are not equally or more committed to reducing water wastage, they are unlikely to make attempts to further reduce their own consumption. The research found a belief that the problem of water scarcity is a result of mismanagement by water companies.

7.5 Lessons for design and delivery of interventions

The following conclusions can be drawn in terms of the lessons learned during the delivery of the interventions themselves.

Doorstepping and community engagement were both successful at reaching their target audiences.

This is evidenced by the fact that recall of these intervention types was significantly higher in those areas where they had been undertaken compared with control areas.

Measuring the actual impact of interventions on water consumption levels can be problematic.

There are several aspects to this conclusion.

In the first instance, it can be difficult to obtain sufficiently detailed, reliable and relevant data. In the case of the Living River pilot, there was no provision for obtaining data specific to the study area and so the study had to rely on data at the DMA level. Attempts to analyse these data to detect possible changes associated with the interventions showed that this level of data is not sufficiently sensitive to changes resulting from the intervention work to be a useful tool for this purpose. It may be that data at a more refined level, such as the Control Zone Level data identified at the end of this study, could prove to be an appropriate alternative.

Second, as experienced in the case of the Bath pilot, even when provision has been made to monitor water consumption within a study area, a range of practical problems can be experienced. These included difficulties locating relevant pipework and trouble securing supplies of suitable equipment.

In the third instance, even if data can be obtained they are often (for practical and budgetary reasons – collected at an aggregated basis, making it difficult to isolate both the performance of individual households and the causes of any anomalies observed.

Restricting socially based interventions to parts of a community or area undermines communication efforts.

This was certainly the case in the Bath project, where only certain blocks were supposed to receive social interventions. As a result, the channels for communication were severely restricted making it difficult to publicise the water efficiency event in a number of ways to target residents. Although targeted communications (e.g. posters in flats or face-to-face communication via door-knocking) are possible, the effect of these is limited when they are not complemented by blanket communications.

Adopting a case-control design for the purposes of this research project was part of the reason for this restriction on where to deliver social interventions. It would seem more appropriate, in the future, to adopt a before-and-after design without using control groups.

Local knowledge and local social networks can play an important role in creating support for, and involvement in, an intervention.

This was certainly the experience of the research team in the Living River project, where local people made themselves available to participate in the project and used their social networks and skills to get others involved. The degree of social cohesion in this community is also likely to have contributed to the responsiveness of people to communications, as evidenced by the very good attendance levels at the event in comparison with the event in the Bath pilot.

Similarly, when local people were employed to conduct doorstepping work in the Bath pilot, their local knowledge and contacts in the community within which they were working contributed positively to the way that they were received by local residents. No conclusions can be drawn from this study regarding the impact of this on people's behaviour with regard to water efficiency. For the purposes of planning future interventions, however, the intervention itself is more likely to obtain local support, interest and participation if local knowledge and connections can be mobilised.

Social factors can influence people's willingness to engage with messages about water efficiency.

This was clearly evident in the Living River project where people gave of their time and energy to become involved in planning a water efficiency event which would deliver water efficiency messages to their local community. Various social motivations for involvement were likely at play, including personal and group desires to build new local

relationships and/or establish or maintain reputations. However, what this project was not able to do was prove conclusively that people's use of water became more efficient as a result of this engagement.

Pledging schemes were problematic as a tool for engagement.

This is not to say that they will always be. Indeed, the research team is aware of other pledging schemes that were successful in attracting the attention of the target audience and obtaining their participation in the scheme. However, the schemes used in the pilots did not generate sufficient interest to justify recommending them again; this is for a number of reasons including lack of strong support and promotion.

8 Recommendations

- Interventions or advice needs on water efficiency need to be delivered proactively. Most people believe they are already doing all they can and are therefore unlikely to seek information or advice.
- Giving people prompts or opportunities to reflect on the value of water to them in their daily lives may help encourage water efficiency. People do value water but also take it for granted.
- Water efficiency campaigns that appeal to environmental values may not be successful as people do not necessarily make links between these values and water usage.
- Providing examples of common domestic situations or ‘people like us’ may help people see where they can use less water. High usage was assumed to be related to large household size such as families with children. Targeted examples of how different size households can be water efficient may help increase uptake of water efficiency messages, as they are less likely to be ignored by smaller households.
- Designers of campaigns and interventions to promote water efficiency should remember that motivations for saving water are complicated and go beyond a perception of immediate water scarcity and cost. Social norms may be important.
- Using ‘water scarcity’ to persuade people to use less water is unlikely to work unless there is perceived to be a shortage of water in their local environment.
- Messages and interventions should be deployed reactively at times of water stress, if possible, as they are likely to have a longer lasting impact.
- Levels of understanding and awareness need to be raised regarding the link between energy and water consumption in the home. This may strengthen arguments for water efficiency but caution is needed not to add to existing confusion.
- Messages or interventions aimed at water savings through washing practices have the potential for significant water savings, but need careful design to overcome negative associations with poor hygiene.
- Interventions and awareness raising around water saving devices could increase uptake and deliver considerable water savings, as awareness and uptake are currently very low.
- People should be encouraged to obtain a meter as a means of achieving water efficiency. However, any activities to promote water meters need to provide clear information about the relative costs.
- Water bills should provide actual consumption data plus aspirational or average figures for which the householder could aim, together with ‘reward’ measures to prevent low users increasing usage.
- Water companies need to exemplify water efficiency and demonstrate very clearly to householders that they are taking responsibility for water efficiency and practising it themselves. Linked to this, there is a need for messages to reassure the public that strategic planning is being carried out

and that cost-effective solutions are being sought to manage water effectively.

- Consideration should be given to financial mechanisms that reward lower consumption levels and enable uptake of water efficiency devices.
- Focusing on the benefits of saving water while reassuring people that they are not going to be paying over-the-odds for the water they do use is an important balance to strike in any public messaging about water efficiency.

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S3	Velicer W F, Prochaska J O, Fava J L, Norman G J and Redding C A, 1998 Smoking cessation and stress management: applications of the Transtheoretical Model of behaviour change. <i>Homeostasis</i> , 38, 216-233.
S14	WWF-UK and Defra, 2006 <i>Community learning and action for sustainable living: a summary of themes from initial research</i> . Godalming, Surrey: WWF-UK. Available from: http://www.wwflearning.org.uk/data/files/clasl-design-summary-web-383.pdf [Accessed 3 November 2009].
M4	Tools of Change website, http://www.toolsofchange.com from Cullbridge Marketing & Communications.
S4	Publications on the 'Social Practices Approach' by Spaargaren, Shove and others between 2002 and 2005.
S19	Publications on WaND ((Water Cycle Management for New Developments) studies by Sharp and Sefton, 2006–present
M3	Doug Mackenzie Mohr's community-based social marketing website, http://www.cbsm.com

Appendix 1: Literature review

Report prepared by Paul White and Veronica Sharp, The Social Marketing Practice

The Social Marketing Practice wish to acknowledge the support provided in this research review by:

- Dr Liz Sharp, Geography and Environmental Science, University of Bradford
- Dr Paul Jeffrey, Centre for Water Science, Cranfield University.

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A1.1 Introduction

This report presents the findings of a desk-based review of social science and marketing intervention approaches in relation to resource efficiency. It forms the first stages of the Environment Agency research project, 'The Social Science of Encouraging Water Efficiency'.

The project aims to provide evidence and understanding, informed by current social scientific thinking and marketing practice, on how successful new approaches could be in changing the behaviour of household water consumers.

The objectives of the desk-based review were to:

- identify insights from the social sciences that could improve current approaches to encouraging water efficiency and resource efficiency in general, in households;
- identify practices from the marketing and communication professions that have the potential to improve current approaches to encouraging water efficiency, and resource efficiency in general, in households.

The review was conducted as tasks 2 and 3 of the project. Following a description of the research scope and methodology in Sections A1.2 and A1.3, the report presents the strategic findings in Section A1.4 and the detailed practical recommendations in Section A1.5. Annex A1.2 contains a full list of the recommendations.

Annex A1.1 lists the sources consulted during the literature review. Detailed reviews of these sources are presented in Annex A1.3.

A1.2 Scope

Tasks 2 and 3 involved a desk-based review of existing research in the areas of the social science of water and other sustainable resource use, and of marketing and communications approaches respectively.

The review was managed by The Social Marketing Practice and supported by Bradford and Cranfield Universities.

The study reviewed and summarised 33 sources of literature, in relation to six key areas:

- social science of resource use;
- marketing and communications;
- water resource use;
- sustainability resource use;
- social marketing techniques and processes;
- UK and international experience.

Emphasis was given to transferable learning from areas of resource use beyond water efficiency. International experience in water efficiency and the findings of the Consumer Council for Water's research study, *Using Water Wisely*, were also used to inform the review.

Table A1.1 shows the types and numbers of source literature listed in Annex A1.1.

Table A1.1 Types and numbers of source literature.

Sub-type of document	Main type of document	
	Marketing	Social science
General sustainability	6	11
Sector-specific – water	3	6
Sector-specific – health	2	0
General theory	0	5
Total	11	22

A1.3 Methodology

The 4Es model (enable, encourage, engage, exemplify) set out in the *Securing the Future*¹ model for influencing behaviour was used as the analytical framework. This model is designed to ensure that all the factors which are necessary to change behaviour are present.

The research process was conducted in four stages:

- **Stage 1** – summaries of the literature references were prepared covering:
 - the principal learnings of the source;
 - the argument supporting those learnings;
 - current relevance and issues;
 - extracting insights for water behavioural projects framed around the 4Es model of behaviour change.
- **Stage 2** – a keyword analysis was carried out on the insights, identifying some 50 themes across the 4Es, as well as for overall strategic design. A frequency analysis was also conducted to identify how many source documents each theme appeared in.
- **Stage 3** – the summaries were reviewed against each theme in order to distil practical recommendations.
- **Stage 4** – informed by the practical recommendations and the frequency analysis, the themes were grouped into a more manageable number (18), still ordered within the five categories of ‘Strategic design’, ‘Enable’, ‘Engage’, ‘Encourage’ and ‘Exemplify’.

The relationships between the four stages are shown in Figure A1.1. Figure A1.2 summaries the analytical structure.

¹ <http://www.defra.gov.uk/sustainable/government/publications/uk-strategy/>

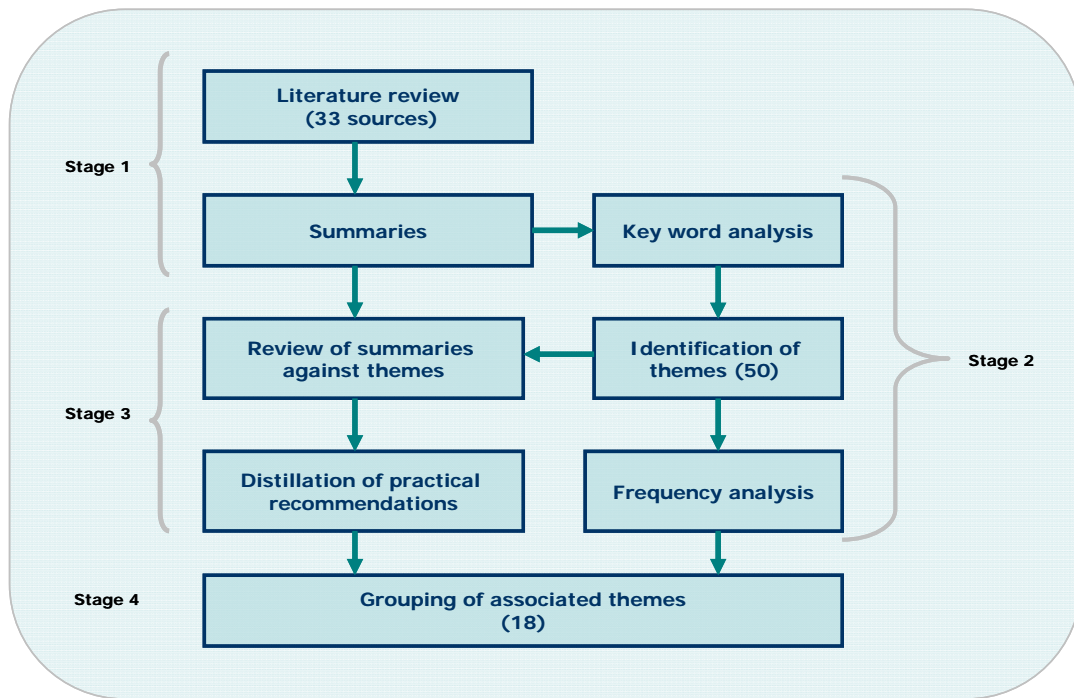


Figure A1.1 Methodological process.

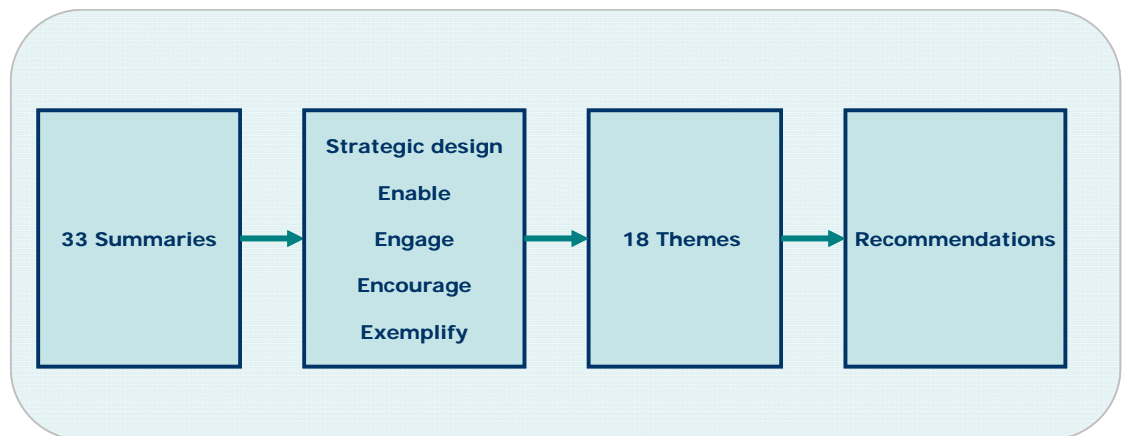


Figure A1.2 Analytical structure of the review.

A1.4 Principal findings

The 18 themes identified are grouped in the 4Es model as shown in Figure A1.3. Overviews of each theme are given below.

Projects aiming to influence more sustainable practice in water consumption should address as many of these themes as possible to ensure success. For the proposed pilot projects, some theme elements are not applicable as they involve policy or infrastructure changes. However, the majority can be introduced into the design.

The ‘exemplify’ themes are particularly important for water efficiency. Householders need to see that they are not the only ones being asked to take action and that they are part of something bigger. This is particularly true for water companies themselves, which need to demonstrate, for example, what they are doing to reduce leakage.

Approach evolves as attitudes and behaviours change over time

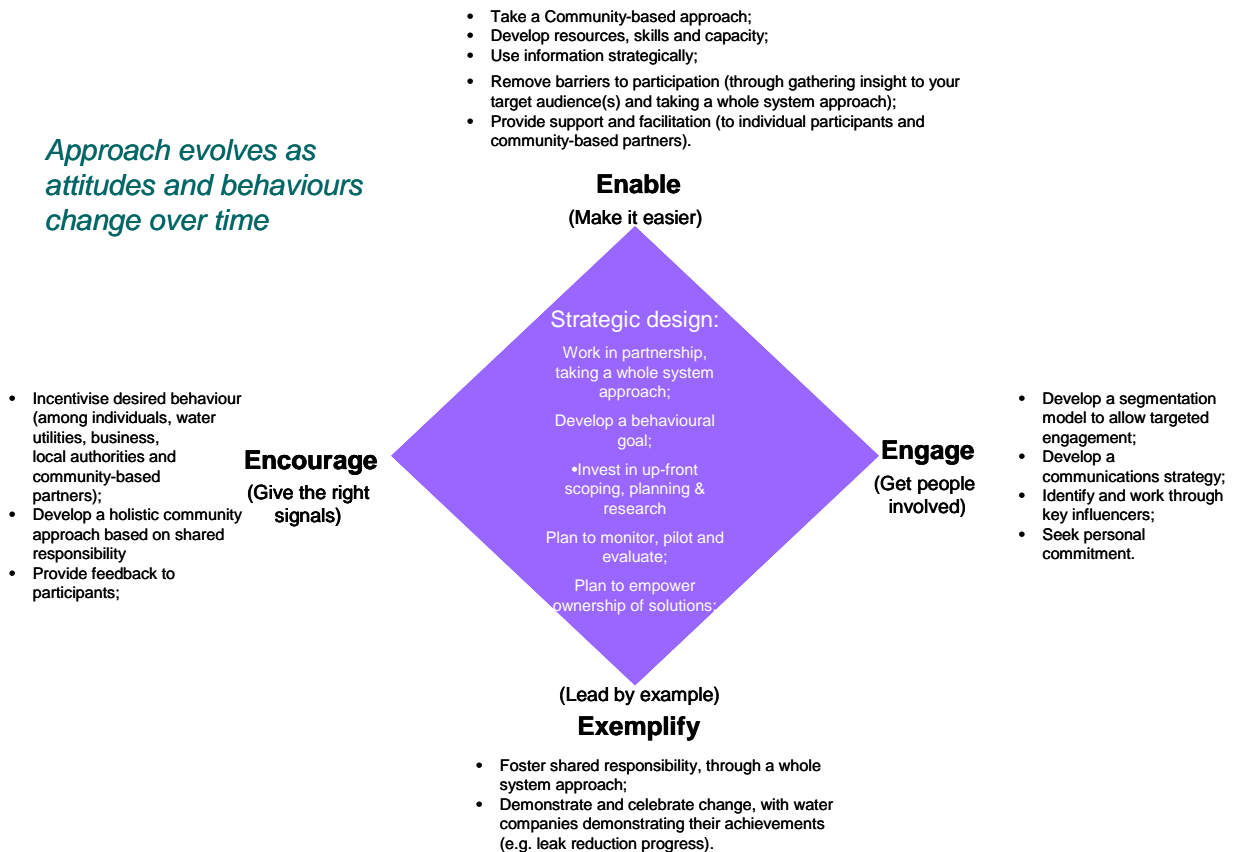


Figure A1.3 Themes identified by the review.

Theme overviews

Strategic design

- **Work in partnership, taking a whole system approach** to enable, engage, encourage and exemplify changes in water use behaviour at all levels of society from communities to big business and government.
- **Develop a behavioural goal** to ensure focus on specific water use behaviour(s) and target audience(s).
- **Invest in up-front scoping, planning and research** to:
 - identify partners and how to work with them;
 - develop insight into target audience(s);
 - ensure setting realistic objectives;
 - use a relevant mix of tools and a suitable balance of innovation/conservatism;
 - consider cross-social goals (e.g. social capital, employment), scale up and durability of the change.

- **Plan to monitor, evaluate and pilot** to understand and evaluate what works and what does not – thus providing robust feedback to refine the intervention, inform policy, and encourage continued participation.
- **Plan to empower ownership of solutions** to encourage active participation, social norming and diffusion of water conservation behaviours (e.g. through action research/learning) and involving people in intervention design (co-production).

Enable

- **Take a community-based approach:** work with social networks, local businesses, local authorities, schools and established community-based initiatives concerned with sustainability issues to empower local ownership and ensure local needs are met.
- **Develop resources, skills and capacity:** ensure that skilled, dedicated, empathetic people are available to support and facilitate change, and have the necessary resources, through eg providing funds, training, retrofit devices, access to wider expertise.
- **Use information strategically:** provide clear, vivid and personalised information in a number of relevant ways so that people know what they can do, how to do it, and how their actions are helping.
- **Remove barriers to participation** through gathering insight into the target audience and taking a whole system approach. Barriers to uptake of a new behaviour can be both external (e.g. social context, physical facilities/infrastructure, seasonality) and internal to the individual (e.g. the belief that an individual cannot make a difference, habits, personal norms). For example, in the water context, this could mean that housing design and construction does not easily allow greywater recycling and/or that the market does not offer a choice of effective, appropriate, suitably priced retrofit products/services. The internal barriers may be real or perceived (e.g. lack of time, availability of retrofit products, inconvenience of fitting etc). Barriers are complex and vary according to lifestyle, personal experience and context. It is possible that some barriers to water conservation behaviour may be the same as for energy conservation and some may be different.
- **Provide support and facilitation** to individual participants and community-based partners in as many relevant ways as possible to empower ownership of solutions and encourage continued participation, for example, through:
 - community-based action research and learning groups, personal intention plans, peer support groups, and prompts for individuals;
 - providing opportunities for community-based partner initiatives to maximise their funding.

Engage

- **Develop a segmentation model to allow targeted engagement.** Individual behaviour is embedded within a social structure that shapes early experience and values. Through understanding salient beliefs, social networks, interests and propensity to behave in certain ways, the most important influencers on similar groups of individuals can be identified and communications can be targeted that are meaningful to those groups. Segmentation models do already exist based on socio-demographics, geo-

demographics, behavioural or psychographic factors; however, most existing environment-related segmentation models are context-specific (applied to only one type of behaviour such as energy or waste) and are not transferable. Segmentation models do not have to be complex structures.

- **Develop a communications strategy.** Construct simple, specific, attractive and accessible messages that:
 - are meaningful to the target audience;
 - have a central theme;
 - are constructed to motivate through overcoming barriers;
 - are adjusted over time to provide feedback.

Deliver messages in a number of ways, for example, through face-to-face interaction (on the doorstep, or via action research and learning groups), the media, public events, project partners, schools, role models, virtual and real social networks, etc. Contextualise local, community-level strategies within a national strategy through branding (if appropriate).

- **Identify and work through key influencers.** Behaviour change message bearers need to be trusted members of the community such that the resulting messages and approaches are rooted in social and cultural norms. Social networks (real and virtual) provide an opportunity for identification of key connectors, who could be fostered as champions of change to model and diffuse relevant behaviour. Other trusted sources and/or key influencers (depending on the target audience in question) include retailers, the supply chain, families and peers of young people and communities of interest (e.g. leisure and special interest groups and religious bodies). With the right skills and approach, project workers or volunteers can be constructed as trusted messengers.
- **Seek personal commitment.** Once individuals are engaged, obtaining their specific commitment to a small, easy activity will increase their propensity to carry out that activity and commit to future, more challenging activities.

Encourage

- **Incentivise desired behaviour** among individuals, water utilities, business, local authorities and community-based partners. Incentives can take many forms and are not necessarily financial:
 - *Individuals* – through:
 - direct financial incentives, e.g. discounts on products/services, water use related discounts/rebates, grants for retrofit;
 - voluntary incentives such as points collection for later exchange for goods/services, efficient homes awards, cash back for communities based on cumulative water savings, community league tables with environmental enhancements for the winning area, pledges leading to equipment for schools;
 - policy mechanisms/regulation and disincentives, e.g. increased metering, summer surcharges, tiered pricing.
 - *Big business and utilities* – through:
 - penalties and policy mechanisms/regulation;

- better enforcement of existing penalties e.g. fines for over-use/leakage.
- *Community-based partners, local authorities and SMEs* – through:
 - flexible funding/grants;
 - water efficiency requirements built into Local Development Frameworks.
- **Develop a holistic community approach based on shared responsibility** will help to shift social values and develop water saving behaviour as the norm.
- **Provide feedback to participants** in a variety of ways, e.g. personal tracking systems as part of action research and learning groups, better household-level infrastructure (meters), more informative bills and community events celebrating successes. People need to see how they are doing and how their local action affects the bigger picture; fostering personal efficacy as part of collective efficacy builds self-confidence and motivates continued involvement.

Exemplify

- **Foster shared responsibility through a whole system approach.** People need to know that they are not expected to act alone – that government, local authorities, business and water utilities are all playing their part to conserve water. This includes the need for:
 - consistency in policies, e.g. with regard to planning guidelines for water efficiency measures in new build and ease of transferability of behaviour from home to work;
 - people to be involved in the design of community plans that affect their water behaviour (co-production and co-management).
- **Demonstrate and celebrate change.** It is not enough for government, business, water companies, the project team and partners, role models and community champions to say they are behaving appropriately: people need to see for themselves. This needs demonstrating through a range of methods such as:
 - water companies showing progress in respect of leakage reduction;
 - retailers promoting retrofit devices/water efficient products at discounted prices;
 - media coverage of successes and case studies;
 - feedback at community level;
 - reproduction of successful projects;
 - community events celebrating success.

A1.5 Recommendations

Annex A1.2 provides a full list of practical recommendations organised under the 18 themes. The recommendations are referenced to the source document summaries given in Annex A1.3.

All the recommendations should be considered within the design stage of the social marketing process (see Figure A1.4), being concerned with such core social marketing concepts as:

- working with others;
- developing insight;
- scoping, planning, piloting and refining strategy;
- monitoring and evaluation activities built into strategy design at the beginning of the scoping phase.

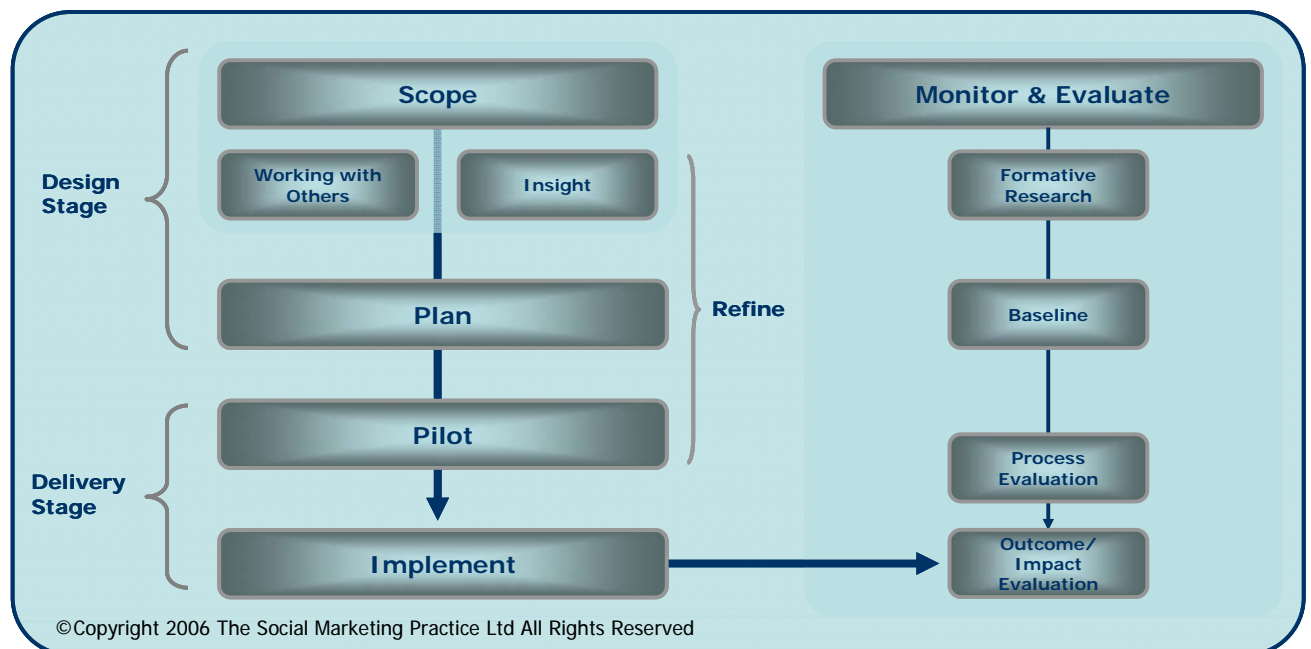


Figure A1.4 The social marketing process.

Intervention toolbox

Given the constraints of developing pilot projects at local and regional levels, the recommendations in Annex A1.2 provide a toolbox of interventions for use at the stage of project design. Their applicability will depend on the context, resources and partnership nature of the pilot projects selected.

Those recommendations that are 'greyed out' in the tables are not deemed to be practical within the scope and duration of the pilot projects. They have been left in for completeness, as having these as part of a longer term behaviour change strategy would enhance the design, delivery and impact of water efficiency outcomes.

Intervention recommendations

The Social Marketing Practice recommends that the following are essential requirements in the development of effective behaviour change projects to encourage water efficient behaviour:

- development of a systematic social marketing design approach that embraces the core social marketing concepts as presented in Figure A1.4 with measurement indicators designed in at the outset;
- water company demonstration that it is 'on a journey', addressing a programme of leak reduction and other water efficiency measures;
- involvement of participants early on the project design;
- provision of regular feedback to participants.

Approaches

The essential requirements, the 18 themes and toolbox outlined above should be road tested using the following approaches:

- community-based social marketing;
- whole town approach.

These approaches provide the best evidence where they have been proven to work, not only in the water efficiency context but in a number of other areas in the UK and internationally.

Community-based social marketing

Taking a community-based social marketing (CBSM) approach will involve research into consumer barriers to develop insight, e.g. via observations, surveys and focus groups (of both active and in-active participants). The project design will incorporate a segmented and targeted approach and will work with community-based partners, trusted intermediaries and reference groups to help establish social norms.

Using the social marketing process will be crucial to:

- setting a measurable behavioural goal;
- gaining insight;
- working with others;
- designing interventions that motivate people over time, e.g. by utilising social marketing techniques such as norms, prompts, pledges (commitments) and appropriate incentives;
- training delivery staff;
- providing feedback to encourage change.

A CBSM approach will seek to address both external and internal barriers to participation that are within the project scope. Therefore, it will be essential that partners not only exemplify what they are doing in order to reduce water consumption along with householders, but provide the enabling infrastructure (see below).

Water Efficient Durham is a good example of such an approach and is described in reference summary M4.

Whole town approach

Developing a high density or critical mass to an intervention in a local community, town or region is a common theme in many successful interventions, in particular where the concept of shared responsibility is applied – bringing together business, the community and public sector focusing on a common goal. The fostering of partnerships and interconnected networks is a fundamental precursor to success, and if the environmental goal can be linked to a social goal of local relevance, the intervention becomes even more powerful.

Zaragoza (reference M8.1) provides an excellent example of this approach.

Underpinning

It is essential that these approaches (CBSM and whole town) are underpinned by:

- participative co-design;
- partnership engagement including exemplifying.

Participative co-design

This is a powerful method of increasing partnership stakeholding and participation, particularly with the target audience whose behaviour is addressed. Involving the target audience in the design of the initiative, builds in insight and ownership – empowering stakeholders and participants alike.

Such an approach can be built into a systematic social marketing process. Activmobs is a good example of this approach applied to healthier living and is described in reference summary M6.2.

Partnership engagement including exemplifying

Partnerships are invaluable for enabling and engaging behaviour change. They can provide accessibility to householders through existing networks and develop long-term durability through differing funding streams and cross-social goals. However, significant investment is required in developing relationships at the outset and involvement in the design stage of the intervention.

Early stakeholder analysis will help in prioritising potential partners. There are opportunities to work with partners in the energy efficiency and waste reduction fields for mutual benefit, particularly where community networks have already been established. Partners can help to remove external barriers such as provision of effective, appropriate and suitably priced retrofit products/services.

Partnership needs to be reinforced by exemplifying behaviour; in particular those participating as partners and the regional water companies to encourage householders to act. The Zaragoza example in Spain began by building a network of partners before implementing their behaviour change campaign (see summary reference M8.1).

Annex A1.1 Literature reviewed

Type of document	Reference
Marketing: general sustainability	M1 The Social Marketing Practice, 2006 <i>Marketing strategies to promote retrofitting behaviour</i> (for The Environment Agency).
	M2 Darnton A, 2006 <i>Segmenting for sustainability</i> (for The Social Marketing Practice).
	M3 Mackenzie Mohr D, community-based social marketing website (http://www.cbsm.com).
	M4 Cullbridge Marketing & Communications, Tools of Change website (http://www.toolsofchange.com).
	M5 Futerra, 2005 <i>Communicating sustainability: how to produce effective public campaigns</i> (for UNEP).
	M7 The Social Marketing Practice (in preparation) <i>Innovative approaches to sustainable consumption and production</i> (for Defra).
Marketing: sector- specific – water	M8.1 Fundación Ecología y Desarrollo/LIFE Programme, 2005 <i>Zaragoza: water saving city</i> . Zaragoza, Spain: Fundación Ecología y Desarrollo.
	M8.2 Kotler P and Lee N, 2004 Home Depot's 'Water: Use It Wisely' (in 'Best of Breed', <i>Stanford Innovation Review</i> , Spring 2004).
	M9 Various authors/dates: three public water conservation programmes in the USA.
Marketing: sector- specific – health	M6.1 National Social Marketing Centre Benchmark Criteria and Smoking Cessation (case study).
	M6.2 Activmobs (case study).
Social science: general sustainability	S6 Defra, 2005 <i>Helping people to make better choices</i> . In <i>Securing the Future: The UK Government Sustainable Development Strategy</i> , Chapter 2. London: HMSO.
	S7 Darnton A, Elster-Jones J, Lucas K and Brooks M (2006), <i>Promoting pro-environmental behaviour: existing evidence to inform better policy making – summary report</i> . The Centre for Sustainable Development, Westminster University (for Defra).
	S8 Various authors, 2005–2006 Behaviour change series of practical guides for policy-makers and practitioners (for Defra).
	S9 Barr S, Gilg A and Shaw G (2006) <i>Promoting sustainable lifestyles: a social marketing approach. Final summary report</i> . University of Exeter (for Defra).
	S10 Brook Lyndhurst (2006) <i>Triggering widespread adoption of sustainable behaviour</i> (for Defra).
	S11 Uzzell D, Jackson T, Ogden J, Barnett J, Gatersleben B, Hegarty P, Muckle R and Papathanasopoulou E (2005). <i>Choice matters: alternative approaches to encourage sustainable consumption and production</i> . Final report to Defra, Environmental Psychology

Type of document	Reference
	Research Group, University of Surrey.
S12	Sustainable Consumption Roundtable, 2006 <i>I will if you will: towards sustainable consumption</i> . London: Sustainable Development Commission.
S13	Stern P C, Dietz T and Guagnano G A (1995) The new ecological paradigm in social-psychological context. <i>Journal of Environment and Behaviour</i> , 27(6), 723-743.
S14	WWF-UK and Defra, 2006 <i>Community learning and action for sustainable living: a summary of initial research findings</i> . Godalming, Surrey: WWF-UK.
S15	Centre for Sustainable Energy and Community Development Exchange, 2007 <i>Mobilising individual behaviour change through community initiatives: lessons for climate change</i> (for: Defra).
S22	Various authors, 2005: feedback for energy behaviour change
Social science: general theory	S1 Ajzen I, 1991 The theory of planned behaviour. <i>Organizational Behaviour and Human Decision Processes</i> , 50, 179-211.
S2	Granovetter M, 1983 The strength of weak ties (social network theory). <i>Sociological Theory</i> , 1, 201-233.
S3	Velicer W F, Prochaska J O, Fava J L, Norman G J and Redding C A, 1998 Smoking cessation and stress management: applications of the transtheoretical model of behaviour change'. <i>Homeostasis</i> , 38, 216-233.
S4	Spaargaren, Shove and others, 2002–2005: the Social Practices Approach
S5	Jeffrey P and Seaton R A F, 2004 A conceptual model of 'receptivity' applied to the design and deployment of water policy mechanisms. <i>Environmental Sciences</i> , 1(3), 277-300.
Social science: water	S16 Opinion Leader, 2006 <i>Using Water Wisely: a deliberative consultation</i> (for Consumer Council for Water).
S17	Medd W and Shove E, 2007 <i>The sociology of water use</i> . UKWIR Report Ref No 07/CU/02/2 (for UK Water Industry Research).
S18	Every L and Foley J, 2006 <i>Every drop counts: achieving greater water efficiency</i> (for Institute for Public Policy Research).
S19	Sharp E and Sefton C, 2006/forthcoming: WaND studies ((Water Cycle Management for New Developments)
S20	Tur A A, Noguera G O, Jeffrey P, Gearey M, Rinaudo J D, Loubier S, Veljanovski T and Ravbar N, 2006 <i>Socio-cultural influences on water utilisation: a comparative analysis</i> . In <i>Water Management in Arid and Semi-Arid Regions: Interdisciplinary Perspectives</i> (ed. P. Koundouri, D. Assimocopoulos, M Lange and P Jeffrey), pp. 201-225. Cheltenham: Edward-Elgar Publishing.
S21	Lam S, 2006 Predicting intention to save water: theory of planned behaviour, response efficacy, vulnerability and perceived efficiency of alternative solutions. <i>Journal of Applied Social Psychology</i> , 36(11), 2803-2824.

Annex A1.2 Full list of recommendations

Those recommendations that are 'greyed out' in the tables below are not deemed to be practical within the scope and duration of the pilot projects. They have been left in for completeness, as having these as part of a longer term behaviour change strategy would enhance the design, delivery and impact of water efficiency outcomes.

Strategic design

Work in partnership, taking a whole system approach

Recommendation	Source
Develop national level links and partnerships with:	
<ul style="list-style-type: none"> Government departments currently working on behavioural change to connect householder retrofitting behaviour with wider policy to devise a way forward in the context of sustainable homes/living initiatives; 	M1
<ul style="list-style-type: none"> consumer and business groups including the home improvement market to address opportunities for standards in training and skills development. Strengthen the relationship between householder and plumber, installer, builder and others connected with domestic water use and information products (manufacturers, distributors, retailers and architects). 	M1, M8.1
Work with businesses to embed water efficiency as part of their brand values to harness their marketing and communication expertise, product knowledge and the means to monitor product sales to evaluate intervention success.	M8.2
Bring together a diverse group (e.g. designers, policy analysts, professionals and psychologists) to work with participants and local stakeholders in project design at community level.	M6.2,
Create partnerships to work with the media.	S13
Work at the community level:	S6
<ul style="list-style-type: none"> link with the schools citizenship and sustainable development syllabuses; identify existing non-water community-based initiatives; develop links to create opportunities for shared action (through the principles of the Compact on Relations between Government and the Voluntary and Community Sector (http://www.thecompact.org.uk)). 	
Work with local authorities.	S15
Consider partnering with energy initiatives.	S18
Identify which partners need to be targeted for change themselves rather than just delivering change through them as intermediaries.	S7

Develop a behavioural goal

Recommendation	Source
Focus on one behaviour at a time (e.g. residents' lawn watering to reduce the community's water usage) and analyse it to identify the responsible actors and actions.	M3, M7, S7

Invest in up-front scoping, planning and research

Recommendation	Source
Conduct consumer research into attitudes and behaviours before and after campaign delivery to establish insight from the consumer perspective and increase impact.	M1, M5 M6.1, M7, S2, S5, S7
Engage with communities to research and identify their own solutions, set their own agendas and remove the need for identifying change champions 'from above' as they will find them for themselves.	M7
Reduce wasted time and resources by planning systematically at the start of a campaign.	M5
Use a relevant mix of tools, e.g. a combination of prompts and commitment is more effective than prompts alone.	M3, S7
Set achievable objectives, integrating monitoring and evaluation. Consider whether change needs to be incremental (if already close to desired behaviour) or transformational (if problem is dynamic and complex). Have realistic expectations about the outcomes.	M1, M3, M5, S7
Scope carefully before committing to community initiatives and plan to scale up keeping expert help low through training/working with community members.	S15, M7
Plan a holistic approach: <ul style="list-style-type: none"> • involving all agents over time; • adding value through planning to sustain and extend interventions over a long period of time; • using consistent innovative and creative approaches; • taking risks; • implementing simultaneous interventions at multiple levels; • designing schemes that will become self-financing and foster job creation. 	M7, S8
Plan to add value through joining up agendas, for example: <ul style="list-style-type: none"> • develop household efficiency ratings for water and energy which estate agents and local authorities highlight; • offer credits for water and energy savings linked to a 'power/water pension' – receiving 'points' for increasing efficiency measures, which are then drawn down as a 'water/energy annuity' in retirement. 	S22
Plan to balance innovation with conservatism:	M6.2, S10

- build on what people are already doing;
 - be conservative when enabling, innovative when encouraging and exemplifying, and consistent when engaging.
 - Identify opportunities for including water in sustainable community strategies and local action plans such as parish plans, neighbourhood plans, housing and planning policies. Involve communities in those plans. S6
 - Review the Community Action 2020 project – part of the Government’s ‘Together we can’ programme² – and other relevant publications to identify routes to linking with community initiatives.
- Use household voluntary sign-up to a membership programme to obtain insight into the population. M5

Plan to monitor, evaluate and pilot

Recommendation	Source
Integrate monitoring and evaluation into project from the outset.	M1, M3, M5, S7
Use methods appropriate to the behavioural goal, for example:	M7
<ul style="list-style-type: none"> • samples of self-report water usage; • actual changes in water usage as measured by water companies; • efficient water product sales; • valuation of any brands launched around water saving initiatives; • intervention cost versus the projected cost of building new infrastructure to cope with demand. 	
The tool developed by the WWF and CAG Consultants for measuring the impact of community projects on behaviour change programmes should be investigated to establish if it is of use for water behaviour projects.	S15
Pilot to test and revise an approach before implementing more widely, with feedback loops to allow adjustment.	S2, S7
‘From Pilots to Crystals’ – water behaviour interventions need to progress from a model in which novel ideas are piloted, refined and then (if successful) rolled out to one in which novel ideas are used perpetually to seed, catalyse or act as crystals for pro-water efficient behaviour change.	S10
Design and pre-test new marketing /information material with target population.	M6.1

Plan to empower ownership of solutions

Recommendation	Source
Develop and implement action research and learning programmes at	M1, S7, S14

² <http://togetherwecan.direct.gov.uk>

community level (e.g. with schools/youth groups) to facilitate people to:	
develop their own solutions to the problem, help unlock agency, and overcome external conditions through group action (e.g. Global Action Plan EcoTeams ³), within a cycle of action and reflection (e.g. Ballards' 5As model).	
Adopt the principle of user-centred design, working with people in communities in whatever kind of grouping already exists (e.g. small, informal and non-hierarchical social groups) and develop supported self-organised groups to become more active in water efficient behaviour.	M6.2
Develop a supportive aspect of an action learning group, using the 'Stages of Change' themes of Dramatic Relief, Self Re-evaluation, Helping Relationships, Counter Conditioning, etc (e.g. personal testimonies about water wasting behaviours) and provide/facilitate development of a framework for personal intention/action plans.	S3
Develop a framework for tracking people's journey through the five Stages of Change (Pre-contemplation, Contemplation, Preparation, Action and Maintenance), either as a self-support tool within an action research/learning group context or as project evaluation tool.	S3
Identify opportunities for including water in sustainable community strategies and local action plans such as parish plans, neighbourhood plans, housing and planning policies, and involve communities in those plans.	S6, S20
Facilitate co-production and co-management of water through providing the necessary infrastructure/facilities for people to take part in rainwater harvesting and greywater recycling.	S17

Enable

Take a community-based approach

Recommendation	Source
Facilitate neighbourhood coaches (e.g. train senior citizens to provide retrofit assistance to other seniors, students to help retrofit in low-income homes), and support self-organised peer support groups (drawing inspiration from existing group structures). NB Links with action learning.	M4, M6.2, M9
Work with household plumbers and set up community-based water efficiency advisors and helplines.	M1
Facilitate and support the creation of local initiatives in a manner ensuring ownership and local relevance, building in recognition of small successes, ensuring the response is recognised by those in authority, and making sure any funds/resources are sustained.	S15
Identify community mentors and community development workers, and find a way to strengthen their capacity to support community action on sustainable development generally, ensuring water efficiency is included.	S6

³ <http://ecoteams.org.uk>

Develop resources, skills and capacity

Recommendation	Source
<ul style="list-style-type: none"> • Provide training and other resources (e.g. for researchers and writers in the mainstream TV, writing and entertainment fields) to ensure accurate information is portrayed to the public. • Develop resource packs for schools including DVDs, posters and teacher training materials. • Train dedicated helpline personnel. • Train home auditors to carry out retrofit measures. 	M3, M7, S22
<p>Ensure business partners are skilled to provide relevant advice/training (e.g. water efficient gardening and DIY training).</p>	M8.2
<p>Ensure community helpers are trained, e.g. senior citizens providing retrofit assistance to other seniors, students helping install retrofit devices in low-income homes.</p>	M9
<p>Consider the mix of skills necessary to set up the scheme and recruit as necessary – provide dedicated project workers and home visits.</p>	M6.1, M6.2
<p>Consider how to engage with other professionals who interface with the consumer – what resources/skills are needed to engage with them (e.g. if using role play, this is a specialist skill).</p>	
<p>Develop a standardised language of what 'behaviour change' and 'behavioural measures' mean in terms of water behaviour so that community initiatives have a common understanding and can minimise transferability issues.</p>	S15
<ul style="list-style-type: none"> • Work with community mentors and community development workers to strengthen their capacity to support community action on sustainable development, particularly in relation to water behaviour. • Identify opportunities to provide (or fund) learning and training on the role of water behaviour in sustainable development. • Identify opportunities to maximise funding impact through providing match funds or services in-kind for community projects on sustainable development (adding a specific water focus). NB The Home Office online portal (http://www.governmentfunding.org.uk) provides access to grants for the voluntary and community sectors and may offer a starting point for identifying opportunities. • Improve/provide information of funding availability relating to community-led behaviour projects. 	S6
<p>Provide training to householders so they can self-audit.</p>	S22
<p>If encouraging business networks as fora for exchange of best practice etc. and/or encouraging mentoring, ensure those involved have the necessary skills.</p>	S8

Use information strategically

Recommendation	Source
Use information/education alongside other tools, e.g. pledges and feedback.	M7
Provide clear, easy, vivid, personalised, tailored and multilingual information for consumers about: <ul style="list-style-type: none"> • how they can change their water habits; • what measures are available and how to access them/implement them; • what the savings and other benefits might be; • how they can become active participants in the change programme. For example, provide 'how to' guides, leaflets, newsletters, information cards and consider innovative ways such as a dedicated magazine and/or website.	M1, M3, M4, M6.1, M6.2, M7, S9
Train researchers and writers in the mainstream TV, writing and entertainment fields to ensure accurate information is portrayed to the public.	M7
Provide resource packs for schools including DVDs, posters and teacher training materials.	M7
Identify those involved with the supply of water, and water-related products and services, and provide information through the supply chain, facilitating training as necessary.	M8.1
Identify businesses involved with the supply of water, and water-related products and services, and enable and encourage them to provide training on water efficient behaviour in workshops.	M8.2
Work with water companies to develop more easily understood and informative bills.	M9
Provide clear information through product/appliance standards/labelling schemes.	S7, S18
Identify community-based opportunities to provide learning and training on the role of water behaviour in sustainable development and provide information of funding availability for projects.	S6
Consider working with the energy sector to develop innovation in metering technology to allow for provision of feedback information (e.g. interactive via a PC, smart metering, prepayment).	S22
Consider working with water companies to provide more information on bills (e.g. comparative historical data, comparisons with similar households) or separate reports (e.g. quarterly) linked with incentives.	S22
Provide advice on appliances/fitments/behaviour when people move house or have major renovations – perhaps in partnership with the energy sector.	S22
Identify business networks and encourage sharing of water efficient information/advice/best practice/help points through fora and mentoring relationships between businesses, local authorities, voluntary	S8

Recommendation	Source
organisations and others.	
Ensure information is accurate in order to instil consumer trust and aim to change belief strength (e.g. that self-installation of retrofit appliances requires minimal DIY skills).	S1
Set up central source for information – extend the Energy Savings Trust remit to water.	S18
Provide prominent information about the current state of local water resources to help bridge the disconnection between people’s understanding of how domestic water use impacts on the natural environment.	S19
Ensure any web-based support provides necessary information, tools, etc. for participants and support agents.	M6.2

Remove barriers to participation (through gathering insight to your target audience and taking a whole system approach)

Recommendation	Source
Identify where people are starting from, and the key barriers and incentives for water efficient behaviour, through formative research (involving eliciting and measuring salient beliefs and current water behaviour habits).	M5, S1, S3, S7
Peer ethnography through water usage observations of family and friends may offer insight: arguably people will be more honest when reporting other people’s water usage than they will be about their own.	M7
Barriers may be:	M3, M6.1, S7, S14
<ul style="list-style-type: none"> • external to the individual, i.e. abilities/conditions (e.g. infrastructure, financial, legislation), social context and lock-in (norms and habits); • internal, i.e. psychological/dispositional: <ul style="list-style-type: none"> - agency (the belief that an individual cannot make a difference); - norms (three types – subjective/societal, personal/self-concept, ‘role belief’ – what type of person might do in particular situation); - habits (frequently undertaken behaviours at low levels of consciousness – an individual’s ‘standard operating procedure’); • real or perceived (e.g. lack of time and resources); • specific to specific behaviours and individuals. 	
Take a holistic approach that encompasses the whole system of production and consumption. The ‘Production, Retail, Consumption’ triangle details this. Convenience for all agents – water companies, appliance retailers and customers – needs to be increased in order to reduce their ‘intention–behaviour’ gaps and enable them to implement changes in water behaviour. Such interdisciplinary working will help to change the social context and reinforce new norms.	S7, S8
To remove the intention–behaviour gap, either make the desired behaviour the only option through policy measures/availability of products/services or create a range of two to three clear, viable, alternative choices in order to increase willpower (commitment is shown	S6, S3, S9, S21

Recommendation	Source
to increase).	
Remove external barriers in advance in order to support norming of new behaviour and use a relevant mix of voluntary/other policy instruments to support removal of specific external barriers (e.g. infrastructure such as drains, which hamper greywater recycling).	S4, S7
Ensure expectations of the individual are clear, simple and achievable.	M5
Identify the variables that impact on water consumption behaviour such as:	M9
<ul style="list-style-type: none"> • weather; • household composition; • how long people have lived in arid area; • ethnicity; • physical infrastructure of house; • landscape flood irrigation. 	
If barriers are transferable to water behaviour from other environmental practices, then make behaviour easy, convenient, free of cost, quick (i.e. no additional cost in time, or even time saved) and incremental. Where lack of convenience/choice is a barrier, offer an increase in convenience and choice of options so that intention is easier to implement, e.g. more specific or flexible plumber appointments so people don't have to wait at home for half (or even whole) days. Where cost is a barrier, reduce it; for example, allow the cost of retrofit measures and installation to be paid for from savings in the water bill.	M3, S8, S9
Use consumer insight as a basis for overcoming specific barriers – some insight might be gained from existing information held by water companies.	M4, S22
Explore both the extent to which disconnection between people's understanding of domestic water and the natural environment is a barrier and ways to overcome it.	S19
Explore potential differences in local water cultures and adapt campaigns accordingly (showing sensitivity towards the kind of relationship, symbolic perception and physical interrelation that citizens maintain with water).	S20
Combine community participation, and convenient systems and infrastructure through for example:	M1, M3, S17, S22
<ul style="list-style-type: none"> • household plumbers; • local water efficiency advisors; • home auditors installing retrofit devices; • targeting people who are moving house or undertaking home improvements through partnerships with energy-focused organisations, estate agents, builders/developers, home improvement outlets, kitchen/bathroom suppliers/fitters, etc. 	
Invest in blanket provision of unsolicited self-audit kits, and free water audits and retrofits.	M9

Recommendation	Source
Coincide promotion of provision of new facilities/infrastructure with the preparation of personal intention plans in the 'Preparation' stage of change (in community groups).	S3
Identify and put in place the necessary infrastructure/legislation/support to change the social context so that values not supporting the desired behaviour can be challenged as being 'undesirable'/'inappropriate'.	S13
Work with regulators, retailers and manufacturers to label products for water efficiency and edit the choices available in the market place, while still providing products that perform and are affordable, using a mix of voluntary initiatives and regulation. In addition, label products for water efficiency in their production and disposal processes and ensure that water efficiency is considered on this whole life basis (rather than just as a water efficient product for the consumer).	S7, S11, S16, S18
Consider feasibility of greywater reuse and rainwater harvesting systems in both new build and as retrofit. This would require planning guidance changes, would need to be cost-efficient as retrofit, and would perhaps only be suitable to certain types/ages of property on which clear guidance would be needed.	S4, S17

Provide support and facilitation (to individual participants and community-based partners)

Recommendation	Source
Provide ways to bring habitual water wasting actions to people's conscious attention, together with prompts to help people to remember new behaviour, e.g. <ul style="list-style-type: none"> • switching off the tap when brushing teeth; • taking showers instead of baths; • washing vegetables in a bowl rather than under running water; • installing a rain gauge to prevent over-watering of lawns; • putting a tag on the outside water tap to encourage lawn watering on odd or even days; • arranging with local retailers to attach decals to lawnmowers that encourage householders to raise the level of the lawnmower and encourage the grass clippings to be left on the lawn (mulched) as a natural nutrient; • attach decals to dishwashers and washing machines in retail stores encouraging full loads; • attach decals to low-flow toilets and shower heads indicating that they save water and money. 	M3, M4, S8
Consider transferability of/combining with energy-related household level infrastructure innovations which might act as more effective prompts, e.g. interactive feedback via a PC (energy tracker/home dashboard/virtual house).	S22
Work with water companies to provide prompts and supportive information via the billing system.	S22

Facilitate the setting up of peer support groups and training of neighbourhood coaches providing opportunities for explicit discussion of water efficient practices in order to bring them into discursive consciousness and allowing people to engage with change in the 'Action' stage and sustain it in the 'Maintenance' stage.	M4, S3, S4
Use the 10 processes and five Stages of Change to create a framework for personal plans of intention within a specific water conservation behaviour; use the framework in community groups so that individual plans can be prepared to track movement from the stage that people start at.	S1, S3
Comparing inexpensive (e.g. cutting shower times) and expensive (e.g. buying a water-efficient washing machine) actions with retrofitting behaviour may establish how intentions are affected in the face of these alternatives.	S21
Offer practical support and facilitation from a dedicated project worker to individual participants and/or community group organisers.	M6.1, M6.2, S7, S14
Ensure day-to-day experiences of new behaviour reinforce its continued practice.	S13

Engage

Develop a segmentation model to allow targeted engagement

Recommendation	Source
Develop a segmentation model with behavioural and psychographic variables mapped to a profile variable such as house type to provide insight into target audiences.	M1, M2, S9
Explore whether Barr's Sustainable Lifestyles model and/or the work by the Energy Savings Trust can be extended to water behaviour.	
NB Barr's model segments people according to four types of environmental behaviour within the context of household habits, purchasing and recycling. Further research is recommended before exploring possibilities with Barr as, from the literature reviewed, it is not clear how these clusters were generated and whether/how they can be applied to segment a broad audience.	
If segmenting according to the four cluster types, target each differently, and target purchasing behaviour separately from habitual household level behaviour, which requires a joined up approach, i.e. cross-sectoral partnerships (energy).	
Segment stakeholders into action/interest groups in order to clarify their role in the project.	M7
Target young people through experiential methods and via a range of formative influencers (e.g. families) NB There is research by the Scouting Association that shows families remain a key influencer.	S13
Target according to social networks.	S10
Target individuals differently to businesses and target businesses according to size and nature.	S7

Segment and target according to the Stage of Change.	S7
Target the 'unwilling and unable', 'unwilling and able', 'willing and unable' and 'willing and able' according to life stage.	S16
<ul style="list-style-type: none"> • Younger singles or couples will have received knowledge from school or university, but often lack the resources to turn this into action. • Middle life stage people usually have families, are focussed on cost and routine, and not always motivated to engage or take action. • Older people, often widowed and retired, are far more knowledgeable, engaged and actively involved in water conservation. 	
Explore whether the sense of local culture which differentiates national attitudes to water within Europe is a key influence within the UK (e.g. at regional or even more localised levels) and, if so, what those differences are and their geographic boundaries and segment/target accordingly.	S20
Explore whether ethnicity/race affects water use and how (e.g. do Spaniards living in the UK bring their own cultural influence to their water use or do they adopt the local culture) and segment/target accordingly.	

Develop a communications strategy

Recommendation	Source
<i>Deliver messages in a number of different ways:</i>	
<ul style="list-style-type: none"> • Identify and engage with trusted members of the community/key influencers to deliver messages through social networking such that the resulting messages and approaches are rooted in social and cultural norms. 	M7, S13
<ul style="list-style-type: none"> • Work with voluntary and community sector bodies and other organisations (e.g. local authorities, Primary Care Trusts, SMEs), networks, supply chains, society as a whole, and across disciplines. 	S7
<ul style="list-style-type: none"> • Face-to-face such as through an individualised water efficiency approach (i.e. home visits, tailoring activity appropriately) or canvassing of retrofit devices. 	M1, M3, M4, M9, S1
<ul style="list-style-type: none"> • Word of mouth. 	M4, M6.2
<ul style="list-style-type: none"> • School programmes – involve the family, work within the curriculum, give presentations at assemblies. 	M4, M5, M8.1, M9, S15
<ul style="list-style-type: none"> • Work programmes that influence the home. 	M4
<ul style="list-style-type: none"> • Use commercial sector marketing expertise: mass advertising campaigns, direct mail, deliberative fora. 	M4, M5, M6.2, M7, S6, S10
<ul style="list-style-type: none"> • Community events led by partner organisations. 	M1
<ul style="list-style-type: none"> • Link with other sustainable home community based initiatives such as EcoTeams where appropriate (i.e. waste and energy). 	M1
<ul style="list-style-type: none"> • Through a voluntary household membership programme offering environmental 'health checks'. 	M5
<ul style="list-style-type: none"> • Through places where people visit in the community (hotels, gyms, public buildings). 	M8.1

Recommendation	Source
<ul style="list-style-type: none"> • Initiate water celebrations/festivals. 	M8.1, M9
<ul style="list-style-type: none"> • Through public seminars. 	M9
<ul style="list-style-type: none"> • Through engaging with business partners to provide relevant advice/training/workshops, e.g. water efficient gardening and DIY training. 	M6.2, M8.2
<ul style="list-style-type: none"> • Through virtual media. 	S22
<i>Messages need to:</i>	
<ul style="list-style-type: none"> • be simple, specific, attractive, accessible and meaningful to the target audience, with a central theme and adjusted over time to provide feedback; 	M1, S12, S16, S17
<ul style="list-style-type: none"> • be vivid, concrete and personalised; 	M3
<ul style="list-style-type: none"> • highlight the benefits of behaviour, e.g. easy, convenient, free of cost, quick (i.e. no additional cost in time, or time saved) and incremental, as well as the benefits of taking part (e.g. a social opportunity); 	M6.1, M6.2, S9
<ul style="list-style-type: none"> • move away from existing language around water behaviour; 	M6.2
<ul style="list-style-type: none"> • build motivation over time, i.e. be matched to overcome barriers to, and promote opportunities for, new behaviour and linked to activities people are already doing; 	M4, S7
<ul style="list-style-type: none"> • highlight people as part of the solution to the water issue; 	S12
<ul style="list-style-type: none"> • provoke emotions around water; 	S11
<ul style="list-style-type: none"> • share lessons of what works; 	S14
<ul style="list-style-type: none"> • promote joint responsibility for management of our water resources, and the importance and need for water in order to care for the environment; 	S16
<ul style="list-style-type: none"> • overcome the strong perception that Britain is a wet country; 	S19
<ul style="list-style-type: none"> • engage an entire community; 	M7
<ul style="list-style-type: none"> • keep residents informed of developments. 	M7
<i>Branding needs to:</i>	
<ul style="list-style-type: none"> • link local messages under a national umbrella and brand, e.g. WRAP's 'Recycle Now' and the Department of Transport's 'THINK' campaign); 	M1
<ul style="list-style-type: none"> • be trusted (if it's too 'official looking' it might have the opposite effect); 	M6.2, S9
<ul style="list-style-type: none"> • work across all sectors if working cross-sectorally; 	
<ul style="list-style-type: none"> • be established in partnership with other stakeholders. 	M7

Identify and work through key influencers

Recommendation	Source
Identify trusted members of the community, e.g. community leaders; Imams to engage with the Muslim population. NB Water companies, the Government and those in control are not trusted.	M3, M7, S7, S14, S16, S19

Identify special interest groups with an interest in water (e.g. biodiversity conservation membership organisations, gardening clubs, DIY and health professionals) and other influencing bodies in individuals' lives such as charities or sports/arts/religious organisations.	M1, S8
Use water sector installers and suppliers as intermediaries.	M8.1
Identify key social networks for influencing water use behaviour. Narrow them down to those that best lend themselves to the diffusion of change and identify the foci of greatest influence within those networks to work with/through.	S10
Partner with businesses/large retailers, e.g. water efficient gardening and DIY training.	M8.2, S9
Research what would be needed to turn existing (mistrusted) professionals into trusted messengers.	M6.1
If using project workers, make sure they present themselves as trusted messengers.	M6.2
Engage social connectors in certain audience segments to make particular practices more acceptable or even 'cool', e.g. teenagers.	M7
Remove the need to identify change champions 'from above'; facilitate the community to find them for themselves.	M7
Engage with participants and stakeholders through workshops to identify existing social networks – in both real and virtual* communities – identify those that are key for influencing water use behaviour, narrow them down to those that best lend themselves to the diffusion of change, and identify the foci of greatest influence within those networks to work with/through as 'change champions'.	M6.2, S2, S3, S8, S10, S11
Provide and promote volunteering opportunities:	M6.2, S6, S7, S8
<ul style="list-style-type: none"> • Identify, skill and support motivators/'change champions' to use their social, motivational and organisational skills to get groups action learning networks going and keep them going. • Explore Ballard's three types of champion – formal, informal visible, informal less visible – with a view to adopting. 	

* For example, MySpace, Facebook, web groups that exchange topic-specific messages on virtual notice-boards, bloggers and moneysavingexpert.com

Seek personal commitment

Recommendation	Source
Provide opportunities for people to make pledges committing them to an initial small/easy action (verbally or written) and subsequently to other (more demanding) behaviours. For example: <ul style="list-style-type: none"> • ask homeowners to commit to raise the height of their lawnmower, thereby reducing evaporation and the need for lawn watering; • when going door-to-door with water efficiency kits, ask homeowners who wish to take the kit to make a public commitment to install it. 	M3, M4, M7
Provide opportunities for people to take part as a social commitment.	M6.2
Offer periodic rewards for achievement of personal commitment goals.	M6.2

Recommendation	Source
Provide opportunities for people to make public testimonies of their commitment to make the relevant changes.	S3

Encourage

Incentivise desired behaviour (among individuals, water utilities, business, local authorities and community-based partners)

Recommendation	Source
<i>Use a range of incentives in combination with other tools (e.g. feedback and community initiatives), tailored to overcome barriers of a given target audience:</i>	
<ul style="list-style-type: none"> • Financial and linked with regulation/policy, e.g. <ul style="list-style-type: none"> - council tax reduction and/or reduction in water rates or structured tariff systems for retrofit of packages of water efficiency through an award scheme; - subsidised or free retrofit measures; - rebates; - household level grants. 	M1, M4, M9, S6
<ul style="list-style-type: none"> • Voluntary, e.g. <ul style="list-style-type: none"> - efficient homes awards (perhaps linked with energy); - cash back for communities based on cumulative water savings; - community league tables with environmental enhancements for the winning area; - pledges leading to equipment for schools; - lottery-style prize draws; - vouchers – discounts on specified facilities and services topped up on a regular basis according to water savings against personal commitments; - water/energy saving credits linked to a ‘Water/Power Pension’ – receiving ‘points’ for increasing efficiency measures, which are then drawn down as an ‘energy/water annuity’ in retirement, again linking with energy schemes to work jointly. 	M1, M6.2, S6, S22
<ul style="list-style-type: none"> • Financial savings attributable to implementation/adoption of different measures/behaviours. 	M1
<ul style="list-style-type: none"> • Use incentives at the time the behaviour occurs, make sure people know about them, and consider the ways in which people might try to avoid them, e.g. <ul style="list-style-type: none"> - with new meters that can record time of use, - charge variable rates based on time of use; - provide loans, grants, or rebates to foster the installation of low-flow toilets. 	M3
<ul style="list-style-type: none"> • Offer in-store promotions on water efficient products. 	M8.2
<ul style="list-style-type: none"> • Fund incentive and rebate programmes through summer price surcharge (see policy/disincentives). 	M9

- Consider grants to community organisations as an incentive for them to include water conservation behaviour in their activities. S7, S8, S15
- Incentivise according to Stage of Change. S7
- Work with water companies to offer incentives (e.g. audits, retrofit, discounts, rebates) via bills S22

Disincentives/policy mechanisms/regulation:

- Fines for non-adoption of certain measures – BUT these need to be seen as fair and, in particular, so vulnerable groups do not bear too high a burden. NB *Tax and the Environment: Using Economic Instruments** might help to identify potentially useful tools. M1, M4, S3, S6
- Price measures e.g. M3, M9
 - price increases;
 - summer price surcharges based on winter usage;
 - high users required to prepare conservation plans;
 - tiered pricing;
 - where metering allows, charge variable rates based on time of use.
- Industry should be penalised, not individuals, and existing penalties should be enforced (e.g. leakage behaviour). S6, S9
- Domestic water quotas (i.e. rationing – stick approach) reducing as people ‘spend’, again perhaps linking with energy schemes to work jointly. S22
- Explore feasibility/robustness of ‘willingness to pay’ extra for water provided the surcharge is spent on environmental protection. S20
- Policies to increase the rate of introduction of water meters to homes. M1
- National policy on water usage needs to be made relevant to local needs. S15
- If using taxes: S6
 - (a) give advance notice of any that are new;
 - (b) ensure extensive consultation on design to allow people or companies to adapt their practices;
 - (c) recycle some of the proceeds to communities to help speed the response;
 - (d) allow discounts in return for negotiated commitments to reduce water use and use some of the proceeds to offer alternatives.
- Regulation carefully targeted at businesses, coupled with consumer pressure. S8
- Local authorities to build water efficiency requirements to Local Development Frameworks. S18
- Water companies to be required to promote water conservation – through the fixed targets of the proposed Water Efficiency Commitment (WEC).
- More compulsory metering in water-stressed areas.
- Explore how effective the message ‘get a meter to save money and reduce wastage’ is likely to be. S16

- Identify drivers (i.e. legislation, targets, etc.) in order to inform relevant mix of incentives/disincentives (c.f. National Resource and Waste Forum (NRWF) model of supply and demand) to support change. S7

* HM Treasury 2002 (<http://www.hm-treasury.gov.uk/d/adtaxenviron02-332kb.pdf>)

Provide feedback to participants

Recommendation	Source
Use feedback at both individual and community level, along with other tools to motivate continued and wider action through showing collective progress and results.	M4, M5, M7, M8.1, S12
<ul style="list-style-type: none"> • Work with water companies to provide feedback via bills. M9, M22 • Use any existing water utility-owned data to inform feedback (e.g. against historical data, or against data for a comparative household). • Train dedicated enthusiastic, supportive and empathetic project workers in feedback techniques to boost individual self-esteem. M6.1, M6.2, M7, S16 • Encourage personal efficacy using fun, easy-to-use systems that allow individuals to see their own progress, e.g. water diaries. 	
Promote examples of successful community action across the country to help communities inspire one another, i.e. share lessons of what works.	S6, S14
Establish a baseline (e.g. through audit, either self or independent) to provide feedback at household level.	S22
Innovative household systems of tracking information (e.g. online/PC-based) could make feedback more accessible (e.g. Home Dashboard) – could be joined with energy initiatives.	S22
Partner with businesses to provide training and information in workshop situations to promote self-efficacy.	M8.2
Individual actions are seen as futile, particularly where scarce resources require mutual restraint in consumption, so the impact of collective effort making a real difference needs highlighting – keeping it local, but showing how things fit into the bigger picture.	S8, S12, S15, S19, M5
Celebrate water as a shared and valued resource from the local to the global level, and demonstrate community pride in successes, e.g. through hosting an international conference.	M8.1, S6

Develop a holistic community approach based on shared responsibility

Recommendation	Source
People often decide what attitudes and actions are appropriate from observing those around them. Provide exemplifying water behaviour through role models within social networks in order to encourage adjustment of the norm.	M4, S11, S12
Use voluntary incentives to achieve social recognition, e.g.	M1, S6

Recommendation	Source
<ul style="list-style-type: none"> • efficient homes awards; • cash back for communities based on cumulative water savings; • community league tables with environmental enhancements for the winning area; • pledges leading to equipment for schools; • lottery-style prize draws. 	
Develop a holistic community-wide approach based on shared responsibility to help to develop water saving behaviour as a norm.	M8.1
Put in place the necessary infrastructure/legislation/support to change the social context so that values not supporting the desired behaviour can be challenged as being 'undesirable'/'inappropriate'.	S13
Shift values to sustain change through providing community-level action learning opportunities with respect to water efficient behaviour.	S14
Tackle the issues of 'social acceptability' and 'acceptance of personal responsibility' of the consequences of water wasting via communities of interest (e.g. charities/sports/arts/religious organisations).	S8

Exemplify

Foster shared responsibility, through a whole system approach

Recommendation	Source
Metering of businesses, council premises, local housing authority properties; water utilities reducing leakage.	M1
Involvement throughout the community.	M8.1
Central government, local authorities, utilities, public institutions, business to be seen to be leading by example.	S6, S9, S12, S14, S16, S19
Partner organisations/bodies that are propagating change to adopt wider sustainability practices, e.g. according to Morton's (2002) environmental procurement model.	S7
Consistency across policy an example of government responsibility, e.g. <ul style="list-style-type: none"> • synergy between measures to encourage good water efficiency behaviours at work and at home (transferability of behaviours); • revisions to Water Fitting Regulations, addressing new build, to incorporate water efficiency product specifications. 	M1, S7

Demonstrate and celebrate change

Recommendation	Source
Make public case studies (e.g. using the media) of examples of shared responsibility and exemplification, e.g.	M1, S8, S13

Recommendation	Source
<ul style="list-style-type: none"> • of partner staff action, • of metering of council premises, • of reduction in leakages by water companies, home award schemes, etc. 	
<p>Showcase successful projects in other communities (if a practice proves 'sustainable' in one location it may cause the same form of the practice to be reproduced in another location or time).</p>	M6.1, S4
<p>Publish real life stories and testimonials, e.g. of champions/role models/early adopters.</p>	M6.2, S7, S11, S14
<p>Provide opportunities for people to see for themselves the impact of their collective behaviour and the impact of non-action, as well as what others are doing (in order to convince them of shared responsibility).</p>	S9, S16, S19
<p>Demonstrate the link between the local and the broader contexts.</p>	S7, S14
<p>Recognise and celebrate successful community action on water behaviour.</p>	S6

Annex A1.3 Summary of research compendium

Note that the summaries refer to the content of the source document at the time it was published and not necessarily to the time of writing this report.

Marketing: general sustainability

Reference: M1

TITLE	Marketing Strategies to Promote Retrofitting Behaviour		
AUTHORS	The Social Marketing Practice (for the Environment Agency)	PUBLISHED	2006
CONTEXT	Marketing and communications: sustainability – general		
SOURCE	Available from: http://publications.environment-agency.gov.uk/pdf/GEHO0906BLID-e-e.pdf		
<p>Principal learnings</p> <p>The study reviewed around 20 secondary and primary sources in the areas of social theory and research, and marketing strategies for sustainable behaviour (e.g. the government's 'Are you doing your bit?' campaign).</p> <p>The most important general learnings are as follows:</p> <ul style="list-style-type: none"> • The best way to change behaviour is through communities and special interest groups where good behaviour can be encouraged by social pressure and poor behaviour is discouraged. • Providing practical 'on-the-ground' support for behaviour change tailored to specific audiences and localities is more effective than raising awareness. • Providing a combination of prolonged support coupled to a convenient system and community participation can influence a significant and sustainable behaviour change. • Convenient infrastructure should be in place before engaging to encourage action. However, there may be a need to 'warm up' the audience as infrastructure is coming online. • Incentives can reflect the shared social responsibility of householders and government and are important where behaviour is not a social norm and convenience is compromised. • These approaches need advocating by building relationships at national and local levels to develop and deliver a strategy – between policy, business, communities, consumers, utilities, etc. • A strategy focusing on retrofitting within one policy area (e.g. water) needs: <ul style="list-style-type: none"> - contextualising within wider sustainable homes policies; 			

- sustaining over time.

The most important **marketing** learnings are as follows:

- Consumer segmentation is at its most powerful if it is extended to the level of psychographic profiling. It can provide insight to the target audience attitudes and values enabling in-depth, focused and, in the long run, potentially more cost-efficient campaign targeting to reach outcome objectives.
- Messages should be simple, specific, attractive, accessible and meaningful, and have a central theme. They should be repositioned to respond to consumer learnings. When used they should be conveyed by a trusted intermediary.
- Messages at national campaign level are not always necessary (especially within a community-based context), but do help to provide reinforcement to local level delivery and can provide a point of reference in the form of a strong 'brand', consistency in information and advocacy for the audience.
- Engagement can be most effective through community networks where messages and information are more trusted. Strategies should maximise the use of personal contact, ideally face-to-face.
- There is good evidence that council tax incentives increase the recruitment of householder retrofitting measures.

The key **gaps** identified are in:

- exemplifying good householder behaviour – the Fenland Energy Award scheme is the only example of awarding households for retrofitting;
- providing positive feedback – EcoTeams and the Village Initiative are the only examples of this and it has proved particularly beneficial in motivating behaviour change;
- good quality consumer research prior to and post campaign delivery, and measurement systems to evaluate success;
- consumer research to examine the 'rebound' impact of retrofitting, e.g. using more rooms due to comfort from cavity wall insulation, or using efficient shower heads and energy efficient light bulbs for longer because they are deemed to be efficient;
- research to establish the influence on parent behaviour through school education on sustainability issues, particularly in the context of the longer term impacts of early learning on future adult behaviour;
- hard data on actual water savings (i.e. litres per household per measure) in order to allow informed cost-benefit analysis.

Argument

A number of issues underpin the key learnings, namely:

- the existence of a value/action gap as evidenced by the comparison of self-reported behaviour with observed behaviour, even where environmental responsibility is strong;
- the need for supporting infrastructure and incentives;
- the need for social norming alongside incentives in order to create sustained change;
- the need for visible cues to prompt the new behaviour over old habits;
- the need for new behaviour to be easy and for feedback to be provided;
- the need for trusted messengers who are likely to persuade widely – use of

'protagonists';

- the need for public participation in decision making in order to build trust.

Marketing strategies/campaigns include four key determinants – segmentation, incentives, message strategies and community partnerships.

(1) **Segmentation** falls into three categories:

- Profile variables (i.e. demographics, socio-economic status, geographic such as ACORN, MOSAIC);
- Behavioural variables – which are based on consumer research in respect of a specific offering;
- Psychographic variables (i.e. lifestyle, interests, attitudes, social values).

Profile variables are most commonly used but are least likely to offer enough insight for pro-environmental behaviour change. Behavioural and psychographic variables together, mapped to a profile variable such as house type, are more likely to offer the necessary insight. However, they do not exist in an off-the-shelf form and are costly to tailor.

(2) **Incentives** need to be underpinned by one or more of:

- appeal to wider lifestyle attributes of the target audience;
- infrastructure and clear guidance to support new behaviour;
- trusted groups to endorse and maintain behaviour;
- voluntary action prompted through feedback rather than financial disincentives.

Incentives fall into three types:

- financial/carrot, e.g. shared responsibility through 50 per cent council tax reduction in respect of energy efficient behaviour, subsidised compost bins, and free water-saving retrofits.
- voluntary/carrot, e.g. energy efficient homes awards (supported by financial/carrot of council tax rebate and potential improved re-saleability of home), cash back for communities based on recycle levels at bring site.
- Financial/stick, e.g. fines/legal action for not using a recycling box or for putting rubbish out early.

The Defra project, 'Evaluation of Local Authority Experience of Household Waste Incentive Schemes', identified a range of incentives being trialled including:

- community league tables with environmental enhancements for the winning area;
- pledges leading to equipment for schools;
- lottery-style prize draws;
- waste weighing technology to measure the impact of incentives accurately.

Incentives need to be tailored to overcome barriers and disincentives need to be perceived as fair.

(3) **Message strategies** need to be:

- targeted to specific audiences and behaviours, and evolving over the lifetime of the project, in order to provide feedback;
- accessible and meaningful to the target audience and their motivations, with different parts of the message prioritised accordingly (e.g. financial benefit before environmental, call to action, or highlighting of values through emotional leverage),

and language and graphics used appropriately;

- delivered through a mix of methods such as newspaper inserts, adverts, posters and face-to-face (e.g. through doorstepping or community events), and supported by trusted community-based intermediaries;
- branded in order to provide:
 - a strong voice and positive image that projects a sense of belonging;
 - a positive and modern image of taking part;
 - an 'identifying tag' that provides an 'umbrella' so that it can be flexible to work in isolation or with secondary messages;
 - national level reinforcement to local messages;
 - a call to action and how easy it can be.

(4) **Community partnerships** are crucial to delivering sustainability outcomes. They can be used to promote action research and learning, thus empowering people to find their own solutions to problems and therefore to take up and sustain the necessary change. They maximise value by joining up resources and empower partners to achieve their own objectives through joining up agendas.

Current relevance and issues

The key learnings and gaps identified were drawn from a range of projects/strategies/interventions, each of which applied only some of the factors. These learnings and gaps can be seen as a 'box of tools' from which the most relevant can be selected and applied when developing a strategy for any given behaviour change intervention.

There seem to be a number of constraints and, therefore, opportunities for a household level water efficiency strategy or programme:

(1) Although profile variables are the most commonly used segmentation methods, they are least likely to provide the necessary insight for sustainability behaviours; joining up profile variables with behavioural and psychographic variables needs to be done on a tailored basis and is costly. In considering an approach to encourage household water efficiency, upfront investment in developing a segmentation model tailored to domestic water use could prove invaluable in delivering water savings through informing clearly defined target audiences.

(2) While face-to-face message delivery is seen as critical, it is (or is perceived to be) a costly method. However, the DTI-funded Sustainable Travel Towns project (not examined in this study but known to the author of this summary) implemented an individualised travel marketing (ITM) approach in three towns so as to understand current travel patterns and to provide advice on making changes (tailored from a standard set of information). In Darlington, this involved an initial mailshot followed by doorstepping, with up to four call backs at different times of day if a householder was out. Data from Darlington show that the ITM element cost about £870,000 for around 40,000 households), i.e. about £21.75 per household. In addition, different partnerships were formed in each town in order to maximise use of resources and add value, e.g. with primary care trusts (PCTs) and schools. Overall, the targets for reducing numbers of car journeys were achieved earlier than anticipated. In considering an approach to encourage household water efficiency, an individualised water efficiency approach could be developed as one element of a strategy which could also include advice on appropriate types of community-level partner.

(3) Intervention measures aimed at installing retrofitting initiatives by householders require assessment in terms of costs and benefits to gauge their effectiveness. Hard

data on actual water savings (i.e. litres per household per measure) are rarely available, often being based on estimates. Waterwise is developing a database of initiatives in which to trap such data when available or extrapolate where possible. The Social Marketing Practice is working with Waterwise and other partners (including water utilities) to scope an economics and business case toolkit for the evaluation of water demand reduction projects for Defra/DTI. This work could both inform a household level water efficiency strategy and benefit from investment to further develop the necessary tools, thus increasing the benefit to the strategy.

(4) The concept of working through communities/groups can be linked to the need for research to establish the influence on parent behaviour through school education on sustainability issues, as well as to the need for public participation in designing and informing policy and the gaps in exemplifying behaviour and providing feedback. This can be done through school and youth group based action research and learning projects which empower young people to develop their own solutions to problems and thus encourages ownership and wider communication of the necessary action.

Opportunities for feeding back to local and central policy decision-makers are a prime incentive for participation, as can be seen from the Defra-funded food waste consultation that applies this methodology. The Social Marketing Practice is currently working with colleagues who are specialists in delivering environmental education to scope a pilot project to deliver water efficient behaviour. This model could prove beneficial under the wider umbrella of a water efficiency programme.

(5) In considering working through special interest groups, linking with the need for trusted intermediaries and messages that are meaningful to a specific audience, and given that people with a sense of environmental responsibility are found to have a value/action gap, those groups concerned with water in its natural environment could present a key audience. Examples include biodiversity conservation membership organisations such as Wildlife Trusts and WWF.

The Social Marketing Practice is currently working with a local conservation organisation to develop a community-based social marketing approach that would benefit species and habitats of primary concern according to Local Biodiversity Action Plans. Under the wider umbrella of a water efficiency programme, such a model could allow opportunities for engaging both communities of interest and local communities in biodiversity hotspots with domestic water efficient behaviour.

Insights for water behavioural projects

The study identified elements of interventions relating specifically to water-saving retrofit measures. These are considered here in the 4Es diamond model, as well as those elements identified as transferable from other areas of sustainability.

Enable

- Provide convenient, practical, tailored, prolonged and 'on-the-ground' support for whichever measures are being promoted, for example:
 - provision of audit and installation support programmes by water companies;
 - training household plumbers to convey practical messages to householders in the course of their work;
 - helplines and websites;
 - water efficiency advisors working in the field.
- Provide clear information, for example:
 - on measures available and how to access them/implement them;
 - on water and financial savings (where applicable) attributable to implementation/adoption of different measures/behaviours;

- on benefits of water meters, urgency of saving water and retrofit measures;
- 'how to' guides, leaflets, newsletters.
- Provide visible cues to help overcome old habits in favour of new (e.g. shower timers).
- Enable through community participation, and convenient systems and infrastructure (e.g. household plumbers, water efficiency advisors, helplines).

Engage

- Develop a segmentation model with behavioural and psychographic variables mapped to a profile variable such as house type to provide insight into target audiences.
- Conduct consumer research into attitudes and awareness prior to and post campaign delivery, linked to measurement and evaluation activities, and to establish the 'rebound' impact of retrofitting.
- Develop national level links and partnerships with:
 - Government departments currently working on behavioural change to connect householder retrofitting behaviour with wider policy implications and devise a way forward in the context of sustainable homes/living initiatives;
 - consumer and business groups including the home improvement market to:
 - address opportunities for standards and codes of practice in training and skills development;
 - strengthen the relationship between the householder and the plumber, installer and builder.
- Use simple, specific, attractive and accessible messages that which are meaningful to the target audience, have a central theme and are adjusted over time to provide feedback.
- Deliver messages through trusted intermediaries, role models, protagonists, communities and special interest groups (e.g. biodiversity conservation membership organisations, gardening clubs, DIY and health professionals) using a mix of methods including face-to-face (e.g. through an individualised water efficiency approach, community events led by partner organisations).
- Link local messages under a national umbrella and brand (e.g. WRAP's 'Recycle Now', the Department of Transport's 'THINK' campaign).
- Undertake action research and learning initiatives with schools and youth groups linked to measurement and evaluation activities, and establishing an influence on parent behaviour.
- Link with other sustainable home community-based initiatives where appropriate (i.e. waste and energy) such as EcoTeams.

Encourage

- Incentives to reflect shared social responsibility (i.e. financial/carrot), for example/~:
 - council tax reduction and/or reduction in water rates or structured tariff systems for retrofit of packages of water efficiency through an award scheme;
 - subsidised or free retrofit measures.
- Voluntary incentives (i.e. carrot), for example:
 - efficient homes awards;
 - cash back for communities based on cumulative water savings;
 - community league tables with environmental enhancements for the winning area;
 - pledges leading to equipment for schools;

- lottery-style prize draws.
- NB Incentives need to be tailored to overcome the barriers of a given target audience.⁴
- Disincentives (i.e. financial/stick), e.g. fines for non-adoption of certain measures – BUT these need to be seen as fair.
 - Highlight financial savings attributable to implementation/adoption of different measures/behaviours.
 - Policies to increase the rate of introduction of water meters to homes.

Exemplify

This can be done by:

- for example, through a home award scheme;
- providing positive feedback;
- metering (and/or making public case studies) businesses, council premises, local housing authority properties, etc;
- making public the water savings achieved by water utilities reducing leakage;
- ensuring that revisions to Water Fitting Regulations addressing new build incorporate water efficiency product specifications (to demonstrate policy leadership to householders);
- building synergy between measures to encourage good water efficiency behaviours at work and at home (transferability of behaviours);
- model behaviour of the project partners and team.

Researcher comments

Reference: M2

TITLE	Segmenting for Sustainability		
AUTHORS	Andrew Darnton (for The Social Marketing Practice)	PUBLISHED	2006
CONTEXT	Marketing and communications: sustainability – general sustainability		
SOURCE			

Principal learnings

Segmenting the public into clearly differentiated groups can help interested parties identify and understand the most effective means by which to engage those groups. A selection of environment-related segmentation models were analysed as a means of showing the diverse approaches to segmentation that can be adopted.

It was seen that most existing models are behaviour-specific, or relate to a specific behavioural domain, and are context-specific (applied to only one type of behaviour).

Models can be classified in five ways according to the variable they are based on.

⁴ It would be useful to see the results of Defra’s Evaluation of Local Authority Experience of Household Waste Incentive Schemes in order to understand which incentives proved most effective.

- Evidence suggests that **socio-demographic variables** are not effective at segmenting the public into different environmental groups.
- There should not be an over-reliance on **geo-demographic classifications** as they are designed as foundations for context-specific datasets that postcode data provides a link to.
- **Behavioural models** segment people into groups representing the scale of the particular behaviour in question. However they do not provide an insight into what influences the behaviour, and their 'snap-shot' approach may not be useful in the long-term given the assumption that behaviour changes frequently.
- **Psychographic models** are based on psychological factors such as values, beliefs and attitudes, which each vary in their influence on environmental behaviours.
- **Hybrid models** combine elements of these four types of models, so can include all relevant variables. However this can make comparing the component parts of each segment tricky.

Alternatively models can be classified by causal factors of behaviours or the individual attributes of the models.

There is no blueprint for choosing a segmentation model. Those wishing to change a single type of behaviour are advised to identify the variables that impact on the behaviour and use a 'factor analysis' approach to separate groups.

Cross-behaviour changes are difficult and are better approached from an experimental angle, in order to see how far a model can be 'stretched' to perform effectively across a number of behavioural domains. In terms of communications, broad psychographic or behaviour-specific models are beneficial.

For further research, all types of model should be considered, modified and built upon depending on the context under study. However a psychographic approach based on qualitative research will be very helpful.

Argument

The study was designed to assess the value of segmentation models in environmentally-related contexts. Such models are currently limited in number due to:

- difficulties in measuring behaviours and their causal factors;
- the uncertainty surrounding the relationship between attitudes and behaviour in the environmental context;
- ongoing doubts about the relevance of targeted marketing;
- the cost of segmentation techniques in practice.

Another crucial difficulty is the lack of agreement about how to classify and analyse segmentation models.

Using nine models, Darnton discussed methods of classification and the subsequent findings.

Current relevance and issues

This paper draws on a number of different methods already used to segment audiences on environmental grounds. By providing a user guide to selecting a model, the paper helps clarify a number of issues surrounding the crucial process of segmentation for social marketers and others. However it is made clear that none of these methods are of use unless there is a practical need and application for

segmentation.

Insights for water behavioural projects

Given the two elements of behaviour change that are sought out (retrofitting behaviour and water conservation), there are two routes to segmentation:

- identifying the variables that impact on each separate behaviour and tackling each behaviour change separately;
- taking a cross-behaviour approach to segment water users across both behaviours.

The latter approach would require an experimental methodology to stretch existing models and is under-developed in the models. It is not recommended so the insights here concentrate on the former approach.

The recommendation is to build on or adapt existing models, so the strongest models in the analysis are discussed here with suggestions for specific adaptation to water behaviour. As yet none of these models can be applied directly to water behaviours. The two most promising models are Barr's Sustainable Lifestyles model and the work by the Energy Savings Trust.

Though placed under the 'enable' heading, once interventions are rolled out on the basis of these segmentations, there is a place for the segmentations to be utilised to 'engage' consumers in behaviour change.

Enable

Behavioural models

- **Sustainable Lifestyles** (Barr 2005). This four-cluster model was generated based on a wide range of environmental behaviours (which broke down into habit-based, purchasing and recycling behaviours) and is arguably the strongest of the segmentation models discussed. Being solely behavioural in nature, it has been used to examine the relationships between the different segments – thus making communication to and researching of these clusters easier and more effective. Barr intends to extend the model by incorporating travel and transport behaviour. In partnership with him, water-specific behaviours could also perhaps be examined in the next model. Suggested improvements include a larger sample size and inclusion of postcode data in order to identify who the individuals in different clusters are. It should be noted that this 'snapshot' approach limits possibilities to predict future behaviour.
- **Shades of Green** (NCC) and **Ethical Consumer** (Co-Op) models were both considered dated and methodologically weak, so are not discussed.

Psychographic

- **ENCAMS Waste Segmentation** (ENCAMS 2002) is based on public attitudes to waste behaviours, with a focus on recycling. Like Barr, the model identifies four key groups, but did not analyse the two extreme (non) recycling groups. As yet, this model has not been applied to further research or intervention designs, and its focus on only two groups has been criticised.
- **Car Traveller Typology** (Anable 2005). Examining public attitudes to car use, as well as environmental beliefs and values, identified seven segments. This approach to segmenting on attitudes has been taken up by Transport for London. A significant re-write would be necessary to use this model for water behaviour, but it is a strong model upon which to base an attitudinal study.

Geo-demographic

- **MOSAIC** (Experian). A commercial classification system, this service could be

bought in order to segment water behaviours based on household groupings. This is done on the basis of a number of integrated national datasets including Census data, the Land Registry and market research surveys – an invaluable rich tool. There is also a public sector version of the tool and it has been tied into environment-related dataset, ENCAMS. Mosaic has been a powerful tool in designing suitable services and communication strategies. Its lack of exposure to methodological scrutiny has led to a number of concerns, the largest of which is that the pooling of variables obstructs the investigation of correlations between particular attributes and the end behaviour.

Hybrid models

- **EST Consumer Segmentation Model** (Energy Saving Trust). An adaptation of Mosaic, this model also encompasses attitudes and individuals' levels of carbon emissions. Most interestingly it appears to be the only model moving in the direction of examining water usage (in the context of it being an energy saving behaviour). It has developed a toolkit of resources which are being used by EST's network of advice centres to support localised targeting of marketing activities. Further research is needed to assess the success of these toolkits. There is an opportunity to build water-saving behaviours into these resources and working with the EST and its advice centres to enable change.
- **ENCAMS** (Experian) and **COI Synthesis model** (Defra 2006) are two other hybrid models. However, the former appears less tailored to the needs of water behaviour change than either the ENCAMS Waste Segmentation Model or the EST model and the latter faces difficulties in its current state as it is a product of desk-research and it is unclear what the resulting segments actually describe.

Researcher comments

This paper is an excellent introduction to a multifaceted topic. Segmenting the public into different water behaviours, attitudes or geographies, or any sensible hybrid of these, will make enabling behaviour change easier, **if** the right strategy is found. Careful examination of the possibilities (which are not simply limited to those discussed in this paper) is needed before this costly exercise is embarked upon.

Reference: M3

TITLE	Community-based social marketing website		
AUTHORS	Doug Mackenzie Mohr	PUBLISHED	
CONTEXT	Marketing and communications: sustainability		
SOURCE	http://www.cbsm.com/		

Principal learnings

Mackenzie Mohr describes the site as an online book that 'details how to uncover the barriers that inhibit individuals from engaging in sustainable behaviours'. He offers a set of 'tools' that:

'social science research has demonstrated to be effective in fostering and maintaining behaviour change capable of having a substantial impact upon the adoption of more sustainable behaviours'.

His approach is through community-based social marketing which:

'draws heavily on research in social psychology which indicates that initiatives to promote behaviour change are often most effective when they are carried out at the community level and involve direct contact with people'.

The site consists of the following resources:

- an online guide which illustrates how to use community-based social marketing to design and evaluate programs to foster sustainable behaviour;
- searchable databases of articles, downloadable reports, graphics and case studies on fostering sustainable behaviour;
- a listserv for sharing information and asking questions of others.

The key messages are that:

- providing information alone is not enough to influence behaviour;
- barriers to behaviour need to be identified and overcome;
- barriers can be external, internal, multiple and different for different behaviours;
- tools need to be applied at community level in a strategic fashion (personal contact is crucial);
- piloting and evaluation are crucial elements;
- effective tools are commitment, prompts, norms, communication, incentives and convenience;
- a mix of tools has more effect than one alone.

See 'Argument' below for more depth.

One case study ('Turn it Off: Anti-idling project using commitment, prompts and norms'⁵) offers learning from the application of three of Mohr's tools. Communications were also used, partly through personal contact. Results were established through monitoring the response to the intervention and in comparison with control sites and interventions applying just one tool.

Argument

Mohr argues that campaigns assume either that changes in behaviour are brought about by increasing public knowledge, or that individuals systematically evaluate choices and then act in accordance with their economic self-interest. In both cases it is generally assumed that providing information is enough to influence behaviour; Mohr cites examples to show that education alone often has little or no effect upon sustainable behaviour and that information relating to economic self-interest is also not enough. He describes situations where his own behaviour – as an informed, knowledgeable, concerned person whose attitudes support pro-environmental behaviour – is not consistent due to barriers such as weather.

Mohr offers community-based social marketing as an alternative involving identifying barriers to a sustainable behaviour, designing a strategy that utilises behaviour change tools, piloting the strategy with a small segment of a community and, finally, evaluating the impact of the programme once it has been implemented across a community. He notes that:

- there may be multiple internal and external barriers to widespread public participation in any form of sustainable behaviour;

⁵ <http://www.cbsm.com/cases/turn+it+off+antiidling+project+using+commitment+prompts+and+norms> 152

- these barriers will vary for different individuals;
- barriers will be different for different behaviours.

Mohr describes how social science research has identified a variety of 'tools' that are effective in changing behaviour. These tools include such approaches as gaining a commitment from an individual that they will try a new activity (e.g. taking household hazardous waste to a collection depot, or developing community norms that encourage people to behave more sustainably).

The techniques that are used by community-based social marketers are carried out at the community level and frequently involve direct personal contact. Personal contact is emphasised because social science research indicates that we are most likely to change our behaviour in response to direct appeals from others.

Mohr describes the following tools:

- **Commitment** – studies show that people who commit to a relatively small, inoffensive request are more likely to agree to subsequent larger, more challenging requests.
- **Prompts** – most people forget to do things like turn out lights: a visual 'prompt' acts as reminder.
- **Norms** – in a variety of study settings on inconsequential matters, people have been found to alter their answers to be in line with normative, though clearly incorrect, answers given by others: they looked to the behaviour of those around them to determine how they would respond. Several studies have since documented the impact that modelling and social norms can have upon individuals engaging in sustainable behaviour.
- **Communication** – much of human communication involves persuasion; since all persuasion begins with capturing attention, we need to present information that is vivid, concrete and personalised to our audience. This requires:
 - insight;
 - use of credible sources;
 - careful framing of specific, easy to remember, messages;
 - opportunity to meet personal or community goals;
 - delivery via a range of methods including personal contact, social diffusion, community leaders and modelling;
 - giving feedback.
- **Incentives** – whether financial or otherwise (e.g. social approval), incentives can provide the motivation for individuals to perform an activity that they already engage in more effectively (e.g. recycling) or to begin an activity that they otherwise would not perform (e.g. composting). Incentives are usually most effective when they are presented at the time the behaviour is to occur, e.g. charging for the use of plastic shopping bags at the checkout.
 - An incentive will have little or no impact if people are unaware of its existence.
 - When preparing to use incentives, keep in mind that people can be very creative in attempting to avoid them.
 - Be cautious about removing incentives.
 - Incentives need to be large enough to be taken seriously. However, past a certain point, diminishing returns occur from increasing the size of the incentive.
 - Consider non-monetary forms of incentives.
- **Convenience** – make it easy to act. It is important to assess whether it is realistic to overcome the external barriers you identify. Making that activity you wish to discourage less convenient and more expensive can increase motivation for the behaviour you wish to encourage. In short, you want to design a programme that enhances motivation by making the sustainable behaviour more convenient and

less costly than the alternative, non-sustainable activity. It is important to note that some external barriers (e.g. inconvenience) are to some extent a matter of perception and that may change as people have experience of the new activity.

Application of three tools can be seen in the case study 'Turn it Off: Anti-idling project using commitment, prompts and norms' in which communications were developed and personal contact was used.

- **Aim and method.** This pilot project sought to decrease the frequency and duration of motorists idling their vehicle engines. The pilot project involved staff approaching motorists at Toronto schools and Toronto Transit Commission 'Kiss and Ride' parking lots and talking to them about the importance of turning off their vehicle engine when parked and sitting in their vehicle. Approached motorists were provided with an information card, and signs reminding motorists to turn off their engines were posted at both the schools and the Kiss and Ride sites. As part of the conversation, the motorist was asked to make a commitment to turn off their vehicle engine when parked. To assist the motorist in remembering to turn off their engine, they were asked to place a sticker on their front windshield. The sticker served both as a prompt to turn off the engine and facilitated the development of community norms with respect to engine idling (the sticker, which was static-cling and transparent, was placed on the front windshield of the vehicle with the graphic and text viewable from outside of the vehicle). Over 80 per cent of the motorists who were asked to make a commitment to turn off their engine put the sticker on their front window.
- **Barriers** to the successful integration of the project and how 'Turn it Off' addressed them are outlined in the table below.
- **Results.** During the course of the programme, a combination of signs and commitment reduced engine idling incidence by 27 per cent and idling duration by 78 per cent overall compared to the control sites. At school sites, the combination of signs and commitment reduced vehicle idling by 51 per cent and duration by 72 per cent relative to the control sites. At transit sites, the combination of signs and commitment reduced vehicle idling by 27 per cent and duration by 38 per cent relative to the control sites. The use of prompts only (no commitment) was less effective.

Barrier	How 'Turn it Off' addressed the barrier
Convenience/laziness	Reminded drivers to turn off their engines (through signage and vehicle stickers).
Believing that it is easier on the engine/starter than turning the vehicle off Believing that idling uses less fuel than restarting	Clarified the length of time that a vehicle should be idled (10 seconds) before it was turned off (information card). Educated individuals regarding the cost savings of turning off a parked vehicle (information card).
Not believing that turning off an engine while a vehicle is parked is the 'right thing to do'	Developed community norms that insinuated that turning the engine off was the 'right thing to do'.
Comfort	Emphasised the idea (of turning off the engine while waiting) during warmer months of the year (programme was implemented between May and July).

Current relevance and issues

Many of these techniques are fundamental to successful behaviour change and relevant to sustainable behaviours in particular. The practical examples in the website

are primarily sustainable behaviour focus.

Insights for water behavioural projects

Mohr offers some water-related insights directly and these are itemised below. Although they are relevant to the North American/Canadian context, there may be lessons for transferability to the UK context. Other insights are more general.

Enable

- Provide information (clear and easy to understand, e.g. info cards).
- Identify and overcome barriers (external/internal; real versus perceived) to specific behaviours.
- Make new behaviour more convenient and less costly than others.
- Offer visual prompts to remind to do the new behaviour.

Convenience – water efficiency:

- It is inconvenient to purchase and install toilet dams, tap aerators and low-flow shower heads. Solution: Have home auditors install these devices during home visits.
- For many homes, it is too expensive to install a low-flow toilet. Solution: Allow the cost of the toilet and installation to be paid for from savings in the water bill.

Prompts – water efficiency:

- To encourage lawn watering on odd or even days, ask each homeowner for permission to place a tag on the outside water tap.
- Arrange with local retailers to attach decals to lawnmowers that encourage householders to raise the level of the lawnmower. In addition, the decal can encourage that the grass clippings be left on the lawn (mulched) as a natural nutrient.
- Ask homeowners to place an empty tuna can in the garden (to measure adequate watering). When the can is filled with water, the garden or lawn has been adequately watered.
- Attach decals to dishwashers and washing machines in retail stores encouraging full loads.
- Attach decals to low-flow toilets and shower heads indicating that they save water and money.

Engage

- Work in communities.
- Make personal contact.
- Communicate specific, vivid, concrete and personalised messages in a range of ways.
- Harness credible sources, modelling/social norming, social diffusion and community leaders.
- Allow opportunities to meet personal/community goals and provide feedback.
- Seek commitment for a small/easy action before asking for a larger/more difficult one.

Commitment – water efficiency

- Ask householders to sign a pledge form committing themselves to watering their lawn on odd or even days based on their house number.

- Ask homeowners to make a commitment to raise the height of their lawnmower, thereby reducing evaporation and the need for lawn watering.
- When going door-to-door with water efficiency kits (toilet dams, tap aerators and low-flow shower heads), ask homeowners who wish to take the kit to make a public commitment to install it (e.g. have their names advertised in the local newspaper).

Encourage

- Utilise modelling and social norming.
- Use incentives at the time the behaviour occurs, make sure people know about them, and consider the ways in which people might try to avoid them.

Incentives – water efficiency:

- With new meters that can record time of use, charge variable rates based on time of use.
- Provide loans, grants or rebates to foster the installation of low-flow toilets.

Norms – water efficiency:

- Communicate the percentage of people who comply with municipal requests to restrict summer water use.

General

- Strategic design – use a mix of tools.
- Pilot.
- Monitor and evaluate.

Researcher comments

Mohr advocates a personal approach to changing specific behaviour within a community context, harnessing social diffusion and norming. Implicit in this is the need to work in partnership with relevant stakeholders. There is no reference to the costs involved in taking a personal approach.

Reference: M4

TITLE	Tools of Change website		
AUTHORS	Cullbridge Marketing & Communications	PUBLISHED	2004
CONTEXT	Marketing and communications: Sustainability		
SOURCE	http://www.toolsofchange.com		

Principal learnings

The Tools of Change website specialises in the principles of community-based social marketing offering specific tools, case studies and a planning guide for promoting pro-environmental behaviours. The best example for water efficiency is 'Water Efficient Durham'⁶ (Ontario) which demonstrates the full range of community-based social marketing components – see 'Argument' section below.

The community-based social marketing approach adopts the following components for promoting pro-environmental behaviour as key elements of social learning theory:

⁶ <http://www.toolsofchange.com/en/case-studies/detail/156>

- **Building motivation over time.** Motivational techniques such as linking to activities that people are already doing, recognising them for actions already taken, and providing ongoing opportunities to take further steps and become more involved increase the likelihood of starting and continuing the behaviour being promoted.
- **Feedback.** Providing participants with information about the impact of their actions (both individual and community feedback) helps people learn from their actions and make improvements and enables them to see how they are making a difference. It is therefore an important element of building motivation. It helps develop community norms by showing that many others are participating.
- **Norm appeals.** Norm appeals are ways of making group standards more apparent. Norm appeals all do this in a similar manner. They make it more likely that people will observe others doing the activity you are promoting. People often decide what attitudes and actions are appropriate from observing those around them. This kind of influence can have long-lasting effects.
- **Obtaining a commitment.** Ask for a person's pledge or agreement to carry out the actions you are promoting such as requesting that they sign a statement or say a few words indicating their intentions. People who have committed to an activity are more likely to do it. They are also more likely to agree to a subsequent, more demanding, activity.
- **Overcoming specific barriers.** Techniques for identifying and overcoming barriers are often specific to a particular environmental or health promotion activity. Barriers are those factors that discourage people from taking an action they would otherwise do. If any environmental/health action is to be widely adopted by the public, common barriers to doing the action must first be removed; individuals should not be held solely responsible for taking action; networks, organisations and communities must work to remove barriers to make 'the right choice the easier choice'. This is explicitly recognised in health promotion and also holds true for environmental programmes. The key to this is consumer insight.
- **Prompts.** These are cues that remind people to carry out an action they might otherwise forget to do. Many people do not take action for the simple reason that they forget.
- **Vivid personalised information.** Prepare communications that are full of the vigour and freshness of immediate experience, evoking lifelike images that are heard, seen or felt as if they were real. Communication that has been custom-tailored for the person or people receiving the message is more likely to be noticed, remembered and acted upon.
- **Financial incentives and disincentives.** Incentives include discounts that entice people by rewarding them for taking action, and disincentives such as fines for over-watering that discourage people from taking actions you want them to avoid. These are powerful tools for encouraging and discouraging behaviours.

The website also encourages the use of a range of engagement techniques as a multifaceted approach:

- **Home visits.** Because visits to people's homes are very direct and face-to-face, you can identify problems, deal with them immediately, and customise your instructions or persuasive messages for the particular circumstances and concerns of the householder.
- **Neighbourhood coaches.** People are recruited to help their neighbours overcome the barriers that might otherwise prevent them from adopting the activity being promoted. The use of opinion leaders within existing networks is a key element of

diffusion theory.

- **Word of mouth.** Word-of-mouth promotion happens whenever one person tells others about the activity being advanced. Word-of-mouth is often responsible for the bulk of learning about and adopting a new behaviour.
- **Peer support groups.** These involve gatherings of neighbours, friends, colleagues or other peers who may not have previously known each other. Participants meet regularly for a period of time to support one another in taking the desired actions. When they come together they meet as equals.
- **School programmes involving the family.** Activities introduced at school that students can do at home and that specifically involve other members of their families are valuable because school children are often more receptive to learning new ways of doing things than their parents. They can serve as powerful agents of change in reaching other members of their families. These may increase the visibility of participation and making use of norm appeals and it may also be relatively easy to provide individual and group feedback.
- **Work programmes that influence the home.** Workplace promotional programmes represent an additional way of reaching people and offer some particular advantages. For example, it may be easier to:
 - find ways of increasing the visibility of participation and norm appeal;
 - collect certain types of information;
 - provide individual and group feedback.
- **Mass media.** Examples of means of public communication that can 'broadcast' to a large number of people at one time include television, radio, newspapers, magazines, flyers and utility bills.

Argument

The 'Water Efficient Durham' case study illustrates some of the techniques outlined above and a strong social marketing approach – setting a behavioural goal, customer insight and measurement. Peak summer water demand was the challenge in Durham, Ontario. For 20 days per year, the system operated at or near capacity – mainly because people were watering their lawns. To avoid expensive plant expansions, Durham's behaviour goal was to develop a programme that would convince homeowners to water their lawns a maximum of one inch per week, including rainfall (the amount needed to maintain a healthy lawn).

Research revealed that a key barrier to participation would be a concern that less watering would mean a less healthy lawn. In 1997, Durham launched a pilot project in the town of Ajax to test the value of the student employee programme against more traditional methods of public education. The students were handpicked for their social skills and were then trained in social marketing and lawn care skills. Over a ten-week period, the students – travelling by bicycle or on foot – carried out six field interventions at each of 200 houses. During the first intervention, the students adopted the following formula:

- Working in pairs, they used face-to-face engagement, approaching homeowners outside their homes when the owners were not busy. They never approached residents who were leaving the premises.
- They handed homeowners information brochures about water – the same brochures sent to homeowners in the traditional mail-out test area – and engaged them in discussions about water conservation.
- They made the connection between moderate irrigation and a healthier lawn by stressing that lawns need only an average of one inch of watering and rainfall a week to remain healthy.

The students followed up at each house with five more interventions, each time developing a more trusting relationship with the homeowner, building motivation over time. To help establish credibility, they wore project hats, T-shirts and photo-ID. Students monitored and timed the watering habits of homeowners in all four study areas for 14 hours a day during the test period. Their observations showed the most effective method by far was the student employee programme, which relied on community-based social marketing. It reduced lawn watering by 26 per cent.

In the following years, the student employee programme was expanded to around 1,000 houses in communities chosen for their high summer water consumption. Six students repeated the approach with refinements including convincing homeowners to sign a written public commitment and prompts (including rain gauges). Feedback was given through a newsletter to all homeowners every spring and autumn, sharing results from the programme. This was facilitated through bulk metering the areas covered.

Consistent results were being obtained year-to-year with 30 per cent reductions at first, levelling off at around 17 per cent by the next year (no further interventions), and with 80–90 per cent participation rates in the targeted neighbourhoods. The programme cost \$19 per household in 2004; this is considered to be a fifth of the cost of the alternative – to expand the water supply infrastructure.

Current relevance and issues

Many of these techniques are fundamental to successful behaviour change and relevant to sustainable behaviours in particular. The practical examples in the website are primarily sustainable behaviour focus.

Insights for water behavioural projects

The learnings are all valid techniques that should be considered in the water projects, dependent on opportunity, partnerships and funding. They are grouped below under the 4Es model for behaviour change.

Enable

- Overcoming specific barriers (including consumer insight as a basis for this).
- Prompts.
- Vivid personalised information.
- Neighbourhood coaches.
- Peer support groups.

Engage

- Building motivation over time.
- Obtaining a commitment.
- Home visits.
- Word of mouth.
- School programmes involving the family.
- Work programmes that influence the home.
- Mass media.

Encourage

- Use of feedback.
- Norms appeal

- Financial incentives and disincentives

Researcher comments

Reference: M5

TITLE	Communicating sustainability – how to produce effective public campaigns		
AUTHORS	Futerra, in co-operation with UNEP	PUBLISHED	2005
CONTEXT	Marketing and communications: sustainability		
SOURCE	Available from: http://www.futerra.co.uk/downloads/WebEN21.pdf		

Principal learnings

This guide provides case studies from around the world of national and local authorities leading the way in communicating their sustainable development policy effectively. It looks at what works and what doesn't, and offers tips on how to do it. The key learnings are as follows:

- Success is easier to achieve when policy and communications work together.
- The infrastructure needs to be in place for people to act.
- Look beyond mainstream marketing techniques such as advertising and direct mail.
- Reduce wasted time and resources by planning properly at the start of a campaign and partnering with other organisations.
- Target a specific audience with a defined message, rather than raising awareness on a grand scale through advertising.
- Providing information is not enough, look to other disciplines for tools.
- The most successful communication campaigns are the ones that define their target audiences tightly and develop messages appropriate to them.
- Use the drama of challenges and the excitement of solutions to inspire and focus organisations on achieving aims.
- Understand what motivates an audience.
- Translate vision into messages that are both personal to the audience and practical in terms of inspiring a response.

Communication is seen as key to raising awareness, changing attitudes and changing behaviour. The case studies all demonstrate effective awareness raising, but the document recognises that to achieve lasting and meaningful change you are going to need more than communications alone – there being other barriers to behaviour change than just ignorance. The document gives examples of where national and local authorities have worked in partnership – from the local community level right up to the international level – or have made sure communications are firmly linked with policy. The most successful case studies are those that have integrated monitoring and evaluation plans, allowing campaigns to be refined and outcomes measured.

Argument

Campaigns such as France's 'Energy Savings: Hurry up, it's getting warmer', Greece's

'The Mediterranean Component of the EU Water Initiative' and New Zealand's 'The Big Clean Up' all exhibit some of the principles of a social marketing approach but focus mainly on awareness raising.

'Energy Savings: Hurry up, it's getting warmer' was a three-year national campaign linking energy use and climate change. It was launched in 2004 by the Agency for Environment and Energy Management (ADEME) and combined a high profile advertising campaign to raise awareness with activities implemented by partners at a national and local level to encourage behaviour change. The cost of running the campaign was USD12 million.

Initial research indicated that 73 per cent of the population were aware that changing lifestyles is important for climate change, but less than 10 per cent were aware of the environmental impacts of their everyday energy use. The campaign aimed to increase public awareness on the environmental cost of energy use and the economic costs of over-consumption, as well as change public behaviour to deliver energy savings.

Advertisements were placed in regional newspapers, followed by short television clips and radio promotion. ADEME also developed and distributed a communications tool called CLIMACT (<http://www.climact.com>), which connected personal energy consumption and environmental impact with specific energy saving solutions.

The campaign brought together 35 national and over 100 regional partners to implement a behaviour change campaign on the ground. There was a range of activities:

- home improvement stores promoted good products and methods of energy saving;
- WWF launched a partner national communication campaign on behavioural change;
- 300,000 CLIMACT tests were distributed.

The campaign reached a large number of people, raising awareness on the need to save energy. However, it was difficult to ascertain whether behaviour change was achieved.

'The Mediterranean Component of the European Union Water Initiative' (MED EUWI) is based upon partnership working across local, national and international levels in the Mediterranean region. It was set up by the Greek government in 2003 in recognition that the only way to tackle issues of water supply and sanitation, and integrated water resources management is through co-operation at all levels.

The aims of MED EUWI are to:

- raise awareness of the EU Water Initiative and reinforce political commitment to action on water-related issues in the Mediterranean;
- define regional and national priorities for water sanitation and integrated management;
- facilitate better co-ordination of water programmes and projects;
- enhance co-operation for better design and proper implementation of water programmes.

With a budget of approximately USD856,000, MED EUWI uses stakeholder dialogue to raise awareness and increase commitment to change. Meetings have been held in Athens, Brussels and New York and participants include:

- EU governments;

- regional non-governmental organisations (NGOs);
- companies;
- academia;
- regional networks.

A large web-based network is used to co-ordinate stakeholders. The aim of this networking is to allow the transfer of technology, capacity-building, education on water and sharing of good management practices.

‘The Big Clean Up’ (BCU) was launched in 2002 by the Auckland Regional Council (ARC) in New Zealand to encourage 1.4 million householders living in the Auckland region to live more sustainably. It had a budget of USD2.4 million.

Critical to its success was audience research conducted at the very start of the campaign. A pre-campaign survey identified key barriers and incentives for pro-environmental behaviour, segmented by target audience. Six key public requests gave a focus for the entire campaign:

- Give ‘bite-sized’ chunks of information.
- Keep the audience informed and show results.
- Keep it local, but show how things fit into the bigger picture.
- Make it fun, simple and rewarding.
- Give people simple things to do.
- Make it relevant to ‘me’ (i.e. personalise it).

The 10 most important environmental areas were selected by considering these requests and where the public could have most impact.

Alongside mass advertising campaigns and school programmes was a membership campaign of over 40,000 households. The membership programme was an innovative way of providing personal and practical advice to the public while collecting useful information about their behaviour. Environmental ‘health checks’ were sent to over 300,000 households. People were asked to join by filling in details of their household behaviour. The information was then processed by ARC and each member household sent a personalised action plan. Incentives were offered to encourage members to change behaviour.

Public surveys indicate that 10–12 per cent of people taking part in the campaign have changed their behaviour. Awareness of the BCU has tracked at 50 per cent of the general public. Of those, 99 per cent support the programme and 75 per cent believe it is very or extremely worthwhile.

Evaluation of the campaign will allow ARC to refine its communication strategies and incentives. Development plans include:

- how to give Aucklanders a greater sense of personal and community responsibility;
- how to reward Aucklanders for ‘doing the right thing’.

Current relevance and issues

The focus of these three campaigns is on awareness raising and obtaining a commitment to change. The document provides a useful guide for successful sustainable development communications, which could form part of a social marketing approach applied to water efficiency.

<p>Insights for water behavioural projects Mapping the learnings from this document onto the 4Es model for behaviour change illustrates that the focus of the case studies is nearly all on engagement.</p> <p>Engage</p> <ul style="list-style-type: none"> • Understand the situation before starting. • Conduct audience research. • Set clear and achievable objectives. • Define messages and channels. • Plan how you will manage the campaign as it progresses. • Measurement and evaluation. <p>Encourage</p> <ul style="list-style-type: none"> • Use of incentives.
<p>Researcher comments</p>

Reference: M7

TITLE	Innovative approaches to sustainable consumption and production (draft)		
AUTHORS	Social Marketing Practice	PUBLISHED	In progress
CONTEXT	Marketing and communications: sustainability/non-sustainability – general sustainability		
SOURCE			
<p>Principal learnings Reviewing a range of intervention projects, six strategic themes for optimal interventions were identified:</p> <ul style="list-style-type: none"> • Fostering empowered stakeholders. This results in building relationships, enabling and empowering these partners, and monitoring and managing the momentum of the intervention. • Fostering empowered participants. Allowing people to use their voice and shape their environment is a powerful tool. • Developing resources and skills to deliver interventions. Research, strategy, project management, stakeholder management, monitoring and evaluation, social marketing and means of disseminating learnings were identified as voids. • Capturing added value. The ability to measure intervention outcomes in monetary terms is crucial and requires pre-planning. • Planning intervention ‘scale ups’. A conceptual phase of planning is needed early in the agenda to devise means of expanding the scope of intervention at the appropriate time. • Ensuring durability. The idea of behaviour change taking time needs to be 			

fostered. Planning realistic milestones and deliverables is a means of doing this.

Thus, intervention frameworks need to take a broader approach with a large degree of investment placed in:

- scoping the project;
- building relevant partnerships;
- investing in the correct skills and resources;
- taking a long-term view to sustaining and managing the intervention.

Argument

To date, behavioural influence programmes have been constrained by many factors including:

- a lack of understanding of underlying theory;
- an absence of baselines, measurement data and insufficient formative research;
- little recognition of the long timeframes involved with changing behaviour;
- a lack of skills, experience and capacity to drive change;
- a poor demonstration of commitment and leadership in the field by business and Government;
- poor collaboration across multi-disciplinary policy teams.

By examining a vast range of intervention projects from around the world, this document pulls together themes of best practice upon which to build future interventions in the area of sustainability as well as more generally.

Current relevance and issues

Though not all of the interventions examined are from the sustainability field, the themes which run through the projects are extremely relevant. Similarly, many of the projects are not UK-based so there may be some transferability issues – though of course none of the projects could be transferred directly without a degree of formative research into the market.

However, to date very few projects span more than two or three of the strategic themes listed, so more examples of best practice across the themes need to be developed. What also needs to be stressed is the element of trade-off in many of these projects; it was found difficult to achieve both high robustness and high coverage with any intervention.

Insights for water behavioural projects

In drawing out the key learnings and classifying them into the 4Es diamond model, examples have been taken directly from existing interventions. Though these can not be transferred directly, some important practical learnings can be gained.

Enable

Developing resources, skills and capacity

- Providing easy and multilingual information access for consumers about how they can change their water habits and how they can become active participants in the change programme is important. This approach was taken in Seattle, USA, by King County Metro Transit when persuading more people to use public transport instead of cars. Helplines can also be implemented to good effect as found by the British

Heart Foundation in its 'Give up before you clog up' campaign.

- Mainstream TV, writing and entertainment can be used to influence behaviour. By training researchers and writers in these fields to ensure accurate information is portrayed to the public, the 'Hollywood and Health' organisation works to disseminate health-related information through these media. The water industry can follow suit using tools such as website resources and case studies to educate media professionals.
- Resource packs could be developed for schools including DVDs, posters and teacher training materials. This approach has been adopted by Anti Bullying UK.

Planning intervention 'scale ups'

- By keeping expert help at a low level and minimising external funding for pilot projects, the UK Department for International Development's Self-Help business models in India avoided the common problem of attempting to replicate a resource-heavy project within stricter financial constraints.
- Conversely, if the intervention operates on a national scale from the outset, then scaling up will not be an issue – as was the case with the global public–private partnership for hand-washing.
- Consistent innovative and creative approaches, such as those taken with the 'Red Dress' appeal for heart disease, will help sustain and extend interventions over a long period of time.

Ensuring durability

- Designing schemes that will become self-financing, as opposed to relying on external funding, will ensure longevity of projects. This practice has been adopted by the Road Crew drink-driving prevention initiative.
- Using different routes for the message, appearing in new media and gathering input from new stakeholders over time has helped to keep the 'Sunsmart' sunscreen message fresh. Thus, the holistic approach involving all agents that has been suggested elsewhere needs to be considered in terms of temporal development.
- If job creation is fostered as a part of water behaviour change initiatives, this may play some part in ensuring durability of projects and consumer/resident engagement (as well as developing resources, skills and capacity). This was found to be the case in Canada with the development of the Halifax Regional Municipality Waste Management Strategy.

Engage

Fostering empowered stakeholders

- Behaviour change message bearers need to be trusted members of the community such that the resulting messages and approaches are rooted in social and cultural norms. Social networking will play a role in identifying and fostering these individuals; for example, the Family AIDS Education and Prevention through Imams (FAEPTI) project in Uganda involved community Imams in designing and running interventions for the country's sizeable Muslim population.
- Commercial sector marketing expertise needs to be utilised in order to create appeals which resonate with the aspirations and motivations of different target markets, e.g. soap manufacturers have worked with the public sector to deliver effective messages about hand-washing.
- Segmenting stakeholders into action/interest groups can clarify their role in the project. This was the approach adopted by the Department of Health's obesity strategy.

- Encouraging stakeholder involvement and participation in establishing a trusted brand to instil acceptance in the cause has worked in the case of two US initiatives – TXU Energy's 'Energy Star®' homes and the 'Get in the Loop' recycling campaign.
- Stakeholders need to be empowered before they can be engaged. The case of Zaragoza in Spain is a perfect example: by engaging the entire community, providing relevant training, utilising new technologies and keeping residents informed of developments, a feeling of involvement and power was engendered.

Fostering empowered participants

- On the ground research with target communities is vital, as found in developing Self-Help business models in India. Villagers identified their own solutions, set their own agendas and removed the need for identifying change champions 'from above' as the community found them for themselves.
- By establishing the cause of the issues surrounding water from the consumer perspective, an 'in their shoes' approach can be more easily taken. For example, the 'Truth' campaign in the USA found that teenagers were ready to blame big business for the proliferation of youth smoking and empowered them to make a stand. Evidence suggests that many people feel water companies are not doing their bit to save water, so this feeling can be harnessed and used.
- Practical applications of social network theory have been implemented to engage social connectors in certain market audience segments to launch new products, and make particular practices more acceptable or even 'cool'. This has been formalised by Proctor & Gamble through its 'Tremor' programme which invites teenagers to join testing panels and then tell their friends about upcoming products. Direct transferability is not suitable on this occasion due to differing market focus, but lessons can be learnt upon closer examination of this formalised application. Viral marketing is not recommended until ways of controlling the message and measuring effectiveness have been devised.
- Self-prophecy marketing techniques on a mass scale have been shown to reliably change environmental and health behaviours. Commercial use of this technique has also been made. The technique can be implemented around the issue of increasing self-efficacy in water behaviour change – 'I can make a real difference if ... I install X/change habit Y'.
- Commercial and social ethnography can play a role in identifying triggers, barriers and sub-motivations for water behaviour in its naturally occurring context. Peer ethnography through observing the water usage of family and friends may be a suitable application. Arguably people will be more honest when reporting other people's water usage than they will be about their own.
- The issue of trying to change one behaviour rather than a host of behaviours is crucial. As demonstrated by the effectiveness of the 'Water Efficient Durham' campaign, which focused solely on resident lawn watering to reduce the community's water usage, the local government was able to be more specific in its demands on local residents. This community-based social marketing approach successfully empowered the populace through educational materials, pledges and feedback.

Encourage

Capturing added value

- If progress following intervention can be measured, further partnership growth and roll-outs to new areas can be justified. However, a suitable set of measures needs to be identified. Possibilities could include samples of self-report water usage, actual changes in water usage as measured by water companies, or perhaps

valuation of any brands launched around water saving initiatives. In the 'Water Efficient Durham' project, local water usage in targeted neighbourhoods was measured at peak times across the years to assess intervention effectiveness. It was also measured in terms of the intervention cost versus the projected cost of building new infrastructure to cope with peak demand. On both these grounds it was declared successful.

Researcher comments

The collection and analyses of interventions is a reassuring testimony to the fact that behaviour change can and does occur. The framework for best practice will be an invaluable tool in planning water behaviour interventions. Although the scope of some of the suggestions may be beyond the means of the current project, they should not be disregarded when discussing scaling it up.

Marketing: sector-specific – water

Reference: M8.1

TITLE	Exemplar water initiatives – Zaragoza, the water saving city		
AUTHORS	Fundación Ecología y Desarrollo/LIFE Programme	PUBLISHED	2005
CONTEXT	[Marketing & Communications: Sustainability, Area of behavioural focus: water		
SOURCE	Zaragoza: Water Saving City. Small steps, big solutions		
<p>Principal learnings</p> <p>Supported by the European LIFE Programme, Zaragoza City Council developed a water efficiency campaign between 1995 and 1999. The campaign was also sponsored by a bank and supported initially by four companies. The project's purpose was to promote a new water-saving awareness of this life-giving resource.</p> <ul style="list-style-type: none"> • The project set a measurable behaviour goal. • Systems focus. All the determinant elements of a water culture (institutional policy, available technology, information, legislation, consumer habits) were formed as a virtuous circle. • Principle of shared responsibility. All agents contributing to the water problem had to participate in the solution. Consuming businesses such as hotels, restaurants, bars, gyms and public buildings were important participants – both as contributors to water reduction (<i>exemplifying</i>) and as communicators to the public (<i>engagement</i>). This demonstrated a collective challenge to bring about the participation of all agents making up the water culture. • There was an emphasis on technological change enabling water saving to be maintained once the campaign was concluded. • Management of demand, not a policy of supply as used as the system for increasing efficiency in water use. 			

- Savings in domestic use involve stirring thousands of people. Working on domestic use was where most consciences were to be raised.

Key elements were:

- developing a holistic city-wide community approach based on shared responsibility, which helped develop water-saving behaviour as a norm in the city;
- an extensive preparatory stage of partnership development before the engagement campaign with consumers;
- providing feedback to water consumers on progress and results to encourage them;
- organising an international conference as:
 - a positive message based on celebrating water as a shared and valued resource;
 - a means of expressing the city's success with pride.

Argument

The project's goal was to promote a new water saving awareness with rational management of this limited and life-giving natural resource. Specifically, the objective was to save 1,000 million litres of water in the homes of the city of Zaragoza in a period of one year.

There were two distinct phases. February 1997 saw the start of the preparation phase in which the promotion structure (promotion partners, sponsor, promoting companies and the first collaborating bodies) was established. October 1997 saw the start of the execution phase in which specific actions were carried out with the different sections of the public. An international conference on water efficiency was scheduled for 1999 to celebrate the campaign success, along with a city festival.

A holistic community approach was used involving consumers, financial institutions, retailers, businesses, architects, building companies, manufacturers and public sector administrators – even the mayor was involved. By the end of the project, 150 bodies were collaborating in saving water – public institutions, NGOs, private companies, trades unions, small shopkeepers, department stores, schools, professional bodies, local community organisations, business associations and the media. They were all united in the need to make proper and rational use of the scarce commodity.

The principal stakeholders and intermediaries targeted included the following groups:

- **Prescribers** – professionals working in connected with domestic water use (manufacturers, distributors, retailers, promoters, builders and architects) – an important group in providing information and advice to clients;
- **Large-scale consumers** – hotels, restaurants, bars, public buildings;
- **Schools and young people** – 70 per cent of the city's schools collaborated in the project;
- **The general public** – the main target for behaviour change.

An evaluation was carried out after one year of the savings achieved, i.e. 1,176 million litres – 17.6 per cent more than projected.

- Before the campaign, one in three homes employed some water saving measure. By the end of the campaign, this figure had risen to two in three.
- Before the campaign, almost 60 per cent of the inhabitants had no knowledge of water saving measures. Afterwards, ignorance of such measures had gone down to 28 per cent.
- During the year of the project, 3,990 dwellings in the city had introduced some sort of water saving device.

- 300,000 inhabitants (50 per cent of the population) had adopted some kind of water saving habit in their homes.
- 65 per cent of sales outlets collaborated in the project – one example outlet recorded a 58 per cent rise in sales of automatic taps.

The cost of water supply and treatment for every 1,000 litres of water in Zaragoza is 169 pesetas. The cost to the project for every 1,000 litres not consumed was 70 pesetas.

The project inspired further work by the partners to target large organisational consumers of water; good practice labels were awarded to 50 large 'symbolic' consumers.

The latest initiative, 'Schools for the efficient use of water in the City', seeks to widen the behavioural impact in the city, making Zaragoza a 'reference city' for the whole of Spain in relation to water management.

Current relevance and issues

The principal of shared responsibility and exemplifying by all parts of a community are reflected in the *I Will If You Will* report (S12) and in the Consumer Council for Water *Using Water Wisely* research.

Demonstrating shared responsibility is effective when a whole geographical area (particularly a town) participates as a community effort, requiring strong partnership relationships. This effect is seen in many good examples of successful initiatives in sustainability globally (see M7).

Insights for water behavioural projects

The initiative provides a model for potential replication in the UK. The development of partnerships in water efficiency across the community is essential as the foundation for such an initiative. This requires time and resource at the earliest stages to foster strong relationships and commitment. This then enables wider community exemplification to motivate behaviour change.

Enable

- Partnerships with water related 'prescribers' and information products.
- Information through training and involving the supply chain.

Engage

- Water sector installers and suppliers were used as intermediaries.
- Use of places where people visit (hotels, gyms, public buildings).
- Schools programme to engage children.
- Celebrating water (positive message).

Encourage

- Developing a norm through the whole community and using feedback.
- Hosting an international water conference to inspire change.

Exemplify

- Shared responsibility throughout the community.

Researcher comments

An impressive example of the impact of shared responsibility, demonstrating the need

for business and public sector to act along with householders in order to deliver a successful initiative.

Reference: M8.2

TITLE	Home Depot's 'Water: Use It Wisely' campaign		
AUTHORS	Philip Kotler and Nancy Lee	PUBLISHED	2004
CONTEXT	Marketing and communications: sustainability – water		
SOURCE	'Best of Breed', <i>Stanford Social Innovation Review</i> . Available from: http://www.ssireview.org/articles/entry/best_of_breed/		

Principal learnings

There are benefits in working with businesses in delivering social goals, particularly where this matches with their product or service expertise and business area.

The main benefit for business in applying corporate social marketing to behaviour change is that a change in personal behaviour stands a good chance of affecting change in consumer purchasing behaviour. When people change the way they act and then personally benefit from those actions, they are likely to have a strong positive association with the company that spurred the change.

This case study demonstrates

- the benefits of active partnering with businesses in behaviour goals;
- the value of self-efficacy through training and practical engagement with consumers;
- the value of monitoring product sales as a means of evaluating impact.

Argument

Water is a precious resource for Arizona, USA. Increasing frequency of droughts and a growing population makes water conservation a major policy goal for the state.

In 2003, all 40 of Home Depot's Arizona stores participated in a collaborative effort with 'Water: Use It Wisely' – a conservation campaign founded in 1999 by the Arizona Department of Water Resources. The campaign now includes 143 public and corporate partners throughout North America (<http://www.wateruseitwisely.com>).

The Water: Use It Wisely team approached Home Depot as a product knowledge partner. The issue of water conservation dovetailed well with Home Depot's longstanding commitment to its communities and the environment. and the company was impressed by the visual quality and overall intelligence of the campaign materials. The multimedia package is centred around '100 ways in 30 days to save water' and includes:

- print, radio and television advertisements;
- brochures;
- web-based presentations;
- T-shirts, decals and baseball caps.

Home Depot recognised that to change behaviour you need to engage a person. To

that end, the business ran hour-long in-store workshops on water conservation every Saturday and Sunday during September (Water – Use it Wisely month), featuring the ‘100 ways in 30 days to save water’ promotion. To promote the event, Home Depot invested \$100,000, mainly for public relations – including arranging television appearances by its employees to demonstrate water conservation – and in-store signage. The retailer also benefited from television and print ads sponsored by the Water – Use It Wisely partners, which featured Home Depot’s logo.

Each weekend workshop was devoted to a different topic:

- water conservation basics;
- repairs and retrofits;
- drought-resistant gardening;
- irrigation.

A total of 3,120 consumers attended the workshops.

One aim of the workshop format was face-to-face contact with customers, including children for whom special activities were planned during the first workshop. Another aim was to provide basic hands-on training, which general awareness campaigns lack.

Home Depot also incorporated its traditional emphasis on community service into its water conservation efforts by supporting employee volunteers who used water saving products to retrofit and re-landscape a housing complex for low-income seniors in South Phoenix.

The month’s activities resulted in:

- 12.5 million impressions from TV and print adverts;
- 4.5 million impressions from signage;
- distribution of 40,000 ‘Water – Use It Wisely’ guides to Home Depot customers.

Surveys conducted by Home Depot after September 2003 showed a marked shift in customer attitudes toward the importance of water conservation.

From a business perspective, this experience highlights the superior marketing power of corporate social marketing. When Home Depot not only teaches the importance of water conservation but also how to use Home Depot products in order to conserve, it creates a strong and positive familiarity with its products among consumers.

Home Depot’s experience demonstrates that retailers can benefit from participation in this kind of campaign. After the workshops in September, Home Depot sales of its water conservation products showed an increase over previous months. The specific results are confidential but the company considered plans to repeat the effort in Arizona in April 2004, followed by water conservation social marketing programmes in other markets.

Current relevance and issues

For the UK, partnering with retailers and manufacturers in engaging with consumers on water efficiency presents a real opportunity.

Insights for water behavioural projects

Corporate social marketing works best in public–private partnership. The current pattern of businesses embedding sustainability as part of their brand values is on the increase. Businesses can offer marketing and communication expertise, product

knowledge and the means to monitor product sales to evaluate intervention success.

Enable

- Self efficacy developed through training and information in workshops.

Engage

- Partnering with businesses to engage with consumers (rather than simply communicate) on water efficiency, e.g. water efficient gardening and DIY training.

Encourage

- In store promotions on water efficient products.

Researcher comments

Reference: M9

TITLE	Three public water conservation programmes in the USA		
AUTHORS	Various	PUBLISHED	-
CONTEXT	Marketing and communications: sustainability – water		
SOURCE	<p>(1) Campbell H E, Larson E H, Johnson R M and Waits M J, 1999 <i>Some best bets in water conservation. Results of multivariate regression analysis, City of Phoenix 1990–1996: Final report to Arizona Department of Water Resources</i>. Tempe, AZ: Morrison Institute for Public Policy, School of Public Affairs, Arizona State University.</p> <p>(2) USEPA, 2002 <i>Irvine Ranch Water District, California: Reducing purchased water costs through rates</i>. In <i>Cases in Water Conservation: How efficiency programmes help water utilities to save water and avoid costs</i>, pp. 24-26. EPA832-B-02-003. Washington, DC: US Environmental Protection Agency, Office of Water (http://www.epa.gov/WaterSense/docs/utilityconservation_508.pdf).</p> <p>(3) USEPA, 2002 <i>Albuquerque City, New Mexico: Long range planning to address demand growth</i>. <i>Cases in Water Conservation: How efficiency programmes help water utilities to save water and avoid costs</i>. pp. 7-9. EPA832-B-02-003. Washington, DC: US Environmental Protection Agency, Office of Water (http://www.epa.gov/WaterSense/docs/utilityconservation_508.pdf)</p> <p>All sources held by Waterwise.</p>		

Principal learnings

(1) City of Phoenix 1990–1996

The study describes a number of interventions implemented by the City of Phoenix between 1990 and 1996. It concludes that, for single-family residential water conservation:

- water price can be an even more effective conservation method than the most effective non-price method (10 per cent price increase giving a saving of 0.54 units

per month per household);

- a citywide mandate of water saving devices for all new and replacement fixtures saved the most water of any non-price policy (~0.008 units per household/month);
- targeted retrofit programmes are the next most promising category of measures.

(2) Irvine Ranch Water District, California, 1991

The aim was long-term water efficiency while maintaining stable utility revenues through a five-tiered rate structure. The rates were adjusted on each bill to reflect estimated needs based on daily fluctuations in precipitation. When customers use more, they are given progressively more expensive penalties – thus alerting them to excess use/leakage. The result was an immediate impact, with a 19 per cent reduction in 1991/1992 compared with 1990/1991, with 85–95 per cent customer satisfaction.

(3) Albuquerque City, New Mexico 1994–2014

The aim is to reduce water usage by 40 per cent by 2014 through a range of incentive and public education programmes. In addition, surcharges are imposed when summer usage exceeds 200 per cent of winter usage with over half the revenue from the surcharge funding the conservation programme and a high portion returned to customers through the rebate scheme. In addition, all customers using >50,000 gallons/day have to prepare and implement a water conservation plan. The result has been to slow drawdown of groundwater supply.

Argument

(1) City of Phoenix 1990–1996

Non-price measures observed were:

- Seniors helping seniors – trained senior citizens provided retrofit assistance to other seniors;
- Low-flow fixtures and devices ordinance – all new and replacement fixtures were required to meet low-flow requirements in a phased programme from January 1990 to January 1992;
- Neighbours helping neighbours – students from a high school helped install retrofit in low-income homes;
- Unsolicited audit kits (1993–1995) – self-audit information was sent out with a reply card enclosed so householders could conduct an audit and either purchase their own devices or request them from the city authorities;
- Retrofit device canvassing (1989–1991) – provision of 8,000 kits.

However, there were caveats: it was not possible to know whether devices provided for self-fit were installed or whether devices fitted by seniors/neighbours stayed in place.

Other measures were not seen as being effective for single family water conservation, even causing increased water use, e.g. Union Hills Plumbing Products Drop-off (government programme, to doorstep) and Depot Plumbing Products Pick-up (government programme, requiring collection)

The literature supports this:

- People engage in off-setting behaviour when asked to consume more of a good.⁷

⁷ Chirinko R S and Harper E P, 1993 Buckle up or slow down? New estimates of offsetting behaviour and their implications for automobile safety regulation. *Journal of Policy Analysis and Management*, 12(2), 270-296.

- Water-conserving hardware can lead to off-setting behaviour e.g. longer showers, flushing twice on low-flow toilets.⁸

The study considered the potential impacts of a range of variables:

- climate/weather;
- household composition:
 - presence of children or not;
 - people who have lived in Phoenix long-term or not;
 - people who have lived in the arid West or not;
 - race/ethnicity;
 - income;
 - size of household, ages and gender;
 - education;
 - rented or owned.
- physical infrastructure of house:
 - number of bathrooms/bedrooms;
 - value;
 - age;
 - landscape flood irrigation (i.e. grass watering thru' unmetered flooding in summer months).

(2) Irvine Ranch Water District, California, 1991

Individualised rate accounts were provided based on:

- landscape square footage;
- number of residents;
- additional needs e.g. medical uses;
- daily evapotranspiration rates.

There are five tiers:

- low volume discount;
- conservation base rate;
- inefficient;
- excessive;
- wasteful.

Customers correcting the problem can request removal of the penalty, which is usually done quickly.

There is also a fixed water service fee based on meter size to ensure revenue stability.

(3) Albuquerque City, New Mexico 1994–2014

Incentive programmes included:

- conversion of high-flow toilets to low-flow, with rebates of up to \$125 per toilet;
- conversion of high-water use landscapes to xeriscapes, with rebates of up to \$800 for residents and \$5,000 for businesses;
- high-use washing machines changed to low-use, with rebates of \$100 per machine;
- free water audits and retrofits for residents and commerce;

⁸ Geller E S, Erickson J B and Buttram B A, 1983 Attempts to promote residential water conservation with educational, behavioural and engineering strategies. *Population and Environment*, 6(2) 96-112.

- rebate programmes for rainwater harvesting barrels, hot water circulation units and sprinkler timers.

The public education programme included:

- free water conservation seminars;
- water festivals;
- co-operative programmes with schools and community organisations.

Current relevance and issues

Although the programmes started 17 years ago and US-based, they offer some insight for water efficiency in the UK. These insights are summarised in the table below.

Insights for water behavioural projects

	Phoenix	Irvine	Albuquerque
Enable	Neighbours helping neighbours Blanket provision of unsolicited self-audit kits Consider impact of variables	Individualised bills providing information on use	Free water audits and retrofits
Engage	Retrofit device canvassing		Public education programme
Encourage	Price increases as disincentive Phased mandatory retrofit of some items	Tiered pricing as disincentive Feedback available through bills	Summer price surcharges based on winter usage Incentive and rebate programmes funded through surcharge, with discounts for retrofit items High users required to prepare conservation plans
Exemplify	Senior citizens		

Researcher comments

Marketing: sector-specific – health

Reference: M6.1

TITLE	Smoking Cessation Programme for Pregnant Women in Sunderland		
AUTHORS	National Social Marketing Centre	PUBLISHED	2007
CONTEXT	Marketing and communications: Health		
SOURCE	http://www.nsmcentre.org.uk		

Principal learnings

The intervention 'Smoking Cessation Programme for Pregnant Women in Sunderland' is a case study example of social marketing found on the National Social Marketing

Centre website.

The transferable learnings from the case study are as follows:

- Investment in target audience research at the outset provides insight which drives an effective intervention strategy. The impact improvements can be significant and pay dividends on the initial investment.
- Understanding the perspectives of those who engage and influence the behaviour of the target audience can be equally important.

Based on the National Social Marketing Centre's social marketing benchmark criteria, the key features of the case study are:

- a clear focus on the behaviour it wants to impact, setting a specific and measurable behaviour goal;
- used relevant consumer research to inform the intervention at the scoping phase;
- identified the motivations and barriers to changing behaviour and how they differed according to the individual;
- the focus was on how to change behaviour rather than the risks of continuing to behave in this way and the need to take account of smoking in the wider context of the individual's life (argument was already won on the benefits to the consumer of changing behaviour);
- boosted people's self-esteem (avoided internal competition and competition between individuals);
- used a segmented approach to identify key target in terms of need (tailored intervention to suit needs of targeted audience);
- a range of methods used as part of the intervention.

The only benchmark that this case study does not demonstrate is a theory-based approach to inform the intervention.

Argument

The Smoking Cessation Programme for Pregnant Women in Sunderland demonstrates how social marketing techniques have been used to achieve a behavioural goal. In response to the behavioural challenge that approximately 30 per cent of women who smoke in Great Britain continue to smoke during pregnancy, Sunderland's Primary Care Trust (PCT) sought to increase the uptake of smoking cessation services and quit rate among pregnant women in Sunderland.

The intervention was underpinned by qualitative research that explored what it was like to be a pregnant smoker in Sunderland and provided insights into the particular issues facing smoking pregnant women. Individuals were recruited for 12 focus groups, spanning 10 years from 1992. The focus groups were segmented in relation to age, social class, smoking behaviour/history and cohabitation status.

The focus group analysis showed that smoking during pregnancy seemed to be most prevalent for women from deprived areas. Benefiting from this deep understanding and insight into the motivations for giving up smoking within its target audience, the PCT found that many women feel awful, see themselves as second to the baby, are information poor and don't want to be criticised. There were also other barriers such as lack of available information and little enthusiasm among health professionals.

The PCT used a range of methods to tackle barriers. Efforts were focused where women were most likely to be recruited. Support was designed to be consumer friendly, using information from focus groups, recruiting skilled and empathic dedicated

workers and using feedback techniques. A full-time worker was recruited to provide long-term, home-based, user-friendly support.

Role play was used to train health professionals to engage more effectively with smokers. Using active participation in group work, professional staff were able to obtain direct feedback on how it felt to be the target women and what approaches might work more effectively. The role play sessions with health professionals were crucial to the success of the intervention approach. The innovative participatory sessions were valued highly by the health professionals.

Smoking cessation activity was collected using paper forms and included numbers of women referred to the service, quit dates and numbers quitting at the four-week point. During the intervention, there was a 10-fold increase in the number of women setting a quit date and quitting while pregnant. This was far higher than in other PCTs.

Current relevance and issues

This was a very successful intervention. Although it is in the health arena and focused on the individual, it does have transferability for water efficiency as a similar approach to achieving behaviour change could be used. In water efficiency there is also a focus on the individual, it is just put in the context of the wider environment.

When segmenting an audience, you may not do it to the same micro level as seen here. Other social marketing principles such as investing in audience research at the front end of an intervention or being insight driven are applicable to both fields.

Insights for water behavioural projects

The case study can be mapped to the 4Es model for behaviour change.

Enable

- Proactive recruiting, dedicated worker, home visits.
- Consumer friendly cessation support (including dedicated worker).

Engage

- Segmentation to identify and target those most in need.
- Design and pre-test new marketing/information material with target population.
- Provided solutions to giving up rather than risks of behaviour.
- Role play to engage health professionals.

Encourage

- Made known the benefits for the health of the baby and the woman.
- Tailoring incentives to the individual.
- Boosting individual's self-esteem.
- Posters and leaflets that meet women's needs.

Exemplify

- Highlight the success of the programme in Sunderland to other Primary Care Trusts in north-east England.

Researcher comments

Reference: M6.2

TITLE	Activmobs (Making preventative health fun and accessible)		
AUTHORS	Design Council	PUBLISHED	2007
CONTEXT	Marketing and communications: Health		
SOURCE	http://www.designcouncil.org.uk/en/Case-Studies/All-Case-Studies/Activmobs/		
<p>Principal learnings</p> <p>The Activmobs case study is an example of the identification of a problem (in this case people's unhealthy lifestyles), the response and the result.</p> <p>Lessons learned were as follows:</p> <ul style="list-style-type: none"> • Ensure ownership of the service lies with the users. Make sure it is a system that meets their needs and desires. • Go with participants' ideas. If necessary, these can be modified later. • Facilitate creative thinking through cross-disciplinary working. • People are more likely to do an activity they are already doing. • Need to make it easier for people to try something new. • Activities need not be traditional group activities. • There should be 'open' groups (in other words anyone can join) and 'closed' groups by invitation only. • People define themselves more by lifestyle than by age. There should be no restriction on age range. • Scheme should clarify the benefits of exercise through real life stories and testimonials. • Word of mouth is the most powerful tool for advertising and growing the service. Direct mail and advertising on the internet are also very effective at getting the message across. • People wanted to recruit friends and family into the scheme, but found it difficult to describe the concept or come up with inspiring suggestions for possible activities. A magazine helped to communicate the concept to others and show them the sort of activities they might want to be involved with. • Don't be afraid to drop something if it isn't working. • Need to create trust and ensure the scheme is useful. 			
<p>Argument</p> <p>In 2005, Kent County Council (KCC) identified that many residents in Kent needed to increase their levels of personal activity. In partnership with the Design Council, KCC took a completely different approach to preventative healthcare and used the principle of user-centred design to lead to a new way of exercise.</p> <p>At the suggestion of KCC, the Design Council worked with residents from the Park Wood estate in Maidstone. Team members drew inspiration from small, informal and non-hierarchical social groups that existed on the estate and developed Activmob – a new type of service that supported self-organised groups to become more active.</p>			

There are three primary roles within the Activmob system:

- **Motivator** – uses their social, motivational and organisational skills to get groups going and keep them going.
- **Activmob trainer** – helps determine the most appropriate activity for the group and set the right levels of exertion. Offers practical advice and motivation
- **'Mobber'** – joins a group of likeminded individuals to undertake healthy activity.

The first Activmobs scheme was up and running early in 2007. Three facilitated 'mobs' were created by residents:

- 'Wellimob' was a five-strong team of dog-walkers;
- 'Backmob' was an older group of four who took up gentle exercising under the supervision of the trainer;
- 'Timemob' was led by a history enthusiast organising walking tours of local historical sites of interest.

The benefits of the 'mobs' approach were evident both for the design team and the participants:

- The small group model made 'mobs' fun, a social occasion and a personal commitment.
- Groups provided self-confidence and offered a sense of security.
- Groups formed because of a shared interest or among people with similar lifestyles and values, with members sharing common goals which helped them to remain motivated.
- From a financial perspective, the cost of providing one trainer between six people compares favourably with an appointment for each of them with a GP.

The design team is now looking to introduce the scheme to other locations within Kent without losing sight of the project's original aims and objectives, and without diluting the potential impact of the system.

Current relevance and issues

Activmobs is a great example of community-based behaviour change. It got people thinking innovatively about how to tackle the problem of unhealthy lifestyles and achieved what other approaches such as government-led mass communications campaigns had failed to do. Taking inspiration from the motivation of individuals and geared towards small groups, this is a co-created system that can be replicated elsewhere.

Insights for water behavioural projects

The Activmobs case study can be mapped to the 4Es model for behaviour change. Many of the learnings are transferable.

Enable

- People recruited to help set up the scheme.
- A diverse group of designers, policy analysts, healthcare professionals, personal trainers and psychologists were brought together to work with participants and local stakeholders on design of Activmob.
- Professionally qualified 'mob trainers' were used.
- The scheme was promoted through the ideas and news section of the 'your.mob'

magazine and a website (www.weare mobs.org).

- 'Timemob' organiser given the support and structure needed to organise activities.
- Future ideas include tools to help residents find 'mobs' in their local area, vote for 'mobs' they want to see started, and registration and administration tools for motivators.

Engage

- Activity audit to understand activity and personality type.
- Workshops with participants and local stakeholders.
- Moved away from language of existing healthcare services.
- Focus on individual activities.
- Three informal 'mobs' created – Welliemob, Backmob and Timemob.
- Communicated messages through word of mouth, direct mail and advertising.
- Produced branded posters (later dropped because of 'official' look).
- Groups formed on basis of shared interest and lifestyles, not age
- Trainers built up trust with the 'mobs' who could see use in activity.
- Although based on existing social networks, 'Timemob' organiser advertised, recruited and provided significant co-ordination.
- Activities became a social occasion and a personal commitment.

Encourage

- Vouchers – discounts on facilities, childcare and travel topped up on a monthly basis on completion of the well-being cards.
- Well-being cards and periodical well-being progress reports.
- Fun and easy to use measurement systems that enable participants to visualise progress.
- Commitment goals and rewards – periodic offer of collective rewards obtained by reaching self-set commitment goals.
- Groups encouraged to organise activities for themselves.
- 'Mobs' provided self-confidence and offered a sense of security.

Exemplify

- Used real life stories and testimonials to clarify benefits.

Researcher comments

Social science: general sustainability

Reference: S6

TITLE	'Helping people to make better choices', Chapter 2 of <i>Securing the Future: The UK Government Sustainable Development Strategy</i>		
AUTHORS	Defra	PUBLISHED	2005
CONTEXT	Social science: sustainability		
SOURCE	http://www.defra.gov.uk/sustainable/government/publications/uk-strategy/		
<p>Principal learnings</p> <p>The chapter highlights the following:</p> <ul style="list-style-type: none"> • Research shows that a more active mix of approaches to behaviour change is needed to change habit (i.e. a shift away from 'classic' command and control regulation), given that the mix of control and awareness raising has not led to action. • Introduction of the 4Es diamond model of behaviour change advocates the need to enable, engage, encourage people and communities, with the government leading by example. • There is a need for appropriate policy design in order to catalyse and maintain change. • Citizen and community action are central to a changed approach. 			
<p>Argument</p> <p>Social support is vital in breaking habits and delivering new social norms, and practical support is needed for communities to take action for change, as well as better co-ordination between local and national levels of policy.</p> <p>With this in mind, 'Community Action 2020: Together we Can' is a programme of government support for action on sustainable development that aims to enable community development practitioners and mentors to be better equipped to support communities through:</p> <ul style="list-style-type: none"> • improving access to information, advice, materials, community packs, web portals and training which will all help communities take action on sustainable development; • increasing opportunities for community workers and communities to learn about sustainable development; • including sustainable development in National Occupational Standards and accredited units which set out the skills and principles of practice for community development work; • increasing opportunities for individuals within communities to volunteer in sustainable development activity. <p>In addition, increased use of deliberative fora/citizen's juries will involve people directly in policy decisions.</p>			

Current relevance and issues

Since this document was published, there has been more research and more on the ground work to influence and empower behaviour change using the principles of the 4Es diamond model. That said, this document still provides the context within which all the recent work has taken place and the content of the general 4Es model serves as a useful reminder of the intention behind the design. The content of the Community Action 2020 model provides useful insights for water behavioural projects.

Insights for water behavioural projects

The content of the general 4Es model has been repeated here, married with the content of the Community Action 2020 and translated for water relevance wherever possible:

Enable

General

- Remove barriers.
- Give information.
- Provide facilities.
- Provide viable alternatives.

Community Action 2020 translated to water

- Work with community mentors and community development workers to strengthen their capacity to support community action on sustainable development, particularly in relation to water behaviour.
- Identify opportunities to provide (or fund) learning and training on the role of water behaviour in sustainable development.
- Identify opportunities to maximise funding impact through providing match funds or services in-kind for community projects on sustainable development (adding a specific water focus) NB The Home Office online portal (www.governmentfunding.org.uk) provides access to grants for the voluntary and community sectors and may offer a starting point for identifying opportunities.
- Forge links with the schools citizenship and sustainable development syllabuses.
- Improve/provide information of funding availability relating to community-led water behaviour projects.
- Involve communities in drawing up plans which affect them (see Chapter 6), specifically with regard to water behaviour.

Engage

General

- Community action.
- Co-production.
- Deliberative fora.
- Personal contacts/enthusiasts.
- Media campaigns/opinion formers.
- Use networks.

Community Action 2020 translated to water

- Identify opportunities for including water in sustainable community strategies and local action plans such as parish plans, neighbourhood plans, housing and planning policies, and involve communities in those plans.
- Provide and promote volunteering opportunities on water in sustainable development.
- Build links to improve opportunities for action through existing non-water initiatives.
- Review 'Community Action 2020: Together we can' and other relevant publications to identify routes to linking with community initiatives.
- Work in partnership with the voluntary and community sector through the principles of the Compact on Relations between Government and the Voluntary and Community Sector (www.thecompact.org.uk)
- Review the toolkit for climate change communications (see Chapter 4 of *Securing the Future*). This is designed to provide a model for future behaviour change campaigns on other issues.

Encourage

General

- Tax system.
- Expenditure – grants.
- Reward schemes.
- Recognition/social pressure – league tables.
- Penalties, fines and enforcement action.

Community Action 2020 translated to water

- Inspire, recognise and celebrate successful community action on water behaviour.
- Promote examples of successful community action across the country to help communities inspire one another.
- Review *Tax and the Environment: Using Economic Instruments*⁹ to identify any potentially useful tools.
- If using taxes:
 - give advance notice of any that are new and ensure extensive consultation on design to allow people or companies to adapt their practices;
 - recycle some of the proceeds to communities to help speed the response;
 - allow discounts in return for negotiated commitments to reduce water use, and use some of the proceeds to offer alternatives.
- Also consider a mix of regulation, trading schemes and voluntary agreements.
- Make sure that change is fair and in particular that vulnerable groups do not bear too high a burden.
- Consider local or targeted 'positive incentives' in motivating more sustainable behaviour.¹⁰

⁹ HM Treasury, 2002 *Tax and the Environment: Using Economic Instruments*. London: HMSO. Available from: <http://www.hm-treasury.gov.uk/d/adtaxenviron02-332kb.pdf> [Accessed 9 November 2009].

¹⁰ For example see: Holdsworth M and Boyle D, 2004 *Carrots not sticks: the possibilities of a sustainable consumption reward card for the UK*. London: National Consumer Council.

Exemplify

General

- Achieving consistency in policies/

Community Action 2020 translated to water

- Lead by example with clear and consistent messages from central government, local authorities and water utilities on:
 - community empowerment;
 - the importance of water behaviour in sustainable development through 'Vision for Sustainable Communities' (Chapter 6 of *Securing the Future*) and supporting employee volunteering schemes.
- Review the peer review toolkit on sustainable communities mentioned on page 41 of Chapter 2 to identify any opportunities.

Researcher comments

This document suggests that there is a wealth of opportunity for water behaviour programme/projects to link with community action on sustainable development. However, further and wider research as indicated above would be necessary.

Reference: S7

TITLE	Promoting pro-environmental behaviour: existing evidence to inform better policy making – summary report		
AUTHORS	Andrew Darnton, Jake Elster-Jones, Karen Lucas and Mike Brooks, The Centre for Sustainable Development, Westminster University (for Defra)	PUBLISHED	2006
CONTEXT	Social science: sustainability		
SOURCE	Available from: http://randd.defra.gov.uk/Document.aspx?Document=SD14002_3822_FRP.pdf		

Principal learnings

This study undertook comprehensive (though by no means exhaustive) research to understand how government can encourage pro-environmental behaviour change. The scope included theory on organisational and systemic behaviour change, and focused on seven domains:

1. Helping businesses to produce more sustainably (farmers, food industry and wider industry)
2. Encouraging sustainable consumer behaviour (purchasing)
3. Encouraging sustainable resource use within the home and by businesses (design, energy, water, etc.)
4. Tackling the waste challenge (reduce, reuse, recycle by households and businesses)
5. Encouraging sustainable behaviour for different sections of society (e.g. the young)
6. Helping farmers (and fishers) become more sustainable land (marine) managers
7. Sustainable procurement – using Government purchasing to influence markets

Available from: http://www.wasteonline.org.uk/resources/Attitudes/carrots_not_stick_NCC.pdf
[Accessed 9 November 2009].

The main learnings are as follows:

- Behaviours are complex and non-linear. They require external (e.g. infrastructure) and internal (e.g. psychological) factors to be addressed at all levels of society, i.e. any intervention needs to address society as a whole in order to generate long-term normative change.
- Different audiences behave differently and require targeted/tailored, context-specific interventions.
- Audiences are not passive but active (i.e. they are 'actors' at the heart of the change process) and therefore should be involved at the earliest opportunity in any change along with other partners.
- 'Feedback' is critical to delivering and sustaining change, i.e. change is an ongoing process not a one-off event, and requires learnings to be captured and used to influence policy. It thus requires formal evaluation structures with built in 'feedback loops'; the current gap between policy design and delivery outcomes needs to be closed.
- Government policy needs to convey consistency and pull in one direction, i.e. Defra, other government departments, EU.
- Individuals have the potential to act as 'change champions' within networks and organisations – focusing on key individuals may be more effective than targeting all.
- Policy design needs to consider equity and fairness, avoiding disproportionate negative financial/environmental impact for the most vulnerable/marginalised people.
- Stability of financing is a key issue for community-based initiatives. Clear legislative guidelines contribute to success, as does interactive working with policy-makers.
- Action is needed now – change takes time.

Argument

In addition to a policy review and a review of 14 case studies, the following bodies of literature were examined:

- models of socio-psychological behaviours in individuals;
- theories of organisational behaviour change and in particular learning theory;
- theories looking at 'whole systems' change across wider society.

The theoretical literature identifies many organisational and societal factors impacting on individual behaviour. Change is circular, a process over time, filled with interactive feedback and learning loops, and cycles of activity and reflection. Thus a 'whole system' approach to change is supported, with change being embedded horizontally (i.e. within an organisation) and vertically (i.e. between organisations).

The policy review highlighted an appreciation of the need for a multi-instrument approach, as well as a lack of consistency between the strategies of different departments.

The review of real world initiatives and practical projects was limited and it was not possible to identify success criteria to inform policy. However, there is a suggestion that smaller, less complex projects are easier to replicate; that said, complex systems break down into smaller components, so a social marketing approach may offer a useful way forward.

Current relevance and issues

The authors reviewed 65 sources, many in the area of 'grey' literature. They note that:

- the study is not a systematic review of the theoretical literature relating to pro-environmental behaviour change, given the undefined scope of relevant evidence and

the amount of potential sources;

- socio-psychological behavioural models are designed to generalise behaviours and predict aggregate outcomes – they do not transfer well from one context to another and are only as accurate as the data are representative and robust.

The Westminster study reviews theoretical literature and other studies that may also have been reviewed separately by the researchers under this Environment Agency water behaviour study (e.g. Stern, Prochaska, Barr *et al.*). However, this does not reduce the value of the learnings as all insights will be drawn together.

Insights for water behavioural projects

Given the extensive nature of the Westminster study, there is a vast range of insights some of which are more easily translated to the water context at this point in time than others; where obvious, this has been done. In addition to insight according to the 4Es model, the study also provides some general insights. These are also listed here.

General

- Identify target behaviour, analyse it to identify the responsible actors and actions, and identify the causal variables and their relevance to the end behaviour from the actors' perspective.
- Have realistic expectations about the outcomes.
- Monitor and adjust projects continually through evaluation and feedback loops, and also feedback to policy design, thus allowing learning from failure.
- Consider whether change needs to be incremental (if already close to desired behaviour) or transformational (if problem is dynamic and complex).
- Put the public at the centre of the process and start where people/organisations are currently at.
- Joint working/partnering opens up the question of whether their relevant behaviour needs changing (i.e. should they also be a target of the intervention as well as a protagonist). If so, consideration needs to be given to what internal cultural change might be necessary and how that might impact the intervention (all change takes time!).
- Undertake out rigorous planning and research to ensure provision of relevant mix of project activities.
- A review of Hampshire County Council's Natural Resource Initiative (p. 31) and the Total Market Approach perspective (pp. 32–33) might offer some useful insights for water behaviour projects.
- Piloting offers the opportunity to test and revise an approach before implementing more widely.

Enable

- Remove barriers to individual change:
 - External: i.e. abilities/conditions (e.g. infrastructure, financial, legislation), social context and lock-in (norms and habits);
 - Internal: i.e. psychological/dispositional
 - agency (the belief that an individual cannot make a difference);
 - norms (three types – subjective/societal, personal/self-concept, 'role belief' – what x type of person might do in y situation);
 - habits (frequently undertaken behaviours at low levels of consciousness – an individuals 'standard operating procedure').
 - NB Remove external barriers in advance in order to support norming of new behaviour.

- Ensure relevant mix of voluntary/other policy instruments (to support removal of external barriers).
- Provide suitable infrastructure/systems/appliances (or facilitate access to) for water conservation behaviour.
- Provide clear information, e.g. through labelling schemes.
- Provide hands-on support and facilitation.
- Encourage interdisciplinary working, taking a whole system approach to change the social context and reinforce new norms.
- Implement an action learning approach (to unlock agency and overcome external conditions through group action).
- Create opportunities for changed behaviour.

Engage

- Work with voluntary and community sector bodies and other organisations (e.g. local authorities, PCTs, SMEs), networks, supply chains, society as a whole, and across disciplines.
- Target individuals differently to businesses and target businesses according to size and nature.
- Segment and target according to Stage of Change.
- Match opportunities and abilities (see Enable) with messages in order to motivate
- Use a relevant mix of activities.
- Identify 'channels' in order to target message delivery.
- Use action learning approaches (e.g. Ballard's 5As model) to encourage group level activity within a cycle of action and reflection (e.g. Global Action Plan EcoTeams).
- Understand the actors' perspective and stay within the bounds of their tolerance.
- Identify, skill and work through 'change champions' as leaders of action learning networks: Ballard classifies three types of champion – formal, informal visible, informal less visible (p. 23).
- Involve people in decision-making.

Encourage

- Rank organisational performance to create competition to drive change.
- Incentivise according to Stage of Change.
- Contribute to financial stability of community initiatives.
- Involve people in decision-making.
- Identify drivers (i.e. legislation, targets, etc.) in order to inform relevant mix of incentives/disincentives (c.f. NRWF model of Supply and Demand, p. 30) to support change.
- Apply mix of policy instruments relevant to target audience (e.g. individuals, big business, SMEs, type of business).
- Offer within local context.

Exemplify

- Suitable infrastructure/systems/appliances for water conservation behaviour as standard in new build;

- Within local context but demonstrate wider context.
- Provide feedback on progress using information gathered during evaluation processes.
- Use 'change champions' who embody the desired change.
- Use partner organisations/bodies that are propagating change.
- Review Brown's systems approach to urban waste management systems ((Australia, 2004; p. 24) to identify transferability, e.g. in respect of utilities leakage rates, in order to target them with change utilising action learning and change champions in order to offer exemplification.
- Through adoption of wider sustainability practices by partners, e.g. according to Morton's environmental procurement model (Morton 2002).

Researcher comments

Reference: S8

TITLE	Behaviour change series of practical guides for policy-makers and practitioners		
AUTHORS	Various, Defra	PUBLISHED	2005-2006
CONTEXT	Social science: sustainability		
SOURCE	Available from: http://www.defra.gov.uk/sustainable/government/what/priority/behaviourChangeResearchAndGuidance.htm		

Principal learnings
 The guides draw out the findings of *Promoting Pro-Environmental Behaviour (S7)* in context specific situations.

- **Pro-environment behaviours are complex**, and highly context- and audience-specific, so a package of interventions is the most efficient stimulus of behaviour change.
- **Outcomes of interventions are difficult to predict**, so policy measures need to be context-specific. There must be an acceptance of the risk-taking elements of interventions.
- Targeting and/or **tailored interventions** that recognise diversity are crucial for maximum impact. Social marketing principles provide a useful framework for a staged approach to this.
- **Consumers play an active role** in the change process and accordingly should be viewed as 'partners' in process development. Theories suggest that collective action and participatory planning will engage behaviour (especially in a local context).
- **Change is a slow, ongoing process**, so constant feedback from the change process into policy-making is critical, as is consistent monitoring and evaluation. Policy-making needs to be reflexive so as to take constructive lessons from mistakes. Action needs to be taken now to influence societal change.
- **'Agents of change'** in the community, workplace and networks may be effective in mobilising widespread change. Advocates and opinion leaders in these areas

should be encouraged.

- Policy design should work on the basis of equity and fairness in order to maximise compliance. Any **new research should be policy-focussed** and framed around the 4Es diamond model.

Argument

Defra's 2005 research programme looked at how the Government (and others) can promote pro-environmental behaviour at the level of individuals, organisations and whole systems. Studying a mixture of applied and theoretical literature, and using empirical approaches, the following context-specific practical guides were produced:

- (1) Sustainable Resource Use in the Home
- (2) Targeting Specific Lifestyle Groups
- (3) Sustainable Development as a 'Collective Choice' Problem
- (4) Triggering Widespread Adoption of Sustainable Behaviour
- (5) Understanding Choice
- (6) Sustainable Shopping and Sustainable Production
- (7) Enhancing Sustainability at Farm Level
- (8) Tackling the Waste Challenge
- (9) Encouraging Sustainability Amongst Small Businesses
- (10) Sustainable Resource Use in Business and Organisations

Current relevance and issues

As well as theoretical literature, a large number of case-studies were analysed in the course of this research, indicating a high relevance to the context-specific findings. However, the breadth of perspectives means that caution is required in applying all of the suggestions concurrently.

Insights for water behavioural projects

The insights from the guides are largely focused on advice (both practical and theoretical) for policy development. Key findings from each guide (indicated in parentheses by its number) are highlighted here. The suggestions below go towards building the 'package' of interventions advocated by the guides.

Enable

- (1) and (6): An 'unfreezing and re-freezing' as posited by Lewin's Change Theory is necessary in order for habitual water-wasting actions to be brought to conscious attention (unfrozen), changed, then repeated until they become new habits (re-frozen); for example:
 - switching off the tap when brushing teeth;
 - taking showers instead of baths;
 - washing vegetables in a bowl rather than under running water.
- (2): To tackle the issues of 'social acceptability' and 'acceptance of personal responsibility' of the consequences of water wasting, alternative lifestyle groups need to direct different messages to engender/reinforce the issues. For example, by establishing people's behavioural characteristics, practitioners will be able to work with influencing organisations in individuals' lives such as charities or sports/arts/religious organisations.
- (2): The 'intention-behaviour' gap can be narrowed by lowering the bar of 'expectation' of water-saving commitment for certain lifestyle groups. For example, offering an increase in convenience and choice of options so that intention is easier to implement such as more specific or flexible plumber appointments so people don't have to wait at home for half (or even whole) days.
- (6): Driving home the message, interventions need to take a holistic approach that

encompasses the whole system of production and consumption. The 'Production, Retail, Consumption' triangle¹¹ details this. Convenience for all agents – water companies, appliance retailers and customers – needs to be increased to reduce their 'intention-behaviour' gaps and enable them to implement changes in water behaviour.

Engage

- (2): Consumers perceive 'big business' as a barrier to environmental action. Water companies can overcome this perception by methods such as developing different brands of water-efficient appliances and change programmes which target specific lifestyle groups. Hence water companies need to use of social marketing practices to segment and target markets.
- (2), (8) and (10): The role of 'community' or 'change' champions to engage others around them is crucial. In the case of consumers, this could be especially significant for those identified as 'non-environmentalists' who exhibit a lack of trust in information. Thus social networking will play a crucial role in identifying and fostering these champions. For example, web-based communities and applications of social network theory can be used to link up lifestyle groups.
- (3): 'Collective choice theory' has been successful in explaining the success of many local efforts at sustainable development. It concerns itself with choices regarding scarce resources which require mutual restraint in consumption (e.g. water). The key message is that focus needs to be placed on the effort of the *group*, rather than the individual (an objective to be counterbalanced with the tailored approach), so marketing and media management should consider this.
- (3): Rather than attempting to predict when water behaviours will change, 'coaxing diffusion' through perpetual innovations will maximise behavioural change in this uncertain setting. Risk-taking, broad policies, simultaneous interventions at multiple levels, playing to the nature of the networks to which the individual belongs (e.g. spatially, belief or locally based) and using marketing expertise will all help to enable effective interventions. In other words, the message needs to come from a variety of different sources and directions in order to penetrate successfully.

Encourage

- (6) and (8): Carefully targeted regulation can force businesses to adapt their water usage behaviours. Evidence shows that consumer-side pressures alone may not be enough to do this, especially in SMEs. For example, water companies can set up 'OFWAT' style regulation for their business customers.

Exemplify

- (6) and (8): Business leaders drive change in this area. Their involvement through action learning groups and promotion of their water-saving activities sets an example. For example, interested parties can publicise successful behaviour change by such leaders through relevant media (e.g. *Financial Times*).
- (9) and (10): Fostering water-saving activities in SMEs and larger organisations should be supported. This can be done through:
 - encouraging business networks as fora for sharing best practice;
 - developing mentoring relationships between businesses, local authorities and voluntary organisations that provide specialist advice on water saving;
 - support skills and capacity building in organisations that offer help so that they can identify risks and opportunities in companies' practices;
 - increasing awareness to businesses of the issues and where help is available;

¹¹ Wilson R S, 2004 *A UK framework for waste prevention*. London: National Resource & Waste Forum (NRWF) Steering Group. Available from: <http://www.nrwf.org.uk/Wasteprevention.htm> [9 November 2009].

- providing more flexible funding to help organisations change their behaviour. For example, a ranking system (as used by WWF for power companies) of the 'best' water-saving organisations can be implemented to pressurise change and encourage partnerships with mentoring organisations.

Researcher comments

The various stances taken by these guides provides a good sounding board for formulating ideas relevant to the water industry. Some particularly interesting angles come from lifestyle group targeting (2) and working with businesses to drive change (9, 10). However, the interventions presented above should not necessarily be treated as a mix-and-match package. Careful strategising in light of other models of behaviour change will be needed to select the most effective parcel of interventions.

Reference: S9

TITLE	Promoting sustainable lifestyles: a social marketing approach – final summary report		
AUTHORS	Stewart Barr, Andrew Gilg and Gareth Shaw, University of Exeter (for Defra)	PUBLISHED	2006
CONTEXT	Social science: sustainability		
SOURCE	Available from: http://www.defra.gov.uk/sustainable/government/what/priority/behaviour/ChangeResearchAndGuidance.htm		
<p>Principal learnings</p> <p>This research set out to examine behaviour change in terms of three key issues:</p> <ol style="list-style-type: none"> 1. Linking environmental practice to everyday behaviour 2. Knowing who to target: through segmentation, providing a basis for targeting policy to specific lifestyle groups; 3. Establishing the potential for change: for each type of activity and lifestyle segment, examining the barriers and motivations for action. <p>The study re-examined quantitative data from a sample of 1,265 people surveyed in during 2001–2003 in four areas of Devon and gathered qualitative data from eight focus groups based on statistical analysis of the earlier findings to establish levels of behavioural commitment.</p> <p>Quantitative learnings</p> <ul style="list-style-type: none"> • Environmental activity is not carried out by people according to sector (e.g. water, energy) but according to three types of behaviour: <ul style="list-style-type: none"> - purchase decisions (i.e. shopping habits); - house related habits (e.g. turning off lights); - recycling (i.e. waste management) behaviour. • Four types of behaviour were identified: <ul style="list-style-type: none"> - committed environmentalists; - mainstream environmentalists; - occasional environmentalists; - non-environmentalists. • Behaviour is impacted by a complex range of variables, with none proving statistically significant. 			

Qualitative learnings

- **Barriers.** These vary according to lifestyle with cost, convenience and time being predominant. Time seems to be a crucial resource in today's society, with car journeys measured according to how long they take rather than distance or cost of fuel. People will not stop using supermarkets as they are convenient.
- **Incentives.** For specific practices, incentives are preferred to penalties for individuals, but industry should be penalised and existing penalties should be enforced more than they are across the board (e.g. 'everyone' drives at 80 mph, and is allowed to, so it's hard for people to change their driving behaviour even if it could benefit the environment and save them money).
- **Change** needs to be gradual and seen both to be shared and making a difference. People are willing to make incremental adjustments, but want to see that government and business are making changes too and to know what impact collective action is having (e.g. if people could see that 'everyone' was consistently driving at slower speeds, and know what impact that had on the environment, then they would feel able to sustain change themselves).
- **Intention-behaviour gap.** This exists, even among committed environmentalists.

Argument

Of the four behaviour types identified, the largest group is 'occasional', followed by 'mainstream'. No significant difference is seen between 'committed', 'mainstream' and 'occasional' according to either socio-demographic criteria or social and environmental values. However, 'non-environmentalists' are seen to be different from the other three types. Psychological variables show differences between the groups.

Two focus groups were conducted with each group type, who presented a range of degrees of awareness/perceptions/opinions in respect of six themes – summarised in the table below.

Theme	Group type			
	Committed	Mainstream	Occasional	Non
Awareness and responsibility towards the environment	<ul style="list-style-type: none"> • Widest knowledge • Awareness of food miles and global warming • Individual responsibility recognised 	<ul style="list-style-type: none"> • Lack of collective will an issue 	<ul style="list-style-type: none"> • Mix of awareness and confusion over facilities • Government and business responsibility required 	<ul style="list-style-type: none"> • Limited awareness • Mis-understanding
Experience of actions and role of facilities	<ul style="list-style-type: none"> • Explicit link between behaviour and financial savings (e.g. water meter) • Lack of clear information an issue (e.g. which plastics to recycle) 	<ul style="list-style-type: none"> • Laziness a factor • Tendency to perverse reaction (e.g. wasting water through running shower longer) • Lack of clear information on an issue (e.g. which plastics to 	<ul style="list-style-type: none"> • 'Warm glow' from doing little things 	<ul style="list-style-type: none"> • 'Pain in the arse' • Laziness • Expense • Lack of space

		recycle)		
	NB Environmentally friendly behaviour some of the time but at risk of being lost if not easy, convenient, costs, or if others don't do it			
Cost and convenience	<ul style="list-style-type: none"> Local, organic, 'fair trade' purchases as matter of principle and willing to pay more Mostly shop by car at supermarket 	<ul style="list-style-type: none"> Ambivalent – some see local/organic as more expensive, others as cheaper Congestion charge seen as tax 	<ul style="list-style-type: none"> Cost and convenience issues Products could have an environmental rating to allow consumers to make personal trade-off re price/ environmental impact 	<ul style="list-style-type: none"> Price greatest influencing factor
Branding	Generally mixed – some use branded clothes/food, others avoid deliberately. Deciding factors could be social/ethical, quality, value for money, desire to spurn being branded. Much cynicism about truth of labels, e.g. battery hen eggs in free range boxes; questions about environmental credentials of 'fair trade' label.			
Intended and actual behaviour and barriers preventing behaviour	<ul style="list-style-type: none"> Lack of choice forces gap Cost and convenience force gap 	As Committed plus: <ul style="list-style-type: none"> Laziness Perceived minimal impact of individual action 	<ul style="list-style-type: none"> Some not bothered Some want to do better but lack knowledge and convenience 	<ul style="list-style-type: none"> Lack of time Too much effort
Awareness and influence of policy making by controls and incentives	<ul style="list-style-type: none"> Aware but more publicity needed Mix of controls, incentives and education needed 	<ul style="list-style-type: none"> More publicity to emphasise threat of non-action and raise awareness Better enforcement of existing controls (e.g. litter) Mix of incentives and explanation 	<ul style="list-style-type: none"> Mix of incentives and education 	<ul style="list-style-type: none"> Government to lead by example Controls not seen as effective
	Controls on big business, not individuals			

Current relevance and issues

This report focuses predominantly on qualitative work; quantitative work also needs exploring to try to understand how the three types of activity and four types of behaviour were derived from the original data.

Although the types of statistical methodology are identified (factor analysis, cluster analysis and path analysis), it is not clear what the significant factors were in informing the cluster (behaviour) types, i.e. what criteria were used to segment both the original sample and the focus group participants into 'committed', 'mainstream', 'occasional' and 'non-environmentalists'. Also, it is not clear what range of variables was considered and which were significant, to what degree and among which clusters. It would also be interesting to see all the barriers mapped against each cluster type.

An analysis of significant factors/similarities and differences within and between cluster types, mapped to barriers, would help to identify whether these four types provide an appropriate segmentation model for targeting environmental behavioural change interventions.

Insights for water behavioural projects

Much of what comes out from this study is already known and is also very general. Where possible, key insights have been drawn out and translated for the water context.

Enable

- Make water conservation behaviour easy, convenient, free of cost, quick (i.e. no additional cost in time or time saved) and incremental.
- Provide clear information/education to support the change.
- Make the desired water conservation behaviour the only choice!

Engage

- If segmenting according to the four cluster types, target each differently.
- Highlight zero cost in time or time-saving.
- Target purchasing behaviour separately from habitual household level behaviour, which requires a joined up approach, i.e. cross-sectoral partnerships.
- Work with/through large retailers.
- Use branding, but it needs to be trusted in order to overcome cynicism – if working cross-sectorally, then brand should apply across the board.
- Show who is doing what and impact of collective action.
- Show the impact of non-action.

Encourage

- Incentives for individuals.
- Penalties for business.
- Better enforcement of existing controls/obligations – in the case of water, this links to leakage behaviour.

Exemplify

- Government to be seen to be leading by example.
- Impact of collective behaviour needs to be seen by people (for themselves).
- Impact of non-action needs to be seen.

Researcher comments

As mentioned in the section on Relevance and Issues, the quantitative data should be explored to see if further understanding of the segmentation model is forthcoming.

Reference: S10

TITLE	Triggering widespread adoption of sustainable behaviour.		
AUTHORS	Brook Lyndhurst (for Defra)	PUBLISHED	Summer 2006
CONTEXT	Social science: sustainability		
SOURCE	Available from: http://www.defra.gov.uk/sustainable/government/what/priority/behaviourChangeResearchAndGuidance.htm		
<p>Principal learnings</p> <p>This short report is based on a review of three conceptual models of change:</p> <ul style="list-style-type: none"> • Malcolm Gladwell's Tipping Points (2000) • Phillip Ball's 'Critical Mass' (2004) • Mark Buchanan's 'Ubiquity' (2002) <p>Although the contributions from these texts are at first sight very different and at times apparently inconsistent, the report identifies three important, common factors.</p> <ul style="list-style-type: none"> • Inherent uncertainty. The Gladwell analysis (S-curve) cannot tell us precisely how many and which connectors, mavens and salesmen will be needed to catalyse a transformation. The Ball model (phase transition) cannot tell us precisely when a change will occur. The Buchanan approach (punctuated equilibrium) cannot tell us which steps will be large and which small. These limitations are not an outcome of weak analysis, poor understanding or a shortage of data, they are inherent, emergent properties of the large, open, complex systems that our societies are. • Networks. The mechanisms by which pro-environment behaviour change will take place will be among groups in society that are network-based. Better understanding of which networks are functioning, in what ways, with respect to different types of environmental behaviour – switching off lights, recycling, walking rather than driving, and so forth – will add powerfully to the ability of policy-makers to target their endeavours. • Broad targeting is not merely appropriate, it is essential. Within all network systems, there will be foci of greater influence, either because of the strength of linkages, the frequency of linkages or linkages to other networks. Identification of key intervention points will not merely be more resource efficient, it will maximise the chance of having any influence at all on the system in question. Rather than just focusing on the most important groups, in order to boost the probability of success policy should be focusing on groups whose network properties best lend themselves to the diffusion of change. 			
<p>Argument</p> <p>Taken together, the three elements identified by the Brook Lyndhurst analysis – inherent uncertainty, network based, targeted intervention – culminate in the idea that policies to promote pro-environmental behaviour cannot in fact aim to 'nudge an S-curve'. Such an idea falls into the trap of presuming a potential linear connection between cause and effect, between intervention and outcome. Instead, the radical idea presents itself that policy should be attempting perpetually to 'seed' or catalyse change, through a wide variety of mechanisms, in a wide variety of places. A range of fundamental features of the social system mean that a model of policy intervention predicated on the steady refinement of interventions towards a set of policies that 'work'</p>			

may be ill-founded. Rather, given the complexities of 'behaviour change', a model of ceaseless innovation – with broad parameters of focus and in a network setting – offers a potentially valuable conceptualisation of how to move forward.

The authors acknowledge that, in many respects, the quest for 'innovation' is already embedded into policy-making (they reference the Environment Action Fund and the 'Engage, Encourage, Enable, Exemplify' model in the UK Sustainable Development Strategy as examples). However, the interesting element of this report's findings is not the need for innovation per se, but the need for perpetual innovation in a setting of inherent uncertainty and in the absence of an ultimately effective set of policy interventions towards which to refine policy.

Current relevance and issues

By taking on board insights from complexity science and reflecting a post-modernist agenda, this report stands out as somewhat different from the others reviewed. The implications of the authors' thinking (in terms of relevance to contemporary debate and policy development) can be summarised as follows:

- **Tolerate waste and take risks** – risk-taking as an inevitable part of behaviour change policy-making.
- **Build on successes but avoid over-specifying policies.** Detailed knowledge on the behaviours, motivations, desires, etc. of groups (networks) and the interrelations (linkages) between them will help to construct policies which should work, but in the absence of causality we cannot be sure that they will work.
- **Statistic rather than ballistic approach** – policy should aim simultaneously to intervene on multiple levels in order to maximise the probability of behaviour change.
- **Focus on the common denominator of groups and networks.** The issues that provide the basis for belonging to a group (the nature of the network linkages) are the appropriate locus for intervention with that group or network.
- **Hitchhike on consumer marketing.** The greatest expertise in the art of persuading people to change their behaviours is found in the field of marketing. In formulating interventions, policy should continue to make more explicit, strategic and tactical use of this kind of resource.
- **From Pilots to Crystals.** Interventions need to progress from a model in which novel ideas are piloted, refined and then (if successful) rolled out to one in which novel ideas are used perpetually to seed, catalyse or act as crystals for pro-environmental behaviour change.

Insights for water behavioural projects

As noted above, the authors of this report recognise the role that the 4Es can play but go further in calling for perpetual innovation in a setting of inherent uncertainty. The comments below take this proposed strategy as a starting point and anticipate how the effectiveness of the 4Es might be affected by it.

Enable

Effective enabling strategies and tools are complementary with existing institutional, technological and social systems. A high rate of innovation risks creating discontinuities and incongruences between an enabling action and the setting it is designed to serve. More than any other element of the 4Es, 'enabling' bridges the gap between the old and the new (behaviours, technologies, etc.) and there is, arguably, a case for conservatism in the design of enabling functions and tools.

Engage

In one sense, perpetual innovation in this area could generate confusion among consumers who look for consistent messages and storylines that legitimate or justify behavioural change. Inconsistent messages, particularly about the nature and immediacy of the problem/challenge, could also provide excuses for non-response and apathy. Variation in the mode or means of engagement may prove more fruitful however.

Encourage

Here, continuous innovation could prove highly productive. Individuals respond differently (some might even say idiosyncratically) to different styles of encouragement. Variation in the nature, function and longevity of social networks is a prime example of how opportunities for encouragement are often transitory and difficult to take advantage of.

Exemplify

Again, constant innovation could be productive here. Experiences from other fields (i.e. technology transfer) suggest that using a diversity of examples of demonstrating benefit and utility quickly generates a critical mass of change advocates. Such examples also need to be responsive to emerging trends and niche applications where additional advantages might be identified.

Researcher comments**Reference: S11**

TITLE	Choice matters: alternative approaches to encourage sustainable consumption and production		
AUTHORS	David Uzzell, Rachel Muckle, Tim Jackson, Jane Ogden, Julie Barnett, Birgitta Gatersleben; Peter Hegarty, Eleni Papathanasopoulou (for Defra)	PUBLISHED	2005
CONTEXT	Social science: sustainability		
SOURCE	Available from: http://www.defra.gov.uk/sustainable/government/what/priority/behaviourChangeResearchAndGuidance.htm		

Principal learnings

This Defra-sponsored study conducted by a team from the University of Surrey was based on two multi-disciplinary expert workshops focused on influencing and understanding behaviour, plus an extensive literature review and collation of evidence from other research. The overall objective was to assess the relevance or potential of three approaches to sustainable consumption and production:

1. Restricting choice and constraining freedom
2. Using social networks
3. Provoking emotions.

Overall, the project found compelling evidence that the three reviewed approaches to promoting behavioural change would be effective in influencing behaviour change towards sustainable consumption and production.

It also suggested the following initiatives:

- A research project based on the alternative approaches would be a major step forward for Defra policy-makers and analysts in furthering understanding.
- Action based research projects should be considered to measure people's actual resistance to change (e.g. under what circumstances is forced behaviour change acceptable?). Such research projects should assess the long-term impact of forcing behaviour change and indicate at what point a positive response to the new behaviour comes into being.
- Techniques employed in social marketing, which hold potential promise for behavioural change, could be explored further in conjunction with recognised findings from research relating to social influence processes and social networks.
- Research is commissioned to identify which emotions are sympathetic to changing consumption and production, and will be most likely to lead to behaviour change. The report's authors recommend that the emphasis should be on positive emotional responses to sustainable consumption and production, e.g. making people feel good about their behaviour rather than making them feel fearful of the consequences.
- The evaluation criteria identified (i.e. scientific and policy development) should be used to ensure that projects, initiatives and strategies designed on these guidelines would have built in methods to measure effectiveness, giving decision-makers the reassurance that the evidence upon which policies are based is sound and robust.

Argument

Evidence suggests that there is a strong argument for the need to 'kick start' change through regulation. The example shown in the case study suggests that people are willing to change but feel unable to do so.

Evidence suggests a social networks approach is a good framing for future research as it deals with the adoption of new behaviours rather than thinking about attitudes and perceptions. Increasing sustainable consumption and production could be conceptualised within the context of the diffusion of innovation; the spread of a new idea from the early stages when few people adopt the innovation to the time when almost all members of society accept it. The notion of social networks is a key to understanding diffusion of innovation as it helps understand who influences who. Research conducted during World War II highlighted the importance of identifying key people and facilitating communication within their social networks.

Evidence suggests that sustainable behaviour can be substantially explained by moral emotions. Previous research has often focussed on the role of negative emotions (e.g. fear), which play a part in the encouraging more positive environmental behaviour. However, recent transport research has shown that positive emotions play an important role in travel behaviour; the emotions evoked by travelling relate to people's preference for a particular transport mode. An experiment that evoked the emotion of fear as a basis for attitude change demonstrates clearly that emotions have a part to play in encouraging sustainable consumption and production.

Current relevance and issues

The premise of this research is that the choices made during production and consumption are of primary importance to the sustainability debate. When producers decide to make a particular product, they choose to use resources in a way which may or may not be sustainable. Consumers then have the option to buy these products, which may or may not have been produced based on sustainable principles and which

may or may not be sustainable in their use of resources over the product lifespan. Such choices are critical throughout the life span of a product, service or utility from production to purchase, consumption and disposal. It is these choices that must take into account environmental resources and disposal as well as other social and economic sustainability issues over and above aesthetic appearance, 'must-have' branding and basic functionality. The question therefore is how to make sustainability an automatic and primary part of producer and consumer choice rather than an optional extra of fringe interest.

The research has cross-cutting relevance to both the Government's *Securing the Future*¹² (2005), and Defra's Framework for Sustainable Consumption and Production¹³ (2003), as well as the work of many other government departments such as DTI, DfT and ODPM. *Delivering the Essentials of Life: Defra's Five Year Strategy*¹⁴ (2004) highlights changing behaviours and the need for producers and consumers to adapt. It recognises that particularly the sustainable consumption part of the framework in particular is underdeveloped. Furthermore *Securing the Future* (sustainable development strategy) specifies sustainable consumption and production as one of four agreed priorities.

Insights for water behavioural projects

Enable

This document does not address enabling factors.

Engage

The report suggests that 'provoking emotions' has a part to play in encouraging sustainable consumption and production. The argument is that emotional experiences can have an important influence on people's overall attitudes towards a particular experience, and therefore may influence their future behavioural intentions and be an important means of achieving policy outcomes. Evidence to support this proposition is provided in the report, but neither candidate nor appropriate techniques for achieving such provocation are articulated.

Encourage

The role of social networks is emphasised within the report as a useful way of framing the adoption of new behaviours. Regulation is also suggested as a way of kick-starting behavioural change.

Exemplify

Not explicitly addressed.

Researcher comments

¹² <http://www.defra.gov.uk/sustainable/government/publications/uk-strategy/>

¹³ <http://www.defra.gov.uk/Environment/business/scp/index.htm>

¹⁴ <http://www.defra.gov.uk/corporate/about/what/5year-strategy/index.htm>

Reference: S12

TITLE	I will if you will: towards sustainable consumption		
AUTHORS	Sustainable Consumption Roundtable	PUBLISHED	May 2006
CONTEXT	Social science: sustainability		
SOURCE	Available from: http://www.sd-commission.org.uk/publications.php?id=367		
<p>Principal learnings</p> <p>The headline assessment of this report is that a critical mass of citizens and businesses is ready and waiting to act on the challenge of sustainable consumption. But to act, they need the confidence that they will not be acting alone, against the grain and to no purpose. Both the business world and citizens are increasingly willing to embrace key aspects of a smarter, more sustainable lifestyle, but on one reassurance: that others, whether your neighbour at home or your competitor in business, act likewise – the simple idea of ‘I will if you will’.</p> <p>The report goes on to emphasise that it is government, at all levels, which is best placed to co-ordinate a collective approach to change through an enabling policy framework. People, business and government each occupy a corner in a triangle of change. Different corners lead at different times by doing what they can do best. Until now this has often been accidental. The change might be profound if it were co-ordinated. The report only identifies evidence-based learnings from the previously published <i>Looking Forward, Looking Back</i> report of 2006 as follows;</p> <ul style="list-style-type: none"> • There is not enough evidence that green consumers on their own are able to change mainstream product markets. These consumers may, in some cases, have played a role as early adopters, but the translation to the mainstream depends on a number of other factors. • The crucial requirement is for products to perform up to the expectation of the relevant market. Successful products are largely not sold on a green or ethical platform unless they appeal strongly to the emotions, as in the case of dolphin-friendly tuna. People do not eat sustainability or drive it. They eat food and drive cars, and product performance has to be the primary focus of marketing, even for sustainable products. • Choice editing for quality and sustainability by regulators, retailers and manufacturers has been the critical driver in the majority of cases. Simply providing information fails to get more than a minority of people buying the most energy-efficient dishwashers, fridges and washing machines. But when labelling is combined with action on the part of regulators, retailers and manufacturers, rapid efficiency gains mean even the least efficient new fridge freezer on sale today consumes only half as much energy as the least efficient products on the market eight years ago. • Labelling of performance ratings from A–G is a key enabler for choice editing, but does not by itself drive significant market transformation. • Early announcement of legislation to set minimum standards drives a virtuous cycle of rapid innovation and further choice editing by retailers and manufacturers. • Voluntary industry initiatives are an important ingredient. In the case of dishwashers and washing machines, manufacturers averted regulation by negotiating to remove 			

models rated D or below voluntarily. But voluntary industry initiatives rarely play a leadership role.

- Fiscal incentives only work if they close the price gap for more sustainable products or create significant tax rebates for their use. Incremental VAT reductions on products like compact fluorescent lamps (CFLs) and insulation do not by themselves create demand.
- Where a sustainability issue acquires emotional resonance, consumers can lead some degree of market transformation. To date, this has generally been confined to food-related issues that align with people's emotional concerns for personal health and animal welfare. External events – NGO campaigns, a food scare or a climate-related event – can suddenly cause background concerns to be manifested in consumer behaviour change. Businesses that move in anticipation of this type of external influence and sudden consumer awareness can become market leaders.

Argument

The report sets out how a significant shift towards more sustainable lifestyles is possible and positive all round. While accepting that some of the building blocks are already in place, it emphasises the need to take action that enables people to take up the more sustainable habits and choices that they want. The message is on the need to create a supportive framework for collective progress rather than exhorting individuals to go against the grain – encapsulated in the notion of 'I will if you will'. The conclusion is that it is possible to make sustainable habits and choices easier to take up by drawing on insights about consumer behaviour and using people's preferences for purchasing shortcuts, and what the authors call the trend towards 'choice editing'.

The following points are raised:

- **People, business and government.** The three groups at the corners of the 'triangle of change' are posited to play a key part in this transformation. The report looks at each group in turn and then at policies that can link them. The illustrations offered do not solve all the issues of a sustainable future. But by opening people's minds to the impacts of their actions and demonstrating alternatives, they help build the space for more mandatory policies to tackle the most difficult issues.
- **There is space for change.** Government can be bolder about driving markets, as there are 'win-win' outcomes. A mass of people are ready and willing to see new policies introduced that will help them change their behaviour in the face of climate change and global poverty. But they need the government to set an example and make it easier for them to do the right thing.
- **Start from where people are.** Four areas of our lives generate four-fifths of our overall impact on the environment around us: how we run our homes; the food we eat; how we get around; and how we travel on our holidays. The way to connect with people's aspirations in these areas is to promote symbolic and effective action that touches their everyday lives.
- **Don't put the burden solely on green consumers.** Government and business must focus fairly and squarely on mainstream consumers rather than expecting the heroic minority of green shoppers to shop society's way out of unsustainability. Choice editing by manufacturers, retailers and regulators already has a track record in getting high-impact products off the shelves and low-impact products onto them – so bring out the responsible consumer in everyone by making sustainable products the norm.
- **Show people they're part of something bigger.** People are willing to change, but they need to see others acting around them to feel their efforts are worthwhile.

Fairness matters. A combination of incentives, community initiatives and local feedback will reassure people that they are part of a collective movement that's making a real difference.

- **Develop the tools and momentum to tackle more difficult issues.** There are ways in which sustainability imperatives collide with contemporary consumer aspirations, particularly when it comes to foreign travel and the car culture. With the right process, government should not be scared to engage people and business in dialogue on thorny issues.

Current relevance and issues

The Government's sustainable development framework for the UK aims to deliver a better quality of life within global limits. The challenge of sustainable consumption is about ways of living that can achieve both principles. The opportunity explored in this report is whether we can update our lifestyles and get smarter about how to do this.

The contemporary relevance of the study is demonstrated through reference to national and international drivers and initiatives. On current growth rates, Chinese consumer spending will make the country the world's second largest market in terms of household consumption by 2014. Over the same time horizon, the UN Millennium Development Goals aim to drastically cut human poverty. Sustainable consumption is not a luxury concept for the rich to worry about. It is a necessity for all. The connections between how we live and the natural systems of the planet are made opaque by the complexity of today's economy. Yet the simple truth is that if everyone in the world consumed at the average rate we do in the UK, we would need three planets.

The study findings, which are upbeat and positive, build on what has been achieved through the recognition of the wider challenge of 'sustainable development' in so much of business life and government policy. The work was set in train by the Government's sustainable development strategy, *Securing the Future*, which establishes sustainable consumption and production as one of four priorities. The principles enshrined in this strategy for UK make clear for the first time that sustainable consumption is the model we need to realise the twin goals of 'living within environmental limits' and 'ensuring a strong, healthy and just society', underpinned by good governance, sound science and a sustainable economy. Building on the thinking first set out in *Changing Patterns*, alongside work from the Prime Minister's Strategy Unit, *Securing the Future* illustrates the UK Government's increasingly sophisticated model of behaviour change for sustainable consumption

The findings by the Sustainable Consumption Roundtable provide a platform for building practical steps with consumers. The findings also build on existing government action relating to the role of business and the products they make and sell in achieving sustainable consumption. The report draws on the recommendations of the government's Advisory Committee on Consumer Products and the Environment, as well as pioneering sectoral strategies co-ordinated by both DTI and Defra, including the draft Food Industry Sustainability Strategy.

Insights for water behavioural projects

This document makes significant use of the 4Es framework as a way of helping people make better choices. It argues that the distinguishing feature of sustainable consumption policy will be the way in which it engages honestly and courageously with people to create and retain its mandate. But although the text is scattered with short examples of how these components of a sustainable consumption strategy might be effected, there is little evidence of impact /influence.

Enable

The report draws attention to the primary role of information from government and product/service suppliers in enabling choice and also self-monitoring of sustainable consumption patterns. It also draws attention to the importance of enabling people to be part of the solution instead of simply blaming them as part of the problem.

Engage

The need for government courageousness in engaging with other stakeholders and the public on difficult and potentially contentious issues is a feature of the report. Allusion to the 'right process' for achieving such engagement suggests that the authors are unable to go beyond broad prescription, but the message itself is well evidenced.

Encourage

Little direct material in the report is relevant to this component. The report lauds the role of social networks and group settings in overcoming apathy and encouraging people to help each other achieve sustainable change, and also flags up the role of business services in encouraging sustainable consumption.

Exemplify

Perhaps the strongest feature of this report in the context of our study is in terms of highlighting the power of role models. In particular, the report promotes the role of government and public institutions in providing leading light examples of change.

Researcher comments**Reference: S13**

TITLE	The new ecological paradigm in social–psychological context		
AUTHORS	Paul C. Stern, Thomas Dietz, and Gregory A. Guagnano	PUBLISHED	November 1995
CONTEXT	Social science: general sustainability		
SOURCE	<i>Journal of Environment and Behaviour</i> , 27(6), 723-743.		

Principal learnings*Background*

At the time of writing, the New Ecological Paradigm (NEP) was the most frequently used measure of public environmental concern – a scale of 15 items developed by Dunlap, Van Liere et al. (1978, 1992) concerned with:

- the present or future state of the biosphere;
- human relationship with the nature;
- characteristics of the biophysical world;
- relative rights of humans.

According to Stern et al., the NEP represented:

‘a coherent cognitive structure, or worldview within which human survival is understood to depend on the health of the global environment’.

Study method

The authors embedded the content and logic of the NEP in a larger conceptual model, married with social–psychological work on environmental concern (Schwartz’s 1978 norm-activation model, which analyses behaviour as a function of beliefs about the consequences of actions and norms about personal responsibility). In addition, the larger model included:

- norms based on self-interest;
- concerns for other species, the biosphere and other humans;
- linkage of norms about behaviour to protect the environment to awareness of the consequences of ongoing (or anticipated) environmental conditions for self, the biosphere and others.

The resulting General Awareness of Consequences (GAC) model was used to survey a random sample of 199 adults. Statistical analysis was then carried out to understand whether the NEP can be considered a ‘generalised belief’ about human–environmental relations, underlying more specific beliefs and attitudes.

Conclusions

- NEP measures a generalised set of beliefs/worldview about human–environmental relations.
- Such beliefs can be seen as a link between social structural forces, the socialisation processes that influence them, and specific attitudes and behaviours that flow from them.
- NEP and GAC may be measuring two closely related but distinct concepts, not quite in the same place causally: ‘if NEP measures folk ecological theory, then GAC may measure folk environmental impact assessment’.
- General assumptions about causal ordering (as with other social–psychological theories) require testing to inform further work on environmental attitudes and behaviour, specifically:
 - the way values and worldview are implicated in the framing of public debate and construction of public opinion: ‘how the general influences the specific’;
 - the way new information about the environment (including that presented by the media, in conversation with others, and from day-to-day experience) influences values and worldview: ‘how the specific influences the general.’

Argument

Stern et al. perceive the NEP to be a measure of ‘folk ecological theory of how the world works, the nature of the biosphere, how it functions, and how it is affected by human actions’ and want to understand how such a set of general beliefs fit into a theoretical model of environmental concern they developed in which individual behaviour is a function of behavioural commitment and intentions, which in turn are:

- impacted by specific beliefs and attitudes;
- influenced by general beliefs, worldview, folk ecological theory which act as filters for new ideas/information;
- governed by values derived from position in social structure, institutional constraints and incentive structure.

Their model is presented without causal linkages as, although they believe it to be a top–down process (from social structure to behaviour), they point out that:

- there will be exceptions and feedback loops that need testing;
- non-adjacent variables can impact each other directly.

They also note that:

- the individual is embedded within a social structure with strong influence on all psychological variables, which shapes early experience and thus values (which are probably fairly stable over life because they can only be challenged in terms of their desirability and appropriateness) and general beliefs/worldview (which are vulnerable to empirical challenge);
- values and worldviews are 'causally antecedent to personally held norms, intentions and other proximate causes of particular actions'.

Current relevance and issues

Although written in 1995, the learnings are still relevant, specifically the points about:

- values and worldview being causally antecedent to personally held norms;
- individual behaviour being embedded within a social structure that shapes early experience – and therefore values are formed early in life, within the family, becoming 'as basic as personality itself';
- values being challenged in terms of their desirability or appropriateness;
- influence of the media, other people and our day-to-day experiences on values and worldview.

Insights for water behavioural projects

The relevant learnings can be translated into the 4Es model as follows:

Enable/Encourage

- Put in place the necessary infrastructure/legislation/support to change the social context, so that values not supporting the desired behaviour can be challenged as being undesirable/inappropriate.
- Ensure day-to-day experiences of new behaviour reinforce its continued practice.

Engage

- Target young people through experiential methods and via a range of formative influencers (e.g. families).
- Work with the media to influence appropriately.
- Identify and work with key influencers on target audience.

Exemplify

- Through showcasing appropriate behaviour of key influencers.

Researcher comments

The model depicted in this paper seems much more useful than the NEP sounds from its description. It is important to note that this model is not the NEP and that the NEP sits within it as general beliefs/worldview/folk ecological theory.

Reference: S14

TITLE	Community learning and action for sustainable living: a summary of initial research findings		
AUTHORS	WWF-UK and Defra	PUBLISHED	2006
CONTEXT	Social science: sustainability		
SOURCE	Available from: http://www.wwflearning.org.uk/data/files/clasl-design-summary-web-383.pdf		
<p>Principal learnings</p> <p>The Community Learning and Action for Sustainable Living (CLASL) project conducted a review of a range of secondary sources concerned with:</p> <ul style="list-style-type: none"> • behaviour and attitude change, both generally and in relation to sustainable consumption; • community involvement with sustainable living. <p>Findings were consistent across five themes:</p> <ol style="list-style-type: none"> 1. Public awareness of environmental sustainability – this is high, and more is not needed 2. The problem is not a lack of information – but a range of other factors 3. Behaviour change – requires social learning to sustain it 4. Environmental citizenship – where people act for the common good rather than just as consumers 5. Social learning in behaviour and value change – where people work together and are empowered to find their own answers to problems. <p>The conclusion was that the CLASL project should include at its core both action learning (AL) and research (AR), and monitoring and evaluation (M&E), in order to ensure social learning. Both AL and AR in a project context require groups or teams of participants to be facilitated by someone with relevant skills. M&E should be participative, and aim to capture and share lessons in a meaningful way.</p>			
<p>Argument</p> <ol style="list-style-type: none"> 1. Public awareness is high and what is needed is practical support tailored to a particular behaviour and locality; linkage of individual/community change to wider change (including government and business) to create a critical mass so that sustainable living is mainstreamed; and sharing of lessons on what works. 2. Information alone does not create change. Other factors include: <ul style="list-style-type: none"> • lack of trust in the messenger/message; • value/action gap; • lack of time/resources; • perception that an individual cannot make a difference. 3. Behaviour change. Individual behaviour is based on individual values and attitudes (shaped by collective and social norms and expectations), habits and situations. Sustained behaviour change is not brought about by taxes and incentives alone, but through social learning utilising peers and role models. 			

4. **Environmental citizenship.** People take a role as 'citizen' as distinct from that of 'consumer'. As environmental citizens they act on behalf of society for the common good in relation to ensuring current and future generations have access to the resources they need. Sustainable living requires that people take both roles at different times.

5. **Social learning.** Values can change through social learning and people learn from each other, often through working together in a 'communality' (action learning), which might be geographically local or communal in some other way. Either way, links with mainstream organisations are needed to ensure top-down support and bottom-up/top-down learning. Social learning allows people to find their own answers to problems at different times.

Current relevance and issues

The learnings from this study are still relevant and underpin a number of approaches/interventions:

- Social marketing argues that information alone is not enough to create a sustained behaviour change, requiring infrastructure, support, skills and education processes, working together with all concerned, insight into what motivates different individuals, and empowerment of the individual;
- The Defra-funded waste research project WRT419 is taking an action learning/research approach to the issue of food waste through facilitating young people in schools and youth groups to understand the issue and its context, and empowering them to develop possible solutions which they will communicate to local and central waste policy decision-makers.
- The Defra-funded waste research project WRT113 applies the Global Action Plan approach to involve groups of volunteers with changes in waste behaviour through local, facilitated EcoTeams.

Insights for water behavioural projects

As can be seen from the application of the 4Es diamond model, the learnings from the CLASL literature review translate into a clear set of actions for inclusion in a strategy focussed on water-efficient behaviour.

Enable

- Practical support tailored to water-efficient behaviour.
- Overcome barriers (real or perceived) (e.g. lack of time and resources).

Engage

- Tailor support to specific audiences.
- Share lessons of what works.
- Use trusted messengers.

Encourage

- Share lessons of what works.
- Kick start change through incentives and disincentives.
- Shift values to sustain change through providing action learning opportunities with respect to water efficient behaviour.

Exemplify

- Show how individual/community change links with wider changes in water efficient

<p>behaviour (water companies, government, business) so that people can see that their action can make a difference.</p> <ul style="list-style-type: none"> • Show that a critical mass is being achieved so that people can see water efficient behaviour is being mainstreamed. • Share lessons of what works. • Use role models and peers. <p>Empower</p> <ul style="list-style-type: none"> • Use action learning and research to facilitate people to develop their own solutions to the problem and adjust water company/government/business behaviour/policy accordingly. • Treat people as citizens as well as consumers. • Work in partnership with everyone concerned.
Researcher comments

Reference: S15

TITLE	Mobilising individual behavioural change through community initiatives: lessons for climate change		
AUTHORS	Centre for Sustainable Energy & Community Development Exchange (for Defra)	PUBLISHED	2007
CONTEXT	Social science: sustainability		
SOURCE	Available from: http://www.cse.org.uk/pdf/pub1073.pdf		

Principal learnings

There is little empirical evidence to back up the hypothesis that communities are well placed to influence individual behaviour. Where such evidence does exist, it has been difficult to measure the captured added value of the community initiative on the behaviour change, although tools to do this have recently been developed and piloted.

There appears to be a 'language barrier' between different community-based initiatives, as the term 'behaviour change' means different things to different practitioners. The authors fear this will make transferability of findings difficult.

Six critical success factors for community initiatives are identified:

- ownership and control of projects by the local initiatives;
- relevance to local needs;
- the ability to achieve small successes;
- a sense of satisfaction and well-being;
- receiving an appropriate response from those in authority;
- a trusted and sustained resource base.

It was found that a supportive national policy context is needed to influence the

formation and support for community-based initiatives but that, on their own, these would be insufficient to motivate behavioural change. Research suggests that developing trust with a community is very important to establish and maintain the engagement of individuals. This long-term process requires adequate and sustained funding. Local authorities can provide qualitative support by developing and supporting community programmes, especially where this is joined up with support from officers and members. Another area scoped for possibilities was the linking up of community initiatives with education programmes.

The key challenge for stimulating individual and community engagement to tackle climate change is to address the need for a realistic, dynamic sense of collective agency ('We have ... now you' rather than 'I will if you will') and is consistent with national policy.

Argument

The issue of climate change is long term, 'worst somewhere else' and has benefits of action which accrue principally to unknown others elsewhere at some unspecified point in the future means individual actions are invisible and insignificant in the context of the science of climate change.

This paper looks at climate change in this global perspective instead of trying to squeeze it into the straightjacket of simply another local behaviour change programme. It was realised that this could lead down the route of community initiatives trying to change the focus of climate change to make it seem like a local issue. This risks 'forcing the science' as climate change is unlikely to have many immediate local impacts, when instead the focus is better placed on trying to engage people into a sense of collective action and responsibility.

Current relevance and issues

The issues of water behaviour are intrinsically tied up with climate change, so many of the key arguments are directly transferable. However two drawbacks to this study are:

- it was conducted over a very short timeframe, with a limited theoretical literature review and questionable methodology;
- there is an acknowledged shortage of robust empirical studies within this field, and few ways to measure their impact.

Insights for water behavioural projects

The paper provides a number of suggestions for the appropriate role of local and community initiatives, and what is needed to enable and engage communities to undertake this role successfully.

Enable

- Some work needs to be done to develop a standardised language of what 'behaviour change' and 'behavioural measures' mean in terms of water behaviour. This is so community initiatives have a common understanding and can minimise transferability issues.
- The issue of measuring the impact of community projects on (water) behaviour change programmes needs to be addressed. A tool has been developed by the WWF and CAG Consultants, and its success should be monitored.
- Building on active initiatives, rather than starting from scratch, has been found to be effective. This approach also benefits from existing community trust and project credibility.

Engage

- Trust, social networks and social cohesion within the community need to be fostered. This will require a long-term funding commitment, stable government priorities and strong community engagement techniques in the area of water behaviour. Thus, initial scoping and planning is important before there is a commitment to new community initiatives.
- Local authorities need to be involved in promoting water behaviour change. Evidence to date has shown them to play a crucial part of successful community initiatives, though their impact cannot easily be measured.
- Linking water behaviour initiatives in the community with relevant education programmes may be an effective tool. This could take the shape of initiative involvement with the curriculum or less formally (and perhaps more realistically) at school assemblies or presentations.
- If a collective attitude is to be successfully developed, interventions should honestly reflect the scientific insignificance of individual actions around water behaviour. It should focus on the political and environmental significance of group action and demonstrate how this genuinely underpins the legitimacy of UK leadership in seeking a global solution to the threat.

Encourage

- An affirmative national policy context is important in stimulating and shaping community initiatives. National policy on water usage must be made relevant to local needs, though such an outcome is beyond the control of this project.

Recommendations for further action

- The Government needs to set clear roles and guidelines for the community sector around what levels of behaviour change they should be achieving.
- The Government must review its policies, programmes and organisations to assess whether they are providing a supportive infrastructure for successful community based initiatives.
- An assessment of current communication strategies around the issues of climate change (and water behaviours) needs to be undertaken to ensure that a sense of common purpose and collective agency is being promoted.
- Further evaluation of community based initiatives is required. It is suggested that research councils should initiate a thorough longitudinal study of community based initiatives.

Researcher comments

Both climate change and water usage are global issues, so this paper is an excellent example of easily transferable findings. It highlights that communities are unlikely to pay heed to these issues without active intervention by local, issue-led organisations. They need to be led to the issues rather than finding their own way there. While some of the suggestions are somewhat lightweight and underdeveloped, there appear to be the beginnings of some good suggestions here, which if implemented, could lead to a richer field of empirical work and measurement tools to silence those who doubt the efficiency of community-based motivations to change behaviour.

Reference: S22

TITLE	(1) Making it obvious: designing feedback into energy consumption (2) RED Future Currents: Designing for a changing climate. Work in progress. Section 6: The householder as active energy manager		
AUTHORS	(1) Sarah Darby, Environmental Change Institute, University of Oxford (2) RED – Matthew Lockwood and Robin Murray	PUBLISHED	(1) 2001 (2) 2005
CONTEXT	Social science: sustainability		
SOURCE	(1) In Proceedings of 2nd International Conference on Energy Efficiency in Household Appliances and Lighting, Italian Association of Energy Economists/ EC-SAVE programme. (2) Design Council RED Future Currents project. Available from: http://www.designcouncil.info/futurecurrents/downloads/FutureCurrents-RedesigningEnergyPolicy-18-10.pdf		

Principal learnings

Study (1)

Sarah Darby's study suggests that the individual consumer sees energy in three main ways:

- as a commodity;
- as social necessity;
- as an ecological resource.

Environmental policy aimed at reducing energy use has failed so far to recognise adequately the crucial link between our (generalised) sense of our environment and our (specific) daily needs and actions. There is a need to extend expertise much more widely and to do so by focusing on how people connect their lives to the environment.

The study considers a general approach to cutting carbon that begins from existing patterns of energy use in their cultural context and looks at needs and aspirations, aiming to identify processes by which people might come to use energy in more environmentally friendly ways.

Literature on the effectiveness of three types of feedback to domestic consumers was reviewed:

- direct feedback in the home;
- indirect feedback via billing;
- 'inadvertent' feedback (a by-product of technical, household or social changes).

The study concluded that:

- direct feedback in conjunction with other factors such as advice/information has a significant role to play in raising energy awareness and in bringing about reduced consumption of the order of 10 per cent;
- direct financial incentives make little lasting impact – once withdrawn, consumption

reverts;

- there does not seem to be any correlation between the scale (or temporal location) of the project and the outcome in terms of reported savings/awareness;
- opportunities exist for designing it into energy-related systems which have yet to be realised, for example:
 - developing billing to send more frequent and clearer messages to customers;
 - providing accessible, clear and simple feedback and information systems to allow people to understand how to control their energy;
 - making energy more visible to reinforce the link between energy as we consume it and as an ecological resource.

Study (2)

The Design Council study sees energy consumers as co-creators of their own energy services, actively managing use and production, and concludes that a 5 per cent saving across the board (which is postulated could be achieved through smart metering and innovative technology) would be the equivalent of the expected savings of the second round of the Energy Efficient Commitment. However, Ofgem ruled out the use of smart meters as it does not recognise behaviour change as a valid energy saving measure.

Argument

Study (1) begins an investigation into the extent to which householders can teach themselves about energy usage in the way in which they teach themselves about so many other things – by using feedback signals from their own actions and their own consumption.

It notes that much policy is based on the conception of energy as a commodity: customers are generally more aware of fuel price, but most only have fleeting contact with the financial cost of their energy services. As a social necessity (basic human need), energy is most noticeable when in short supply; people need to understand how to control their energy and access help when needed. People are divorced from the concept of energy as an ecological resource because it is largely invisible. People don't generally see the mining, tree felling, growing of fuel crops, gas and oil extraction, dam construction, pipelines, power lines, power stations and other impacts and infrastructure involved with providing energy. Thus energy tends only to be an issue for people when in short supply/expensive.

Study (2) adds to this invisibility with the internal infrastructure in our homes, notes that it is generally antiquated, and agrees that invisibility is a major barrier to change, together with the lack of immediate information about use or feedback on the impact of change.

Study (1) notes that current methods of metering, billing, etc. do not allow people to easily learn and adjust their actions and consumption. Feedback is fundamental as an element in early learning, but we tend to forget that it remains crucial throughout life – learning is an active process and learning about practical issues is related to 'reality as it presents itself'. Policymakers could provide a toolkit mixing hard feedback mechanisms (e.g. better direct displays of energy use) with opportunities for learning about energy from the daily usage in homes, connected with learning in the local community, or from interactions with utilities, government and government agencies.

Study (2) argues that the step change in domestic energy consumption can only be achieved by giving a more central role to the householder – both as a consumer of energy and as a producer. Energy efficiency schemes have been designed to deliver

insulation and low energy light bulbs rather than behaviour change. They work in a way that minimises the involvement and awareness of energy users – us. The authors agree that billing information is inaccessible and inadequate, and suggest a separate, periodic energy report alongside real-time feedback through smart meters, designed to be 'attractive'.

Current relevance and issues

The author of study (1) notes that the review of 38 feedback studies carried out over a period of 25 years demonstrated the possibilities of some types of feedback and also some of the issues that affect interpretation of the results. She notes a number of difficulties in comparing, and even categorising, these studies; all contain a different mix of elements such as:

- sample size (from three to 2,000);
- housing type;
- additional interventions such as insulation or the provision of financial incentives to save;
- feedback frequency and duration.

The timing of the study itself may also be significant in relation to the energy politics and research paradigms of the period. In spite of these areas of uncertainty, though, some lessons can be learned.

She also notes that any intervention might help if it triggers householders into examining their consumption, or that the personal attention of the experimenters motivated the householders into action. However, she concludes that the documentation of these feedback projects points strongly to other factors at work, of which immediacy or accessibility of feedback data – allowing the householder to be in control – are highly important, accompanied by clear information that is specific to the household in question.

Insights for water behavioural projects

There are similarities between energy and water in as much as they are both largely invisible until the point of use and meet basic human needs. As such, there are potentially transferable insights and these have been framed under the 4Es model (predominantly ENABLE), using the typology (A–E) of approaches outlined in Study (1) (references are available in the source document – see section on Forms of Feedback). Study (2) ideas may allow linking up between energy and water in the home. Further research may prove necessary to establish whether transferability is feasible in practice

Enable – Study (1)

A. Direct feedback: available on demand. Learning by looking or paying.

- a) *Direct displays.* Customers who have their supply metered are unlikely to consult their meter; it will probably be hidden away and difficult to understand. Better designed meters will have an appeal because they will be seen as high quality products; this appears to be the case with high-efficiency cold appliances
- b) *Interactive feedback* via a PC has shown promise. Some energy utilities (e.g. Scottish and Southern Energy) already offer this service to large business customers.
- c) *Smart meters.* Possibilities include meters operated by smart cards and two-way (automatic) metering
- d) *Trigger devices/consumption limiters.* These are contentious because they can cut the supply of low-income consumers.

- e) *Prepayment meters*. The continued usage of these meters by consumers on low incomes in the UK – in spite of the extra cost – is an indication of the high importance attached to debt avoidance and the value of direct feedback to people with limited resources.
- f) *Self-meter-reading*. Valuable as part of an effective feedback programme.
- g) *Meter reading with an adviser* – as a tool in advice programmes.
- h) *Cost plugs* or similar devices on appliances.

B. Indirect feedback – raw data processed by the utility and sent out to customers.
Learning by reading and reflecting.

- a) *More frequent bills* based on meter readings (where possible).
- b) *Frequent bills based on readings plus historical feedback* – comparison with the same period of the previous year, weather-adjusted.
- c) *Frequent bills based on readings plus normative feedback* – comparison with similar households.
- d) *Frequent bills plus disaggregated feedback*. This is relatively expensive, though popular when tested. NIALMS and DIACE systems allow for automatic end use breakdown by pattern recognition.
- e) *Frequent bills plus offers of audits or discounts on efficiency measures*. Frequent, informative bills can stimulate a demand for audits by raising awareness.
- f) *Frequent bills plus detailed annual or quarterly reports*.

C. Inadvertent feedback – learning by association

- a) *New energy-using equipment in the home*. When a person moves house or when there are changes in the physical fabric of the dwelling, this provides an opening for effective ‘opportunistic’ advice.
- b) *Development of community conservation projects*, with their potential for social learning.

D. Utility-controlled feedback – learning about the customer

Utility-controlled feedback is not designed with householders’ learning in mind, but it is rapidly being developed and debated with a view to better load management.

E. Audits

Audits provide vital baseline information on the ‘capital’ of a dwelling as well as giving guidance on how to improve it. Audits may be

- a) undertaken by a surveyor on the client’s initiative
- b) undertaken as part of a mortgage or other mandatory survey
- c) carried out on an informal basis by the consumer

Enable – Study (2)

- Home Dashboard – attractive, easy to use, energy management monitor.
- Energy Tracker – downloadable software for use on a home PC that interfaces with the digital output of the Home Dashboard.
- Virtual House – online product, built on existing websites such as the Open University’s interacting energy house, using building science data from reputable bodies where the householder selects an appropriate type of dwelling, approximates it to their own and tests new ideas to understand the financial and energy impacts of new hard measures and benchmarks them against other similar dwellings.

Encourage – Study (2)

- Household energy rating highlighted by estate agents.
- Domestic carbon quotas (i.e. rationing – stick approach) reducing as people

<p>'spend'.</p> <ul style="list-style-type: none"> • Carbon credits linked to a 'power pension' (i.e. carrot approach) – receiving 'points' for increasing efficiency measures, which are then drawn down as an 'energy annuity' in retirement. <p>Exemplify – Study (2)</p> <ul style="list-style-type: none"> • Data from users of Virtual House confirmed by independent auditor, leading to desire of others to 'keep up with the Jones'. • Household energy rating highlighted by local authorities to promote area as a good place to live.
<p>Researcher comments</p> <p>Although these two studies are fairly short, they are rich in ideas that deserve consideration in respect of their potential for transferability to water behaviour and the possibility of joining-up agendas and technology. Some of the Study (2) ideas would definitely require cross-sectoral working more widely than both energy and water.</p>

Social science: general theory

Reference: S1

TITLE	The theory of planned behaviour		
AUTHORS	Icek Ajzen	PUBLISHED	1991
CONTEXT	Social science: general theory		
SOURCE	<i>Organizational Behaviour and Human Decision Processes</i> , 50, 179-211.		

Principal learnings

The theory of planned behaviour (TPB) predicts deliberate behaviour. Intention is considered to be the immediate antecedent to, and thus the best predictor of, behaviour. Intention itself is determined by:

- attitudes towards the specific behaviour;
- subjective norms (perceived social pressure with respect to the behaviour);
- perceived behavioural control (self-perception of ability to perform the behaviour).

As a general rule, the higher these three factors, the greater will be the intention to perform the behaviour.

If there is enough actual control over the behaviour, people are expected to carry out their intentions as often as they can. However this isn't the case for many behaviours; control is not always as high as is desired. Thus, alongside intention, the model treats levels of actual behavioural control as a second predictor for behaviour.

In using TPB as a basis of behavioural intervention, Ajzen presents a three-stage process:

- formative research;

- targeting the intervention;
- formulation of implementation intentions.

He offers a comprehensive web-based set of tools and a consulting service for those who wish to apply the theory in practice.

Argument

TPB is derived from Ajzen and Fishbein's work on the theory of reasoned action (TRA), which was related to voluntary behaviour. However, when it became clear that some behaviours are involuntary, perceived behavioural control was factored in resulting in the TPB model.

The theory gives explanations for the roots of attitudes, subjective norms and perceived behavioural control in the model. These three factors are the products of behavioural beliefs, normative beliefs and control beliefs respectively, and all of these beliefs are interlinked.

Current relevance and issues

This model has frequently been applied empirically. Relevant case studies include:

- ecological behaviour;¹⁵
- waste management programmes;¹⁶
- water saving intentions.^{17,18}

Lam's work modified the TPB model for this area including other variables such as:

- perceived right to water;
- subjective effectiveness of alternative solutions;
- perceived moral obligation.

In separate studies based in Taiwan he found that:

- the TPB variables improved the prediction of intention to use less water;
- they were less successful in predicting intention to install water-efficient appliances;
- perceived rights to water further improved the prediction of intention to install water-efficient appliances;
- subjective effectiveness of alternative solutions had significant effects on people's intentions to retrofit.

Thus it appears that the variables in Ajzen's TPB model alone are not sufficient for studying water behaviour and models need to be modified to include other suitable predictors.

Insights for water behavioural projects

Interventions based on TPB to change behaviour can be directed at one or more of its determinants: attitudes, subjective norms, or perceptions of behavioural control. This

¹⁵ For example: Kaiser F G, Woelfing S and Fuhrer U, 1999 Environmental attitude and ecological behaviour. *Journal of Environmental Psychology*, 19, 1-19.

¹⁶ For example: Taylor S and Todd P, 1995. An integrated model of waste management behaviour: a test of household recycling and composting intentions. *Environment and Behaviour*, 27, 603-630.

¹⁷ Lam S-P, 2006 (S21)

¹⁸ Lam S-P, 1999 Predicting intentions to conserve water from the theory of planned behaviour, perceived moral obligation, and perceived water right. *Journal of Applied Social Psychology*, 29, 1058-1071.

needs to be done through changing the salient beliefs upon which these constructs are based. Behavioural intentions should change as a result, and if there is sufficient actual control over the behaviour, the new intentions should be carried out whenever circumstances are appropriate. The methods suggested mostly fall under the enabling aspect of behavioural change with exemplification, encouragement and, to a large extent, engagement falling outside of the remit of the model.

Enabling

- Through a process of **formative research**, involving eliciting and measuring salient beliefs and then developing and piloting a suitable intervention (e.g. persuasive communications, face-to-face discussions, observational modelling), the intervention can be correctly targeted to most efficiently change water usage behaviours.
- **Targeting the interventions** requires knowledge of whether there is much room for change in water behaviours. Hence degrees of positively and negatively valenced attitudes towards water saving behaviour need to be established, as do levels of perceived behavioural control. (Due to statistical complexities the relative weights of the three predictors may not be a good guide to targeting an intervention.)
- To **change determinants of behaviour**, the model suggests either attacking the strength of the beliefs upon which the predictors are based or attacking the direction of beliefs. For example, persuading water users that self-installation of retrofit appliances requires minimal DIY skills would be an example of changing belief strength. Changing the direction of beliefs may not prove appropriate in this case as there is a general understanding that water saving is desirable, even if actions don't match these beliefs. It is vital that new information provided to change beliefs is as accurate as possible to instil consumer trust in the messages.
- The final stage of the process is helping customers form an **implementation intention**. Individuals must be able to carry out their newly formed intentions. Being able to formulate a detailed plan of when, where and how they will start saving water will be the most crucial part of enabling them to benefit from the intervention.

Engagement

- Various engagement methods can be used to help with the process of forming an implementation intention (e.g. community action, media campaigns).

Researcher comments

This tidy model is a good starting point for implementing an intervention, but as empirical studies indicate, it is somewhat incomplete for our purposes. More relevant predictors can be included in the model, which will help to refine the intervention. Similarly the intervention process is somewhat lacking in concrete findings. Ajzen's process, though theoretically sound, is likely to be most useful when viewed in light of existing interventions to highlight any gaps in the formative research rather than being used as a launch pad for an intervention in its own right.

Reference: S2

TITLE	The strength of weak ties (social network theory)		
AUTHORS	Mark Granovetter	PUBLISHED	1983
CONTEXT	Social science: general theory		
SOURCE	<i>Sociological Theory</i> , 1, 201-233.		
<p>Principal learnings</p> <p>We each have circles of close friends and kin (strong ties), as well as a number of acquaintances (weak ties). The paper's main premise is that the strength of weak ties (SWT) plays a vital role in the communication of ideas and social organisations, as they link us into our acquaintance's own circle of strong ties. The paper reviews an array of empirical studies which support this hypothesis.</p> <p>Weak ties are useful in:</p> <ul style="list-style-type: none"> • accessing information from distant parts of the social system; • diffusion of new ideas, cultures and technologies; • aiding social and employment mobility; • organising individuals into political or goal-orientated movements outside of their social circle. <p>Such bridging of weak ties also exposes people to a variety of opinions and viewpoints, and are thus an 'essential prerequisite for the social construction of individualism' – an increasingly important attribute in Western society.</p> <p>However strong ties do also have value. They are more motivated to be of assistance and are easily available. With respect to information flow, they are shown to increase the speed of flow, credibility and, most importantly, influence of the information in question. Thus it is argued that innovations cross social groups via weak ties, but their influence is spread through strong ties.</p>			
<p>Argument</p> <p>Granovetter's study is derived from social network theory, which views social relationships in terms of nodes (individuals within the networks) and ties (the relationships between these individuals). A social network is thus built of nodes, which are tied together by various types of relationships (e.g. financial exchange, friendship, web links). Emphasis is placed on the interdependent nature of the ties rather than the independent attributes of the individual actors within the networks.</p> <p>Social network theory has developed rapidly since the 1970s when formal mathematical theories and powerful computers, which could track and measure networks, were developed. The theory has since found important applications in organisational behaviour, mental health, social support and animal social organisation, as well as the diffusion of ideas and information. SWT theory examines the strengths of the ties, rather than the nature of the nodes in order to draw its conclusions.</p>			
<p>Current relevance and issues</p> <p>In his review Granovetter points out that, while empirical findings are encouraging, none offer conclusive support for SWT. There is also little in this idea that directly</p>			

points towards a theory of behaviour change; it is implicitly assumed that information flow across ties influences ideas and behaviours. However, this is not necessarily to its detriment, as it provides a setting in which to implement other more specific theories and policies of behaviour change (which often lack a contextual setting).

However, the survey does prove to highlight the importance of weak ties. With the recent development of online communities where people can get in touch with old acquaintances and join interest groups, social network theory and the SWT derivation of it are currently highly relevant.

Insights for water behavioural projects

Social network theory sits in the sphere of engagement with respect to behaviour change, with its focus on a bottom-up approach of information and idea flow across networks. The two applications below are likely to appeal to different demographics, so formative research and pilots should be encouraged before a broad application is undertaken.

Engagement

- Internet social networks provide a virtual forum for networking with interest groups, friends and acquaintances. Two popular examples are MySpace and Facebook; in these communities, founders invite members of their personal network to join the site. The sites take a blended approach, offering offline elements such as meetings and reunions. Similarly web groups who exchange topic-specific messages on virtual notice-boards are prolific, as are bloggers. These tools can all be utilised to engage interested parties in discussions about water behaviour change, providing a medium for debate, experience sharing and possibly innovation diffusion.
- Face-to-face social networks, such as in the local community, can also be utilised to get people involved. Community or change champions for water behaviour change may be chosen on the basis of the size and strength of their social networks in order for their work to have the highest impact. To the same effect, these champions may be encouraged to network in order to increase their web of weak social ties in order to diffuse ideas to other networks.

Researcher comments

The theory provides a broad perspective through which to view more specific theories of behaviour change. Its reliance on mathematical modelling to measure networks could be considered as a hindrance or complication to any real-life application, but it is this scientific approach that will allow for an effective policy analysis after implementation.

Social network theory is a useful tool for engaging groups in behaviour change, but lacks an individualistic focus. However, the theory is fascinating in light of the internet as a medium for idea diffusion and growing our social networks, and is likely to be most useful when considered in this context.

Reference: S3

TITLE	Smoking cessation and stress management: applications of the Transtheoretical Model of behaviour change		
AUTHORS	W F Velicer, J O Prochaska, J L Fava, G J Norman and C A Redding	PUBLISHED	1998
CONTEXT	Social science: general theory		
SOURCE	<i>Homeostasis</i> , 38, 216-233.		

Principal learnings

The Transtheoretical Model has been applied successfully in health contexts. It involves emotions and cognitions to produce a model of intentional change. Decision-making processes of the individual are focused on, as opposed to, external stimuli such as peer or biological influences. The model involves three key concepts:

- Stages of Change;
- outcome measures;
- Processes of Change.

Stages of Change

Taking a temporal approach – largely ignored by other models of change – the model posits a five stage process to behaviour change:

- Precontemplation;
- Contemplation;
- Preparation;
- Action;
- Maintenance.

Regression back to earlier stages is an accepted element of the model. Relapse occurs when regression from ‘Action’ or ‘Maintenance’ to an earlier stage takes place.

Outcome measures

The model provides a framework of three sensitive measures with which to track progress through the stages.

- The **Decisional Balance Construct** measures the individual's relative weighting of the pros and cons of changing their behaviour. Weights differ across the stages depending on the type of behaviour change involved.
- The **Self-Efficacy construct** measures the confidence that people have that they can maintain their behaviour under high-risk situations.
- The **Situational Temptation construct** measures the opposite dimension, reflecting the strength of desire to engage in a specific behaviour under high-risk situations. The former is an increasing function across the stages, while the latter decreases across time.

Processes of Change

These are the independent variables that people need to apply in order to move across the Stages of Change. There are ten identified processes, which are split into:

- Experiential Processes (mainly used in the early stages);

- Behavioural Processes (mainly used in the later stages).

Analysing engagement with these processes across the stages can determine the success of interventions across different groups and stages.

Argument

The Transtheoretical Model of Change takes an integrative approach to behaviour change. It takes a long-term perspective to behaviour change and gives few time constraints as to how long an individual spends in each stage. This temporal, flexible approach is deemed realistic than alternative short-term, stringent perspectives. The model also accounts for regression and relapses between the stages. Uniquely, it makes no assumptions about how ready someone is to change and takes a tailored approach to intervention dependent on which stage people are at.

The model has been applied to a number of problem behaviours including dieting, alcohol abuse, sunscreen usage and smoking cessation. Based on the success of such programmes, the authors argue that this model has the potential for both high efficacy and a high recruitment rate, resulting in a high potential impact on behaviour change.

Current relevance and issues

This model has not been applied to sustainability, but examination of the five Stages of Change and ten Processes of Change highlights its transferability. Given the absence of obvious 'high-risk' situations faced by the individual in the context of sustainable behaviour, it is likely that the Decisional Balance construct will be a more valid measure of tracking progress than either the Self-Efficacy or Situational Temptation constructs. However, these constructs could be adapted accordingly if required.

Insights for water behavioural projects

Application of the model will support demand-reducing behavioural change. A number of the identified Processes of Change can be transposed onto the 4Es model in the areas of enabling, engaging and encouraging.

Enabling (experiential processes)

- **Consciousness raising.** By providing information about the consequences and solutions to water-wasting behaviours, transition from 'Precontemplation' into the 'Contemplation' and 'Preparation' stages can be facilitated. Interventions can include education and media campaigns. This is crucial given the lack of consumer knowledge about water-efficient fittings.
- **Dramatic relief.** Media campaigns and personal testimonies about water-wasting behaviours which produce increased emotional experiences, followed by a lessened response if efficient behaviour is undertaken, will again enable people to move across the early stages. This also links in with raising awareness about the effects of water wastage on the social environment (classified in the model as Environmental Re-evaluation).
- **Social liberation.** By providing facilities for change, water users will see that society is changing to make water reduction easier. It will then be easier for plans of action to be developed in the 'Preparation' stage. Advocacy and empowerment for communities to increase water-saving facilities could be useful at this stage.
- **Self re-evaluation.** Again tying into the media campaigns and some of the behavioural processes below, if consumers focus on cognitive and affective assessments of themselves (both as high and low water users), this imagery will aid the transition towards the 'Preparation' and 'Action' stages.

Engaging (behavioural processes)

- **Helping relationships.** Making use of personal contacts and networks of fellow water-reducers will engage behaviour change in the 'Action' stage and sustain it in the 'Maintenance' stage.
- **Reinforcement management.** Highlighting the money saving aspect of water efficiency will provide a consequence for changing behaviour. Rewards are found to be more relied upon than punishments, so such a positive reinforcement of financial rewards will spur people on to 'Action' and 'Maintenance'.
- **Counter conditioning.** By engaging consumers in learning water-efficient behaviours, they can substitute these for their old habits. The paper suggests that instilling confidence in the lifestyle choices they are making will help water savers to do this, facilitating the 'Action' and 'Maintenance' stages and hopefully reducing the risk of relapse.
- **Self-liberation.** By giving customers two or three options as to how to reduce water usage, willpower and commitment is shown to increase. Thus no single approach should be focused upon to achieve optimal results. Public testimonies can also reinforce people's individual commitment to the cause, thus engaging them further in the 'Maintenance' stage.

Encouraging (behavioural processes)

- **Stimulus control.** This calls for the removal of cues for unhealthy habits (e.g. inefficient water appliances), perhaps through penalties or price disincentives. However, this requires a large-scale intervention on the part of interested parties, and may be outside the remit of this project.

Researcher comments

There are some interesting theoretical insights in this paper, which have been reassuringly applied in practice. However, prior work with the model has been health-related and consequently focused on the participants' concern for their own health. Therefore it is likely that amendments will be needed in order to apply this model in scenarios where personal benefits (with the exception of possible monetary rewards) are less obvious to the individual.

Reference: S4

TITLE	The 'Social Practices' approach		
AUTHORS	Spaargaren, Shove and others	PUBLISHED	2002–2005
CONTEXT	Social science: general theory		
SOURCE	<ul style="list-style-type: none">• Reckwitz A, 2002 Towards a theory of social practices: a development of culturalist theorizing. <i>European Journal of Social Theory</i>, 5(2), 245-265.• Shove E, 2003 Converging conventions of comfort, cleanliness and convenience. <i>Journal of Consumer Policy</i>, 26, 395-418.• Southerton D, Warde A and Hand M, 2004 The limited autonomy of the consumer: implications for sustainable consumption. In <i>Sustainable Consumption: The Implications of Changing Infrastructures of Provision</i> (ed. D Southerton, H Chappells and B Van Vliet), pp.32-48. Cheltenham: Edward Elgar.		

- Spaargaren G, 2004 *Sustainable consumption: a theoretical and environmental policy perspective*. In *Sustainable Consumption: The Implications of Changing Infrastructures of Provision* (ed. D Southerton, H Chappells and B Van Vliet), pp.15-31. Cheltenham: Edward Elgar.
- Sofoulis Z, 2005 Big water, every day water: a socio-technical perspective. *Journal of Media and Cultural Studies*, 19(4), 445-463.
- Warde A, 2005 Consumption and theories of practice. *Journal of Consumer Culture*, 5(2), 131-153.

Principal learnings

- The practices perspective is an emerging set of conceptual understandings that help to understand patterns of routinised behaviour and how these change through time.
- It is people's desire to carry out a practice (e.g. showering or laundering) that drives their use of resources such as water, rather than a desire to use water per se.
- A practice-based analysis considers how various lifestyle and structural elements have changed to enable particular practices to emerge.
- Specific forms of a particular practice vary between occasions, the person carrying it out and the institutional setting. Each form of a practice can be associated with specific understandings, procedures and engagements, and can be identified as more or less sustainable.
- Achieving purposive change in practices requires that what was in 'practical consciousness' is brought into 'discursive consciousness' – i.e. that an action ceases to be routinised and is thought about.

Argument

- Practice theory is a subset of 'cultural theory' that focuses on symbolic understandings and routinised actions. It is distinguished from other cultural approaches by focusing on the 'practice' as the smallest unit of analysis. A practice (e.g. showering or laundering) is continually 'performed' and re-performed by many people in routinised procedures or habits, often without conscious engagement (Warde 2005).
- Three elements constitute a practice – understandings (thinking), procedures (doing) and engagements (relating to ends or goals of a practice). Often the procedures involve interaction with objects such as water. It is people's desire to carry out a practice which creates consumption of water, not the desire to consume water per se (Reckwitz 2002, Shove 2003).
- Practices are influenced by 'internal' or 'lifestyle' elements (e.g. social norms and convenience) and 'external' or 'structural' elements (e.g. the nature of the large technical systems) (Spaargaren 2004). An example of practice-based analysis applied to a 'water' related practice is the 'story' of the emergence of showering (Southerton et al. 2004). The shift from bathing to showering is explained with reference to structural factors including:
 - reliable systems of water and electricity provision;
 - the emergence of new shower technology;
 - lifestyle factors such as changing social norms about cleanliness and convenience.
- Specific structural factors can 'build-in' wastage. For example, Sofoulis (2005) argues that the existence of sinks, plugs and drains structure practices such that it

is challenging for even the most motivated of consumers to reuse greywater in their gardens.

- Practices are associated with practical consciousness. Achieving purposive change in a practice require that it is explicitly thought about and thus brought into 'discursive consciousness' (Sofoulis 2005)

Current relevance and issues

The practice-based perspective forms the basis for the analysis of Medd and Shove (S17) and is implicitly similar to the intellectual basis of the WaND studies (S19). In particular, it shares with these studies a critique of approaches to behaviour that focus on individuals weighing up the costs and benefits of specific actions.

The practices perspective offers considerable insights for policy makers wanting to promote behaviour change. In particular:

- A practice analysis considers how various lifestyle and structural elements have changed to enable particular practices to emerge offering potential insight into what factors might need to change to enable further changes towards more sustainable practices to occur.
- By analysing the combinations of understandings, procedures and engagements associated with more sustainable forms of a practice, insight might be gained into how sustainable practices might be encouraged.

Nevertheless, the practice analysts themselves are cautious about making specific claims that their analysis will inform and achieve behaviour change. As an emerging perspective on behaviour and behaviour change, the full significance of the practices perspective may yet be felt.

Insights for water behavioural projects

Enable

The practices perspective emphasises the need for enabling, which it would see as ensuring that the 'external' or 'structural' factors are such that water efficiency behaviour is possible. The insight by Sofoulis (2005) into the 'saver unfriendliness' of drains is particularly challenging.

Engage

If practices are to change, they must be brought from practical consciousness to discursive consciousness through explicit discussion.

Encourage

The practices perspective plays down the importance of encouragement in achieving change, arguing that people seldom weigh up the costs and benefits of routinised actions, and thus that changing the cost-benefit equation through incentives will make little difference to behaviour.

Exemplify

Ensuring that a practice is 'sustainable' in one location may cause the same form of the practice to be reproduced in another location or time. To this extent, (only) the practices perspective would suggest that exemplifying water efficiency has the potential to facilitate more water efficient practices occurring.

Researcher comments

The practices perspective offers a telling critique of rational choice approaches to behaviour and an alternative set of understandings to guide behavioural investigations

and to inform policy. This perspective has considerable potential to provide important insights.

Reference: S5

TITLE	A conceptual model of 'receptivity' applied to the design and deployment of water policy mechanisms		
AUTHORS	P. Jeffrey and R A F Seaton	PUBLISHED	May 2004
CONTEXT	Social science: general theory		
SOURCE	<i>Environmental Sciences</i> , 1(3), 277-300.		
<p>Principal learnings</p> <p>This contribution describes the structure of, and articulates the use of, a conceptual model that has been adapted from the field of technology transfer to aid evaluation of water policy tool design and deployment. The paper describes three very different case study contexts where the model has been found useful and clear benefits of model application have been identified in each case. The additional insights and benefits gained from the application of the receptivity model can be summarised as follows;</p> <ul style="list-style-type: none"> • The model places people, communities and institutions at the centre of policy tool evaluation. • The approach encourages policy tool designers to: <ul style="list-style-type: none"> - place themselves in the position of consumers; - explicitly consider the process of policy tool appropriation by those who are being expected to respond to the tool's deployment. • The approach is sensitive to spatial and temporal changes in individual, community, and institutional perspectives, attitudes and behaviours. • By being mechanism independent, the receptivity model supports comparison of different types of policy mechanism within the same analytical framework. • Output from the analysis of receptivity issues, by identifying how and why receptivity might be compromised, suggests an agenda for policy mechanism deployment (e.g. design of complimentary or supporting initiatives). 			
<p>Argument</p> <p>The concept of receptivity as discussed above suggests a process framework that can be broken down into four components;</p> <ol style="list-style-type: none"> 1. Awareness – the capability to search and scan for knowledge which is new 2. Association – recognition of the potential benefit of this knowledge by associating it with needs and capabilities 3. Acquisition – the ability to communicate with others (in an organisation, household, community) to assimilate the knowledge and acquire 4. Application – the ability to actually apply knowledge to achieve a benefit as judged by the recipient. <p>Three case studies provide an initial test of the receptivity. In the first, the adaptive capacity of recipients to policy instruments is explored. Thus, the model is used as a simple taxonomic device that enables barriers to adaptation be more precisely located. The second example describes differences in level of problem focus from diffuse problem symptoms to quite well specified technology options. The third example shows</p>			

how the model and choice of enquiry techniques may have to be adapted around different constituencies or stakeholders.

The paper goes on to argue that the design of water policy instruments, particularly those which seek to influence behaviour, is something of a black art at present. Confidence in design and implementation is eroded by uncertainties regarding the degree of impact which a policy instrument will have, the longevity of any impact, and unintended secondary consequences of policy instrument implementation. By comparing the detailed design of a policy instrument against each element of the receptivity model, a qualitative risk assessment can be achieved. In this sense, the model provides a set of deployment tests against which a policy instrument can be appraised.

Current relevance and issues

This paper argues that the design and application of water policy instruments has been informed by a methodological framework that views human beings as simply another element to be added to a largely process oriented model of water management. People, institutions and communities are thereby seen as consumers of a product, as receivers of a service, rather than as an embedded part of the water management system itself. Furthermore, models of individual and group responses to policy mechanisms are typically couched in terms of a simple 'stimulation–reaction' progression.

The ability to incorporate technological or behavioural innovations will be variable both across space and through time, within and between communities, and across types of innovation. The extent to which social actors are able or willing to react positively to policy mechanisms is a function of the 'fit' between actors' motivations, expectations, norms and means, and the ambition of the mechanism itself. Hence, the authors argue that there is a need for a richer understanding of consumer responses to specific policy mechanisms; one which incorporates the capacity for response as well as the ambition of policy.

In many ways, the receptivity model is typical of a group of revisionist approaches to socio-technical system characterisation. It insists on the primacy of the social over the technical and seeks to provide a framework for reconciling the incongruent dynamics of demand and supply.

Acknowledged limitations of the receptivity model and its application are chiefly associated with the need to involve a broad group of domain experts and stakeholders who can inform a debate on policy instrument design and deployment. The model itself provides no answers. It is a conceptual instrument that can frame dialogue and analysis, providing a 'way of thinking' about the issues which, however, generates information of direct relevance to the planning and management of water policy instruments. However, the authors maintain that providing that a clear understanding of the conceptual model's structure and meaning is acquired, as well as of its strengths and limitations, the model can be effectively employed by a wide range of disciplines and professions.

Insights for water behavioural projects

In many ways, the 4Es and the 4As (an alternative name for the receptivity framework) models are highly compatible. The authors of the receptivity model have always been careful to emphasise the diagnostic strength of their approach and are adamant that it has no predictive and little prescriptive capability. It provides a useful set of reference points for thinking about technology or behaviour adoption as a process, but provides no clues as to how the various elements are to be promoted. In contrast, the 4Es guide

action more explicitly by describing techniques for achieving change.

The table below shows where the 4Es might be supportive of the various elements of the receptivity model. Symbols indicate the potential for each row heading to contribute towards promotion of each column heading.

	Awareness	Association	Acquisition	Application
Enable	✓	?	✓	✓
Engage	✓	✓	✓	?
Encourage	✓	✓	✓	?
Exemplify	✓	✓	✓	✓

Researcher comments

Social science: water

Reference: S16

TITLE	Using Water Wisely: a deliberative consultation		
AUTHORS	Opinion Leader (for Consumer Council for Water)	PUBLISHED	2006
CONTEXT	Social science: water-focused behavioural study		
SOURCE	http://www.ccwater.org.uk/upload/pdf/Using_Water_Wisely_Final_Written_Report.pdf.pdf		

Principal learnings

- Participants had a range of responses to the rising importance of water explored in the research (see 'argument' for detailed meanings):
 - pragmatic; refusal to engage;
 - denial;
 - anger and blame.
- Information and discussion impacted on the majority's awareness of water issues, but only a few participants changed their views about who was to blame for water shortages.
- Water companies and leakage from their pipes are seen as the main cause of problems with water. This view was reinforced when volume figures about leakage were made available.
- Scepticism about water company motivations means that their promotion of metering and water efficiency is regarded with suspicion.
- Perceptions of water companies varied around the country, with more criticism and blame tending to be levelled in areas where water is short.
- Over half the participants agreed that 'all of us' are responsible for dealing with water shortage. Similarly, participants were keen to promote a 'super-ordinate goal', i.e. the idea that all were jointly responsible for addressing water problems.
- Forum participants felt that:
 - better information should be provided to the consumer about how to save water

- at least cost to themselves;
- Government should ensure that there are water-efficient devices available and affordable;
- they might respond to messages about the impact on the environment;
- metering might appeal if presented as both reducing wastage and saving money;
- 'reducing wastage' was a strong message that could be understood across the country.
- Forum organisers concluded that:
 - 'it is important to use communications to continually inform the public of how their actions fit into the wider context; and what actions other parties are also taking' (p.10);
 - 'there is currently a void in terms of a trusted source for communication, but at the same time a real need for consistent, independent and trustworthy communications' (p.10);

Argument

Research involved four evening workshops in different locations spread around the country and one deliberative all-day forum in London. Between the workshops and the forum, participants were provided with information and asked to keep a water diary. A total of 92 participants were involved.

- Participants had a range of responses to discussion of water shortage:
 - **Pragmatic** – assimilate, evaluate and accept changing circumstances – attempt to change basic assumptions and behaviour;
 - **Refusal to engage** – resistance to considering the challenges – often because they are perceived as distant and do not impact directly (e.g. in water plentiful areas);
 - **Anger and blame** – threatened and fearful – seeking someone to blame;
 - **Denying reality** – looking to re-establish historical status quo – 'there is not really a shortage, it is caused by mismanagement [of supply] by the water companies' (p. 6).
- 'Water diaries' completed by participants show how focusing on the issue can help people to identify areas where they are wasting water unnecessarily.
- Organisers recommend communications targeted at the 'unwilling and unable', 'unwilling and able', 'willing and unable' and 'willing and able' respectively, through a strategy to engage, educate, enable and encourage. In general they concluded that:
 - 'younger participants, single or young couples, have received knowledge from school or university but they often lack the resources to turn this into action;
 - middle life stage participants, usually with families, are focussed on cost and routine, and not always motivated to engage or take action;
 - older participants, often widowed and retired, are far more knowledgeable, engaged and actively involved in water conservation' (p. 61).

Current relevance and issues

The forum took place during the height of the 2006 drought and should be seen as significantly influenced by the media coverage around this event.

Any deliberative forum such as this is also significantly influenced by the questions asked and the information provided. In this respect, it may not be surprising that the forum organisers concluded that the Consumer Council for Water was a perfect organisation for being the 'trusted source for communications' which they have called for.

Insights for water behavioural projects

Enable

- The research shows that there is a need for reliable information from a trusted source.
- The research indicates that Government should ensure that water efficient products are available and affordable.
- The deliberative process indicated that information by itself could increase water efficiency awareness, but would have limited influence on people's existing views about who is responsible for water scarcity.

Engage

- Messages need to build on people's idea that we are all jointly responsible for management of our water resources.
- Water companies and the Government are not trusted, and are therefore not the best sources of information about water.
- People recognise the importance and need for water in order to care for the environment and this issue could be emphasised in messages.
- Messages should not overload people with information.

Encourage

- The message 'get a meter to save money and reduce wastage' is likely to be an effective one.

Exemplify

- Government and water companies taking action on water efficiency and leakage reduction is key. People are only likely to take action if they regard their own efforts as part of a wider push to take action on water.

Researcher comments

The organisers' conclusions about communications campaigns seem to inform the Environment Agency's research specification for this project. However, the precise meanings given to the terms 'engage', 'educate', etc. appear to differ, so care should be taken in interpretation of this material.

Reference: S17

TITLE	The sociology of water use		
AUTHORS	Will Medd and Elizabeth Shove, University of Lancaster (for UK Water Industry Research)	PUBLISHED	2007
CONTEXT	Social science: water-focused behavioural study		
SOURCE	UKWIR Report Ref No 07/CU/02/2		
Principal learnings			
The investigation explored how social science can help the water industry, focusing largely on how it might inform strategies to manage demand. It found:			
<ul style="list-style-type: none">• most water is consumed in 'practices' (routine habits) such as showering,			

laundrying and gardening;

- how and whether a practice is carried out depends to a considerable extent on the institutional systems which support it;
- analysis of water demand should focus on how and why there are variations in the quantities of water consumed in specific practices. Such analyses would yield potential insights about 'low use' practices, and how institutional systems might facilitate them in the future.

Argument

Literature was used to:

- frame a series of seminars ('Traces of Water') for the water industry and interested academics on how social science can inform water decisions;
- inform a study of quantitative data on water consumption.

The argument as follows:

- Most water consumption is embedded in habitual routines like showering, laundrying and gardening. Consequently, approaches to understanding water consumption which assume that people weigh up the costs and benefits of different actions are inappropriate. Instead, analysis could focus on habitual routines or 'practices', considering how and why water consumption associated with a particular practice varies. Such analysis could inform strategies to reduce water consumption.
- Individual practices cannot be separated from the institutional systems which support them; for example, demand for 'showering' in the current UK context is linked to the reliable availability of water and electricity. Opportunities for changing consumption might be explored through examining alternative ways of carrying out particular practices. Specifically, studies should consider variations
 - between the same people's practices on different occasions;
 - between different people's practices in the UK;
 - between practices in the UK and overseas (particularly in countries with low water consumption);
 - between the UK now and in the past.
- The use of averaging in understanding domestic consumption (e.g. in relation to micro-component analysis) is limited, obscuring patterns in the way that water is actually consumed. Instead, cluster analysis is one way to look at similarities and differences within a sample of household micro-component consumption data.

Current relevance and issues

This UKWIR-funded study can be seen as a first attempt to apply some of the insights from the social practices model to water issues in the UK. The work is very recent and we have yet to know precisely what impact it has had upon the water industry.

Although this work and the associated seminars theoretically concerned the insights from social science to all water industry practices, in fact the focus was almost entirely on the drivers of consumption. The researchers' message that water efficiency efforts should be focused on the institutional system rather than the individual is contrary to much current practice (e.g. water efficiency messages that focus on the individual). From the seminars, it appeared that this was a message that was difficult for the water industry to assimilate.

Discussion in the seminars revealed a range of drivers that impact on the way that water efficiency is promoted. For water providers, the most important concerns

appeared to be:

- influencing peak demand at peak season;
- predicting water demand (rather than reducing it);
- predicting the impact of water efficiency messages.

These are understandable concerns for water providers. This focus on the **predictability** of demand (rather than its overall level) may raise questions about whether it is appropriate that water providers are the primary organisations tasked with promoting water efficiency to the public.

Insights for water behavioural projects

Medd and Shove suggest that any focus that considers only individual behaviour is misplaced. Instead, they suggest that we need to consider how the systems of water supply and drainage 'build in' water consumption and wastage – in 4E terms, we need to enable as much or more than we engage, exemplify, or encourage.

It is also possible to make an interpretation of their approach which is more critical of the 4E approach; this would argue that we need to enable, engage, exemplify, encourage and catalyse the use of water efficiency technology and systems by builders, planners, plumbers, etc. rather than by the consumer. In this respect, Medd and Shove would question the consumer focus of the concept of water efficiency.

Enable

- Medd and Shove's message for how 'enabling' should be achieved is focused on carrying out further research into practices in different locations and times in order to open up ideas for different ways of configuring our water systems. They argue that:
 - there are multiple opportunities to influence demand through the way the water system is configured;
 - the water industry needs to open its mind to alternative possibilities. 'The dominance of the engineering mentality, premised on the need to ensure certainty of supply, coupled with an aversion to risk by water companies and regulators alike, evidently limits the imagination when conceptualising and constructing alternative modes of provision' (p. 62).
- In particular, Medd and Shove highlight the need to consider how the current institutional systems need to shift to support co-production and co-management of water resources (e.g. through supporting rainwater harvesting, greywater recycling, etc.).
- The insight from the seminars about water providers' mixed interests in water efficiency highlights the need to think about the institutional and incentive systems supporting water efficiency at the moment. Are benefits from successful promotion of water efficiency felt beyond the water companies (for example, by the environment)? Is there sufficient incentive for water companies to promote water efficiency at the moment?

Engage

- Medd and Shove suggest that there are multiple 'storylines' through which change to water use can be represented. For example, they recommend that rapid showering can be promoted both as a means of saving water and saving time.
- Medd and Shove ask questions about whether the consumer might be seen as part of the solution rather than part of the problem. Might we recruit consumers (e.g. through promotion of rainwater tanks) as a way of aiding the development of water efficiency?

Researcher comments

The research and seminars raise many useful questions. They can be seen as opening up avenues for research and consideration, however, rather than providing answers at present.

Reference: S18

TITLE	Every drop counts: achieving greater water efficiency		
AUTHORS	Louise Every with Julie Foley (for Institute for Public Policy Research)	PUBLISHED	2006
CONTEXT	Social science: water-focused behavioural study		
SOURCE	http://www.ippr.org.uk/publicationsandreports/publication.asp?id=493		

Principal learnings

These concentrated on promoting metering and water efficiency.

Metering

- There should be an acceleration of compulsory metering in water-stressed areas (which will largely be in the Greater South East), supported through an eased process for applying for water scarce status.
- Better safeguards to support poorer households and vulnerable groups when metered might include innovative social tariffs in the long term. In the shorter term, the existing vulnerable groups' tariff should be better promoted and could be expanded or supplemented by water efficiency improvement grants.

Water efficiency

- The Government should develop a voluntary benchmark for the domestic per capita consumption (pcc) of water as a measure of good practice for sustainable water consumption.
- There should be a national minimum water efficiency target which all water companies are required to meet. Enhanced targets would place more stringent requirements in water-stressed areas.
- A Water Efficiency Commitment (WEC) should require companies to spend money on a choice of approved measures to achieve their water efficiency target.
- The Government should identify a 'priority group' of low income and vulnerable households and set an obligation on companies to meet a proportion of water savings in priority households.
- Local authorities could consider:
 - making water conservation a material consideration in Local Development Frameworks;
 - producing supplementary planning guidance to encourage water-efficient new homes.
- The remit of the Energy Saving Trust should be expanded to include water to provide a reliable single source of information.
- Central government should use product and building regulations to prevent the installation of the least efficient products through:

- the Code for Sustainable Homes;
- voluntary product information labelling schemes.

Argument

Failures of current system

- Unsustainable abstractions put at risk the ability of the UK to meet environmental standards set out in European legislation, most notably the Habitats Directive and the Water Framework Directive.
- Although water companies are expected to balance water supply and demand, the regulatory system rewards supply expansion and water company plans tend to be biased towards supply side measures.
- The current duty for water companies to promote water efficiency and conservation by their customers is not ensuring that companies in water-stressed areas are delivering more household water savings.
- Although water companies have targets for reducing leakage and have to ensure security of supply, they do not have targets for improving the efficiency of water use.

Arguments for these specific changes:

- There is significant scope for water savings in new and existing homes. Potential water savings in the existing housing stock are estimated to range from 12 to 30 per cent (MTP 2006, SDC 2006).
- Water savings from household metering are 10–15 per cent in the UK, with significantly larger peak demand savings, yet currently only 28 per cent of UK households are metered (increasing at approximately 2 per cent a year).
- A Water Efficiency Commitment (WEC) inspired by the Energy Efficiency Commitment could help to ensure a secure and sustainable supply of water for households. Only water efficiency measures with an acceptable level of confidence in the water savings would qualify for inclusion in the WEC. Water companies would have the freedom to meet the target however they chose. All 'approved' water savings must be due to company effort, though joint work with third parties is to be encouraged.
- As well as meeting their targets, the requirement that companies promote water efficiency under the Water Act 2003 should be stipulated to mean that:
 - they will conduct educational and informational programmes to promote water conservation;
 - they will and undertake relevant research where appropriate.

Current relevance and issues

IPPR's work concentrates on how household water savings are facilitated. It highlights how the current system fails in this respect and suggests significant changes to the incentive and support structures for water companies' efforts, with a particular concentration on how increased household metering can be promoted and how the promotion of water efficiency can be enhanced. It also suggests measures through which these changes can be made more acceptable in terms of their potential affect on vulnerable groups.

The work is highly relevant and topical. However, a number of points should be noted.

- The report does not mention or address the argument that water companies avoid promoting metering because metering could expose the weaknesses in their current assumptions about unmetered household per capita consumption and might

show the inaccuracy of their claims to meet their current leakage targets.

- Given the enthusiasm expressed for metering, the report is reticent on measures to promote metering beyond the water scarce areas; the only (implicit) measure suggested is its inclusion as one of the 'approved' efficiency measures under the companies' Water Efficiency Commitment.

Insights for water behavioural projects

Much of the IPPR report focuses on how water savings can be effectively promoted in households. The report's focus, however, is not on achieving behaviour change among the public but among the range of organisations that interact with them. In this sense, the emphasis of the report is on 'enabling' public change, with also some consideration of encouragement. Engaging and exemplifying water efficiency to the public are given a lower emphasis.

Enable

In terms of the public, much of IPPR's emphasis is on enabling change through ensuring that other organisations take action (effectively enabling the public) including:

- Government to provide new product standards;
- local authorities to build water efficiency requirements to Local Development Frameworks;
- Energy Savings Trust's remit to be extended to water savings to act as central source for information;
- water companies to be required to promote water conservation.

Engage

The report makes little direct mention of engagement. Nevertheless, the IPPR's emphasis on ameliorating the impacts of proposed measures on vulnerable groups recognises that public and political 'buy-in' (a sort of tacit engagement?) is required for any new measures. Moreover, the expectation that water companies implementing the WEC should work with 'third parties' suggests some recognition that other organisations, including local authorities, are in a stronger position to win the public's trust than the companies themselves.

Encourage

In terms of the public, IPPR propose two crucial encouragement measures:

- More use of compulsory metering in water stressed areas in the south-east so that householders in this area have a financial incentive to save water.
- It is likely that measures employed by water companies under the WEC will largely fall into the 'encouragement' area.

It should be noted that the IPPR also seek to 'encourage' water company action through the fixed targets of the proposed WEC.

Exemplify

The IPPR puts little weight on exemplifying water savings.

Researcher comments

Reference: S19

TITLE	WaND studies (Water Cycle Management for New Developments) (http://www.wand.uk.net)		
AUTHORS	Liz Sharp and Christine Sefton, University of Bradford	PUBLISHED	2006/Forthcoming
CONTEXT	Social science: water-focused behavioural study		
SOURCE	<ul style="list-style-type: none"> • Sharp L, 2006 Water demand management in the UK: constructions of the domestic water user. <i>Journal of Environmental Management and Planning</i>, 49(6), 869-889. • Sefton C and Sharp L, 2006 <i>Public perception and acceptance of sustainable urban drainage in a district park</i>. In: 7th International Conference on Urban Drainage Modelling and 4th International Conference on Water Sensitive Urban Design (Melbourne, 2006), edited by A Deletic and T Fletcher, Volume 1, 127-134. Melbourne: Monash University. • Sefton C and Sharp L, 2007 <i>What people think about water: lessons in citizen communications and involvement</i>. In Novatech 2007, 6th International Conference on Sustainable Techniques and Strategies in Urban Water Management (Lyon, 2007), edited by B Ulanicki, K Vairavamoorthy, D Butler, P L M Bounds and F A Memon, Volume 1, 365-372. • WaND Key messages, forthcoming. 		
<p>Principal learnings</p> <ul style="list-style-type: none"> • Rich detailed research into what and how people think about water highlights the factors inhibiting or promoting people's engagement with sustainable water management. • Participants expressed incredulity about claims of local water shortages, perceiving rain to be frequent and unwelcome. • Many messages people currently receive about water are negative. More positive 'water rhetoric' (e.g. local water celebrations) might enable a more positive engagement with water. • People's understanding of water depends not just on their direct knowledge and understanding about water, but also on the wider 'common sense' through which they understand their world. Relevant 'common sense' contexts include: <ul style="list-style-type: none"> - mistrust of those in control; - the morality of 'avoiding waste'; - the futility of undertaking individual actions in the face of big problems such as water shortage. • People are not passive recipients of 'water efficiency' policy but receive and develop understandings of their role in relation to water through the cumulative impact of implicit and explicit communications made by policy, pricing, the media and other communications. • Current approaches to water efficiency emphasise individuals' ability to control their water use. A promising alternative approach seeks to actively construct communal 			

responsibility for water resources, for example through:

- local information on current water resources;
- water efficiency promotion with reference to communal needs;
- visible institutional action to value existing assets and resources.

Argument

Participants in Essex and Sheffield were interviewed about their perspectives on water and water management. Current policies supporting water demand management were reviewed.

- Participants considered wasting water to be morally wrong and engaged with the subject of 'water efficiency' from that perspective.
- When asked about water in their daily lives, people highlighted many positive associations; for example, pleasure in bathing and children having fun with water. However, such daily experiences are seldom considered. In contrast, negative water contexts like floods and droughts are articulated constantly in the media.
- People are confused about how water in the home is connected with the environment. Some recognise local reservoirs as providing an indication of local water resources, but many do not connect domestic and environmental water. Many have limited experience of local environmental water, so had limited opportunities to make local connections. Water going down the drain is seen as 'recycling'.
- Prominent demand management policies of metered charging and (much) water efficiency promotion construct water users as active 'customers' making rational individual decisions about the costs and benefits of every water using activity. Less visibly, planning controls, building regulations, the prohibition on disconnection and product regulations construct the water user as passive 'citizens', consuming a communal resource to which they have a right. Arguably, neither construction is accurate: we do have some active control, but the extent to which we assert this control as individuals is limited (see S17). Few existing demand management policies construct the water users as a group who actively manage their communal consumption for their mutual benefit. Such measures, which have been used with some success in Victoria, Australia, offer a promising alternative approach to water efficiency.

Current relevance and issues

The research is not yet complete so the above findings should be seen as interim.

The research was informed by social psychology theory including social efficacy, social representations and social identification. This approach has some characteristics in common with the practices theory of Spaargaren (S4), Medd and Shove (S17); in particular, it avoids naïve individualism associated with rational choice approaches, and recognises that systematic and governance related external factors constrain and/or encourage individual environmental action. The work can be contrasted with that of Spaargaren, Medd and Shove because it focuses more on communications.

The key contribution to contemporary debate is a consideration of how people understand water, thus indicating how communications about sustainable water management might be framed to achieve maximum effect.

Insights for water behavioural projects

The work emphasises the importance of the communicative aspects of policy.

Enable

- The disconnection between people's understandings of domestic water and the natural environment must be overcome if 'the environment' is to motivate water saving. Achieving better understanding of how domestic water use impacts on the natural environment is therefore important, and may require local water environments to be more available and more frequently accessed than at present. Providing prominent information about the current state of local water resources may also help bridge this disconnection.
- Water efficiency messages need to overcome the strong perception that Britain is a wet country. Changing this engrained perception will not be achieved by one communication alone, but rather by the cumulative impact of a range of implicit and explicit communications from a range of sources. Governments and other organisations being seen to enable water efficiency (e.g. provide product labels for water efficient goods) is one of these important communications.

Engage

- Effective engagement on sustainable water management depends on overcoming the current negative associations with water, for example, through more water celebrations.
- People's understanding of water depends not just on their direct knowledge and understanding about water, but also on the wider 'common sense' through which they understand their world. Relevant 'common sense' contexts include mistrust of those in control, the morality of 'avoiding waste', and the futility of undertaking individual actions in the face of big problems such as water shortage.
- Water companies are not the organisations in the strongest position to engage the public with respect to water efficiency. Non-metered customers may perceive such communications as penny-pinching, while metered customers may question why their water company is (apparently) trying to reduce its profits.

Exemplify

- The public are unlikely to take individual action on water efficiency unless they receive cumulative communications that convince them that:
 - water is short;
 - other organisations are taking action to use water responsibly.

Encourage

- Being seen to encourage, in the sense of setting up incentive structures that are not counter-productive to water efficiency, may be important.
- The way encouragement is communicated is crucial. It is important not to communicate an assumption that people will merely conserve water in order to save money, as it:
 - potentially alienates those who are not concerned about money;
 - inadvertently sets water consumption up as a 'prestige' good;
 - implies that those who are not metered should not care about water consumption.

Researcher comments

The work complements that Medd, Spaargaren and Shove – emphasising the limits to current communications about water efficiency and the potential of such communications (if transformed).

It is provocative about:

- the current emphasis on metering (and in particular, metering promoted as merely a

means to save money);

- the current requirement that water efficiency communications are channelled through water companies.

Reference: S20

TITLE	Socio-cultural influences on water utilisation: a comparative analysis		
AUTHORS	A A Tur, G O Noguera, P Jeffrey, M Gearey, J D Rinaudo, S Loubier, T Veljanovski and N Ravbar	PUBLISHED	2006
CONTEXT	Social science: water focus		
SOURCE	<i>Water Management in Arid and Semi-Arid Regions: Interdisciplinary Perspectives</i> (ed. P Koundouri, D Assimocopoulos, M Lange and P Jeffrey), pp. 201-225. Cheltenham: Edward-Elgar Publishing.		
Principal learnings <p>The relative homogeneity of the results of the survey across the four case study areas indicates a generally positive attitude towards water and its management. Specifically, the findings seem to reflect:</p> <ul style="list-style-type: none">• the existence of shared environmentalist values in the samples;• a special concern about water. <p>The authors posit the existence of a shared perspective on water and its use – a water culture.</p> <p>The paper concludes that European communities do indeed display water saving behaviours in a more consistent way than would have been expected from an assessment of the attitudes related to this kind of behaviour. Moreover, it asserts that water saving behaviour has been internalised by the surveyed population.</p> <p>A possible explanation may be related to the multiple meanings and uses of water. In terms of the whole population and their attitude towards water, it would appear that water is not only a natural resource, but also a valuable and scarce economic resource. This fact is reinforced by their daily behaviour. It could also explain the generalisation of post-materialistic values among the respondents.</p> <p>The authors conclude that the surveyed populations commonly understand that water has a dual role:</p> <ul style="list-style-type: none">• Water is perceived as a basic resource. From the responses, we can detect that the willingness to change consumption habits after an increase in the price of water is rather low (57 per cent of the sample would not reduce their consumption) and that, in general, water is perceived as a cheap good (45.9 per cent say it is not expensive).• Water also has an environmental aspect, of a significant symbolic nature, as we have been able to see when analysing this factor; for example, 63 per cent of the sample believe that the main function of water is to support natural life.			
Argument <p>The authors argue that their results not only demonstrate that there is a shared European culture of water but also that environmental values, attitudes and behaviours</p>			

have been internalised – although at a superficial level – by most of the population. This assertion does not contradict the distinction between strong cultural concerns and weak cultural concerns. The sociological theory about cultural change in developed societies proposed by the British sociologist Ronald Inglehart (1989) forecast in the 1980s that there would be an increase in the post-materialistic-environmentalist values in western Europe as a consequence of the material safety that the Welfare State had provided since the mid-1950s. However, the European social dynamic during the last 20 years has not placed environmental values into hard cultural concerns, but into weak cultural concerns (Blühdorn 2000).

The European water culture clearly has contact with local water cultures. These local cultures are the result of the interaction of local populations with water, of their socio-cultural history and of the local environmental characteristics of water with regard to its quantity and quality. Along with this reality of local cultures, in constant dialectics and interaction with the global culture, is the beginnings of an explanation for those differences we find when comparing the results of the four case studies and the internal coherence that the results illustrate when they are analysed at a regional scale.

For example, a 'basic resource' perspective would anticipate the results obtained from the point of view of the local culture; for example, the Spanish respondents are more likely to be concerned with water issues and are the most active in water saving behaviours. In Maslowian terms, scarcity creates the necessity and necessity generates the values. In a region where the water deficit is a structural feature, water is a valuable resource, and this is reflected in the attitude and behaviour of the Spanish consumers.

However, it is not only scarcity or the difficulty of abstracting water which add value to this resource. As responses to the questions about measures to reduce the consumption of water in the future demonstrate, there must be other elements that increase the value of this resource. These values promote a pro-sustainable attitude among the users.

For example, when questioned if they would be willing to accept an increase in their water bills if the additional charge was used for the protection of water in the environment, British respondents most readily agreed with this kind of measure. In this sense, when asked about the option of shifting water consumption to off-peak times, the French respondents offer the highest number of affirmative answers while, contrastingly, the Slovenians are most likely to resist this measure.

Therefore campaigns aimed at improving the water use at a household level should take into account these local differences. Campaigns should be adapted to local water cultures and be extremely sensitive towards the kind of relationship, symbolic perception and physical interrelation that citizens maintain with water.

Current relevance and issues

In scoping a context for their contribution, the authors draw attention to other work that has emphasised how strategies for sustainable water use are promoted by an understanding of the perceptions, attitudes, behaviours and opinions of the final users. This dimension to sustainable development is explicitly stated as an element of Agenda 21 statements that prioritise social participation as a key factor in the construction of environmentally and socially fairer water governance arrangements. They go on to explain how the culture of water is created from the interactions between communities and their water environments. This is a constant process of adaptation involving the redefinition of attitudes and behaviours. These processes of the production of environmental cultures are influenced not only by the economic, political and social

power structures that define their frames of action (Donahue and Johnston 1998), but also by global cultural trends that generate new meanings for the environment (Plumwood 2002). This background generates a critique about the socio-cultural influences on water utilisation being a set of dynamic meanings that generates attitudes and behaviours (Strang 2003). The scientific effort to understand these socio-cultural determinants produces knowledge that allows us to design new formulae for the sustainable use of water with a higher level of confidence.

The paper's broad ambition is rooted in the belief that:

- neither scientists nor technicians have the absolute legitimacy to design new ways of managing water;
- final users must be incorporated in the process of diagnosis, decision making and response.

The innovation introduced by the research lies in presenting a comparative analysis of data from four catchments in France, Spain, the UK and Slovenia. To date, studies regarding domestic water use have been developed exclusively at a national level. Although the Eurobarometer reports supply comparative data about the attitudes of the Europeans towards the environment, they do so without examining water issues specifically. Therefore, the data provided by this survey provide an opportunity to investigate which local factors may influence the design of strategies for sustainable use of water and also to start to explore the existence of a common water culture among Europeans.

Such in-depth comparative studies of European attitudes to water management are rare and, while this paper perhaps suffers from trying to cover too much ground, the data presented are informative. The relevance of the study to our current project is somewhat constrained by a lack of focus on social marketing or incentivising processes.

Insights for water behavioural projects

Enable

No obvious insights from the paper on this topic.

Engage

The study findings identify a strong positive link between how informed citizens are about water, their level of concern about the water environment (water stress) and their willingness to take personal action to mitigate water stress. This evidences the positive effect that engagement can have.

Encourage

No obvious insights from the paper on this topic.

Exemplify

No obvious insights from the paper on this topic.

Researcher comments

Reference: S21

TITLE	Predicting intention to save water: theory of planned behaviour, response efficacy, vulnerability and perceived efficiency of alternative solutions		
AUTHORS	S Lam	PUBLISHED	2006
CONTEXT	Social science: water		
SOURCE	<i>Journal of Applied Social Psychology</i> , 36(11), 2803-2824		
<p>Principal learnings</p> <p>Ajzen's theory of planned behaviour (TPB) (see S1) alone is not sufficient to understand intentions towards retrofitting behaviours. The two studies conducted in Taiwan focused on intentions towards installing dual flushing controllers for toilets. The paper found that subjective effectiveness of alternative solutions (SEAS) is a good predictor of intentions.</p> <p>One study found that people's intention to install dual flushing controllers was related to their estimate of the number of people who would co-operate in a similar fashion. However, intentions are not affected by the estimated level of success of this collective action. Thus two forms of collective efficacy are starkly contrasted. Similarly, the study found that personal efficacy to save money by saving water was an important variable, but personal efficacy to lessen drought was not.</p> <p>Significant demographic variables (e.g. income, housing, education) were not consistent across the studies, apart from finding that age and gender were non-significant in both cases. The results suggest that adoption of water saving technologies involved different demographic variables to those involved with recycling behaviour.</p> <p>Interestingly, none of the TPB variables were found to play a particularly large role in predicting intention. The paper posits this may be because retrofitting appliances were considered a new technology by participants, and so attitudes, subjective norms and perceived behavioural control regarding them may have been vague. Thus strategies that aim to change such factors may be relatively ineffective.</p>			
<p>Argument</p> <p>Lam based his study on drought-ridden areas in Taiwan in 2002–2004. The rationale for his study was that though the Taipei City government was urging citizens to save water (alongside government supply restrictions), the propaganda did not mention much about suitable methods of water conservation. Most recommendations were in the area of habit-changing, i.e. curtailment procedures that required changes in habits and sacrifice in convenience. The author argues that curtailment practices are less effective than efficiency procedures (e.g. retrofitting).</p> <p>Lam uses models of health behaviour to add to the TPB model. In the first study he includes variables of collective response efficacy (perceived efficacy in goal attainment), perceived vulnerability and SEAS as predictors of behavioural intention. In the second study he breaks down the efficacy variable into measures of collective and personal efficacy. By adding these nuanced variables, Lam finds that the predictive power of the models is higher compared to the unexpanded TPB model.</p>			

Current relevance and issues

This paper is a highly relevant application of TPB to water saving behaviour. However, the findings are somewhat culturally specific. It is likely that different results would be found if these models were applied in the UK though, to our knowledge, this has not been done. The absence of strong demographic indicators may also make targeting lifestyle groups difficult should interventions be targeted on these grounds. However again the cultural context may mean this finding is not transferred to the UK.

Nonetheless, these caveats aside, the paper sheds some light on the terms in which consumers view their and others efficacy towards the issue. It also underlines the attention that needs to be paid to promoting the effectiveness of alternative solutions to retrofitting and water conservation schemes.

Insights for water behavioural projects

Due to the exploratory nature of this psychological approach, the suggestions are relatively limited. It is important to note that, given the difference in demographic backgrounds between those with intentions towards water saving behaviour and those who recycle, generic conclusions cannot be drawn from other waste management research in this area. However, some suggestions for future research are given in order to productively guide current findings.

Enable

- Intervention as prescribed by TPB may not be suitable in this case given the non-significance of these variables. It is suggested that a more powerful strategy might be to publicise the relative effectiveness and advantages of retrofitting appliances, as well as alternative strategies for water saving.

Encourage

- Personal efficacy is linked to saving money through water conservation. Hence if financial incentives can be provided, it is likely personal efficacy levels will rise.
- If people can be persuaded that their action is part of a large movement, it is likely that collective efficacy will increase intentions towards retrofitting behaviour.

Suggestions for future research

- Comparing inexpensive (e.g. cutting shower times) and expensive (e.g. buying a water-efficient washing machine) actions with retrofitting behaviour may establish how intentions are affected in the face of these alternatives.
- Since self-report data, as used in this study, usually overstate water conservation intentions, it would be valuable to conduct a study of intentions and actual actions.

Researcher comments

Although the TPB model is used as a basis for exploration, it is felt that the author loses focus of what the theory has to offer as he adds in components of health behaviour models. Findings are disappointingly limited and few strong conclusions can really be drawn. However, the outcome does appear to be a richer model with significant explanatory power and provides plenty of scope for further research and intervention experimentation in the field.

Appendix 2: Assessment criteria for selection of pilot projects

Assessment criteria	Issue	Weighting
Does the proposed timescale fit neatly within the project's timeframe, allowing sufficient time for input into design? Does the project finish in time for data to be available when we need it?	Timing	5
Do the activities proposed match those we want to test? Are the interventions aimed at changing people's behaviour using (at least some) social marketing techniques?	Project design / concept / strategy	25
How sure are we (as a project team) that this project will be going ahead? How sure are we that we have sufficient information on which to assess this project's potential?	Level of certainty	7
Extent to which we feel the project would add significantly to the body of knowledge on how to achieve water efficient behaviours among the project's target audience(s).	Value to Environment Agency	10
Is the project partner willing and able to let us influence their project's design, especially with regard to collection of monitoring data?	Partner flexibility	7
Extent to which we feel we can trust the partner(s) to deliver on what's expected of them? Level of trust we're willing to place in organisation and individuals involved.	Partner 'reliability'	6
Does the project have a significant level of resource commitment already in place to ensure it takes place? Is there sufficient 'budgeting' (of staff time and finances) to allow adequate delivery, including data capture for monitoring?	Resources available and already committed	10
Is it likely that all the resources still outstanding can and will be secured in time?	Resources still needed but unsecured	5
Is the project location 'accessible'? That is, will it be possible for us to work with the project's location (given our limited travel budget)?	Location	5
Do the proposed data collection/monitoring activities fulfil our data requirements in terms of evaluation of project impact/effectiveness? If not, is the project design sufficiently flexible in terms of timescales, resources and activities planned to address this shortfall? Can it be done?	Monitoring requirements	20

Appendix 3: Wessex Water – Water Efficiency Trial – March 2009

**Wessex Water
Water Efficiency Trial
March 2009**



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1. EXECUTIVE SUMMARY

This report outlines a water efficiency trial that Wessex Water undertook in conjunction with Somer Community Housing Trust, the Environment Agency and Resource Futures in 2008/09. The trial involved assessing the uptake, effectiveness and costs of different water efficiency activities in 24 blocks of social housing flats in Bath.

The blocks of flats were split into four groups comprising four or five blocks:

Group 1: Devices only – water saving devices installed free of charge

Group 2: Devices and engagement – both education and devices were offered to the flats

Group 3: Engagement only – visits made with educational information

Group 4: Control – no visits made to the blocks.

Water use in each block was monitored before and after the interventions using meters and data loggers programmed to record flow at 5-minute intervals.

Uptake rates for the interventions were high. 45% of the flats targeted for device interventions had Ecobeta dual flush devices retrofitted and 50% of householders in the flats targeted for engagement activities participated in discussions about water efficiency in their home. These uptake rates are higher than have been found in other studies and it is thought that this is because householders in social housing are used to tradesmen visiting their homes and so were particularly amenable to the interventions. The uptake for a *Water Saving Day* in a village hall which was organised as part of the educational interventions was, however, very low (two attendees from 156 invitations to the event). This further suggests that the residents were most receptive to water efficiency messages if they are presented to them and require minimal effort to receive.

Data analysis of average water consumption shows that 12 out of the 13 blocks where interventions took place used less water following the interventions. Changes in water use in these blocks ranged from -14% to +4%. In contrast, only three out of eight blocks in the control group exhibited reductions in water use over the same period and overall changes varied between -15% and +12%. These findings suggest the interventions were effective in reducing demand.

The device interventions appear to be more consistently effective than educational engagement. Four of the five blocks fitted with Ecobetas showed a reduction in water use which averaged 6.3%. The four blocks which received only the educational engagement visits also show a reduction in consumption however the savings are generally less. Three of the four saw changes of -2.4% to -5.2% although the fourth block recorded a change of -13.9% which appears to be an outlier in the dataset.

The cost benefit analysis, although not conclusive owing to variability in some of the results, indicates device installation alone cost £0.81 per litre saved per day, engagement alone cost £0.78 - £1.62 litre saved/day and devices and engagement together cost £2.03 litre saved/day.

The largest cost component for each of the interventions was staff time either for plumbers to install the devices or social marketing specialists to engage in educational activities with householders. These costs could be reduced by carrying out multiple interventions in a single visit, or by arranging for Housing Associations to carry out installations at the same time as their routine maintenance visits.

2. INTRODUCTION

2.1 Background information

Water efficiency measures can play an important role in maintaining the balance between supply and demand of water resources to help ensure we operate a sustainable business. Furthermore, regulatory legislation¹ to promote water efficiency and government aspirations to reduce per capita consumption mean that understanding the effectiveness (and cost) of various measures is becoming increasingly important.

Wessex Water has undertaken a water efficiency trial in order to:

- gain more understanding of the effectiveness of different approaches to encourage water efficiency
- increase existing knowledge on the uptake of water efficiency activities and
- assess the savings attributed to different activities.

Various water efficiency trials have been carried out by other water companies, however very few have worked with Housing Associations. This trial was therefore set up to explore the benefits of working in conjunction with Housing Associations, and with a different target population.

Somer Community Housing Trust (SCHT) had previously expressed an interest in working with Wessex Water on environmental and sustainability projects and this prior communication helped to develop the partnership for this water efficiency trial.

The project was then identified and selected by the Environment Agency as a suitable project for research into the effectiveness of education and information in reducing demand levels. Resource Futures, a waste consultancy with expertise in communication methods, were contracted to run the social engagement aspect of the project and were also involved in the design of the trial. Resource Futures were also contracted to run the Natural England Living Rivers trial in the Salisbury area, which is a separate study to this.

2.2 Aim and objectives

The project was set up to assess the effectiveness of different approaches (termed interventions in this report) in reducing water consumption in social housing flats. Outcomes of the trial will be used to enhance the existing evidence of water efficiency initiatives and to help determine the costs and benefits of future activities.

The objectives of this project were to:

- determine the uptake of different interventions
- quantify savings from different interventions
- calculate the cost benefit of the interventions
- assess the viability of similar wider scale programmes.

¹ Ofwat have recently set water companies the target of reducing consumption by one litre/property/day from 2010 to 2015 to help achieve the Government's aspirations of reducing average per capita consumption from 150l/p/d to 130l/p/d by 2030.

3. TRIAL LOCATION

Following discussions with SCHAT, it was decided that a suitable location for the trial would be the Twerton Estate on the western side of Bath. 19 blocks of flats were used in Twerton, and a further five blocks were available in the Moorfields area (2 miles east of Twerton). The locations of the blocks are shown in Figure 1 below.

This map has been removed for security purposes.

Figure 1: Location of the blocks of flats within the Twerton area

4. PROJECT APPROACH

4.1 Overview

The trial approach agreed by Resource Futures and Wessex Water was to investigate the effectiveness of the installation of water saving devices compared to educational engagement with residents in influencing their behaviour.

This was achieved by:

- assessing current water usage
- carrying out an intervention
- monitoring the change in water use.

Three groups of interventions and two control groups were applied (shown in Figure 1):

Group 1: Devices only (D)

Group 2: Devices and engagement (DE)

Group 3: Engagement only (E)

Group 4: Control Twerton (CT)

Group 5: Control Moorfields (CM)

The blocks of flats were split into geographical groups, shown in Figure 1. The blocks were divided in this way in an attempt to keep the interventions independent of each other. However, Twerton estate residents are considered to be a fairly tight-knit community so diffusion of information can not be disregarded. The five blocks in the Moorfields area were also used as a separate control group to supplement the control data collected from Twerton.

The activities undertaken in each stage of the study are shown in Figure 2 below.

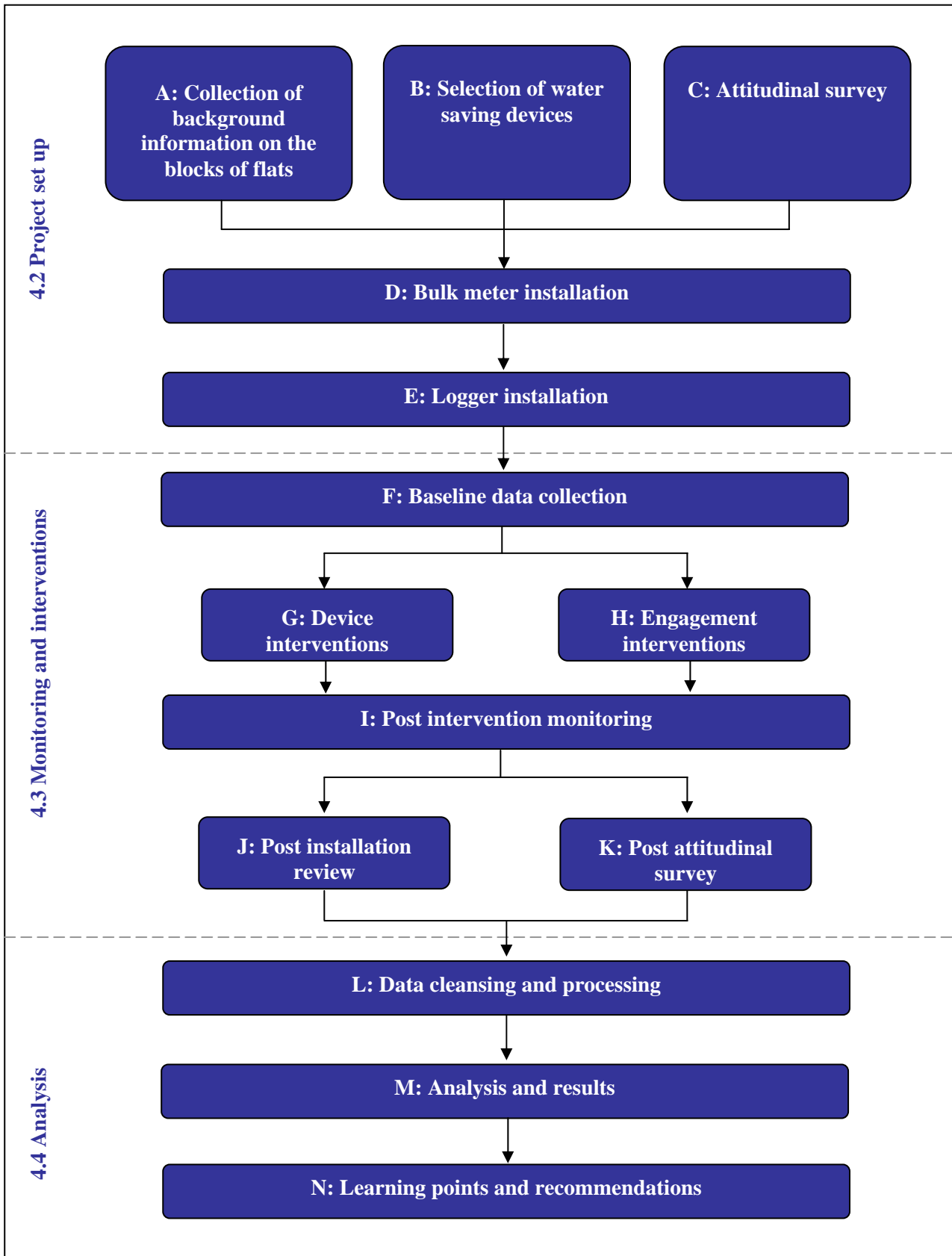


Figure 2: Trial approach

4.2 Project set up

A. Collection of background information on the blocks of flats

For each block of flats in the trial SCHAT provided relevant information on:

- the number of flats in the block
- the sizes and occupancy rates of the flats
- the demographics and management concerns of the blocks
- the number of occupier owned flats and
- the number of flats with a meter.

The blocks of flats are comparable in design. They each have between 10 and 18 flats made up of studios, one-bed and two-bed flats. The number of residents in each block varies between 11 and 38. Ninety percent of flats are social housing properties, managed by Somer Community Housing Trust and 10% are owned by their occupiers as leaseholders. A summary of the details of all the blocks is given in Appendix 1.

B. Selection of water saving devices

The aim was originally to install a range of water efficient devices to gauge the savings that can be made from a 'basket' of measures. Visits were made to some of the flats with a SCHAT tradesman to confirm which measures were appropriate for the flats.

Table 1: Suitability of different measures

Device	Assessment of suitability	Included in trial?
Low flow shower head	Only a small number of the flats have showers, and these are electric showers, which are not suitable for low flow shower heads.	No
Aerating tap inserts	The taps in the flats are all different styles and sizes and some have oval outlets. A variety of tap inserts were trialled but none were found to be suitable.	No
Dual flush retrofit	The toilets are mainly nine-litre cisterns and therefore suitable for dual flush retrofit devices.	Yes
Save a flush	The toilets are suitable for <i>Save A Flush</i> devices.	Yes
Washers to fix leaking taps	Some taps were suitable for washer replacements, others may need complete replacement.	Yes

Although on their visits the plumbers may have found taps suitable for the tap inserts, it was expected to only be in very few cases and it was decided that more could be read into the results if dual-flush retrofit devices along with save a flushes were the only devices used.

Following advice from Waterwise it was agreed that the Ecobeta dual-flush device would be used. The use of these in other trials has shown they are quick and straightforward to install.

C. Attitudinal survey

Resource Futures conducted a survey on attitudes to water use in homes and existing behavioural patterns of the residents in May 2008 before the interventions were carried out. All flats in all of the blocks were targeted, including the control blocks. A letter was sent out prior to the visits to make people aware of the visit and to encourage participation. The survey questions are given in Appendix 2.

D: Bulk meter installation

Between December 2007 and March 2008 bulk meters were installed on the supply pipes to all the blocks by a Wessex Water contractor, Water Support Services. This approach rather than monitoring individual flats was considered the easiest and most cost effective way of collecting data.

Prior to any works commencing, a notice was put up in all the blocks explaining that Wessex Water would be working on the supply pipes. This was to keep the residents informed and to try to dispel any interest in the works. A copy of the notice is included in Appendix 4. The contractors faced several difficulties in installing the meters, due to the lack of detailed mapping of the location of the supply pipes and knowledge of how many supply pipes fed each block. This resulted in several investigatory excavations taking place around some of the blocks, provoking some concerns from residents and SCHT.

Meters were successfully installed on 19 blocks in the Twerton area and five on Moorfield Road. The majority of the blocks had two bulk meters and a few had one bulk meter, further details on this and the dates of installation are given in Appendix 4.

E: Logger installation

Technolog data loggers were fitted to the meters by Mouchel technicians in order to record the water use patterns of the blocks of flats. Sourcing the correct probes for the loggers proved difficult, and this resulted in a delay in connecting some of the loggers to meters. The delay was quite extensive in some cases; the start dates of the logging on the blocks range from April to September 2008 (details are given in Appendix 4). This compromises the baseline logging period for some of the blocks.

The raw data volumes used were recorded in litres per second (l/s), at 5 minute intervals.

The technicians were unable to fit loggers on to two of the blocks: E1 and CM4. There are therefore no results for these blocks in this report. Given the low volumes recorded for DE2 and CT4, it is believed that only half of the consumption of those blocks is being metered.

4.3 Monitoring and interventions

F: Baseline data collection

The logger data was downloaded and calibrated weekly until the team were confident the loggers were recording accurately. Subsequently data was downloaded monthly by Mouchel technicians and meter reads were taken at the same time as a validity check and as a back up. Data was downloaded into PMAC, which is data logging and control software. The software enabled data to be viewed and analysed.

G: Device interventions

Contract plumbers were hired through SCHT to install the devices. They were existing contractors of SCHT and familiar with the properties. A training session was held to give them an overview of the project and details of their role, and to provide training in Ecobeta installation.

The installation of devices took place in October 2008. It was agreed the plumbers would make up to three visits to each flat to install the devices.

The plumbers were asked to inform the residents they were fitting devices for SCHT to save water. Where the residents consented to this, the plumbers were advised to fit an Ecobeta where suitable and a *Save a Flush* cistern displacement device where not. Where dripping taps were found, the plumbers were instructed to replace washers where possible.

The plumbers were paid on a daily rate for six days' work. It was agreed a daily rate was the best way to pay, as the uptake rate was unknown and it was essential that the devices were installed correctly to ensure good performance and customer satisfaction. The plumbers kept records detailing which properties had been visited and whether any taps had been fixed and any Ecobetas fitted, and any comments made by the resident.

H: Engagement interventions

The engagement interventions were led by Resource Futures. A wide range of activities for water efficiency promotion were appraised including pub quizzes, a tour of a water treatment works, children's education days and a travelling information centre.

The final assortment of engagement activities were selected on the basis that

- SCHT felt that residents would be receptive to them
- they could be realistically be done by water companies in the future.

Canvassing

Following discussions with SCHAT, it was decided to take a door to door approach to speak to residents as it was felt that the target population would be more receptive if the message was taken to them.

A team was selected through Resource Futures to carry out canvassing of the blocks. The team was led by a Resource Futures employee and received training prior to making the visits.

The canvassing was carried out at the beginning of October 2008. An approach similar to that of the plumbers was used- with each flat targeted with education interventions being visited up to three times. The canvassers tried to engage the residents in conversation, gave them information and facts and had some “giveaways” to hand out. The “giveaways”, designed by Resource Futures, were to act as reminders in the kitchen and bathroom and all had water saving messages on them. These included shower timers, magnets and *Save a Flush* devices.

The canvassers also handed out pledge cards with actions for people to meet, with an incentive of winning an eco kettle. A copy of the pledge card is given in Appendix 5.

The canvassers were asked to leave a pledge card, a flyer for the Water Saving Day and a ‘*Water saving in your home*’ leaflet when residents had not been in when any of the visits had been made.

Records were kept of which properties had been visited and which “giveaways” had been handed out to the different flats.

Water saving day

A water saving day was promoted to all households in the social engagement blocks by word of mouth, flyers and posters (see Appendix 6). It was held on the afternoon of Thursday 30 October at Twerton village hall half a mile from the trial blocks. The hall was set up with information areas, a water use calculator, information on getting a meter, a face painter, a Wessex Water education adviser and giveaways including tea towels, washing up bowls, watering cans, and information booklets.

I: Post intervention monitoring

Water use monitoring continued for three months following the interventions. Consumption volumes were checked against the respective meter reads on a monthly basis to ensure accuracy. Any problems identified were passed out to the technicians to resolve.

J: Post installation review of the Ecobeta device

In February 2009 a return visit was made to the flats where the Ecobetas were installed. The plumbers questioned the residents on whether the devices were still installed and whether they used the short flush. Any other comments made by the residents were noted.

K: Post intervention attitudinal survey

The post-intervention survey was carried out by mail in February 2009. This was a shorter survey than the original one and residents were asked to post back their answers to Resource Futures. A copy of this survey is provided in Appendix 7.

4.4 Analysis

L: Data cleansing and processing

Water use data was downloaded from the loggers every month, and the total volumes were checked against the meter reads to ensure the loggers were recording correctly.

Although the logging equipment was new, a few issues were experienced with the logger data. Some issues were due to the functioning of the loggers and others for different reasons. To ensure that these issues did not affect the data, it was validated. Table 2 outlines the issues that arose, how these were solved and whether the data was included or excluded from the analysis.

Table 2: Issues experienced with the data and their solutions

	Issue	Data validation and inclusion/exclusion
Logger issues	Some of the loggers were set up reading only proportions (50%/20%) of the volume which passed through the meter.	This was noted when checks were made against the meter reads and volumes were amended and included in analysis
	There were periods when the loggers stopped working- pulse leads or logger technician errors – this is the most common issue.	Sometimes only one of the two loggers did this however the data during this period was excluded from analysis.
	There was a period when the volumes recorded by one of the loggers (D4) was slowly decreasing compared to the meter reads.	The reason for this was not identified, but the pulse lead was replaced and data for the period excluded.
Other issues	On two occasions pulse leads were vandalised so no data was collected until the problem was spotted at the time of the subsequent meter read.	Pulse leads were replaced. There was no data to include in the analysis.
	There were periods of obvious leaks when the five minute data didn't record 0l/s for long periods of time e.g. CT1, CM3 and CM5.	The data was corrected by calculating how much was lost due to the leak using the minimum consumed volume and the number of days this occurred.
	Periods of unexplained unrealistically high or low use.	Excluded from analysis.

An example of a graph produced in the PMAC software is given in Appendix 8. This demonstrates how the leaks were spotted and equivalent volumes were subtracted from the dataset.

M: Analysis and results

Due to the small data set statistical tests could not be carried out on the data collected. Comparative analysis was therefore carried out instead.

Change in consumption:

In order to calculate if any change in consumption resulted from the trial interventions the average daily consumption for the time period following the interventions was compared to the average daily consumption prior to any interventions. Total daily volumes were calculated in PMAC from the five-minute data collected. These volumes were then averaged for the two comparison periods.

For subsequent analysis this data was normalised to eliminate external influences by using the change observed in the control blocks.

The periods considered for the period ‘before’ and ‘after’ are detailed in Table 3 below. The exact periods of time used for the individual blocks vary depending on when the loggers were installed and reading correctly. Dates used for the start of the monitoring period for each individual block are detailed in Appendix 4.

Table 3: ‘Before’ and ‘after’ monitoring periods used for analysis

Intervention group	Before	After
Device only	Start to 12/10/08	24/10/08 to 21/01/09
Device and engagement	Start to 30/09/08	24/10/08 to 21/01/09
Engagement only	Start to 30/09/08	7/10/08 to 21/01/09
Control Twerton	Start to 30/09/08	24/10/08 to 21/01/09
Control Moorfield	Start to 30/09/08	24/10/08 to 21/01/09

Per person consumption

Per person consumption was calculated by dividing the total consumption for the block by the total number of people in the block (using occupancy data provided by SCHAT). Per capita consumption was also worked out for the post intervention period, although these figures will represent the savings made spread over the whole block, and not just in the flats with the interventions.

Savings per visit

The savings made per visit were calculated by dividing the average daily savings for the whole block by the number of successful visits made to the block. Figures for the ‘device and engagement’ group were worked out based on the number of flats receiving at least one intervention.

Cost benefits:

The cost benefit for each of the interventions carried out was calculated by dividing the total litres saved for each group by the cost of that set of interventions. The proportion of time spent on the installations in the specific group determined the proportion of the total staffing cost for that activity. In this analysis the assumption was made that 100% of the savings observed were attributed to the interventions carried out.

5. PROJECT RESULTS

This section presents results on the uptake of interventions (Section 5.1), reviews changes in consumption before and after the interventions and considers the savings made from each visit (Section 5.2). A cost benefit analysis of each intervention group is carried out in Section 5.3.

5.1 Intervention uptake

5.1.2 Householder uptake of devices

Table 4 below shows the number of Ecobetas installed in each of the blocks and other maintenance work carried out.

Table 4: Details of the interventions carried out in the blocks with the devices

Intervention group	Block	No flats	No Ecobetas installed	No refused entries	% flats fitted with Ecobeta	Save A flush fitted	Other work done
Devices	D1	18	10	1	56	0	Replaced 1 lever tap
	D2	16	8	0	50	0	3 new siphons
	D3	18	9	0	50	0	Replaced one lever tap
	D4	10	2	2	20	0	New siphon
	D5	16	8	0	50	0	2 lever taps replaced unblocked wc pan
	TOTAL	78	37	3	47%		
Device and engagement	DE1	18	6	1	50	0	
	DE2	10	3	1	33	0	
	DE3	16	6	2	38	0	
	DE4	16	7	0	44	0	
	DE5	18	11	0	61	0	Tap washer replaced
	TOTAL	78	33	4	42%		
ALL		156	70	7	45%		

Up to three attempts were made to visit each flat during the six days. The contract plumbers fitted Ecobetas in 70 flats out of the total of 156, which equates to 45% properties. Ecobetas were fitted in 47% of the device only flats and 42% of the device and engagement flats.

These are high uptake rates compared to those quoted in other trials. This could be explained by the fact that occupiers of SCHAT properties are used to tradesmen entering their flats for repairs and maintenance checks. The number of devices installed may have been even higher if the plumbers had worked into the evening to catch a different section of the population, or if appointments had been made beforehand.

The devices were well received by most residents, and only seven people said they did not want the device. In 11 flats it was found that the toilet cisterns were inappropriate for the retrofit siphon, the majority of these were already dual flush toilets. All the others already had a *Save a Flush* fitted

apart from one which had a concealed cistern. Therefore no additional *Save a Flush* devices were installed.

In one instance the Ecobeta had to be removed immediately following installation as the ball valve movement was being impeded by the device, resulting in continuous release of water.

A few lever taps and siphons were replaced in the device only block and one washer was replaced on a leaking tap.

Post installation review

In February 2009 one of the plumbers made a return visit to the flats and spoke to residents of 54 of the 70 flats where devices were installed.

- All but three people were happy with the devices, with several commenting they are a really good idea.
- Two people had removed the devices themselves as they felt the pan was not clearing properly and the third device was removed by a SCHAT tradesman when the siphon was replaced.
- All the residents reported that they use the short flush and only one resident commented that it was inconvenient to hold the handle down for a long flush.

5.1.3 Engagement visits

Attitudinal survey

The survey team targeted all the flats in the trial (372) and had an uptake rate of 73 respondents for the pre-intervention survey and 28 respondents for the post-intervention survey. The survey gave some interesting results, see table 5 below.

Table 5: Some results of the attitudinal survey carried out pre and post interventions

	Pre intervention	Post intervention
Agree or strongly agree that everyone needs to do what they can to reduce the waste of water	88%	93%
Think they do all they can already to save water	60%	Not asked
Always turn the tap off whilst brushing their teeth	62%	64%
Always turn the tap of when doing the dishes	87%	82%
Save water even if it requires additional effort	37%	36%
Save water if it requires no additional effort	45%	53%

The results of this survey show that the residents spoken to in the flats are/ say they are good with saving water. There is no great difference in the figures collected from the post-intervention survey to the pre-intervention survey, although the second surveys shows a slightly higher proportion of respondents believe everyone needs to do what they can to save water.

It is important to highlight the change in survey techniques for the pre-and post-intervention surveys. The people who made the effort to return the post-intervention surveys are probably more environmentally conscious than the 'average' person and this therefore may explain the slightly

higher results. Interpretation of attitudinal changes from these results must therefore be considered with caution.

Canvassing blocks

Table 6 below shows the number of flats which received the engagement intervention.

Table 6: Details of the number of blocks which received the engagement intervention.

	Block	No. flats	No. visits	No. refusals	% block visited
Device and engagement	DE1	18	7	1	39
	DE2	10	5	0	50
	DE3	16	8	1	50
	DE4	16	6	2	38
	DE5	18	9	4	50
	TOTAL	78	35	8	45
Engagement	E1	18	10	1	56
	E2	12	5	1	42
	E3	16	8	4	50
	E4	16	13	2	81
	E5	16	7	0	39
	TOTAL	78	43	8	55
		156	78	16	50

All flats were visited during the intervention period, and the canvassers engaged in conversation and gave out “*giveaways*” to residents of 78 of the flats, constituting 50% of all flats. 45% of the ‘devices and engagement’ group and 55% of the ‘engagement only’ group received the intervention.

Residents of an additional 16 flats declined to take part in the engagement activity.

Out of the 78 residents spoken to, nearly all of them appeared enthusiastic about saving water and were keen to have the “*giveaways*”. The table in Appendix 9 details the “*giveaways*” handed out to each block of flats. A total of 95 giveaways were handed out to residents in the ‘device and engagement’ block and 154 to the ‘engagement only’ block.

Residents of 64 of the flats agreed to make a pledge. Only two pledge cards were returned for the competition which, is a low return rate, although the pledge commitments may still have been achieved.

Where the householders were not in water saving leaflets and the Water Saving Day flyer were posted through their letterbox.

Water Saving Day

Despite high interest shown by the residents to the canvassers for the Water Saving Day, only two residents attended. The difference in uptake between this and the canvassing results is a valuable learning point; the social housing residents were more receptive when messages were taken to them.

This contrasts to the experience in Downton, Wiltshire where 200 village residents (adults and children) attended a similar event organised by Resource Futures for the Living Rivers Project. The difference in uptake may be attributable to the demographics of the social housing tenants in Bath, compared to Wiltshire village residents who are mostly employed owner occupiers. A key difference may also be that the Downton residents ‘owned’ the activity, whereas the Twerton residents were given it.

Of the two engagement activities, canvassing is more similar to what water companies would carry out in household audits, so it is beneficial to be able to attribute any savings made to just the canvassing activity.

Unfortunately some of the giveaways such as washing up bowls, tea towels and indoor watering cans were held back for giveaways for the water saving day. More materials could have been handed out in the blocks had it been known the water saving day was not going to be well attended.

5.1.4 Device and engagement visits

In the ‘device and engagement’ intervention group, 33 flats had an Ecobeta installed and 35 received education and information, however only 18 of the 78 flats received both the engagement and the device.

Table 7: Details of flats receiving both device and engagement

Block	No. flats	No. flats receiving device	No. flats receiving engagement	No. flats receiving both
DE1	18	6	7	2
DE2	10	3	5	2
DE3	16	6	8	2
DE4	16	7	6	5
DE5	18	11	9	7
Total	78	33	35	18

5.2 Consumption data analysis

Water use data was collected for 22 of the blocks.

5.2.1 Presentation of results

The results are summarised in Table 8 below and consumption profiles are presented in Figures 3 to 7. Gaps in the daily consumption data exist where no data was recorded by the loggers, and data that is excluded from analysis is represented by the light blue line. The reasons for the exclusion of some data points are explained in Table 2. The grey boxes highlight the periods during which interventions were carried out. Average daily consumption is calculated for the ‘before’ and ‘after’ intervention periods and is illustrated by the red and green lines, with the volume written in bold underneath the line.

Table 8: Average daily volumes before and after the intervention period

	Block	Average daily consumption before (l/block/d)	Average daily consumption after (l/block/d)	% change	Average daily consumption before (l/person/d)	Average daily consumption after (l/person/d)
Device	D1	4166.5	3622.4	-13.1	122.5	106.5
	D2	4786.7	4487.6	-6.3	129.4	121.3
	D3	4693.2	4285.6	-8.7	130.4	119.0
	D4	1743.1	1658.8	-4.8	116.2	110.6
	D5	3502.0	3499.75	-0.1	194.6	194.4
Device and engagement	DE1	3304	3440.8	4.1	110.1	114.7
	DE2	1225.0	902.0	-26.4	68.1	50.1
	DE3	2837.4	2637.1	-7.1	141.9	131.9
	DE4	3970.2	3512.5	-11.5	172.3	152.5
	DE5	4787.0	4481.0	-6.4	126.0	117.9
Engagement	E2	1568.5	1526.0	-2.7	142.6	138.7
	E3	3931.1	3715.7	-5.5	119.1	112.6
	E4	3603.8	3451.4	-4.2	124.3	119.0
	E5	4463.4	3831.8	-14.2	135.3	116.1
Control Twerton	CT1	4187.1	4283.1	2.3	123.2	126.0
	CT2	2967.6	3053.0	2.9	98.9	101.8
	CT3	3738.5	3588.0	-4.0	124.6	119.6
	CT4	1098.7	937.1	-14.7	54.9	46.9
Control Moorfields	CM1	3985.5	4459.9	11.9	153.3	171.5
	CM2	3455.5	3472.9	0.5	132.9	133.6
	CM3	7289.3	6415.0	-12.0	291.6	256.6
	CM5	4449.7	4915.7	10.5	148.3	163.9

The figures in grey for blocks DE2 and CT4 are where it is believed that only part of the total block consumption is being metered. The high value for per capita consumption for CM3 is due to a leak somewhere in the block. The litres/person/day figures are therefore incorrect for these blocks, however overall change in consumption can be included in the analysis.

The per capita consumption calculated varies considerably. This could be explained by variable occupancy rates. Occupancy data was provide by SCHAT, however they were not very confident in the figures they provided us with, stating that there could be fewer or greater numbers in each flat.

Recent billing data was examined for metered flats in the trial area. This showed large variation in daily consumption for individual flats for the same time period in different years, indicating occupancy rates in the flats fluctuate considerably over time.

WESSEX WATER WATER EFFICIENCY TRIAL

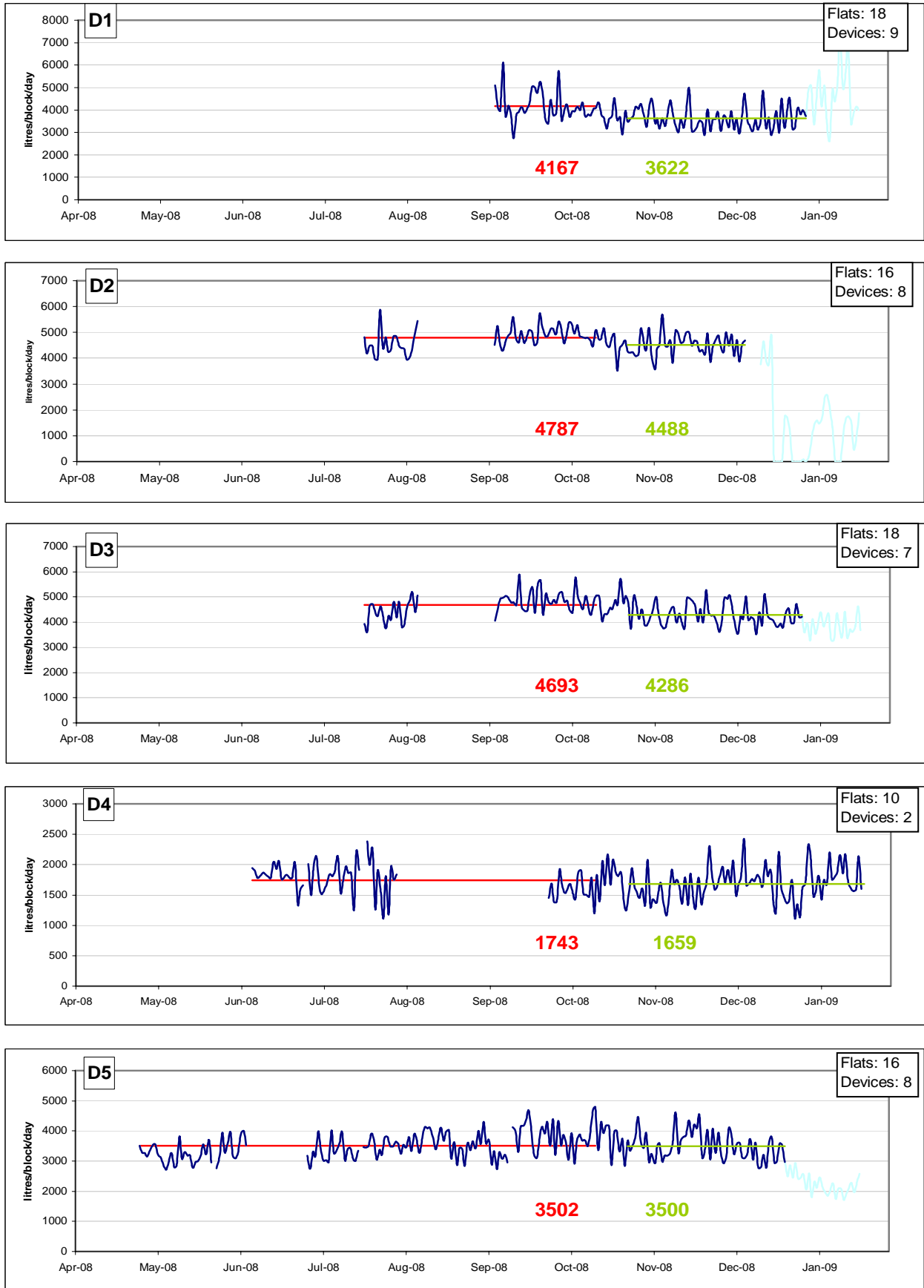


Figure 3: Daily consumption for the 'device only' blocks over the monitoring period and average daily consumption for the 'before' and 'after' periods.

The baseline (pre intervention) data is limited for the 'device only' blocks due to a four week period where loggers on four of the blocks were not recording.

All the 'device only' blocks showed a reduction in consumption following the installation of the Ecobetas. Block D5 showed only a very small reduction, despite half of the flats in the block being fitted with an Ecobeta. The other four blocks showed savings between 5% and 13%.

Block D5 showed the greatest initial consumption (194 l/p/d) and although 50% of the flats in this block were fitted with an Ecobeta, the data shows no subsequent reduction in water use. The raw logger data collected for one of the loggers shows numerous periods of a few hours or more where the consumption line does not drop to 0 l/s, which is unusual and different to the patterns observed in the other blocks. The figure calculated for per capita consumption is therefore higher than it should be, but the issue is prevalent throughout the monitoring period and so changes in consumption between 'before' and 'after' can be considered valid.

However, all blocks are within the 15% reduction evident for control block CT4.

WESSEX WATER WATER EFFICIENCY TRIAL

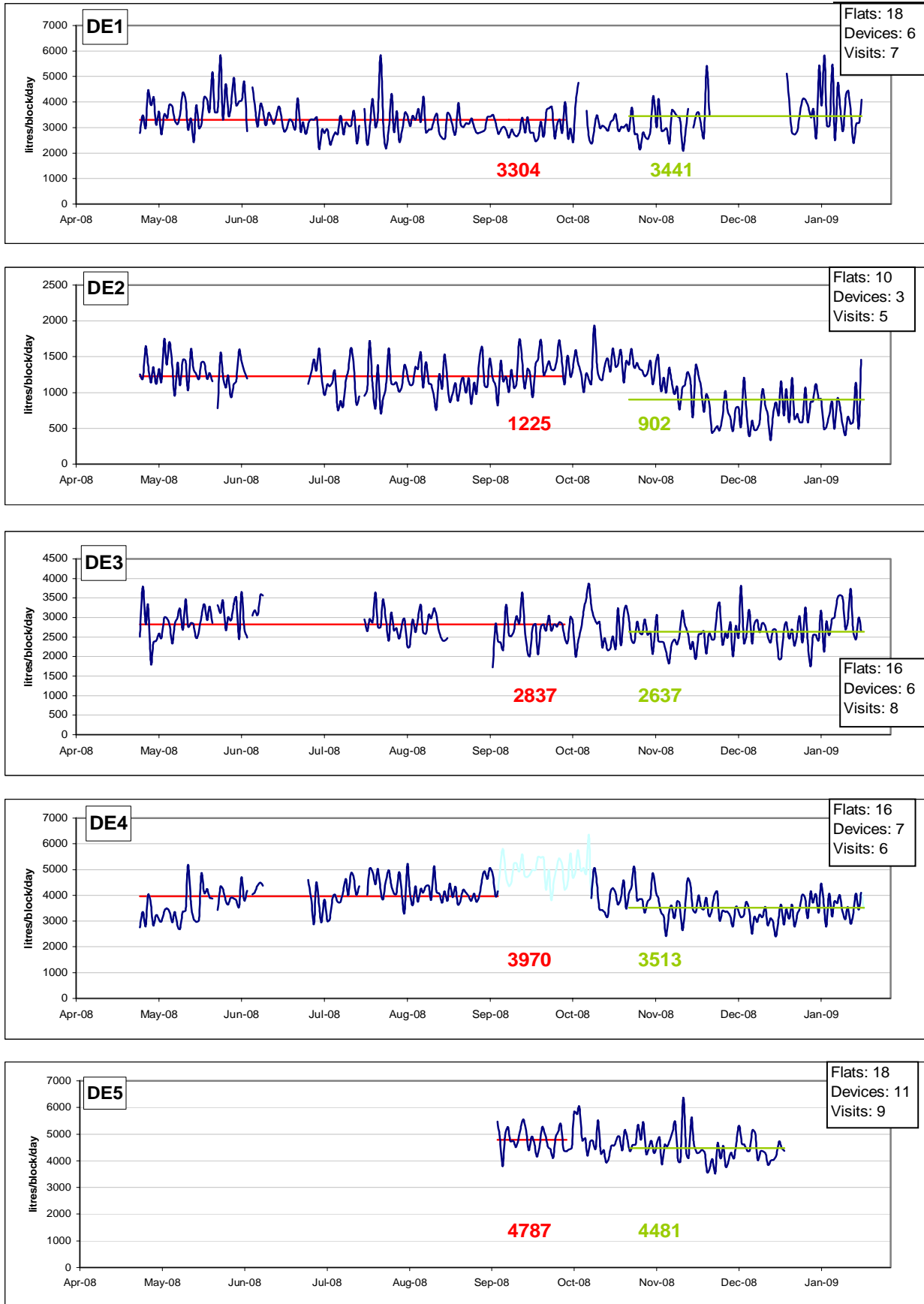


Figure 4: Daily consumption for the 'device and engagement' blocks over the monitoring period and average daily consumption for the 'before' and 'after' periods.

The consumption line for DE2 (Figure 4) shows a slow decline rather than a clear step down following the interventions. Given the nature of this decrease it is assumed to not result from the interventions and the block was therefore excluded from further analysis.

Three out of the four blocks considered for further analysis show a reduction in water used following the interventions. These three had reductions in water use of 6.4%, 7% and 11.5%.

Block DE1 shows an increase in consumption although it received 7 engagement visits and 6 out of 18 of the blocks had an Ecobeta installed.

WESSEX WATER WATER EFFICIENCY TRIAL

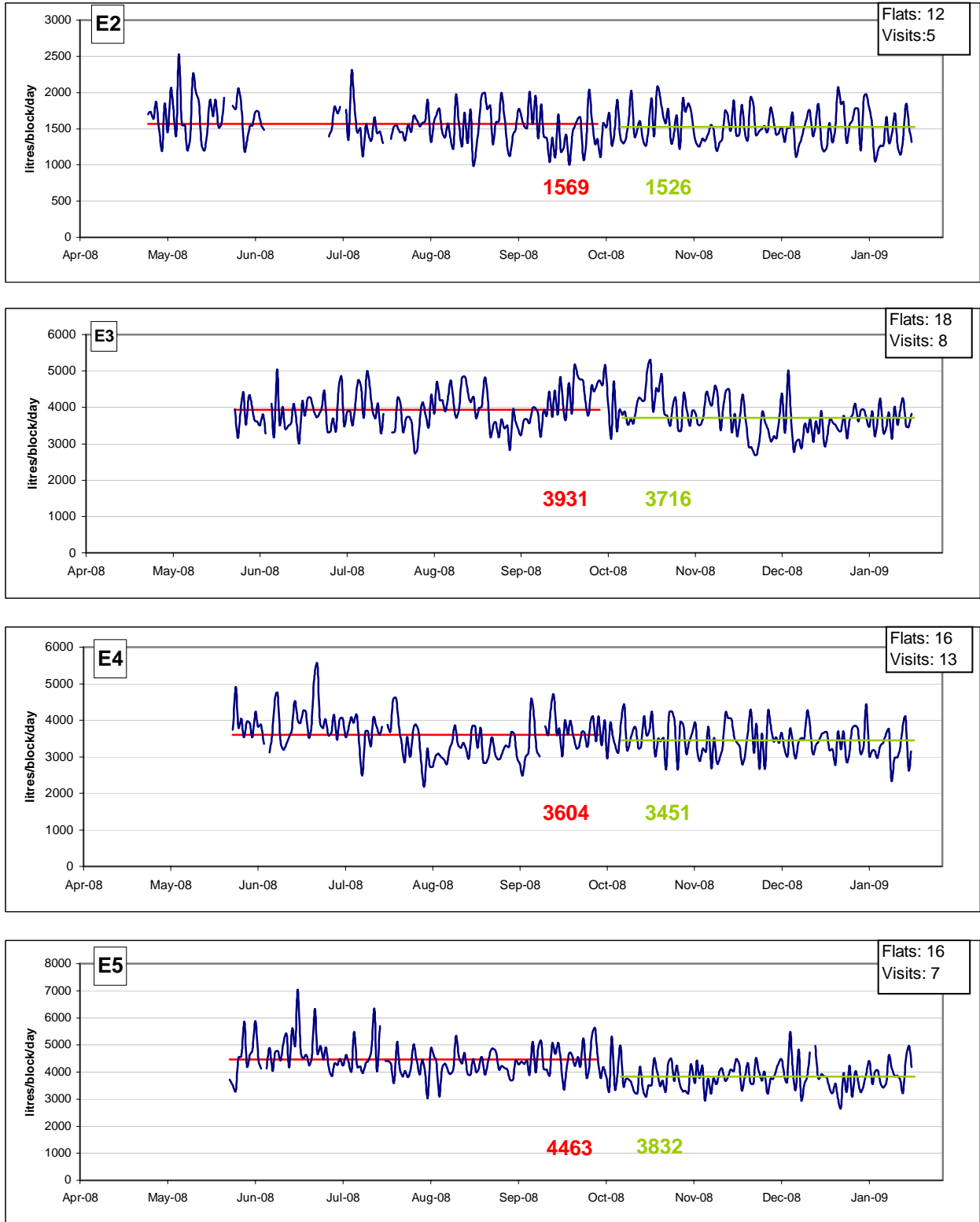


Figure 5: Daily consumption for the ‘engagement only’ blocks over the monitoring period and average daily consumption for the ‘before’ and ‘after’ periods

The monitoring period prior to the intervention is at least four months for all the blocks, which means the baseline data used for comparison is robust.

All the engagement blocks show a decrease in consumption following the canvassing visits. Three of the blocks show savings of between 2.7% to 5.5% and block E5 shows a saving of 14%, which is the highest out of all the intervention blocks.

WESSEX WATER WATER EFFICIENCY TRIAL

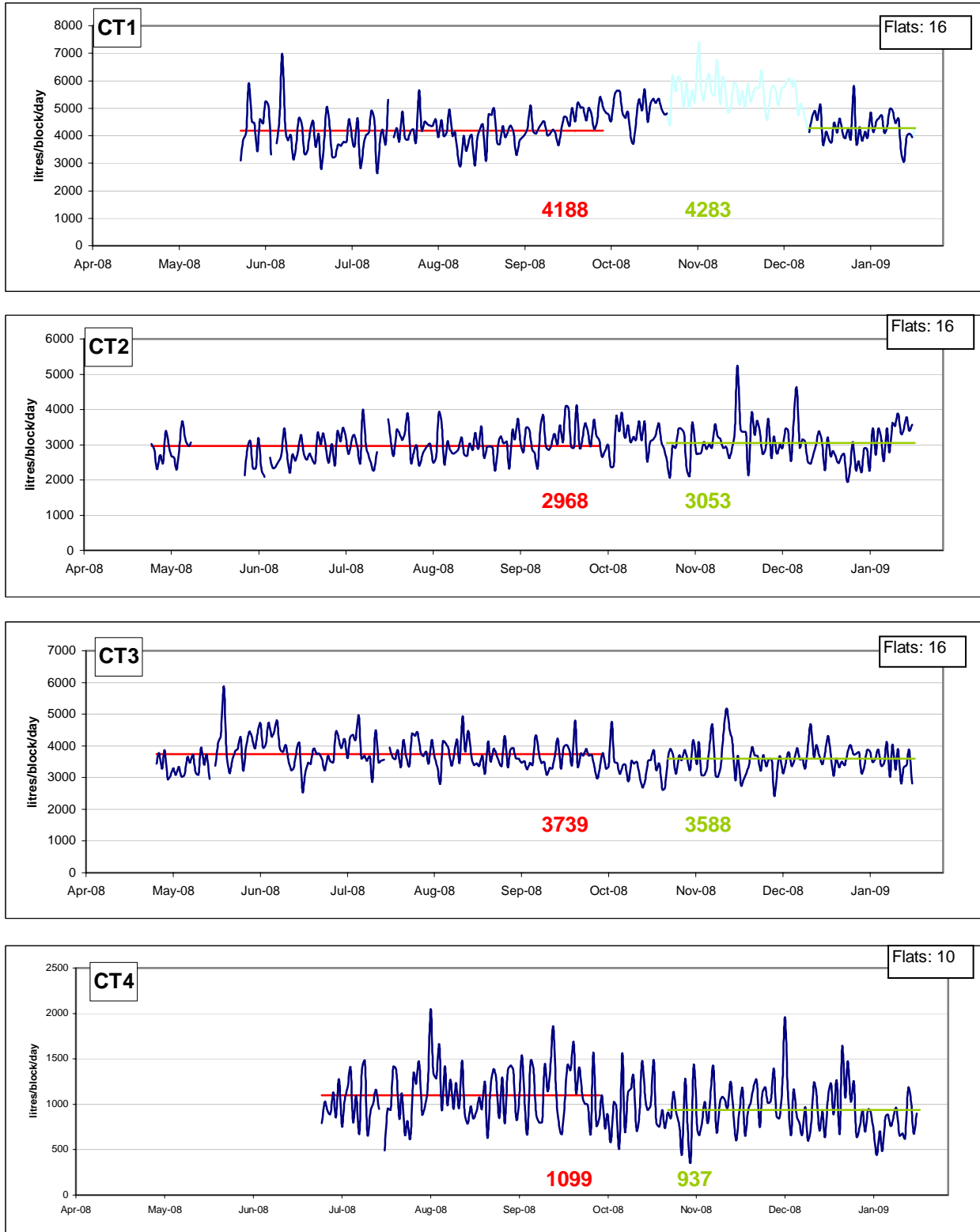


Figure 6: Daily consumption for the Twerton control blocks over the monitoring period and average daily consumption for the 'before' and 'after' periods.

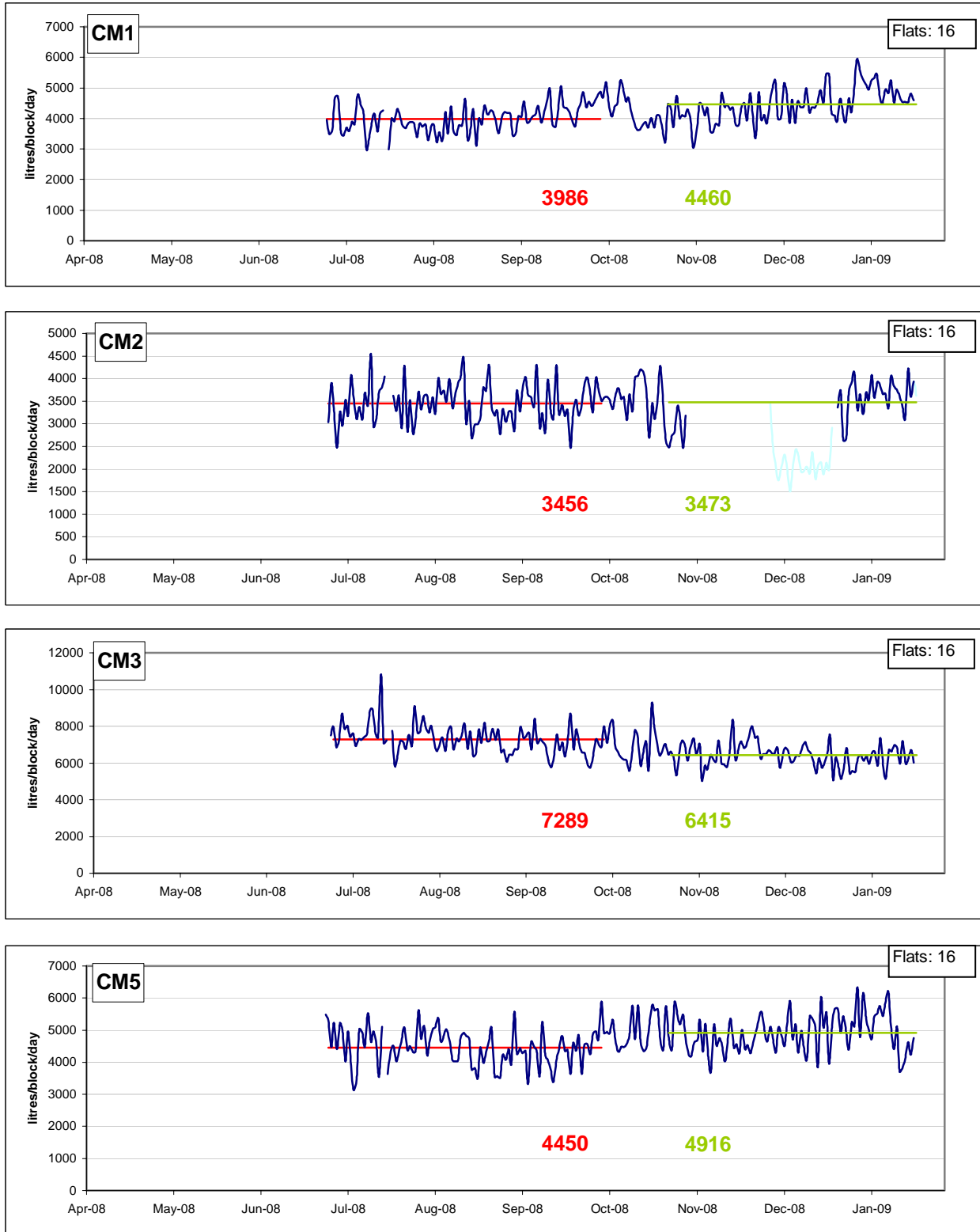


Figure 7: Daily consumption for the Moorfields control blocks over the monitoring period and average daily consumption for the ‘before’ and ‘after’ periods.

The control blocks all vary in terms of daily consumption and the changes in consumption experienced over the trial period. The Moorfield Road control blocks are similar in terms of the

number of flats and residents in each block yet the average daily volumes and the changes before and after the intervention period differ greatly. This highlights the variability in the data.

Out of the eight control blocks, three showed a reduction in water use from November to January and five showed an increase in water use.

The changes in consumption for all the blocks are summarised in Figure 8, and the average change for each group is shown in Figure 9.

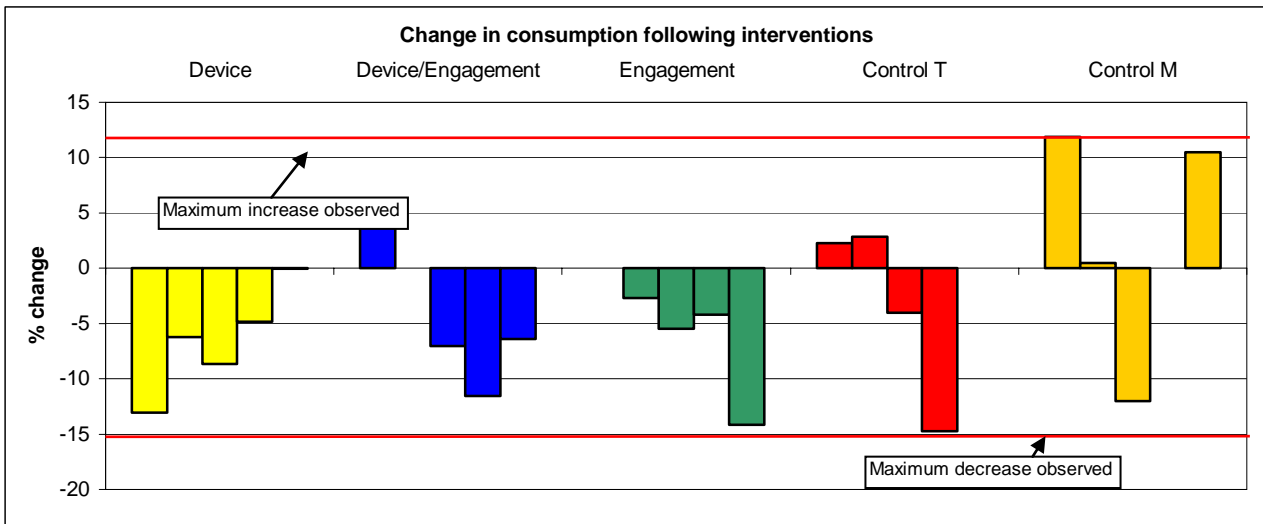


Figure 8: Percentage change in water use observed for each block following the interventions

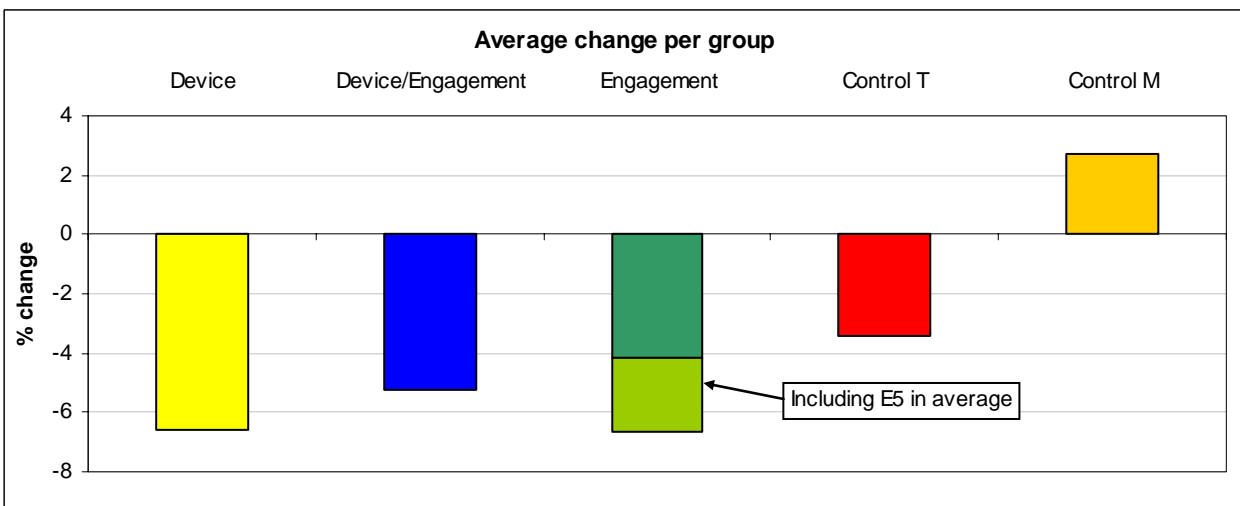


Figure 9: Average change in water use per group

The control data indicated that the consumption in the different housing blocks varies without interventions, yet 12 out of the 13 intervention blocks show a decrease in consumption. This indicates a correlation between interventions and reduced consumption.

Interestingly, the control group in Twerton showed an overall reduction in water use following the intervention period and the control group in Moorfield showed an increase in water use of a similar magnitude (Figure 9). Combined, this is a reduction of 0.3% for the control groups.

The change in water use per block can be normalised to exclude external influences, such as the weather, by using the average change for the control blocks to allow calculations of water savings to be made.

The District Metering Areas (DMA) which cover the Twerton area could have been used to normalise the data however they show the demand from houses as well as flats and therefore the change in demand between summer and winter will not be representative of changes experienced in flats alone. Graphs of these two DMAs are included in Appendix 10.

The normalised consumption for the individual blocks is shown below in Figure 10 below.

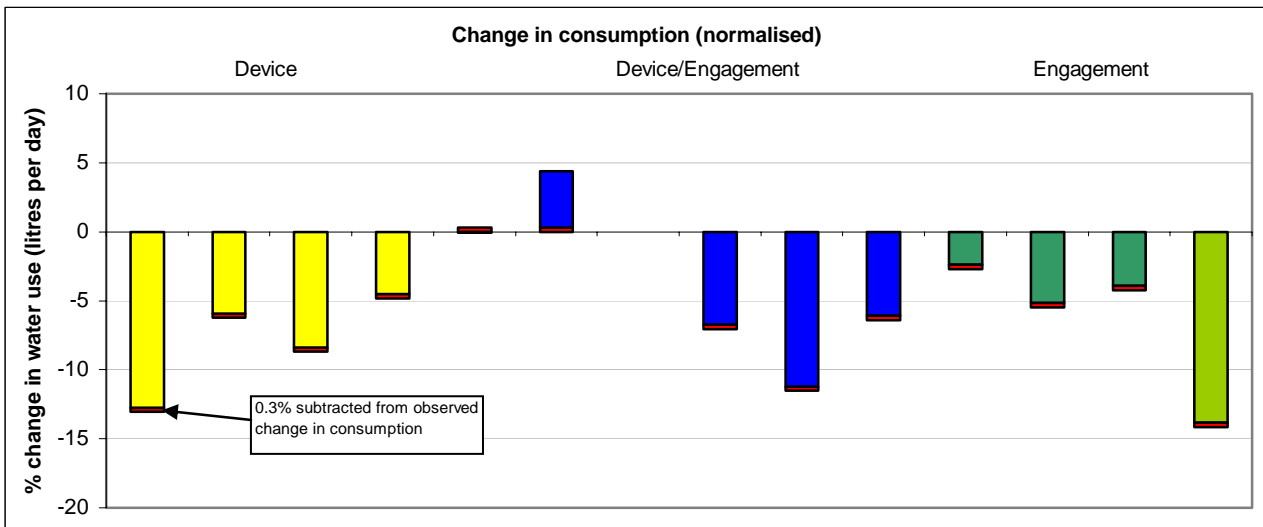


Figure 10: The result of normalising the changes observed in the intervention blocks

Normalising the observed savings results in a slight reduced level of savings in the blocks and the change in consumption for block D5 is now positive.

The savings calculated per visit are presented below.

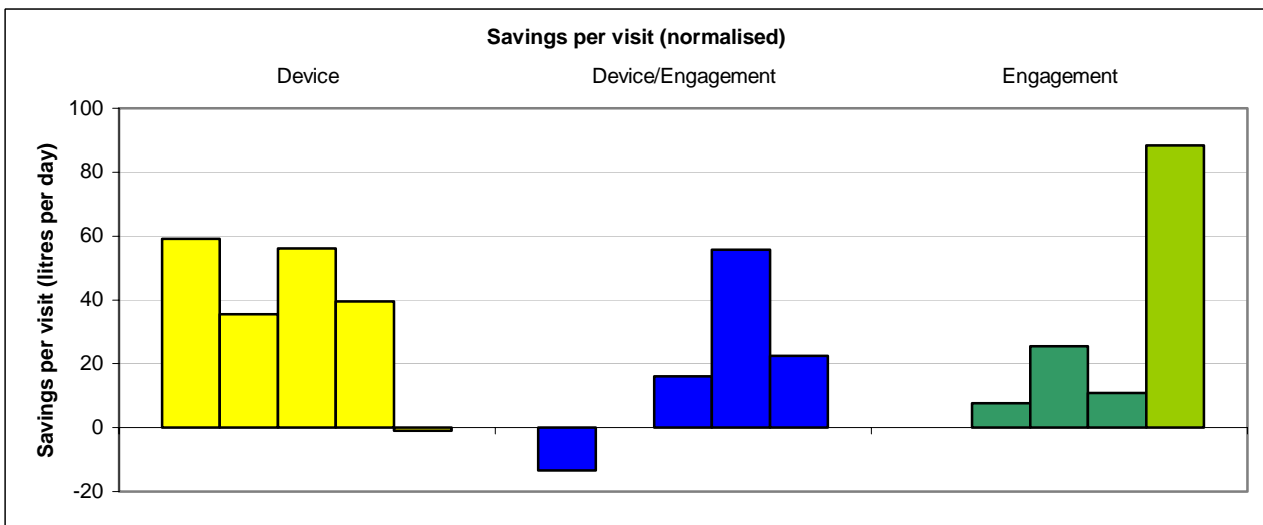


Figure 11: The savings achieved per visit

5.2.2 *'Device only' group findings*

The calculated savings per device range from -1 to 59 litres per flat per day. The four blocks which show greater savings range from 36 to 59 litres/flat/day.

Other research trials have shown savings from an Ecobeta to be in the order of 29 litres per property per day. There are a few possible explanations to explain this difference-

- The original flush sizes in the flats in this trial could be larger (nine litres) and therefore have potential to save greater volumes.
- There may be higher occupancy rates in these flats than in other trials. However the data collected by plumbers suggests an average occupancy rate per block of between 1.2 to 2.7.
- A large proportion of the residents are unemployed so the occupiers may spend more time at home than average, and therefore flush the toilet more than the average 4.2 times a day.
- It is possible that having the Ecobeta installed in their flat provoked residents to think more about the water they use in their home, resulting in reduced use through behavioural changes in other areas of their flat.
- Maintenance may have been carried out on fittings in the flat which reduced water use.

The average change in water use for all the blocks following the interventions was 6.3%, which is higher than the device and education blocks and higher than the education only blocks if block E5 is excluded from analysis.

5.2.3 *'Engagement only' group findings*

These figures are calculated based on the number of householders the canvassers participated in discussions with, and do not take into account the *'Water saving in your home'* leaflets which were left for residents who had not been at home for the three occasions when the canvassers made their visit. The 'per visit' savings figures are therefore slightly overestimated.

The savings made from the 'engagement only' interventions range from 7 litres per visit per day to 88 litres per visit per day, however the 88 l/visit/ day for block E5 appears to be an outlier. The raw data in PMAC shows no obvious reason why the consumption dropped and the graph E5 in Figure 5 does show the trend to occur immediately after the intervention period.

The savings from the engagement intervention group are generally lower than those from the device group. The majority of the residents are unmetered customers and therefore do not have the financial incentive to reduce their water use and therefore are less likely to change their behaviour.

Savings from education initiatives may reduce over time as people resume their former behavioural activities. The graphs in Figures 4 and 5 do not indicate this has occurred within approximately three months of post installation monitoring.

5.2.4 'Device and engagement' group findings

The savings per visit range from 56 litres per flat per day to 16 litres per flat per day and block DE1 shows an increase in consumption by 13 litres per visit.

These results show the savings made in the device and education groups to be less than those in the device only group, which is counterintuitive. If the plumbing and canvassing visits had been made to the flats at the same time, the combined effect of the device plus education could have been analysed.

5.2.5 Summary of observations

- The consumption pattern varies over time, with periods of slightly higher consumption however there is no obvious peak summer demand. This could be because 2008/09 was a wet year and also flats do not use as much water in the summer as properties with gardens.
- No clear weekly trends are observed in the data which could be due to irregular working patterns and weekend work.
- The average consumption per person during the baseline monitoring period varies from 98 l/p/d to 194 l/p/d (excluding DE2, CT4 and CM3). The Wessex Water region average demand is 150 l/p/d for unmetered customers and includes those with gardens, therefore the figure of 194 l/p/d seems high, questioning the accuracy of the occupancy rates.
- The change in consumption per block varies between a 12% increase in water used to a 15% decrease in water used.
- Considering only the blocks which received interventions, 11 out of 13 showed a decrease in consumption and the change ranges from a 14% decrease to a 4% increase. In comparison, the 8 control blocks showed considerable variation in consumption, with 3 of the 8 showing a reduction in water use in the period after the interventions.
- The saving made per visit looks extremely high for many of the blocks, unrealistically so in some cases.
- Figure 9 shows that the greatest savings were made by the installation of the Ecobetas (if block E5 is excluded from analysis).

5.2.6 Limitations with data analysis

It is important to highlight the limitations to the data collected and the analysis carried out:

- Some of the blocks have short baseline monitoring periods of four to six weeks.
- The sample size is too small to be able to draw statistically significant conclusions from the data.
- There are periods of missing data when the loggers were not functioning properly.
- The data collected for the intervention groups was normalised using the change observed in both the control groups. It could be argued that using the Moorfields data alone would have been more appropriate as it is outside the Twerton area, and therefore not affected at all by the other interventions.
- In calculating the savings per visit, it is assumed that all the savings are a result of the visits. Residents could have spoken to their neighbours about the visit and passed on information, which could explain the high savings experienced in some of the blocks.

- The number of people in the flats is believed to vary over time, and a low confidence level is associated with the occupancy data provided by SCHAT.

5.3 Trial costs

The costs incurred for all the intervention activities are detailed in Table 9 below and costs for the whole trial are given in Table 10.

Table 9: Cost for all intervention materials and staff time

Intervention	Item	Unit cost (£)	Number	Total (£)
D/DE	Ecobetas	9.75	67	653.25
E/DE	<i>Save a flush</i>	0.90	41	36.90
E/DE	Shower timers	3.00	31	93.00
E/DE	Leaflets	0.49	128	62.72
E/DE	Magnets	0.61	57	49.41
E/DE	Staff- fieldwork	1603.98	1	1603.98
D/DE	Staff- plumbing	1409.94	1	1409.94
				3909.2

Table 10: Total trial cost

Item	Cost
Monitoring	
Metering materials	£15,263
Metering staff time	£19,228
Logging materials	£14,597
Logging staff time	£25,752
Interventions	
RF staff time	£2,906.26
WW staff time	£3,600.00
Plumbers- Oct +Feb visits	£1,997.42
Materials	£895.28
Total	£84, 238.96

5.4 Cost benefit analysis

A simple cost benefit analysis was carried out to compare the cost of each intervention with the savings it achieved. The costs for installing the meters and loggers on the blocks and for administration were excluded for this analysis. In order to be able to calculate the cost benefits of the interventions, it is assumed that the benefits are 100% attributable to the costs.

5.4.1 Devices

Thirty-four devices were installed and were left in place in the ‘device only’ group, so the cost of the plumbers’ time is taken to be half of that outlined in Table 9, as the other 50% time was spent installing devices in the device and engagement blocks. The overall savings in the ‘device only’ group were on average 1,281 litres per day.

Table 11: Costs and savings for the device only intervention group

Item	Unit cost (£)	Number	Total (£)	Water saved (l/day)	Cost per litre saved/day
Ecobetas	9.75	34	331.50		
Plumbers	704.97 (50% total time)	1	704.97		
			1036.47	1,281	£0.81

This gives a cost of £0.81 per litre saved per day or £810,000 per Megalitre saved/d, however over time there may be deterioration of the devices (Waterwise estimates the asset life of the Ecobeta to be 10 years) or they may get removed over time and yields may therefore not be sustained without additional investment.

5.4.2 Engagement

For the purpose of this analysis, the Resource Futures’ cost for the fieldwork only is considered. It is assumed that the water saving day had no effect on water use as only two people attended, the cost incurred for this are therefore excluded. The costs of the leaflets left when residents were not at home are included in this analysis.

Calculation including block E5

The cost per litre per day for the ‘engagement only’ blocks was calculated using Table 12 below. Thirty-three of the flats in the engagement only blocks (excluding E1) received visits and savings of 1002 litres per day were made.

Table 12: Costs and savings for the engagement only intervention group, including E5

Item	Unit cost (£)	Number	Total (£)	Water saved (l/day)	Cost per litre saved/day
<i>Save a flush</i>	0.90	32	28.80		
Shower timers	3.00	18	54.00		
Leaflets	0.49	60	29.00		
Magnets	0.61	22	13.42		
Staff	673.68 (42% of total time)	1	673.68		
			799.3	1002	£0.78

Calculation excluding E5

If block E5 is excluded, 26 of the flats received visits and savings of 383 litres per day were calculated.

Table 13: Costs and savings for the engagement only intervention group, excluding E5

Item	Unit cost (£)	Number	Total (£)	Water saved (l/day)	Cost per litre saved/day
<i>Save a flush</i>	0.90	25	22.50		
Shower timers	3.00	13	39.00		
Leaflets	0.49	44	21.56		
Magnets	0.61	16	9.76		
Canvassers	529.32 (33% of total time)	1	529.32		
			622.14	383	£1.62

When E5 is included the calculated cost is £0.78/litre saved/day or £780,000/Megalitre saved/day. Excluding E5 gives cost of £1.62/litre/day or £1,620,000/Megalitre/day. These savings are attributed to behavioural change and if the messages given have not been embedded, the residents could revert to former behaviour as time passes. Future campaigns could be needed to further promote water efficiency and to sustain the savings.

5.4.3 Device and engagement

Thirty three visits were made by the plumbers and 35 visits were made by the canvassers. 18 blocks received both interventions. The time and material costs were disregarded for block DE2 as the savings are not included. The costs of the leaflets left when residents were not home were included in this analysis. The total cost for the interventions was £1601.73 and 787 litres a day were saved.

Table 14: Costs and savings for the device and engagement group

Item	Unit cost (£)	Number	Total (£)	Water saved (l/day)	Cost per litre saved/day
<i>Save a flush</i>	0.90	0	0.00		
Shower timers	3.00	8	24.00		
Leaflets	0.49	68	33.32		
Magnets	0.61	24	14.64		
Canvassers	616.90 (38% of total time)	1	616.90		
Ecobeta	9.75	30	292.50		
Plumber	620.37 (44% time)	1	620.37		
Total			1601.73	787.3	£2.03

This gives a cost of £2.03 per litre saved per day, and £2,030,000 per Megalitre saved per day.

Combining these interventions would lead to a reduced cost for staff, which is the largest cost component. Using the average cost for the staff cost components, £618.64, the revised cost per litre saved per day is calculated to be £1.25.

5.4.4 Summary of cost benefit analysis

A summary of the cost benefit analysis is given in Table 15 below.

Table 15: Summary of cost benefit analysis

Intervention	£ per litre/day
Device	0.81
Engagement including block E5	0.78
Engagement excluding block E5	1.62
Device and engagement	2.03
Revised device and engagement cost (see above)	1.25

The intervention which came out with the lowest cost per litre saved per day was the education only if the savings from E5 are included. If these savings are not included, then Ecobeta installation is the most cost effective initiative.

70% of the cost for the device only intervention was for the plumber's time. So the cost could be reduced if Ecobetas could be installed whilst tradesmen or plumbers are doing other work in homes.

Cost would also be reduced if appointment times were pre made, so time is not wasted going from door to door.

It is important to highlight that the initial savings recorded could decrease over time and the yield may not be sustained with just this level of investment. The Ecobeta and *Save a Flush* devices could be removed or degrade and residents may revert to former behavioural activity. Regular investment will therefore be required to sustain the observed level of water saving.

This analysis is also limited by the assumption made that all changes in consumption observed are attributable to the interventions.

6. EVALUATION OF PROJECT

The key findings, successes and limitations are highlighted below.

6.1 Key findings

High uptake rates: 45% of the targeted flats had an Ecobeta installed and 50% of the targeted engagement flats received advice and information from the canvassers. The high uptake rates may be attributed to the fact that residents are used to tradesmen and housing officers calling round.

Householders were satisfied with dual flush device: Only 3 people out of 54 spoken to following installation had removed the device. All the other respondents said they were using the short flush.

The residents are interested in water efficiency and are keen to talk and learn about it. However, the low turn out for the water saving day demonstrates that messages and interventions need be taken to the residents rather than relying on the residents being proactive.

11 out of 13 intervention blocks showed a decrease in water use following the interventions, whereas only 3 out of 8 of the control blocks showed a decrease, indicating that despite variability in consumption, the interventions had an effect.

The average savings made with Ecobeta were 6.3%. The Ecobetas were shown to be more effective in saving water than education alone, possibly because they do not rely on behavioural changes.

The reduction in consumption in areas where engagement visits were made is indicated to be in the order of 3.8% to 6.3%.

Bulk monitoring of flats removes the ability to fully examine water use patterns- for this individual properties would need to be monitored.

The results of the cost benefit analysis are inconclusive. The cost per litre saved is lower for the 'education only' blocks if the block E5 is included in the analysis, otherwise the 'device only' intervention is the most cost beneficial. A simple analysis was carried out which does not allow for the replacement of devices or further engagement activities needed to sustain the yield achieved. Due to the variability of the savings there is low confidence in the results.

There is potential to increase the cost effectiveness of device installation further if installation if device installation is carried out along with routine maintenance work in the flats.

6.2 Project limitations

Delays occurred at the start of the project as surveys to identify the location of supply pipes for meter fitting took longer than anticipated. The monitoring period was further shortened due to the delays in receiving parts of the loggers cut down the baseline period.

A key limitation for the project was the length of the baseline monitoring period. In a few cases the average daily volumes following the intervention period are compared to only four to six weeks' worth of data collected before the interventions. Extensive baseline data is important to be able to understand patterns in water use, especially as it is subject to seasonal change.

Data was recorded using bulk meters. Although this simplified installations and sped up the data collection it caused complications when analysing the data set. Daily profiles were hidden due the data being a combined output from 10 or more flats. It is possible to see overall trends in data, but difficult to calculate savings per device.

The calculations for saving per visit assume that all reductions in water use are attributed to the visits, although other factors such as seasonality, maintenance and occupancy rates may have influenced the amount of water used.

The combined effect of education and devices could not be accurately calculated owing to limited coordination between plumbing and canvassing teams- future projects should seek to improve on this.

The blocks of flats were split up to compare the effect of different water efficiency measures, however it is likely that messages spread between the blocks due to the area being a close knit community. Also, the installation of the devices could have had a roll on effect of people thinking more about water use and changing their behaviour.

Knowledge of occupancy data is critical to determining and understanding the per capita consumption and the savings per visit. Although SCHAT provided information about when flats were vacant, no records are available of when people were away over weekends or had visitors staying. Although asking the residents to keep water use diaries was considered, it was felt that the majority of people would not fill them in.

6.3 Future work

Working in partnership with Housing Associations has the potential to be a cost-effective way of promoting water efficiency. Costs could be cut down by asking Housing Association tradesmen to install Ecobetas or *Save A Flush* devices when they visit flats for other jobs.

The results shown for the education only intervention suggest that offering household audits to customers would be an effective initiative to promote. The majority of households receiving interventions in this study were unmetered, and there could be scope for further savings with metered customers who have a financial incentive to save water.

WESSEX WATER WATER EFFICIENCY TRIAL

APPENDIX 1: COMPARISON OF STUDY BLOCKS

Name of block	No of flats	No residents	No flats with meters	No owner occ flats	Type of housing	Types of social mix	Issues	Problems	External water supply	Other
D1	18	34	0	1	Flats and maisonettes 1/2 beds	?	No issues at present	Low Management issues	yes	Firehose problems
D2	16	37	1	0	Flats and Maisonettes 1/2 beds	?	ASB/G/LM	Some Management issues	yes	Firehose problems / SOMER area office next door
D3	18	36	1	0	Flats and maisonettes 1/2 beds	?	U/R	Some Management issues	yes	Firehose problems
D4	10	15	2	2	Flats 1/2 beds	?	No issues at present	Low Management issues	no	
D5	16	18	2	0	1bed/2 bed flats	?	No issues at present	Low Management issues	no	
DE1	18	30	1	0	Flats and Masonettes 1/2 beds	?	No issues at present	Low Management issues	yes	
DE2	10	18	1	2	1 bed flats/2 bed flats	?	D / ASB / V / U	High Management issues	no	
DE3	16	20	1	3	1 bed flats/2 bed flats	?	D / ASB / V / U	High Management issues	no	
DE4	16	23	2	0	1 bed flats/2 bed flats	?	D / ASB / V / U/LM	High Management issues	no	
DE5	18	38	2	0	Flats and maisonettes 1/2 beds	?	U/R	Some Management issues	yes	Firehose problems Firehose problems
E1	18	37	1	3	Flats and Masonettes 1/2 beds	?	No issues at presentlow	Low Management issues	yes	Firehose problems
E2	12	11	1	0	1 bed flats	50+	No issues at present	No Management issues	no	
E3	16	33	0	1	studio/1/2 bed flats	1 / 1+/2+	LM/U/R/D/ASB	High Management issues	no	
E4	16	29	0	2	studio/1/2 bed flats	1 / 1+/2+	V/LM	Some Management issues	no	
E5	16	33	2	2	Studio/1/2 bed flats	?	U/R	Some Management issues	no	
CT1	16	34	0	3	Studio/1/2 bed flats	?	U/R	Some Management issues	yes	
CT2	16	30	0	0	Studio/1/2 bed flats	?	D / ASB / V / U	High Management issues	no	
CT3	16	30	0	1	Studio/1/2 bed flats	?	V/LM/D/ASB	High Management issues	no	
CT4	10	20	2	1	Flats 1/2 beds	?	No issues at present	Low Management issues	no	
CM1	16	26	4	6	Bedsits/1 bed flats/2 bed flats	S/1+/2+/unemp	LM/R/U/ASB	High Management issues	no	
CM2	16	26	6	3	Bedsits/1 bed flats/2 bed flats	S/1+/2+/unemp	LM/R/U	Low Management issues	no	
CM3	16	25	3	7	Bedsits/1 bed flats/2 bed flats	S/1+/2+/unemp	LM	Low management issues	no	
CM4	16	32	6	4	Bedsits/1 bed flats/2 bed flats	S/1+/2+/unemp	LM/ASB	High Management issues	no	
CM5	16	30	7	1	Bedsits/1 bed flats/2 bed flats	S/1+/2+/unemp	LM/ASB/V/D	High Management issues	no	
	372	665	45	42						

Key to intervention types

80	Control group - no interventions
58	Control group - no interventions
78	Installing of devices only
76	Installation and engagement
78	Engagement only

Total no of flats: 370

Key to social mix	Key to issues
50+ = mainly over 50's	D = Drug use
1+ = single parent families	ASB = Anti-social behaviour
2+ = families	V = Vandalism
S = single person	LM = Loud music
Unemp = largely unemployed	U = Untidyness
Emp = largely employed	R = Rubbish/Litter
Mixed = large social mix	G = Grafitti

APPENDIX 2: ATTITUDINAL SURVEY QUESTIONNAIRE

Water Use Questionnaire - Resource Futures

We're doing a survey about the environment and how people use water. It's research we're doing for the Environment Agency and will not take more than 10-15 minutes. There is a prize draw with it. Do you have the time?

We are not telling you how you should use water - we are just asking you how you do use it. There are no right or wrong answers to the questions.

- Q0a** **Block** _____
- Q0b** **Flat Number** _____
- Q0c** **Surveyor name** _____
- Q1** **Where does the water from your tap come from?**
(Select only one. Do not prompt)
- 1 *A reservoir*
 - 2 *A well*
 - 3 *A river*
 - 4 *Bore hole or aquifer*
 - 5 *Wessex Water*
 - 6 *Don't know*
 - 7 *Other*
- Q2** **How much do you agree or disagree with the following statement: "Everyone needs to do what they can to reduce the waste of water"**
(Select only one. Prompt)
- 1 *Strongly agree*
 - 2 *Tend to agree*
 - 3 *Neither agree nor disagree*
 - 4 *Tend to disagree*
 - 5 *Strongly disagree*
 - 6 *Don't Know*
- Q3** **How important is saving water to you personally?**
(Select only one. Prompt)
- 1 *Very important*
 - 2 *Fairly important*
 - 3 *Neither important nor unimportant*
 - 4 *Not very important*
 - 5 *Not at all important*
- Q4** **Which of these statements best describes your attitude to saving water?**
(Select only one. Prompt)
- 1 *I save water even if it requires additional effort*
 - 2 *I save water if it does not require additional effort*
 - 3 *I do not save water*
 - 4 *Don't know*

REPORTED WATER USAGE - BEHAVIOURAL BASELINE (USAGE)

- Q5** **How many times a day does your household...**
- Q5a Flush the toilet _____
- Q5c Use tap (not bottled) water for drinking _____

- Q6 How many times a week does your household...**
- Q6a Use a washing machine _____
- Q6b Take a bath _____
- Q6c Take a shower _____
- Q6d Wash clothes by hand _____
- Q6e Use a dishwasher _____
- Q6f Wash dishes by hand _____

REPORTED WATER SAVING - REPETITIVE BEHAVIOURS

Go to Q11 if Q4 response was "I do not save water"

- Q7 How often do you do any of the following to save water? (Prompt)**
- | | | <i>Never</i> | <i>Sometimes</i> | <i>Always</i> | <i>N/a</i> |
|-----|---|----------------------------|----------------------------|----------------------------|----------------------------|
| Q7a | Turn tap off while brushing teeth | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |
| Q7b | Turn tap off while doing dishes | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |
| Q7c | Use appliances on full loads only | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |
| Q7d | Take short showers | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |
| Q7e | Take showers rather than baths | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q7g | Use a bucket, not a hose, to wash a car | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |
| Q7h | Fix dripping taps or leaks (or request that they get fixed) | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |

REPORTED WATER SAVING - ONE-OFF BEHAVIOURS

- Q8 In the last 3 years, have you ever made any changes to your home, or any previous home, in order to save water?**
- 1 Go to Q9 *Yes*
- 2 Go to Q11 *No*
- 3 Go to Q11 *Don't know*

Ask if "yes" at 8 above

- Q9 Which of the following changes did you make? (Prompt, multi-code)**
- 1 Fitted water saving devices to toilets to reduce the amount of water that flushes (e.g. Hippo, Save a flush bag)
 - 2 Had a water meter installed
 - 3 Put in a dual flush cistern or toilet
 - 4 Fitted water saving shower heads
 - 5 Fitted tap inserts that reduce flow
 - 6 Bought appliances such as washing machines that are more water efficient
 - 7 Fitted water butts / rainwater harvesting equipment
 - 8 Other (Please specify).....
- Q9a Other response to question above** _____

REPORTED MOTIVATIONS, BENEFITS & BARRIERS

Ask if "yes" at 8

- Q10 Why did you decide to take this/these water saving measure(s)? (Prompt, multi-code)**
- 1 Because it saves me money
 - 2 Because I feel it is better for the environment
 - 3 Prompted by my friends and neighbours
 - 4 Prompted by my children
 - 5 Because I felt responsible and wanted to do my bit
 - 6 Other, please specify.....

Q10a Other response to question above _____

Ask all

Q11 What, if anything, prevents you from saving water/more water, at home?
(Prompt, multi-code)

- 1 I've never thought about saving water
- 2 I don't feel it's a priority ('we have so much water in the UK')
- 3 I do all I can already / don't know what more I can do
- 4 I can't be bothered, it's not easy
- 5 My actions won't make a difference
- 6 It's someone else's responsibility
- 7 It doesn't cost me anything more (whether I use a lot or a little)
- 8 Health & hygiene reasons
- 9 Other, please specify.
- 10 Don't know

Q11a Other response to question above
Go to Q15 _____

PREFERRED INFORMATION CHANNELS

Q15 Have you read, seen or heard about anything about saving water in the last 3-12 months?

- 1 Go to Q16 YES
- 2 Go to Q17 NO

Ask if "yes" at question 15 above

Q16 Please describe where you came into contact with this/these water saving issues?
(Do not prompt, multi-code)

- 1 Council publications, e.g. website
- 2 Water company
- 3 Plumber
- 4 Friends & family
- 5 Schools
- 6 Environment Agency
- 7 Newspaper
- 8 Environmental Organisations (e.g. Friends of the Earth)
- 9 DIY stockists (e.g. B&Q)
- 10 Water festival
- 11 Internet
- 12 TV
- 13 Other, please specify
- 14 Somer Community Housing Trust ('The Trust')

Q16a Other response to question above _____

Ask all

- Q17** **How interested would you be to find out more about water saving in the home? (Prompt, select only one)**
- | | | |
|----------------------------|------------|------------------------------|
| <input type="checkbox"/> 1 | Go to Q18 | <i>Very interested</i> |
| <input type="checkbox"/> 2 | Go to Q18 | <i>Quite interested</i> |
| <input type="checkbox"/> 3 | Go to Q19a | <i>Not very interested</i> |
| <input type="checkbox"/> 4 | Go to Q19a | <i>Not at all interested</i> |

Ask if "very" or "quite interested" in Q17 above

- Q18** **Where might you look for water saving tips and information? (Do not prompt, multi-code)**
- | | |
|-----------------------------|---|
| <input type="checkbox"/> 1 | Council publications, e.g. website |
| <input type="checkbox"/> 2 | Water company |
| <input type="checkbox"/> 3 | Plumber |
| <input type="checkbox"/> 4 | Friends & family |
| <input type="checkbox"/> 5 | Environment Agency |
| <input type="checkbox"/> 6 | Newspaper |
| <input type="checkbox"/> 7 | Environmental Organisation |
| <input type="checkbox"/> 8 | DIY stockists (e.g. B&Q) |
| <input type="checkbox"/> 9 | Water festival |
| <input type="checkbox"/> 10 | Internet |
| <input type="checkbox"/> 11 | TV |
| <input type="checkbox"/> 12 | Other, please specify |
| <input type="checkbox"/> 13 | Somer Community Housing Trust ('The Trust') |

Q18a **Other response to question above** _____

Ask all

Q19 **I'm going to read out a number of comments other people have made about water saving issues. For each one, please state whether you personally agree or disagree, using a scale of 1 to 10 where 1 means completely disagree and 10 means completely agree. (Read out)**

- Q19a 'I am completely confused about what actions I can take to save water' _____
- Q19b 'I don't know how much water I use, or how much I might be wasting' _____
- Q19c 'I don't really understand why saving water is an important issue around here' _____
- Q19d 'I think there are too many do gooders telling the public what they should and shouldn't do regarding the environment' _____
- Q19e 'I'm afraid at the end of the day, the only thing that will make me reduce my consumption of water significantly is if the price shoots up' _____
- Q19f 'I don't understand why people waste water – it's really easy to use it sensibly' _____

Go to Q21

SOCIO-DEMOGRAPHIC / HOUSEHOLD DATA

- Q21** **Do you have a water meter?**
- | | |
|----------------------------|------------|
| <input type="checkbox"/> 1 | Yes |
| <input type="checkbox"/> 2 | No |
| <input type="checkbox"/> 3 | Don't know |
- Q22** **Do you have a garden?**
- | | |
|----------------------------|-----|
| <input type="checkbox"/> 1 | Yes |
| <input type="checkbox"/> 2 | No |

- Q23 Please describe the type of property you live in (Select only one)**
- 1 *House or Bungalow: Detached*
 - 2 *House or Bungalow: Semi-detached*
 - 3 *House or Bungalow: Terraced (including end-terrace)*
 - 4 *Flat, Maisonette or Apartment: In a Purpose-Built Block of Flats*
 - 5 *Flat, Maisonette or Apartment: Part of a Converted or Shared House*
 - 6 *Flat, Maisonette or Apartment: In a Commercial Building*
 - 7 *Caravan or Other Mobile or Temporary Structure*

- Q24 Do you rent your accommodation**
- yes*
 - No*

- Q25 Number of people in household** _____

- Q26 How many of these (including yourself) are females aged...**
- 0-3.. _____
 - 3-6 _____
 - 6-13 _____
 - 13-18 _____
 - 19-24 _____
 - 25-44 _____
 - 45-64 _____
 - 65-74 _____
 - Over 74 _____

- Q27 How many of these (including yourself) are males aged...**
- 0-3.. _____
 - 3-6 _____
 - 6-13 _____
 - 13-17 _____
 - 18-24 _____
 - 25-44 _____
 - 45-64 _____
 - 65-74 _____
 - Over 74 _____

- Q28 Respondent's age group**
- 1 *18-24*
 - 2 *25-44*
 - 3 *45-64*
 - 4 *65-74*
 - 5 *Over 74*

- Q29 Which of the following best describes your employment status**
- 1 *Employed*
 - 2 *Unemployed*
 - 3 *Student*
 - 4 *Retired*

Go to Q31

- Q31 Respondent's gender (Do not ask)**
- 1 *Female*
 - 2 *Male*
-

Thank you very much for your time
If you wish to enter the prize draw, please enter your contact details

Name: _____

Tel No: _____

Address:

This information will not be used for any other purposes than the prize draw. Winners will be notified by 30th June 2008, and published on www.resourcefutures.co.uk

"Are you willing to be included in some local publicity if you are one of the prize winners?"

Yes

No

APPENDIX 3: NOTICE PUT IN BLOCKS PRIOR TO METER INSTALLATION

NOTICE OF WORK ON WATER SUPPLY

Wessex Water and its associated contractors will be carrying out necessary work on the water supply over the next few weeks. If there is any need to turn the water off you will be advised in advance.

We apologise for any inconvenience caused. If you have any queries please contact Kathy Burdett, 01225 526000.



APPENDIX 4: DETAILS OF METER AND LOGGER INSTALLATIONS

Group	Block	No meters	Meter installation date	Logger installation date	Monitoring period for analysis
Device Only	D1	2	01-Feb	04-Sep	04/09 to 12/10 and 24/10 to 30/12
	D2	2	07-Apr	17-Jul	17/07 to 12/10 and 24/10 to 07/12
	D3	2	19-Jun	17-Jul	17/07 to 12/10 and 24/10 to 20/01
	D4	1	20-Feb	23-May	05/06 to 12/10 and 24/10 to 22/12
	D5	2	14-Feb	24-Apr	24/04 to 29/07 and 24/10 to 20/01
Engage + device	DE1	1	13-Mar	24-Apr	24/04 to 30/09 and 24/10 to 19/01
	DE2	1	07-Feb	24-Apr	21/04 to 30/09 and 24/10 to 20/01
	DE3	1	06-Feb	24-Apr	24/04 to 30/09 and 24/10 to 20/01
	DE4	2	05-Feb	24-Apr	24/04 to 05/09 and 24/10 to 20/01
	DE5	2	13-Feb	04-Sep	04/09 to 30/09 and 24/10 to 21/12
Engage	E1	2	25-Mar	x	
	E2	1	25-Jan	24-Apr	24/04 to 30/09 and 08/10 to 20/01
	E3	2	08-Jan	23-May	23/05 to 30/09 and 08/10 to 20/01
	E4	2	09-Jan	23-May	23/05 to 30/09 and 08/10 to 20/01
	E5	2	20-Mar	23-May	23/05 to 30/09 and 08/10 to 20/01
Control Twerton	CT1	2	15-Jan	23-May	23/05 to 30/09 and 24/10 to 20/01
	CT2	2	16-Jan	24-Apr	24/04 to 30/09 and 24/10 to 20/01
	CT3	2	17-Jan	25-Apr	25/04 to 30/09 and 24/10 to 20/01
	CT4	1	18-Feb	25-Jun	25/06 to 30/09 and 24/10 to 20/01
Control Twerton	CM1	2	28-Feb	25-Jun	25/06 to 30/09 and 24/10 to 20/01
	CM2	2	14-Mar	25-Jun	25/06 to 30/09 and 24/10 to 20/01
	CM3	2	21-Feb	25-Jun	25/06 to 30/09 and 24/10 to 20/01
	CM4	2	16-Apr	x	
	CM5	2	31-Mar	25-Jun	25/06 to 30/09 and 24/10 to 20/01

APPENDIX 5: PLEDGE CARD



PLEDGE CARD

I pledge to do all I can to save water (see over)

Name _____

Address _____

Phone _____

At the end of 4 weeks please return this slip in the reply-paid envelope or hand it in to the Somer area office at Meade House for a chance to win one of 10 water-saving eco-kettles! Winners will be drawn at random from all those entering a pledge card - regardless of how many boxes are ticked overleaf. Winners will be notified by the end of December 2008



a YTL company












If you want advice about filling in this card
please ring Resource Futures on 0117 914 3447

- Please do as many of these actions, as often as you can, every week.
- When you feel you are doing it regularly, then tick the box.
- At the end of 4 weeks hand this pledge card in - it doesnt matter if you haven't ticked every box, you have still made a difference!

WATER PLEDGE CARD

	week 1	week 2	week 3	week 4
Date at start of week:				
 <p>WASHING: Filled the basin with 3/4 of the amount that I normally put in</p>				
 <p>BATHING: I ran a bath with 2 inches (5cm) less water than I normally put in <small>Put crosses in these boxes if you take showers instead of baths</small></p>				
 <p>CLOTHES WASHING: Washed on full load / used a shorter cycle in the washing machine</p>				
 <p>BUSHING TEETH: I turned the tap off while brushing my teeth</p>				
 <p>FLUSHING THE LOO: Put a 'save-a-flush' in the cistern, saving 1 litre with every flush</p>				
 <p>SHOWERING: I cut 1 or 2 minutes off my normal showering time <small>Put crosses in these boxes if you dont have a shower in your home</small></p>				
 <p>WATERING: Used bath water for watering my house plants <small>Put crosses in these boxes if you dont have any house plants</small></p>				

APPENDIX 6: WATER DAY PROMOTIONAL LEAFLET

COME TO THE TWERTON

WATER DAY

You are invited to a water saving information day with tips and advice on how you can help save the environment and save yourself money too!

Collect your water saving freebies!

Find out how much money you could save with a water meter

Kids activity zone:
Face painting
Apple bobbing
Water Watch workshop
Colouring competitions

Water saving Pledge Cards with prizes to be won!
Become a water champion!
Quiz sheets with prizes!

Presentation on 'Why do we need to save water?'
Information on the work of the charity WaterAid


Refreshments

REASONS TO SAVE WATER...

TOP TIPS WITH WATER...

EVERY DROP COUNTS...

Thursday 30th October 2.30 – 6.30pm
To be held at Twerton Village Hall
ALL WELCOME! ENTRY IS FREE!



PICK UP YOUR WATER SAVING FREEBIES!

Choice of 3 fridge magnets

Water Wise tea towel

Washing-up bowl

Indoor watering can

Shower timer

Booklet: 100 water saving tips

Just tick the ones you want and bring this flyer with you to claim your water saving items for free! Only one form per household.

WATER DAY

Thursday 30th October 2.30 – 6.30pm

2.30 onwards Hand in your pledge card for entry to the prize draw.
Pick up your water saving freebies!
Enter the quiz and win a prize!
Meet Wessex Water
Find out about how to save money with a water meter

3.00 - 3.30 Water watch workshop for 5-7 year olds

4.00 - 4.30 Water watch workshop for 8 - 11 year olds

3.30 and 5.30 Presentation: Why do we need to save water?

Refreshments served all afternoon

APPENDIX 7: POST INTERVENTION ATTITUDINAL SURVEY

Please just put a tick on the correct box (☑), and check the question instructions. if you are not sure what to do, ring Agnes on 0117 914 4958.

**1. How much do you agree or disagree with the following statement?
“Everyone needs to do what they can to reduce the waste of water”
(Please select only one)**

- | | |
|--|---|
| <input type="checkbox"/> 1 <i>Strongly agree</i> | <input type="checkbox"/> 4 <i>Tend to disagree</i> |
| <input type="checkbox"/> 2 <i>Tend to agree</i> | <input type="checkbox"/> 5 <i>Strongly disagree</i> |
| <input type="checkbox"/> 3 <i>Neither agree nor disagree</i> | |

**2. How important is saving water to you personally?
(Please select only one)**

- | | |
|---|--|
| <input type="checkbox"/> 1 <i>Very important</i> | <input type="checkbox"/> 4 <i>Not very important</i> |
| <input type="checkbox"/> 2 <i>Fairly important</i> | <input type="checkbox"/> 5 <i>Not at all important</i> |
| <input type="checkbox"/> 3 <i>Neither important nor unimportant</i> | |

**3. Which of these statements best describes your attitude to saving water?
(Please select only one)**

- | | |
|---|---|
| <input type="checkbox"/> 1 <i>I save water even if it requires additional effort</i> | <input type="checkbox"/> 3 <i>I do not save water</i> |
| <input type="checkbox"/> 2 <i>I save water if it does not require additional effort</i> | <input type="checkbox"/> 4 <i>Don't know</i> |

**4. How often do you do any of the following to save water?
(tick one box for each)**

	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	<i>N/a</i>
Turn tap off while brushing teeth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Turn tap off while doing dishes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use appliances on full loads only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Take short showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Take showers rather than baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a watering can, not a hose, to water a garden	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a bucket, not a hose, to wash a car	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fix dripping taps or leaks (or request that they get fixed)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flush toilet less often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**5. Have you made any of the following changes in the last year?
(You may give more than one answer)**

- | | |
|---|--|
| <input type="checkbox"/> 1 <i>Fitted water saving devices to toilets to reduce the amount of water that flushes (e.g. Hippo, Save-a-flush (bag in the cistern))</i> | <input type="checkbox"/> 5 <i>Fitted tap inserts that reduce flow</i> |
| <input type="checkbox"/> 2 <i>Had a water meter installed</i> | <input type="checkbox"/> 6 <i>Bought appliances such as washing machines that are more water efficient</i> |
| <input type="checkbox"/> 3 <i>Put in a dual flush system</i> | <input type="checkbox"/> 7 <i>Fitted water butts / rainwater harvesting equipment</i> |
| <input type="checkbox"/> 4 <i>Fitted water saving shower heads</i> | <input type="checkbox"/> 8 <i>Other (please specify below)</i> |

Please enter other response here:

**6. If you did make such changes, please tell us why
(You may give more than one answer)**

- | | |
|---|--|
| <input type="checkbox"/> 1 <i>Because it saves me money</i> | <input type="checkbox"/> 5 <i>Prompted by my children</i> |
| <input type="checkbox"/> 2 <i>Because I feel it is better for the environment</i> | <input type="checkbox"/> 6 <i>Because I felt responsible and wanted to do my bit</i> |
| <input type="checkbox"/> 3 <i>A leaflet came through my door</i> | <input type="checkbox"/> 7 <i>Other, please specify below</i> |
| <input type="checkbox"/> 4 <i>Prompted by my friends and neighbours</i> | <input type="checkbox"/> 8 <i>Someone came to my door</i> |

Please enter other response here:

**7. Have you experienced any of the following in the last year?
(You may give more than one answer)**

- | | |
|---|--|
| <input type="checkbox"/> 1 <i>Someone coming to your door to talk about saving water</i> | <input type="checkbox"/> 4 <i>A community event or talk about saving water</i> |
| <input type="checkbox"/> 2 <i>Someone calling you on the phone to talk about saving water</i> | <input type="checkbox"/> 5 <i>An advert in the press about saving water</i> |
| <input type="checkbox"/> 3 <i>A leaflet through the door about saving water</i> | <input type="checkbox"/> 6 <i>A visit by a plumber about saving water</i> |

8. If you ticked any of the boxes above, has this experience encouraged you to save more water now?

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> 1 <i>Yes</i> | <input type="checkbox"/> 3 <i>N/a</i> |
| <input type="checkbox"/> 2 <i>No</i> | <input type="checkbox"/> 4 <i>Don't know</i> |

9. Do you have a water meter?

- | | | |
|---------------------------------------|--------------------------------------|--|
| <input type="checkbox"/> 1 <i>Yes</i> | <input type="checkbox"/> 2 <i>No</i> | <input type="checkbox"/> 3 <i>Don't know</i> |
|---------------------------------------|--------------------------------------|--|

10. Please tick the box for your age group

- | | |
|---|---|
| <input type="checkbox"/> 1 <i>18-24</i> | <input type="checkbox"/> 4 <i>65-74</i> |
| <input type="checkbox"/> 2 <i>25-44</i> | <input type="checkbox"/> 5 <i>Over 74</i> |
| <input type="checkbox"/> 3 <i>45-64</i> | |

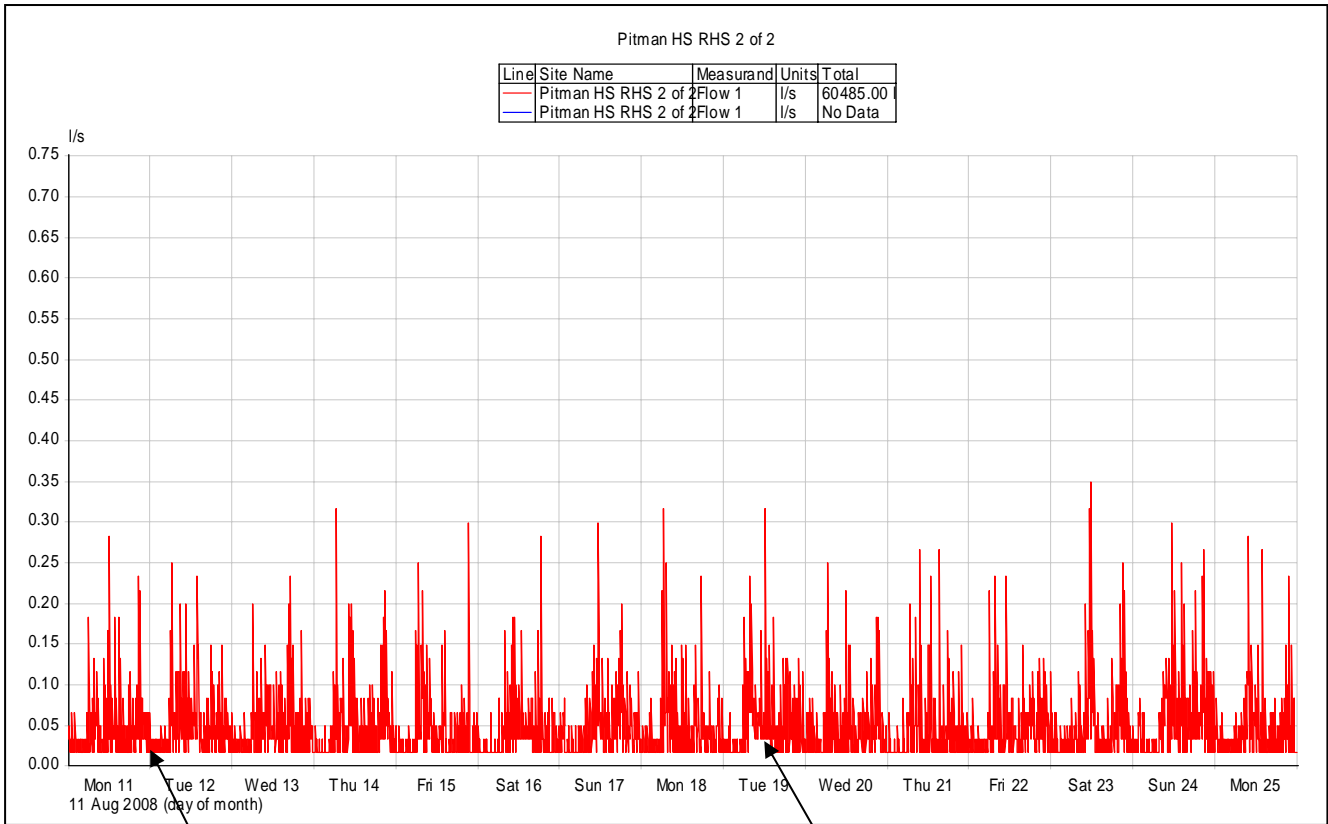
11. What sex are you?

- | | |
|--|--|
| <input type="checkbox"/> 1 <i>Female</i> | <input type="checkbox"/> 2 <i>Male</i> |
|--|--|

Thank you very much!

Please send the completed questionnaire in the envelope provided to Box 203, Resource Futures, The Create Centre, Smeaton Road, BS1 6XN

APPENDIX 8: EXAMPLE OF A PMAC GRAPH



1. Observed leak at rate of $xx\text{l/s} = \text{xxm}^3/\text{day}$

2. Periods of higher consumption

1. Periods during which the consumption didn't drop to zero for x period of time were considered to be leaks and were subtracted from the total volumes for the day.

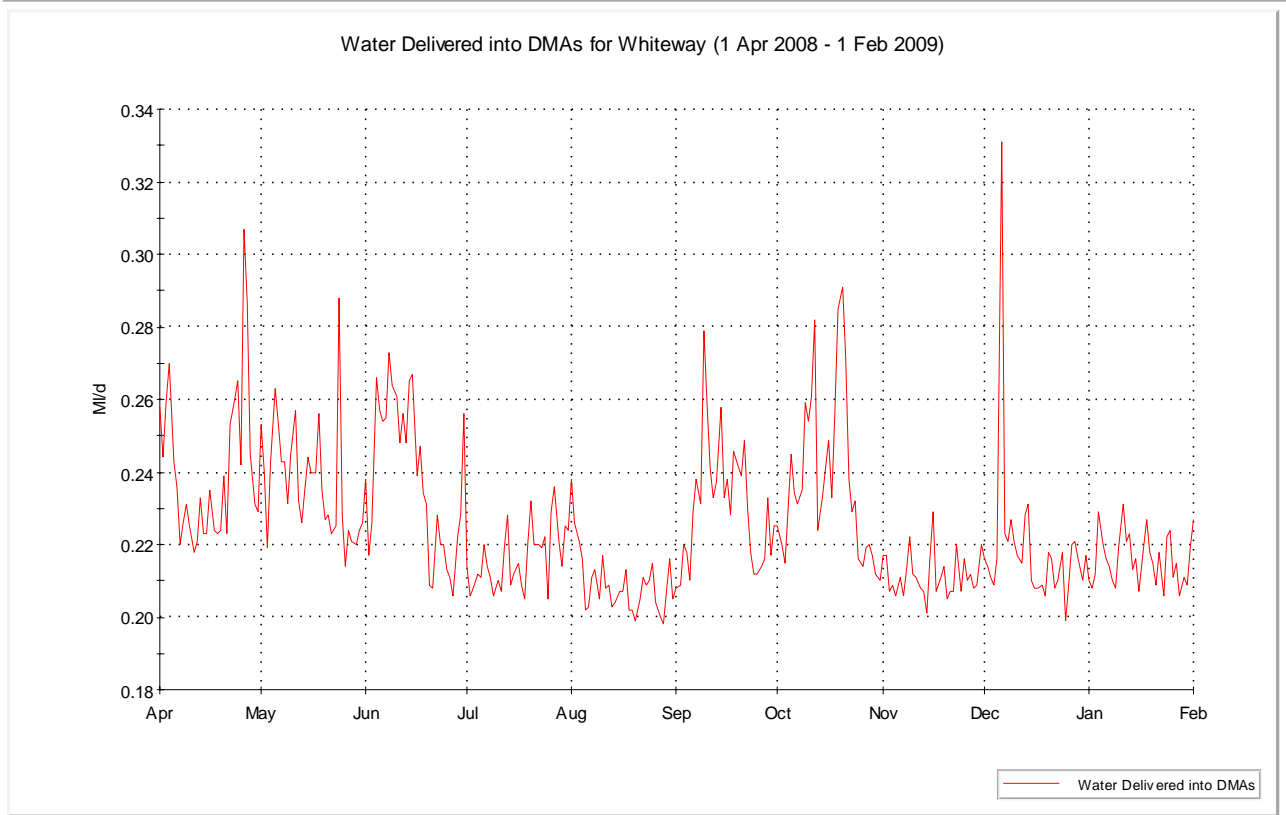
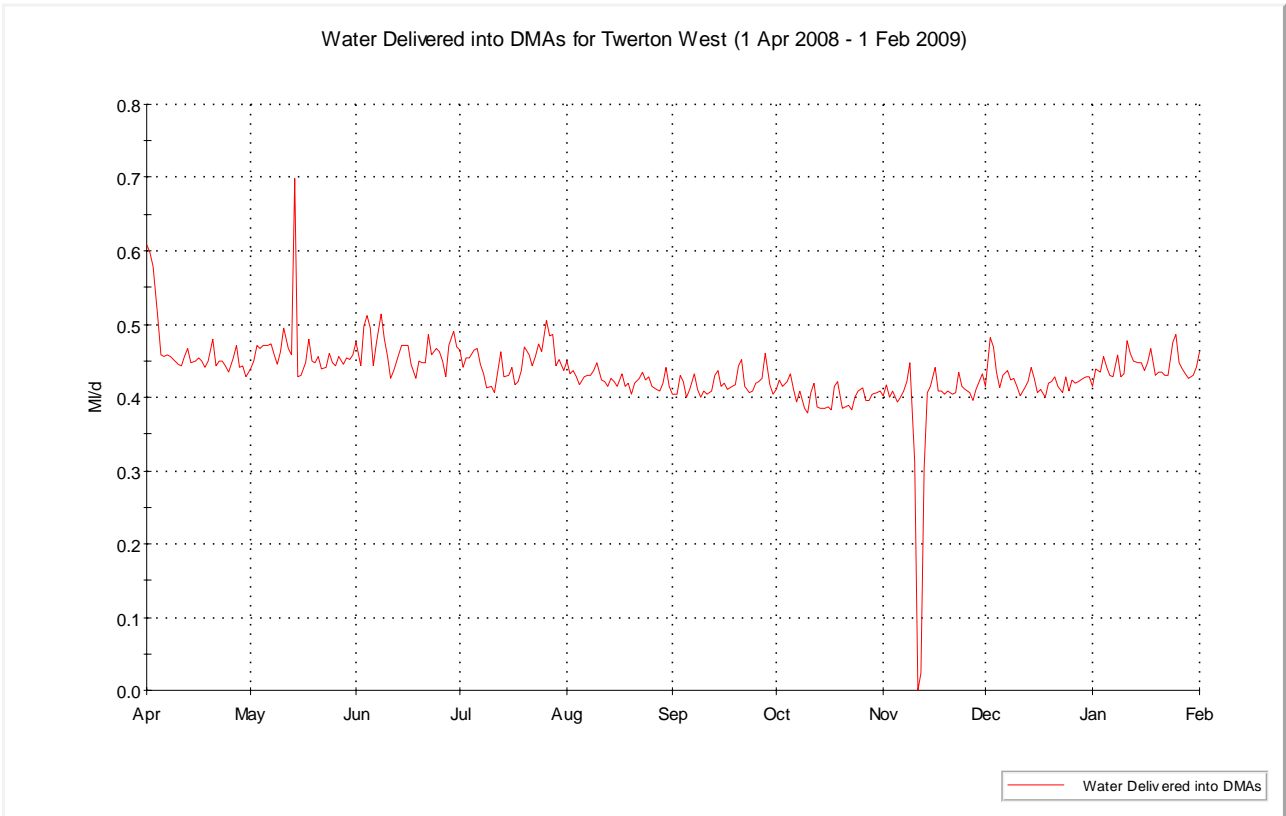
2. Other instances are observed where the consumption remained at higher levels for a portion of the day. Unsure what this is attributed to as it doesn't happen all the time, but it raises consumption level.

APPENDIX 9: DETAILS OF GIVEAWAYS IN ENGAGEMENT BLOCKS

Intervention group	Block	Number of flats	Number of visits	Pledge cards	Magnets	Shower timers	SAF	Leaflet	Total giveaways
Device and Engagement	DE1	18	7	3	5	3		5	16
	DE2	10	5	5	5	3		4	17
	DE3	16	8	7	5	4		4	20
	DE4	16	6	6	5			5	16
	DE5	18	9	9	9	1		7	26
	TOTAL		78	35	30	29	11	0	25
Engagement only	E1	18	10	9	6	2	9	8	34
	E2	12	5	4	3	3	4	5	19
	E3	16	8	4	6	3	8	4	25
	D4	16	13	12	7	7	13	8	47
	D5	16	7	5	6	5	7	6	29
	TOTAL		78	43	34	28	20	41	31
TOTALS		156	78	64	57	31	41	56	249

The table details the “giveaways” handed to residents as they participated in discussion. Pledge cards and ‘*Water saving in your home*’ leaflets were left for all residents who were not home at the time of the visits.

APPENDIX 10: DMA DATA FOR THE TRIAL AREA



Appendix 4: Questionnaires and methodology for focus groups and in-depth interviews

A4.1 Questionnaire used in Avon catchment (Natural England)

Water use questionnaire – Resource Futures

We're doing a survey about the environment and how people use water. It's research we're doing for the Environment Agency and will not take more than 10–15 minutes. There is a prize draw with it. Do you have the time?

We are not telling you how you should use water – we are just asking you how you do use it. There are no right or wrong answers to the questions.

- Q0a Surveyor name _____
- Q0b Area _____
- Q0c ACORN group _____
- Q1 Where does the water from your tap come from?
(Select only one. Do not prompt.)
- A reservoir*
 - A well*
 - A river*
 - Bore hole or aquifer*
 - Wessex Water*
 - Don't know*
 - Other*
- Q2 How much do you agree or disagree with the following statement: (select only one, read out)
"Everyone needs to do what they can to reduce the waste of water"
(Select only one. Prompt.)
- 1 *Strongly agree*
 - 2 *Tend to agree*
 - 3 *Neither agree nor disagree*
 - 4 *Tend to disagree*
 - 5 *Strongly disagree*
 - 6 *Don't Know*
- Q3 How important is saving water to you personally?
(Select only one. Prompt.)
- 1 *Very important*
 - 2 *Fairly important*
 - 3 *Neither important nor unimportant*
 - 4 *Not very important*
 - 5 *Not at all important*
- Q4 Which of these statements best describes your attitude to saving water?
(Select only one. Prompt.)
- 1 *I save water even if it requires additional effort*

- 2 *I save water if it does not require additional effort*
- 3 *I do not save water*
- 4 *Don't know*

REPORTED WATER USAGE – BEHAVIOURAL BASELINE (USAGE)

- Q5 How many times a day does your household...**
- Q5a Flush the toilet _____
- Q5b No question _____
- Q5c Use tap (not bottled) water for drinking _____
- Q6 How many times a week does your household...**
- Q6a Use a washing machine _____
- Q6b Take a bath _____
- Q6c Take a shower _____
- Q6d Wash clothes by hand _____
- Q6e Use a dishwasher _____
- Q6f Wash dishes by hand _____

REPORTED WATER SAVING – REPETITIVE BEHAVIOURS

Go to Q11 if Q4 response was "I do not save water"

Q7 How often do you do any of the following to save water? (Prompt)

	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	<i>N/a</i>
Q7a Turn tap off while brushing teeth	1	2	3	4
Q7b Turn tap off while doing dishes	1	2	3	4
Q7c Use appliances on full loads only	1	2	3	4
Q7d Take short showers	1	2	3	4
Q7e Take showers rather than baths	1	2	3	4
Q7f Use a watering can, not a hose, to water a garden	1	2	3	4
Q7g Use a bucket, not a hose, to wash a car	1	2	3	4
Q7h Fix dripping taps or leaks (or request that they get fixed)	1	2	3	4

REPORTED WATER SAVING – ONE-OFF BEHAVIOURS

- Q8 In the last 3 years, have you ever made any changes to your home, or any previous home, in order to save water?**
- 1 Go to Q9 Yes
- 2 Go to Q11 No
- 3 Go to Q11 *Don't know*

Ask if "yes" at 8 above

- Q9 Which of the following changes did you make? (Prompt, multi-code)**
- 1 *Fitted water saving devices to toilets to reduce the amount of water that flushes (e.g. Hippo, Save-a-Flush bag)*
 - 2 *Had a water meter installed*
 - 3 *Put in a dual flush cistern or toilet*
 - 4 *Fitted water saving shower heads*
 - 5 *Fitted tap inserts that reduce flow*
 - 6 *Bought appliances such as washing machines that are more water efficient*
 - 7 *Fitted water butts / rainwater harvesting equipment*
 - 8 *Other (Please specify).....*

- Q9a Other response to question above** _____

REPORTED MOTIVATIONS, BENEFITS & BARRIERS

Ask if “yes” at 8

- Q10 Why did you decide to take this/these water saving measure(s)?**
(Prompt, multi-code)
- 1 *Because it saves me money*
 - 2 *Because I feel it is better for the environment*
 - 3 *Prompted by my friends and neighbours*
 - 4 *Prompted by my children*
 - 5 *Because I felt responsible and wanted to do my bit*
 - 6 *Other, please specify.....*

Q10a Other response to question above

Ask all

- Q11 What, if anything, prevents you from saving water/more water, at home? (Do not prompt, multi-code)**
- 1 *I've never thought about saving water*
 - 2 *I don't feel it's a priority ('we have so much water in the UK')*
 - 3 *I do all I can already / don't know what more I can do*
 - 4 *I can't be bothered, it's not easy*
 - 5 *My actions won't make a difference*
 - 6 *It's someone else's responsibility*
 - 7 *It doesn't cost me anything more (whether I use a lot or a little)*
 - 8 *Health & hygiene reasons*
 - 9 *Other, please specify.*
 - 10 *Don't know*

Q11a Other response to question above

Q12 Question deleted

Q13 Question deleted

Q14 Question deleted

PREFERRED INFORMATION CHANNELS

- Q15 Have you read, seen or heard about anything about saving water in the last 3–12 months?**
- 1 Go to Q16 YES
 - 2 Go to Q17 NO

Ask if “yes” at question 15 above

- Q16 Please describe where you came into contact with this/these water saving issues? (Do not prompt, multi-code)**
- 1 *Council publications, e.g. website*
 - 2 *Water company*
 - 3 *Plumber*
 - 4 *Friends & family*
 - 5 *Schools*
 - 6 *Environment Agency*
 - 7 *Newspaper*
 - 8 *Environmental Organisations (e.g. Wiltshire Wildlife Trust)*
 - 9 *DIY stockists (e.g. B&Q)*

- 10 Water festival
- 11 Internet
- 12 TV
- 13 Other, please specify

Q16a Other response to question above _____

Ask all

- Q17 How interested would you be to find out more about water saving in the home? (Prompt, select only one)
- 1 Go to Q18 Very interested
 - 2 Go to Q18 Quite interested
 - 3 Go to Q19 Not very interested
 - 4 Go to Q19 Not at all interested

Ask if “very” or “quite interested” in 17 above

- Q18 Where might you look for water saving tips and information? (Do not prompt, multi-code)
- 1 Council publications, e.g. website
 - 2 Water company
 - 3 Plumber
 - 4 Friends & family
 - 5 Environment Agency
 - 6 Newspaper
 - 7 Wiltshire Wildlife Trust
 - 8 DIY stockists (e.g. B&Q)
 - 9 Water festival
 - 10 Internet
 - 11 TV
 - 12 Other, please specify

Q18a Other response to question above _____

Ask all

Q19 I’m going to read out a number of comments other people have made about water saving issues. For each one, please state whether you personally agree or disagree, using a scale of 1 to 10 where 1 means completely disagree and 10 means completely agree. (Read out)

- Q19a 'I am completely confused about what actions I can take to save water' _____
- Q19b 'I don't know how much water I use, or how much I might be wasting' _____
- Q19c 'I don't really understand why saving water is an important issue around here' _____
- Q19d 'I think there are too many do gooders telling the public what they should and shouldn't do regarding the environment' _____
- Q19e 'I'm afraid at the end of the day, the only thing that will make me reduce my consumption of water significantly is if the price shoots up' _____
- Q19f 'I don't understand why people waste water – it's really easy to use it sensibly' _____

Q20 Question deleted

SOCIO-DEMOGRAPHIC / HOUSEHOLD DATA

- Q21 Do you have a water meter?
- 1 Yes
 - 2 No
 - 3 Don't know
- Q22 Do you have a garden?
- 1 Yes
 - 2 No

- Q23 Please describe the type of property you live in. (Select only one)**
- 1 *House or bungalow: detached*
 - 2 *House or bungalow: semi-detached*
 - 3 *House or bungalow: terraced (including end-terrace)*
 - 4 *Flat, maisonette or apartment: in a purpose-built block of flats*
 - 5 *Flat, maisonette or apartment: part of a converted or shared house*
 - 6 *Flat, maisonette or apartment: in a commercial building*
 - 7 *Caravan or other mobile or temporary structure*

Q24 Do you rent your accommodation

Yes
No

Q25 Number of people in household _____

Q26 How many of these (including yourself) are females aged...

0-3 _____
 3-6 _____
 6-13 _____
 13-18 _____
 19-24 _____
 25-44 _____
 45-64 _____
 65-74 _____
 Over 74 _____

Q27 How many of these (including yourself) are males aged...

0-3 _____
 3-6 _____
 6-13 _____
 13-18 _____
 19-24 _____
 25-44 _____
 45-64 _____
 65-74 _____
 Over 74 _____

Q28 Respondent's age group

1 *18-24*
 2 *25-44*
 3 *45-64*
 4 *65-74*
 5 *Over 74*

Q29 Which of the following best describes your employment status?

1 *Employed*
 2 *Unemployed*
 3 *Student*
 4 *Retired*

Q30 Post code _____

Q31 Respondent's gender (Do not ask)

- 1 *Female*
- 2 *Male*

**Thank you very much for your time.
 If you wish to enter the prize draw, please enter your contact details.**

Name: _____

Tel No: _____

Address:

This information will not be used for any other purposes than the prize draw. Winners will be notified by 1st June 2008, and published on www.resourcefutures.co.uk

A4.2 Questionnaire used in Twerton, Bath

Water Use Questionnaire – Resource Futures

We're doing a survey about the environment and how people use water. It's research we're doing for the Environment Agency and will not take more than 10–15 minutes. There is a prize draw with it. Do you have the time?

We are not telling you how you should use water - we are just asking you how you do use it. There are no right or wrong answers to the questions.

Q0a Block _____

Q0b Flat Number _____

Q0c Surveyor name _____

- Q1 Where does the water from your tap come from?
(Select only one. Do not prompt.)
- 1 A reservoir
 - 2 A well
 - 3 A river
 - 4 Bore hole or aquifer
 - 5 Wessex Water
 - 6 Don't know
 - 7 Other
- Q2 How much do you agree or disagree with the following statement: "Everyone needs to do what they can to reduce the waste of water"
(Select only one. Prompt.)
- 1 Strongly agree
 - 2 Tend to agree
 - 3 Neither agree nor disagree
 - 4 Tend to disagree
 - 5 Strongly disagree
 - 6 Don't Know
- Q3 How important is saving water to you personally?
(Select only one. Prompt.)
- 1 Very important
 - 2 Fairly important
 - 3 Neither important nor unimportant
 - 4 Not very important
 - 5 Not at all important
- Q4 Which of these statements best describes your attitude to saving water?
(Select only one. Prompt.)
- 1 I save water even if it requires additional effort
 - 2 I save water if it does not require additional effort
 - 3 I do not save water
 - 4 Don't know

REPORTED WATER USAGE - BEHAVIOURAL BASELINE (USAGE)

Q5 How many times a day does your household...

Q5a Flush the toilet _____

Q5b No question _____

Q5c Use tap (not bottled) water for drinking _____

Q6 How many times a week does your household...

- Q6a Use a washing machine _____
- Q6b Take a bath _____
- Q6c Take a shower _____
- Q6d Wash clothes by hand _____
- Q6e Use a dishwasher _____
- Q6f Wash dishes by hand _____

REPORTED WATER SAVING - REPETITIVE BEHAVIOURS

Go to Q11 if Q4 response was "I do not save water"

How often do you do any of the following to save water? (Prompt)

	Never	Sometimes	Always	N/a
Q7a Turn tap off while brushing teeth	1	2	3	4
Q7b Turn tap off while doing dishes	1	2	3	4
Q7c Use appliances on full loads only	1	2	3	4
Q7d Take short showers	1	2	3	4
Q7e Take showers rather than baths	1	2	3	4
Q7g Use a bucket, not a hose, to wash a car	1	2	3	4
Q7h Fix dripping taps or leaks (or request that they get fixed)	1	2	3	4

REPORTED WATER SAVING – ONE-OFF BEHAVIOURS

- Q8 In the last 3 years, have you ever made any changes to your home, or any previous home, in order to save water?**
- 1 Go to Q9 Yes
 - 2 Go to Q11 No
 - 3 Go to Q11 Don't know

Ask if "yes" at 8 above

- Q9 Which of the following changes did you make? (Prompt, multi-code)**
- 1 Fitted water saving devices to toilets to reduce the amount of water that flushes (e.g. Hippo, Save-a-Flush bag)
 - 2 Had a water meter installed
 - 3 Put in a dual flush cistern or toilet
 - 4 Fitted water saving shower heads
 - 5 Fitted tap inserts that reduce flow
 - 6 Bought appliances such as washing machines that are more water efficient
 - 7 Fitted water butts / rainwater harvesting equipment
 - 8 Other (Please specify).....

Q9a Other response to question above _____

REPORTED MOTIVATIONS, BENEFITS & BARRIERS

Ask if "yes" at 8

- Q10 Why did you decide to take this/these water saving measure(s)? (Prompt, multi-code)**
- 1 Because it saves me money
 - 2 Because I feel it is better for the environment
 - 3 Prompted by my friends and neighbours
 - 4 Prompted by my children

- 5 *Because I felt responsible and wanted to do my bit*
- 6 *Other, please specify.....*

Q10a Other response to question above

Ask all

Q11 What, if anything, prevents you from saving water/more water, at home? (Do not prompt, multi-code)

- 1 *I've never thought about saving water*
- 2 *I don't feel it's a priority ('we have so much water in the UK')*
- 3 *I do all I can already / don't know what more I can do*
- 4 *I can't be bothered, it's not easy*
- 5 *My actions won't make a difference*
- 6 *It's someone else's responsibility*
- 7 *It doesn't cost me anything more (whether I use a lot or a little)*
- 8 *Health & hygiene reasons*
- 9 *Other, please specify.*
- 10 *Don't know*

Q11a Other response to question above

Go to Q15

PREFERRED INFORMATION CHANNELS

Q15 Have you read, seen or heard about anything about saving water in the last 3–12 months?

- 1 Go to Q16 YES
- 2 Go to Q17 NO

Ask if "yes" at question 15 above

Q16 Please describe where you came into contact with this/these water saving issues? (Do not prompt, multi-code)

- 1 *Council publications, e.g. website*
- 2 *Water company*
- 3 *Plumber*
- 4 *Friends & family*
- 5 *Schools*
- 6 *Environment Agency*
- 7 *Newspaper*
- 8 *Environmental organisations (e.g. Friends of the Earth)*
- 9 *DIY stockists (e.g. B&Q)*
- 10 *Water festival*
- 11 *Internet*
- 12 *TV*
- 13 *Other, please specify*
- 14 *Somer Community Housing Trust ('The Trust')*

Q16a Other response to question above

Ask all

- Q17 How interested would you be to find out more about water saving in the home? (Prompt, select only one)**
- | | | |
|---|-----------|------------------------------|
| 1 | Go to Q18 | <i>Very interested</i> |
| 2 | Go to Q18 | <i>Quite interested</i> |
| 3 | Go to Q19 | <i>Not very interested</i> |
| 4 | Go to Q19 | <i>Not at all interested</i> |

Ask if “very” or “quite interested” in Q17 above

- Q18 Where might you look for water saving tips and information? (Do not prompt, multi-code)**
- | | |
|----|--|
| 1 | <i>Council publications, e.g. website</i> |
| 2 | <i>Water company</i> |
| 3 | <i>Plumber</i> |
| 4 | <i>Friends & family</i> |
| 5 | <i>Environment Agency</i> |
| 6 | <i>Newspaper</i> |
| 7 | <i>Environmental organisation</i> |
| 8 | <i>DIY stockists (e.g. B&Q)</i> |
| 9 | <i>Water festival</i> |
| 10 | <i>Internet</i> |
| 11 | <i>TV</i> |
| 12 | <i>Other, please specify</i> |
| 13 | <i>Somer Community Housing Trust ('The Trust')</i> |

Q18a Other response to question above

Ask all

Q19 I'm going to read out a number of comments other people have made about water saving issues. For each one, please state whether you personally agree or disagree, using a scale of 1 to 10 where 1 means completely disagree and 10 means completely agree. (Read out)

- | | | |
|------|---|-------|
| Q19a | 'I am completely confused about what actions I can take to save water' | _____ |
| Q19b | 'I don't know how much water I use, or how much I might be wasting' | _____ |
| Q19c | 'I don't really understand why saving water is an important issue around here' | _____ |
| Q19d | 'I think there are too many do gooders telling the public what they should and shouldn't do regarding the environment' | _____ |
| Q19e | 'I'm afraid at the end of the day, the only thing that will make me reduce my consumption of water significantly is if the price shoots up' | _____ |
| Q19f | 'I don't understand why people waste water – it's really easy to use it sensibly' | _____ |

Go to Q21

SOCIO-DEMOGRAPHIC / HOUSEHOLD DATA

- Q21 Do you have a water meter?**
- | | |
|---|-------------------|
| 1 | <i>Yes</i> |
| 2 | <i>No</i> |
| 3 | <i>Don't know</i> |
- Q22 Do you have a garden?**
- | | |
|---|------------|
| 1 | <i>Yes</i> |
| 2 | <i>No</i> |
- Q23 Please describe the type of property you live in. (Select only one)**
- | | |
|---|---|
| 1 | <i>House or bungalow: detached</i> |
| 2 | <i>House or bungalow: semi-detached</i> |
| 3 | <i>House or bungalow: terraced (including end-terrace)</i> |
| 4 | <i>Flat, maisonette or apartment: in a purpose-built block of flats</i> |

Name: _____

Tel No: _____

Address:

This information will not be used for any other purposes than the prize draw. Winners will be notified by 30 June 2008, and published on www.resourcefutures.co.uk

“Are you willing to be included in some local publicity if you are one of the prize winners?”

Yes

No

A4.3 Methodology for telephone and face-to-face interviews

Purpose of interviews

(Information provided for reference by the interviewer only and not to be shared with interviewee.)

The purpose of these interviews is to explore in more depth issues raised during surveys of local residents in the study areas. In particular, we are interested in the following points:

- which environmental issues are of most concern to people, and whether water is one of them;
- understanding people's water use;
- motivations and barriers to changes in water use;
- why people report doing 'as much as they can' and in some cases this was true but in quite a few there was room to do more such as shorter showering times, fitting displacement devices (e.g. hippos or save-a-flushes) or installing dual flush loos, or fitting tap inserts to reduce flow (which aerate the water).

All questions are intended to be neutral and not infer values to behaviours (i.e. that saving water is 'good' and wasting water is 'bad'). This is important to ensure an honest response from interviewees about their behaviour.

The interview schedule should be treated as a flexible guide and not be applied too rigidly, as we are interested in the issues people raise spontaneously. The aim is not to produce a representative survey, but rather a small number of detailed descriptions of individual behaviour and values.

Introducing self and study

- Briefly explain purpose and nature of the study to the respondent and recap how came to be selected. *[Only a brief description of the study should be given initially to prevent any bias in the answers, i.e. we want unprompted answers from interviewees about water behaviour and telling them up front it is about increasing people's water efficiency may influence that. More information can be provided at the end of the interview.]*
- Request permission to tape-record interview, explaining why this is necessary. Give assurance that answers will remain anonymous in any written reports and responses will be treated as confidential.
- Remind respondent that there are no right or wrong answers, and that although some questions may seem strange, far-fetched or difficult, we're interested in whatever they have to say. Also, remind respondents that they should feel free to interrupt for clarification or to comment on a particular line of questioning.
- Build rapport – share something about self, role, background or interest in study, etc. *(NB Need to ensure what is said doesn't bias questions, i.e. preferably something unrelated to water efficiency/environmental behaviour. Also better not to say anything on personal views about the environment as people may alter their answers if they think they are speaking to a committed environmentalist.)*

Schedule for semi-structured interviews

Thank you for being willing to take part in this interview.

Question topic	Interviewer notes
1. The first question I'd like to ask is what you immediately think about when you hear the word 'water'.	<i>Elaboration can include 'what words/phrases do you associate with water' or 'what mental images does thinking about water conjure up'.</i>
2. In terms of how water is used, please describe the main ways your household uses water at home?	<i>This should be an open and neutral question. Don't ask about water <u>saving</u> at this point. Do explore any 'forgotten' uses, e.g. do you use water outdoors at home?</i>
3. In terms of the ways in which people use water: <ul style="list-style-type: none"> • How would you describe the use of "lots of water", "an average amount", or "not very much water"? Which activities would you put in each of these categories? • And which of those descriptions best matches your own household? 	<i>Looking for values attached to different types of water uses. i.e. do they think they use a lot, an average amount or a little?</i>
4. Is there anything you do (or have done) to save water at home?	<i>If asked for examples, interviewer can prompt with ideas from Box 1 (below) which lists both ongoing, repetitive behaviours and one-off behaviours</i>
<ul style="list-style-type: none"> • If Yes take details of: <ol style="list-style-type: none"> a. Types of actions taken b. Normalisation of behaviour c. Motivations d. Triggers e. Barriers • If No, explore reasons why not (i.e. barriers) 	<i>i.e. for ongoing actions, is it what they 'normally' do? Why do they do it? What drives them to save water? What was the original stimulus to start saving water? Has a particular person or experience encouraged them? Did they receive information? If so, probe for source. Was there a freebie offer or cheaper deal? What, if anything, <u>stops</u> them from saving water at home? Be alert to the fact that they may report water saving behaviour. Explore why they do these, i.e. what the non-water related reasons are, e.g. cost saving etc. Don't prompt with list in Box 1.</i>
5. Do you think your household could be more water efficient?	<i>Record any levels of interest in alternatives not yet considered or actions known but not yet taken up.</i>
6. What, if anything, would <u>help</u> you to do more to save water?	<i>Explore any ideas they may have on how to overcome the barriers they mentioned earlier.</i>
7. How important do you think saving water is? <ol style="list-style-type: none"> a. And by comparison to other activities like switching off lights, recycling or taking 	<i>Unprompted first, then compare with other 'green' actions.</i>

<p>public transport (more, less, same?)</p> <p>b. Why do you think this?</p> <p>c. Do you think there are any links between saving water and other environmental issues?</p>	<p><i>Unprompted but can give examples, e.g. climate change, biodiversity, water quality, etc.</i></p>
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8. Respondent's details:

9. Age:

10. Gender:

11. Water meter? Y/N

12. Housing type: Flat / Terraced housing / Semi-detached / Detached / Other

13. Employment status: Employed / Unemployed / Student / Retired

14. Ownership of property: Y/N

15. Would it be ok for us to re-contact you in the next six months if we have any further questions? Y/N

16. And finally, do you have any questions for me, or want any information?

We should offer all participants the opportunity to find out more about the study, be informed when reports are published, give them contact details for more info, etc.

Box 1

List of potential **ongoing behaviours** taken to save water:

- Turn tap off when brushing teeth.
- Turn tap off while doing dishes.
- Use appliances on full loads or eco-loads only.
- Take shorter showers (if asked for a measure, less than three minutes).
- Take a shower rather than baths.
- Use a watering can, not hose, to water garden (if applicable).
- Use bucket not hose to wash car (if applicable).
- Fix dripping taps / leaks (or request that they get fixed).

List of potential **once-off / infrequent behaviours** taken to save water:

- Fitted water saving devices to toilets to reduce the amount of water that flushes (e.g. Hippo, Save-a-Flush bag).
- Had a water meter installed.
- Put in a dual flush cistern or toilet.
- Fitted water saving shower heads.
- Fitted tap inserts that reduce flow.
- Bought appliances such as washing machines that are more water efficient.
- Fitted water butts / rainwater harvesting equipment.

A4.4 Focus group design

Objectives of focus groups

- To help determine the relative efficacy of the different pilot interventions.
- To further explore and complement issues emanating from the quantitative benchmarking surveys.
- To understand current public knowledge base and perceptions of the water supply/demand balance problem.
- To explore potential behaviour change motivations and barriers.

The focus groups will provide insight into knowledge, attitudes, beliefs and social norms (e.g. peer pressure, social group norms), all of which are important drivers to behavioural intention and ultimately to behaviour itself.

Research structure

- Four focus groups in Natural England project area (one group in each of the three intervention areas and one group in the control area).
- Two focus groups in the Bath Housing Association area (one group from the device and device/engage target groups and one group from the device/engage and third-party target groups).
- Focus groups to be undertaken post-intervention, i.e. October/November.
- One pilot focus group to be undertaken in Natural England project area (Downton) during July to inform topic guide design.

Method

- Recruit standard focus groups of 8–10 people: to include a broad mix of light, medium and heavy water users (definitions to be provided).
- All participants to be from C1 Social Economic Group in Natural England project area (socio-demographic profile to be generic within each group to avoid introducing a social dynamic which may prevent fluid discussion). Groups to contain mixed age and gender range.
- No need to set specific socio-demographic criteria for Bath housing association groups (assumption is all participants will be C2/DE). Groups to contain mixed age and gender range.
- All group participants to have been exposed to the interventions.
- Each focus group to contain no more than three committed environmentalists.
- Participants to be recruited 'on-street' using a screening questionnaire.

- Group duration to be 1 hour 45 minutes. Tape recorded. Facilitator to use flip-chart and meta-plan to aid discussion and structure debate.
- Same facilitator to be used for all groups.
- A cash incentive of £20 to be offered to all respondents.

Topic guide

1. Warm up (10 minutes)

- Introduction to the project, obtain permission to tape discussion.
- How do people use water in the home? Who uses it?
- How do people define a high/medium/low water user? How do they define themselves on this scale?
- Which activities do people associate with greatest levels of water usage (e.g. personal washing, washing clothes/dishes, gardening, etc.)?

2. Explore perceptions of 'the problem' – spontaneous (15 minutes)

Keep neutral initially to see whether people spontaneously frame 'problem' responses. Discuss UK scale first, then local areas.

- If a problem is perceived, is the problem framed (defined) as a water quantity or water quality problem, or both? Do people think there is too little or too much water?
- If too little water, what are the factors most to blame for water stress in the region: climate change/lack of rainfall; domestic use; leakage, business use, agriculture; other?
- Who should be sorting out the problem?

3. Explore motivations and barriers to change (45 minutes)

- What, if anything, would make people reduce their consumption of water?

Facilitator will use a meta-plan and post-its to help participants explore the options. Participants will be asked to write their thoughts on post-its (one thought per post-it) and stick these on the meta-plan (large piece of paper stuck on a wall).

Facilitator will then cluster these post-its into separate themes as a basis for subsequent discussion with the group.

Facilitator to add pre-prepared topics to meta-plan if not spontaneously placed on meta-plan by participants: pre-prepared topics would be 'peer pressure', 'ethical considerations', 'price of water', 'shortages of water', 'influence of children'.

- What are the barriers to change? How might these be circumvented?

4. Explore reactions to pilot intervention strategies (35 minutes)

- What can people remember about the interventions?
- What did people like/dislike about the interventions?

- Have the interventions lead to a change in personal behaviours? Why/why not?
- How could the interventions be improved?
- Is the identity and image of who is delivering the intervention important? Why/why not?

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