

Promoting Pro-Environmental Behaviour: Existing Evidence to Inform Better Policy Making

Summary Report

A Study for The Department for Environment,
Food and Rural Affairs

by

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Defra has commissioned and funded this study, but the views expressed in this report do not necessarily reflect Defra policy.

Executive Summary

Defra's 5 year strategy *Delivering the Essentials of Life* (Defra, 2004) sets out an ambitious agenda for environmental leadership and sustainable development. Embedding these core principles relies on influencing change and making it easier for producers and consumers to behave more sustainably. This is a sizeable task – changing behaviours is a complex matter – and innovative policies and practical solutions are required at every level of society. In response to this challenging remit, Defra commissioned a consortium led by the Centre for Sustainable Development at the University of Westminster to carry out an analysis of the existing evidence base relating to pro-environmental behaviour change. The study reviewed evidence on both producers and consumers, at the individual and collective levels.

Key Messages

- **Behaviours are complex and non-linear.** Each behaviour is determined by various (often inter-related) factors, many of which need addressing simultaneously to facilitate change. Thus interventions should combine multiple types of instrument in a 'package' of measures (e.g. infrastructure, fiscal measures, and information). It is suggested that interventions first address external factors (most notably infrastructure and pricing) and then internal factors (e.g. psychological or attitudinal). As well as working on multiple factors, interventions need to work on multiple levels – ultimately addressing society as a whole in order to achieve sustained change.
- **Different audiences behave differently, and require targeted and/or tailored interventions.** To be effective, policy measures usually need to be highly context specific. Devolving responsibility for policy development and delivery to local bodies (Local Authorities, business and industry groups, the Voluntary and Community Sector) can help to ensure their suitability and can also help to build their legitimacy. Care should be taken to ensure that the relevant skills and resources are available within these organisations to take on these additional duties.
- **The audience for a change intervention should not be regarded as a passive target.** Policy-makers need to view target audiences and other key stakeholders as 'actors' at the heart of the change process. Ideally, a total partnership working approach should be adopted in which change partners (including members of the public) are involved from the start in defining and redefining the problem through a continuous cycle of action and reflection, from which learning and innovation will result.
- **Feedback is vital to driving and sustaining change.** Instead of understanding changing behaviour as a single event, it should be viewed as an ongoing process. Policy-makers should ensure that interventions incorporate opportunities to learn from policy audiences – learning captured and fed back from the change process should influence subsequent policy. In order to facilitate this important reflective process, more effective and consistent data collection and collation is required. In future, the appropriate formal evaluation structures should be put in place at the stage of policy-development.
- **Government policy needs to convey a consistent message and visibly pull in one direction.** The suite of policies emerging from Government needs to avoid contradictions and inconsistencies in order to convey clear messages to target audiences and the public in general. This requirement for harmony needs to apply to all Defra policies and to those coming from the EU, and (possibly more importantly) to those being developed by other Government departments. There needs to be greater collaboration and interdepartmental working to achieve this.

- **Individuals have the potential to act as 'change champions'.** Individuals are vital to delivering pro-environmental change, not just for themselves (on the level of individuals) but also within organisations and networks as 'agents for change' (both as managers and 'change champions'). Engaging and nurturing key individuals may be more effective in bringing about system-wide change than targeting the behaviour of all individuals.
- **Policy design should incorporate considerations of equity and fairness.** It is clearly important that policy-makers ensure that policies at least avoid disproportionate financial and environmental impacts for the most vulnerable in society and where possible reduce inequalities of income. Equity concerns are particularly associated with environmental taxes and charges, which can negatively impact on the competitiveness of small businesses, as well as on disadvantaged individuals. Compliance is likely to prove most problematic where policies are perceived as unfair or poorly targeted, and where alternative options do not appear to be available.
- **Action needs to be taken now to address the pressing environmental problems we face today and in the future.** The appropriateness and relevance of policies to encourage pro-environmental behaviour should be viewed in light of these massive and important global challenges. More far-reaching, targeted and effective policy action is needed than is currently evident. Change takes time, and measures need to be put into place now to influence societal change and respond to environmental pressures.

1. The Study

The overall aim of the project was to use secondary research methods to establish how Government departments (and Defra in particular) can best encourage pro-environmental behaviour change among different audience groups. It was required that both theoretical and applied research evidence be drawn upon, and that the analysis should result in practical recommendations for future work by Defra. Ultimately, the project outputs should help policy-makers to select the right instruments for encouraging the pro-environmental behaviours they advocate among specific audience groups.

In recognition that the literature on pro-environmental behaviour change at an individual level had already been effectively synthesised in previous studies (see Jackson, 2005 and Darnton, 2004a and 2000b), a key aim of the research has been to broaden the current thinking on pro-environmental behaviour change by additionally considering the theoretical literature surrounding organisational and systemic behaviour change. The study has also aimed to bridge the discourse between theoretical analysis and more policy-focused examples relating to policy instruments, target groups, good practice and effectiveness.

The objectives set for the project were to:

- analyse models of pro-environmental behaviour change among different target groups of consumers, and among other related groups including producers;
- identify and analyse policy interventions and other initiatives designed to bring about pro-environmental behaviour change among different target groups; and
- present practical recommendations for future work by Defra aimed at influencing specific pro-environmental behaviour changes.

2. Key findings

The review of the theoretical literature strongly identifies that there are many organisational and societal factors impacting on individuals' behaviours that may serve to prevent change from occurring at the individual level. Change is circular and needs to be understood as progress over time, and not as a single event. Change theories at the individual, organisational and systemic level are filled with interactive loops (both feedback loops and double loop learning), cycles (of action and reflection) and non-linear models.

The complex inter-relations between these multiple factors and organisational levels support the argument for a 'whole systems' approach to encouraging behaviour change. By stressing that organisations and networks are "*complex adaptive systems*" in which change processes must be embedded both horizontally (i.e. within an organisation) and vertically (i.e. between organisations), systems thinking offers new possibilities for effective pro-environmental policy-making.

The policy review demonstrated an increasing recognition of the complexity of environmental behaviour change amongst policy-makers and an appreciation that a multi-instrument approach is needed. There is less evidence of a move towards systematic and holistic policy interventions targeted at 'whole system' change, however. Furthermore, where packages of measures have been designed to address multiple behaviours, there is little to suggest any consistency in policy intention between different Government departments' strategies. These inconsistencies in policy messages and intentions leave the public in a position where they do not know which behaviour is being prioritised.

There are a myriad of practical projects that are successfully facilitating pro-environmental behaviours amongst individuals, within organisations and across whole areas of delivery. The limited evidence available to this study means that it is not possible to identify a set of success criteria for policy-makers. Further research is clearly needed to understand fully to what extent different policies lead to pro-environmental behaviour. This may require undertaking systematic, quantitative evaluation of key programmes, policies and their influence on 'real world' initiatives.

The review of 'real world' initiatives suggests that it may be easier to replicate the smaller and less complex projects than those that are attempting whole system change. However, in practice whole systems can often be broken down into simpler functioning components and responsive approaches developed according to different specific groups, and/or behaviours, and/or activities. For this reason, a social marketing approach may offer a useful way forward in encouraging pro-environmental behaviours at both the individual and organisational levels.

Stable finance is clearly an issue for most community based initiatives; even small amounts of funding can help catalyse and justify the development of new community projects. Initiatives are more likely to succeed where there are clear legislative guidelines supporting their activities, as this helps to ensure that schemes are prioritised within local delivery programmes and can be used to secure the support of local politicians. Pilot schemes can also be useful for securing wider policy buy-in. Initiatives are more likely to achieve success where policy-makers work interactively with target audiences. It is also important to ensure that project participants understand the policy intention and process in a wider context.

3. Lessons for future policy-making

The key lessons for future policy-making arising from this review are identified under the sub-headings below.

Dealing with complexity

Behaviours are complex, non-linear and affected by numerous factors, many of which need addressing simultaneously to facilitate change. Different audiences behave differently, and most behaviours are context-specific (in terms of the behaviour in question, the setting for that behaviour etc.).

Policies that aim to encourage pro-environmental behaviour need to reflect these complexities. They should combine multiple types of instrument in a 'package' of measures (e.g. infrastructure, fiscal measures, and information). It is suggested that interventions first address external factors (most notably infrastructure and pricing) and then internal factors (e.g. psychological or attitudinal).

As well as working on multiple factors, interventions need to work on multiple levels; ultimately addressing society as a whole in order to achieve long-term normative change. Where an intervention addresses multiple behaviours simultaneously, those behaviours should be clustered together as the audience sees them, not as they are arranged in Government departments or delivery units.

Creating an interactive and reflective policy-making environment

The audience for a change intervention should not be regarded as a passive target whose behaviour is to be changed, but as 'actors' at the heart of the change process. Policy-makers need to involve target audiences and other key stakeholders from as early a point as possible in the change process. Ideally, a total partnership working approach should be adopted in which change partners are involved from the start in defining and redefining the problem through a continuous cycle of action and reflection, from which learning and innovation will result.

'Feedback' is vital to driving and sustaining change; instead of understanding the changed behaviour to be the end of the process, interventions should build in 'feedback loops', i.e. opportunities to feed learning from the change process back into subsequent behaviours. Feedback should also be accounted for between individuals and organisations in networks, and across society as a whole. A holistic perspective on facilitating change should be adopted.

Policy-makers should attempt to close the current gap between policy design and delivery outcomes. The effect of this better co-ordination would be reciprocal: policy would be designed in the light of past experience, and desired outcomes and targets would be set more appropriately (ideally through negotiation with delivery partners and change 'actors' themselves).

Providing a consistent message and approach

Policies for pro-environmental behaviour change need to pull in one direction and convey a consistent message to target audiences and the wider public if they are to achieve significant success. This consistency needs to apply across Defra policies and with those coming from the EU, and (possibly more importantly) to those being developed by other Government departments.

To achieve the level of consistency and integration that will be required to achieve visible and sustained improvements to environmental outcomes, Defra will need to collaborate more actively with other departments across Whitehall, as well as with the relevant external agencies (Environment Agency, Carbon Trust, Highways Agency, etc.) and with other key delivery partners.

Defra also needs to ensure more effective and consistent data collection and collation and measurement of performance to assist in the important reflective process. In future, the appropriate formal evaluation structures should be put in place at the stage of policy-development. These may need to be adapted in the light of feedback from those implementing the policies on the ground.

Supporting the champions of change

Individuals are vital to delivering pro-environmental change, not just for themselves (on the level of individuals) but also within organisations and networks as 'agents for change' (both as managers and 'change champions'). Engaging and nurturing key individuals may be more effective in bringing about system-wide change than targeting the behaviour of all individuals.

The Voluntary and Community Sector are already successfully delivering practical initiatives for encouraging and supporting pro-environmental behaviours. These demonstrate that projects are more likely to succeed where there are clear legislative guidelines to support their activities. It is important to ensure that target audiences understand the policy intention and process in a wider context.

Organisations (both business sector and community) are more likely to act if they have been involved upstream in its design and target setting and where they are held responsible for ongoing performance, monitoring, evaluation and refinement. As with individual behaviours, it is more likely that success will be achieved at the organisational level through economic incentives in the market, the removal of barriers and the provision of supportive physical and cultural infrastructure for change. Stable finance is clearly an issue for most community-based initiatives; even small amounts of funding can help catalyse and justify the development of new community projects.

Avoiding inequitable and unjust outcomes

It is clearly important that policy-makers ensure that policies at least avoid disproportionate negative financial and environmental impacts for the most vulnerable in society and where possible reduce inequalities of outcome. Equity concerns are particularly associated with environmental taxes and charges, which can negatively impact on the competitiveness of small

businesses, as well as on disadvantaged individuals. Compliance is likely to be least where policies are perceived as unfair or poorly targeted, and where alternative options do not appear to be available.

When evaluating the likely equity of a policy outcome, it is important to consider both exposure to negative environmental externalities and its effect on opportunities to access goods and services. Any increase in the overall cost of a product or service will be most likely to impact on the activities of groups at the margins, who may experience greater social exclusion as a result of being priced out of that activity. In the past, people on low incomes have tended to be less able to access environmental information and less able to participate in pro-environmental behaviour as a result of policies that have failed to consider their particular needs.

It is also important to consider the wider distribution of policy outcomes, both in terms of their geographical spread and across the different market sectors. Some sectors, for example the building trade, have been demonstrably less responsive to environmental policy directives than others. Finally, past policies have demonstrated all sorts of unforeseen additional side effects, such as the discarding of catches by fishing fleets in response to species-based quotas, leading to an increase rather than the intended decrease, in the proportion of 'at risk' species.

Responding to the magnitude of global environmental challenges

It is important to remember that the environmental problems we are all facing today and in the future are pressing, huge and often fairly poorly understood. The appropriateness and relevance of policies to encourage pro-environmental behaviour should be viewed in light of these massive and important global challenges. More far-reaching, targeted and effective policy action is needed than is currently evident. Change takes time, and measures need to be put into place now to influence societal change and respond to environmental pressures.

1. Introduction

Defra's 5 year strategy *Delivering the Essentials of Life* (Defra, 2004) sets out an ambitious agenda for environmental leadership and sustainable development. Embedding these core principles relies on influencing change and making it easier for producers and consumers to behave more sustainably. This is a sizeable task – changing behaviours is a complex matter – and innovative policies and practical solutions are required at every level of society. In response to this challenging remit, Defra commissioned a consortium led by the Centre for Sustainable Development (CfSD) at the University of Westminster to carry out an analysis of the existing evidence base relating to pro-environmental behaviour change. The study reviewed evidence on both producers and consumers, at the individual and collective levels.

1.1 Aims and objectives

The overall aim of the project was to use secondary research methods to establish how Government departments (and Defra in particular) can best encourage pro-environmental behaviour change among different audience groups. It was required that both theoretical and applied research evidence be drawn upon, and that the analysis should result in practical recommendations for future work by Defra. Ultimately, the project outputs should help policy-makers to select the right instruments for encouraging the pro-environmental behaviours they advocate among specific audience groups.

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As Defra's activities in the area of environmental leadership are wide-ranging, it was agreed at an early stage that the study should principally focus on seven pro-environmental behaviour domains, namely:

1. helping businesses 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; and
7. sustainable procurement – using Government purchasing to influence markets.

1.2 Project Methodology

The CfSD team approached the research study from four perspectives: theory, policy, practice, and implications. These perspectives relate to three different areas of the literature, and allowed for the inclusion of recommendations for future work. In implementing this approach, each area of the study was allocated to one team member, who led on that area, but was supported (and challenged) by at least one other team member. Each area of the enquiry was conducted using secondary (i.e. desk) research methods, supplemented by phone interviews with experts and stakeholders to gather further evidence where necessary.

The study was managed by Defra's Central Analytical Directorate, who assembled an Advisory Group of departmental colleagues to plan in detail the approach to the research study and oversee its progress and outputs. In addition, sections of the review were sent out to independent peer review by two leading academics in the field of pro-environmental behaviour change and systems thinking, and to policy officers responsible for behaviour change programmes within Defra.

1.3 Project outputs

During the course of the project, it was agreed that each of the three areas (theory, policy and practice) should be reported separately, resulting in a set of 'sister' reports on influencing pro-environmental behaviour change. A fourth report would draw out the implications from the whole project, and summarise the key findings – this document represents that summary report. Additionally, it was agreed that the key implications arising from the project would be presented as four short Practical Guides for policy-makers and practitioners, each covering a separate area of public behaviour, relating to clear areas of policy. The four Guides would then form part of a larger series incorporating practical recommendations arising from other Defra research concerned with pro-environmental behaviour change.

All the 'sister' reports and practical guides have been made publicly available on the Defra website: <http://www.defra.gov.uk>, or <http://www.sustainable-development.gov.uk/>

1.4 Structure of the summary report

The remainder of this summary report is structured as follows:

Section 2 identifies the key theories and models of pro-environmental change, synthesising for the first time three different bodies of literature and academic thought, namely:

1. Introduction

- i) models of socio-psychological behaviours in individuals;
- ii) theories of organisational behaviour change and in particular action learning theory; and
- iii) theories looking at 'whole systems' change across wider society.

Section 3 offers a review of fourteen key policy instruments that have been utilised by Defra and others over the past ten years to encourage different target audience (at the individual, organisational and societal levels) to behave in more environmentally considerate ways.

Section 4 illustrates how some of the theories and policies outlined in the previous sections have translated in the 'real world'. Through the evaluation of fourteen case studies, it allows some qualitative conclusions to be drawn in relation to the challenge of promoting pro-environmental behaviour.

Section 5 draws conclusions and outlines key recommendations for future work.

2. Learning from models and theories of pro-environmental change

2.1 Introduction

It is important to note from the outset that this study does not represent a systematic review of the theoretical literature relating to pro-environmental behaviour change. Such a task was considered impossible given the diverse and undefined scope of the evidence that could be considered relevant, and the sheer amount of material that those diverse literatures could provide. Furthermore, many of the sources cited here are not listed on academic databases (thus falling into the 'grey literature'), making systematic searching highly imperfect.

Instead, the method chosen for the theories and models review was based on consultation with key individuals in the field of sustainable development, who it was considered would be best placed to open up relevant areas of literature, and to identify key sources. To start this process, Andrew Darnton and the CfSD team identified sources known to them, and this list was supplemented with information provided by members of the project Advisory Group.

Requests for relevant sources and potential further avenues of enquiry were then sent out to an agreed list of contacts. In that request, relevant material was defined as that covering pro-environmental behaviour from a theoretical perspective, especially where that work included an exploration of modelling behaviours or processes. Through this method we were able to identify 65 individual sources; these are listed in the full bibliography, which appears at the end of this document.

2.2 The constraints of theories and models

It is important to remember that socio-psychological behavioural models are specifically designed to generalise behaviours and predict aggregate outcomes. Thus these models do not identify the wide variability in the behaviour of different individuals, but rather describe the average behaviour of all individuals. Clearly no individual, organisation or society actually behaves in precisely the way a theory or model describes, as they will be influenced by various different factors, impacting in different combinations, and to different extents.

There are limits to how meaningful a model will be if it is derived from one context and applied in a different one. In other words, models don't travel well, although they vary in how far they can be 'stretched'. The study has identified numerous and increasingly more sophisticated models for understanding specific pro-environmental behaviours, for example, car use, household waste production, recycling, composting, etc. These can be highly useful to policy-makers in understanding which variables determine end behaviours and how this might occur. However, they cannot demonstrate exactly how to bring about behaviour change.

Increasing the number of variables enhances the predictive capacity of a model but the complexity of the relationships modelled may well leave the policy-maker uncertain about how to intervene. Furthermore, models require empirical data to operate and their outputs can only be as accurate as these data are representative and robust. The more complex the model the more data it requires, and the more costly it is to populate.

Having outlined these limitations and constraints, it should be recognised that theories and models are of particular value in understanding which internal factors inform the end behaviours of individuals.

2. Learning from models and theories of pro-environmental change

2.3 Scope of the literature

The literature pertaining to theories and models of pro-environmental change is extensive. It can be broadly grouped into three largely discrete knowledge bases, namely:

- i) social-psychological models of individual behaviours;
- ii) theories of organisational change; and
- iii) systemic/whole systems (or societal) change.

This study represents the first synthesis of these three bodies of literature and thus considerably advances our understanding of the relationships and interactions between these different levels of behaviour. It has not, however, been exhaustive, given the extent of the different existing literatures and the time constraints placed upon the study, and it is suggested that further work is needed in this respect.

The evidence to be discussed here shows how the three levels of behaviour change are not simply different units of scale, but are interconnected and mutually reinforcing. In other words, the commentary will not merely show multi-level behaviour change to resemble a 'Russian doll' (individuals comprise groups who together comprise society), but rather 'nested networks' characterised by continuous inter-relationships. This suggests that policy-makers could and should be addressing public behaviours on organisational (i.e. group) and systemic (i.e. societal) levels, as well the individual level.

2.4 Socio-psychological models of individual behaviours

The value-action gap

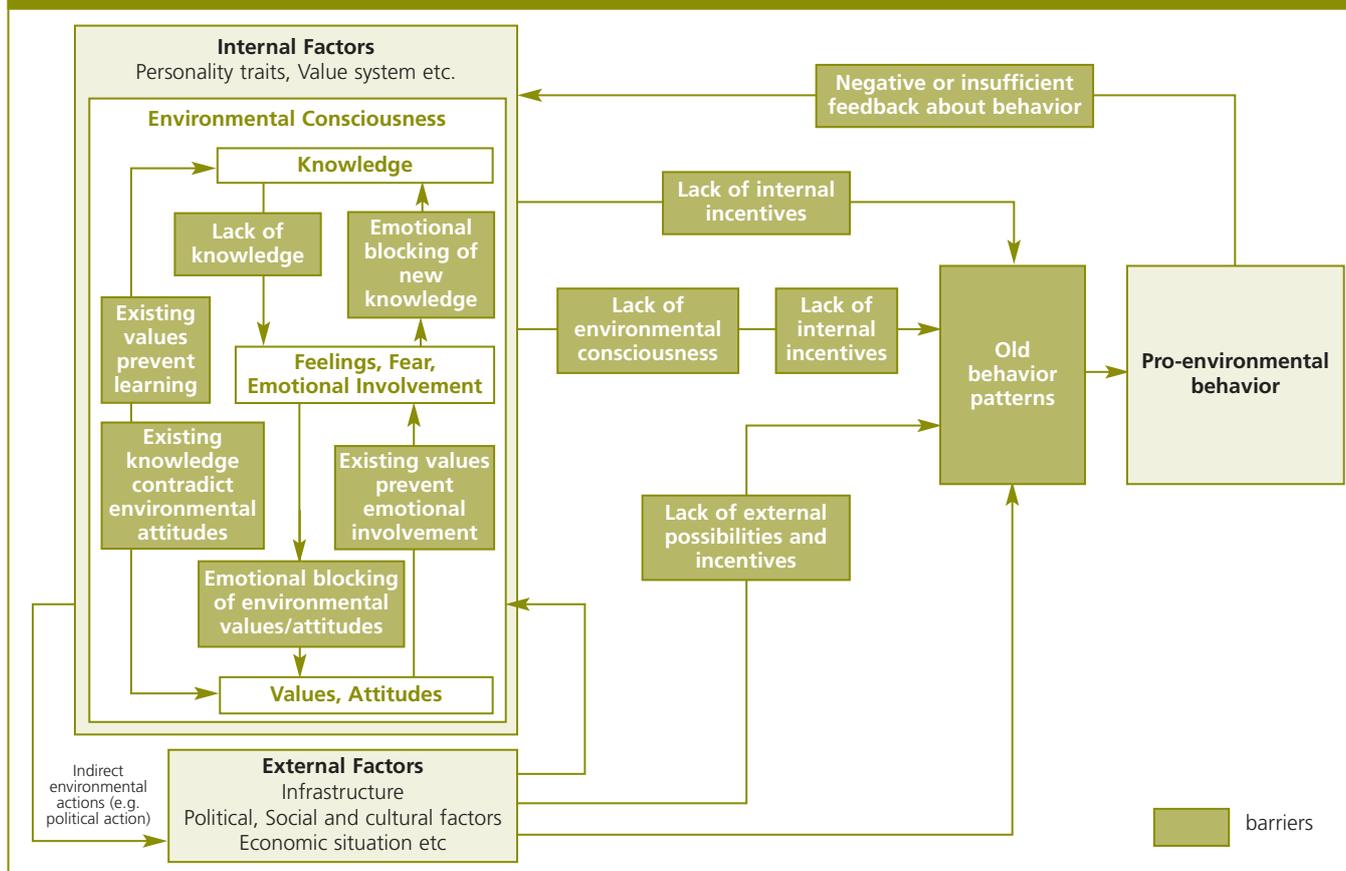
It is significant that previous studies of pro-environmental change have mainly focused on socio-psychological models of individual behaviours. As with previous reviews of these models (Jackson, 2005; Darnton, 2004a and 2004b), this study noted that it is possible to trace a move from simple linear 'information deficit' models (see Figure 1), to those that recognise that holding positive (pro-environmental) attitudes does not automatically lead to undertaking positive (pro-environmental) individual behaviours (see Figure 2).

Figure 1: 'Early model of pro-environmental behaviour', reproduced from Kollmuss and Agyeman (2002)



2. Learning from models and theories of pro-environmental change

Figure 2: 'Model of pro-environmental behaviour' reproduced from Kollmuss and Agyeman (2002)



Researchers in pro-environmental fields have repeatedly shown that holding pro-environmental attitudes does not necessarily lead to pro-environmental behaviours. This is commonly referred to as the 'value-action' gap. Despite some slowness in abandoning a dependence on information-led interventions, policy-makers seem now to have taken this learning to heart; the existence of 'the gap', and its implications for communications activity, is highlighted in the Government's latest Sustainable Development Strategy (HM Government, 2005).

External barriers to individual behaviour change

Jackson's synthesis review (2005) identified three principal external barriers to behaviour change: external conditions; social context and lock in (norms and habits). A well-known model of consumer behaviour from Gatersleben and Vlek (1998), the Needs Opportunity Ability (NOA) model, shows how internal and external factors impact simultaneously (see Figure 5). The clear implication of this model is that the social context needs to be right if the required behaviour change is to result: policy-makers may need to aim for societal change in addition to targeting individuals with change interventions.

Achieving wider societal change to catalyse, support and reinforce pro-environmental behaviour is a common theme throughout the theoretical literature. It pinpoints the need for a fuller exploration of the theories and methods for encouraging behaviour change beyond the individual, i.e. within organisations and across whole systems. Thus a policy approach that targets the behaviour of organisations, networks, supply chains and society as a whole is highly desirable.

2. Learning from models and theories of pro-environmental change

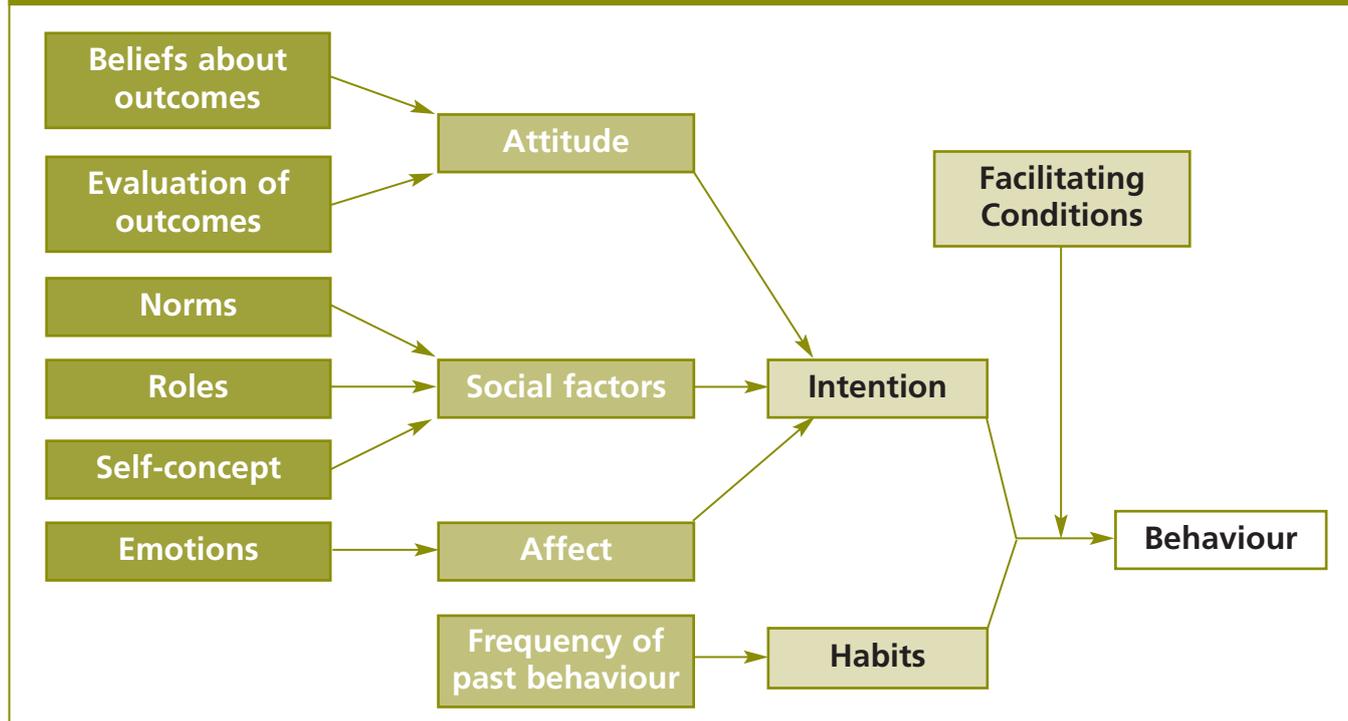
Internal barriers to individual behaviour change

The wide array of behavioural models in the literature present myriad factors which are essentially internal to individuals, in that they are psychological or dispositional. The three principal internal barriers to individual behaviour change are identified as agency, norms and habit.

The role of agency is somewhat contested. In one definition it is the belief of an individual in his/her own capacity to be an 'agent of change', that is, to make a meaningful difference in a situation. As such it has two aspects, both the internal belief that an individual could see a course of action through, and the belief that the action would in turn make a difference.

The idea that behaviours are determined by an individuals' sense of appropriateness is also prominent in the literature. This falls under the broad heading of 'norms'. Subjective norms feature (explained as social rules), as do personal norms (called here 'self concept'), while a third bridging variable is added ('role beliefs', what a type of person would do in that circumstance). Taken together, Triandis' Theory of Interpersonal Behaviour (see Figure 3) labels these as 'social factors'; a neat encapsulation of the impact of (perceived) societal values on an individual's behaviour.

Figure 3: Triandis' 'Theory of Interpersonal Behaviour', reproduced from Jackson (2005)



Habit can also be seen to dominate Triandis' model, which is particularly good at theorising frequently undertaken behaviours, which are performed at low levels of consciousness. From this perspective, habit is a psychological strategy employed to prevent an individual having to dedicate too much conscious thought to what is a frequently repeated action. From Triandis' model, it can be noted that habit is shaped by the frequency with which a given behaviour is undertaken. Stern describes habit as an individual's "standard operating procedure" (2000:417); so thoughtless and engrained are behaviours dominated by habit that, in Stern's view, there is little point in further conceptualising about them.

2. Learning from models and theories of pro-environmental change

Understanding the behaviour change process

Having identified the principal internal barriers to individual pro-environmental behaviour change, the review of theory notes that the socio-psychological models also show behaviours at a single point in time. Turning away from that area of the literature, the review finds other theories which position change within its temporal dimension.

In their Trans-Theoretical Model of Health Behaviour Change, Prochaska and Velicer (1997) note the importance of understanding the process of individual behaviour change over time. They identify ten processes that play a part in moving individuals between the six key stages of the change process, as follows.

1. Pre-contemplation

The stage in which people are not intending to change or take action.

2. Contemplation

People are intending to change within the foreseeable future, but are not ready to take action; doubts about the effectiveness of action and of uneven costs and benefits may stall people at this stage for some time (in a state of “*chronic contemplation*”).

3. Preparation

People are intending to take action in the immediate future; they are very aware of the costs and benefits of change and are likely to have taken some related action recently, including having a plan of action in place.

4. Action

People have made or are making specific overt modifications to their behaviour (note that the level of action constituting a change needs to be stipulated, e.g. is cutting down sufficient, or will only stopping completely be considered?).

5. Maintenance

People are working to prevent a “relapse” to the previous behaviour; levels of confidence about their effectiveness (self-efficacy) tend to be higher than before action was first taken.

6. Termination

The changed behaviour has become normative; there is no chance of relapse.

Prochaska and Velicer observe that previous theories and models have ignored this temporal dimension and so have wrongly construed behaviour change as an event, rather than a gradual process over time. This suggests that a targeted policy approach for interventions is needed, which can address these different stages of individual behaviour and adaptation.

Social marketing techniques

The review has identified that social marketing techniques might prove a useful policy tool for encouraging pro-environmental behaviour amongst individuals and households. There are a few points at which the principles of social marketing coincide with the literature on pro-environmental behaviour change at an individual level.

2. Learning from models and theories of pro-environmental change

- i) It puts the public at the centre of its planning, delivery and evaluation processes.
- ii) It calls for communications activity to be regarded as only one element of the “*intervention mix*”.
- iii) It demands a rigorous planning process before interventions are designed and implemented, in order to understand the target audience.
- iv) It segments the target audience into distinct subgroups according to their attitudes to and involvement in the behaviour in question (i.e. the particular stage of change they currently occupy) – in keeping with Prochaska and Velicer’s staged model for behaviour change.
- v) It calls for multiple relevant theories to be drawn together from a wide range of disciplines (in this way it avoids the opening question for policy-makers of ‘which model do I choose?’)
- vi) The idea of inter-disciplinary working is central to the approach.

Although social marketing is a mature discipline, it is only recently beginning to achieve prominence in relation to UK public policy. Currently, its principles are most commonly observed in behaviour change programmes relating to health and there is as yet little evidence on the effectiveness of applying social marketing techniques to pro-environmental behaviour. However, one early example in this respect is a current project for Defra by Barr et al. (2005). They are using a social marketing approach to explore behaviour change in and around the home, by sub-dividing the public into four segments according to the extent of their pro-environmental behaviour.

An ‘action learning’ approach to changing individuals’ behaviours

Action learning theories have a lot to contribute to better policy-making for environmental behaviour change at both the individual and collective level. For example, whilst Ballard’s ‘5As Model’ (2005) has been specifically employed in efforts to create ‘change champions’ in organisations, its applicability is far broader in identifying the prerequisite qualities of pro-environmental behaviour change among individuals. The ‘5As’ blend internal attributes with external factors, brought together through the medium of action learning activities undertaken by individuals in groups and are as follows.

1. **Awareness** – of what is happening and what action is required. Awareness is described as being a progression through three levels, although behaviour change can result at any point in the progression. Level 1 is simple (factual) awareness, not linked to personal action. Level 2 is awareness including a sense of urgency and priority – the beginnings of personal engagement. Level 3 is ‘mature awareness’, incorporating a sense of the context for and barriers to action, including recognition of key moments for effective action.
2. **Agency** – following on from awareness, agency unlocks action by providing individuals with a sense that they can take meaningful action to address the immense (and often intractable) issues of which they are aware.
3. **Association** – undertaking action through the medium of a group or collective (predominantly because “groups offer agency”).
4. **Action and Reflection** – working in groups, individuals address the issues (and barriers) collectively, undertaking continuous cycles of action and reflection. This method allows individuals to scrutinise and revise the assumptions on which they operate, allowing them to open up new possibilities for meaningful action.

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5. **Architecture** – a recent refinement to Ballard’s process model, architecture represents the external context (both societal and organisational) within which behaviours occur. Architecture comprises both structures (e.g. infrastructure) and processes (e.g. professional development or decision making).

Core principles for influencing individual behaviour change

Stern (2000) has identified a useful set of core principles for policy-makers designing pro-environmental behaviour interventions targeting individuals. The principles combine main points with sub-points, offering important theoretical and procedural observations about both the role of process and the need to address multiple factors in combination.

- A. Use multiple intervention types to address the factors limiting behaviour change:
 - 1. limiting factors are numerous;
 - 2. limiting factors vary with actor and situation, and over time; and
 - 3. limiting factors affect each other.
- B. Understand the situation from the actor’s perspective.
- C. When limiting factors are psychological, apply understanding of the human choice process:
 - 1. get the actors’ attention; make limited cognitive demands; and
 - 2. apply principles of community management (credibility, commitment, face-to-face communication etc.).
- D. Address conditions beyond the individual that constrain pro-environmental choice.
- E. Set realistic expectations about outcomes.
- F. Continually monitor responses and adjust programmes accordingly.
- G. Stay within the bounds of actors’ tolerance for interventions.
- H. Use participatory methods of decision-making.

Stern calls on policy-makers to remove the contextual (external) barriers around a targeted behaviour **before** working with the ‘actors’ to establish measures that target their psychological (internal) barriers. This will ensure that the prevailing conditions exist in society to support a changed behaviour becoming the norm. They recommend that policy-makers should not exhort individuals to modify their behaviour, but rather encourage them to make the changes they themselves identify as possible for them. Stern prefaces his principles with a three-step process for intervening in environmentally significant behaviour by individuals:

- 1. identify the target behaviours (rather than the broader situational problem);
- 2. analyse the behaviours to identify “*the responsible actors and actions*”; and
- 3. *identify the causal variables* and establish their relevance to the end behaviour from the actors’ own perspectives.

2.5 Organisational change theories

There is an extensive literature available concerning change within organisations. It comprises many strands, most of which are not joined up with pro-environmental or sustainability concerns (e.g. social marketing, learning theory, and to a lesser extent management theory). There are also strands of literature concerning pro-environmental organisational behaviours, often within particular business types, or within public sector bodies, and Voluntary and Community Sector groups.

Little in these strands resembles the literature from the social-psychological arena on individual behaviour change: the focus here is more on change (or innovation) than behaviour, and it is notable that few of the available theories have been formulated into models (empirical or otherwise). Joining this literature up with that on pro-environmental behaviour change is a considerable task, and one that has yet to be fully addressed.

The literature on managing pro-environmental change at the organisational level can be understood in two ways, namely whether it is aiming at incremental or transformational change. The difference between the two is broadly one of control, i.e. whether that remains in the centre of an organisation or is to some greater or lesser extent devolved.

Incremental change

In programmes that seek incremental change within organisations, the process is driven from the centre by senior management teams. Their role is to gather in the innovations or solutions suggested by those engaged in practice or delivery, and to then implement those changes across the organisation as a whole (in the language of business, to 'roll out' change). Dynphy *et al.* (2003) find that throughout the 20th century most businesses have made use of incremental processes to provoke changes in their practices.

These processes have worked well in 'hard' systems, where there are known problems with linear solutions. The Toyota Production System offers a famous example of this incremental transformation approach; when an employee becomes aware of a flaw or failure (s)he is empowered to go to the management to suggest a 'fix'; the entire production line will be stopped until the fix is implemented. The chain of command is entirely linear and works best with a system that is already operating tolerably well.

Transformational change

Transformational change is both successor and partner to incremental change. As suggested above, it is a relatively recent practice in business, and one that has emerged alongside rapid developments in society, not least technologically, and improved environmental performance within the business sector. Transformational change is well suited to addressing crises; it requires managers to want to start again, by unleashing a process which will result at some point in "deep change".

This theory of organisational change relates closely to systems thinking. As with the two types of change programme, both 'hard' and 'soft' systems approaches are potentially useful. However, where the boundaries of a system are fuzzy and cannot be objectively agreed upon (and the problems and solutions pertaining are unknowable), soft systems approaches are required. The difference is summed up by Chapman (2004), as being that hard systems approaches are holistic but not pluralistic, whereas soft systems approaches are holistic and pluralistic. Soft systems

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approaches, involving collaborative working through 'action networks', offer the best means of unlocking transformational change.

For instance, soft systems approaches are commonly preferred when a complex system presents a complex problem in the form of a 'mess' (as opposed to a 'difficulty'). According to Chapman, messes are characterised by disagreements about what is wrong, what should be the goals of intervention and what would represent an improvement. Intervening in one mess tends to impact on other messes, so that addressing the issues is usually unbounded in scope, time, resources and people. In a policy context, reducing crime or raising school standards could be described as 'messes'; complex organisations can also be 'messes'.

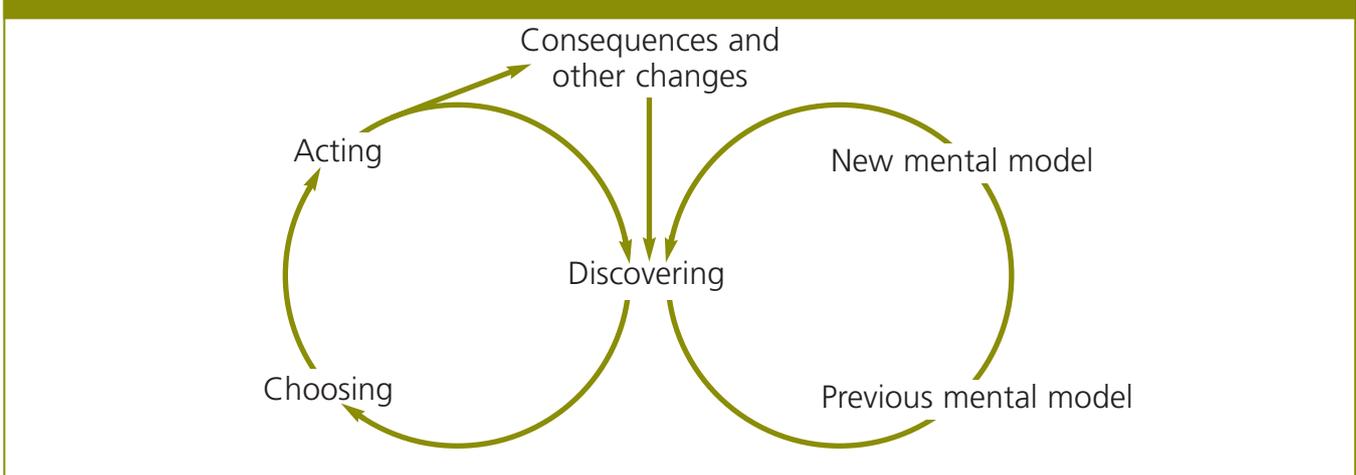
In common with most other systems thinkers, Chapman does not apply his analysis to specifically pro-environmental examples. Nonetheless, it is hard to generalise whether pro-environmental change calls for incremental or transformational change processes; as with other applications of change theory, context is vital in determining the most effective approach. On the one hand, issues relating to sustainability generally, and the environment in particular, are seen to call for transformational approaches owing to their complexity and dynamic nature.

By contrast, and as has already been stressed, the type of change required reflects the starting position of the organisation in question, and the pace at which that organisation needs to change. Thus, those organisations whose policies and practices are already close to pro-environmental good practice will only require incremental change to maximise their environmental performance.

Critics of incremental change, such as Ballard argue that its piecemeal solutions are insufficient to provoke widespread change in complex situations and can act to weaken the whole system. He also notes that they fail to attend to inter-relations between different organisations. Borrowing from educational learning theory, action-learning theorists such as Ballard argue that where more radical change is aimed for a transformational approach is required.

Action learning theorists recommend that a transformational change approach is adopted, where problems are of a complex and dynamic nature. The literature calls on managers to devolve control to interested groups of stakeholders who work through problems together in 'action networks', undertaking a cyclical process of action and reflection (see Figure 4 below). Change will result from such a process (both for the individual participants – the 'reflective practitioners' – and for the organisations and networks involved) but not in a predictable or managed fashion.

Figure 4: 'Argyris and Schon's Double Loop Learning' reproduced from Ballard (2005)



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The role of 'change champions'

Whether incremental or transformational change is sought, it is clear from the literature that lead individuals have a key role to play in organisational change; either as managers in more traditional incremental change programmes, or as 'champions' in more transformational processes of change. Although individuals act as 'agents for change' in both approaches, key individuals are even more prominent in an action learning approach, both facilitating action networks, and embodying the change they seek to bring about among the other participants. Taken as a whole, the literature suggests that managers and/or champions can play a visionary role in identifying new gaps in the marketplace, and simultaneously meeting and shaping consumer demand.

This thinking suggests that pro-environmental change programmes might be best targeted at key individuals within organisations through a process of action learning. Care should be taken to avoid a return to the 'information deficit' model in targeting these individuals, however. It is clearly not the case that all that prevents pro-environmental behaviour change within organisations is a lack of information and expertise amongst their staff. Organisations, in different but comparable ways to individuals, experience a whole range of barriers to pro-environmental behaviour including financial, infrastructural, habitual and societal restrictions. Joining interested individuals together in action networks may represent a new way forward for encouraging change.

In recognition that different individuals in management structures have different characteristics and capacities for driving change within their organisations, management theorist Torbert produced a hierarchy of organisational staff. His Leadership Maturity Framework (cited in Ballard & Ballard 2005a) identifies seven levels of staff, as follows:

i) Opportunist

Individualists who 'win any way possible', traditionally in sales environments.

ii) Diplomat

Managers who avoid overt conflict by falling in with prevailing group values.

iii) Expert

The largest single type of executives, comprising those who have become fluent in their role, but who do not tend to question or go beyond it.

iv) Achiever

The first 'mature' developmental stage – managers who have perfected their discipline and are beginning to engage with other disciplines as part of becoming wider managers.

v) Individualist

A transitional stage of maturity, in which managers question how their organisation works, and actively seek change; however, this stage can often result in disillusionment, and a divergence between the individual's and the organisation's interests.

vi) Strategist

A very small minority of managers (but more common among the highest levels of management), who are constantly alive to opportunities for change, and will draw on good thinking from any discipline in shaping their ideas; strategists both lead change processes (i.e. as 'champions') and encourage others to do so.

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vii) Alchemist

Beyond managerial roles in organisations, this type of leader drives society-wide transformations by integrating material, spiritual and social forces.

Informed by management theory such as Torbert's, Ballard and Ballard (2005b) sought to clarify definitions of champions in their research for Hampshire County Council. Based on research with staff members in local organisations (including the Council itself) they identified three types of champion, in a loose hierarchy (from top to bottom):

i) Formal Champions

Provide visible leadership, have the power to instigate change programmes and convene action networks, and explicitly recognise their role as 'champions'.

ii) Informal Visible Champions

Committed to driving change as part of their organisational role, and seen as agents of change by colleagues, but not ready to take on the title of 'champion'.

iii) Informal Less Visible Champions

Driving change, although that function is beyond their organisational role, and they do not see themselves as 'champions'; by definition hard to reach and engage in championship activities.

Ballard and Ballard stress that a diversity of champion types is required within an organisation to contribute to different change processes (e.g. procurement, marketing, human resources, etc.) as well as different levels of change (e.g. customer care, frontline management, administrative systems, senior management, etc.).

External events

Organisational change can also be triggered by external events; changes in prices or market demand, changes in regulation and enforcement will stimulate change. These can be seen as crises forcing change or opportunities for new practices or markets. Existing sources supply detailed evidence on what motivates specific organisations to undertake pro-environmental behaviour changes. This evidence is divided between the conceptual and the empirical (i.e. social science-based).

The role of different organisations

Looking across the evidence by organisation type, it is clear that all organisations play a dual role in pro-environmental change. They are both targets of change interventions, and propagators of change among other organisations, and on other levels, through purposeful networks and inherent supply chains. Different organisations will have different contributions to make and will require different approaches to their engagement and involvement in pro-environmental change programmes.

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Local Authorities as promoters of change

Local Authorities are primarily conceptualised as promoters of pro-environmental change, although they are also targets for pro-environmental policy interventions or linking pins of networks. A practical embodiment of the linking role of Local Authorities is to be found in models of governance, where they not only work with partner bodies to deliver local services, but engage with those stakeholder partners throughout the process to work out local quality of life agendas.

Voluntary and Community Sector (VCS) groups as programme delivery agents

The pioneering work of local VCS groups in delivering sustainability projects on the ground (see Section 4 for more on this) clearly demonstrates their important role in driving environmental change programmes. Firstly, groups are established to take action (or campaign) on key local issues; these are commonly pro-environmental, and the 'Environmental Community Sector' is increasingly becoming an identifiable subset of the whole VCS (it has always been a very prominent strand in the Sector). Groups can also help individuals undertake pro-environmental behaviour change, both through their campaigning activities (e.g. for better transport links) and through the opportunity they provide for action and reflection.

How to encourage VCS groups to undertake pro-environmental activities and make changes themselves is a less richly evidenced question. Indeed, it is a pressing concern of Government at present as they attempt to operationalise the commitments made to support community action for sustainability in the Sustainable Development Strategy (under the heading 'Community Action 2020 Together We Can').

The CA2020 activity is part of the wider (cross-Governmental) agenda for bringing people and Government closer together (the 'Together We Can' programme, led by the Home Office). Observing many of the theoretical principles required for organisational and systemic change, Together We Can adopts a public participation approach, and one which seeks to let the public set the agenda for change.

Interestingly, the Together We Can work strands include lifelong learning centres (called Adult Learning for Active Citizenship (ALAC) Hubs), some of which are using an action learning approach to encourage change. For example, the Greater Manchester Hub has assembled local groups comprising professionals and members of the public who together are engaged in 'cycles of action and reflection' on issues around gender, civic participation and healthy living.

While CA2020 and Together We Can represent new departures for Central Government, the VCS has long celebrated participative ways of working at a local level. In their study on community activity for sustainability, Church and Elster (2002) recommend that policy-makers begin the process of engaging communities by starting from where organisations already are. They conclude that the community groups that do likewise should be appropriately funded by Government.

Small and Medium-Sized Enterprises (SMEs)

A study of the responses of SMEs to environmental issues undertaken by Kingston University (Revell and Blackburn, 2004) found that the win-win scenario of increased commercial gains and reduced environmental impacts was not yet a reality among smaller businesses. Drawing conclusions across business types, the researchers found that smaller businesses are strongly

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client-focused, and that consumers were not expressing sufficient demand for pro-environmental behaviour to provoke change within these organisations. They concluded that Government's most effective intervention route would be through "*legislative compulsion*". Even financial incentives and charges were deemed inadequate, as they would either be worked around, or passed directly onto consumers in price rises.

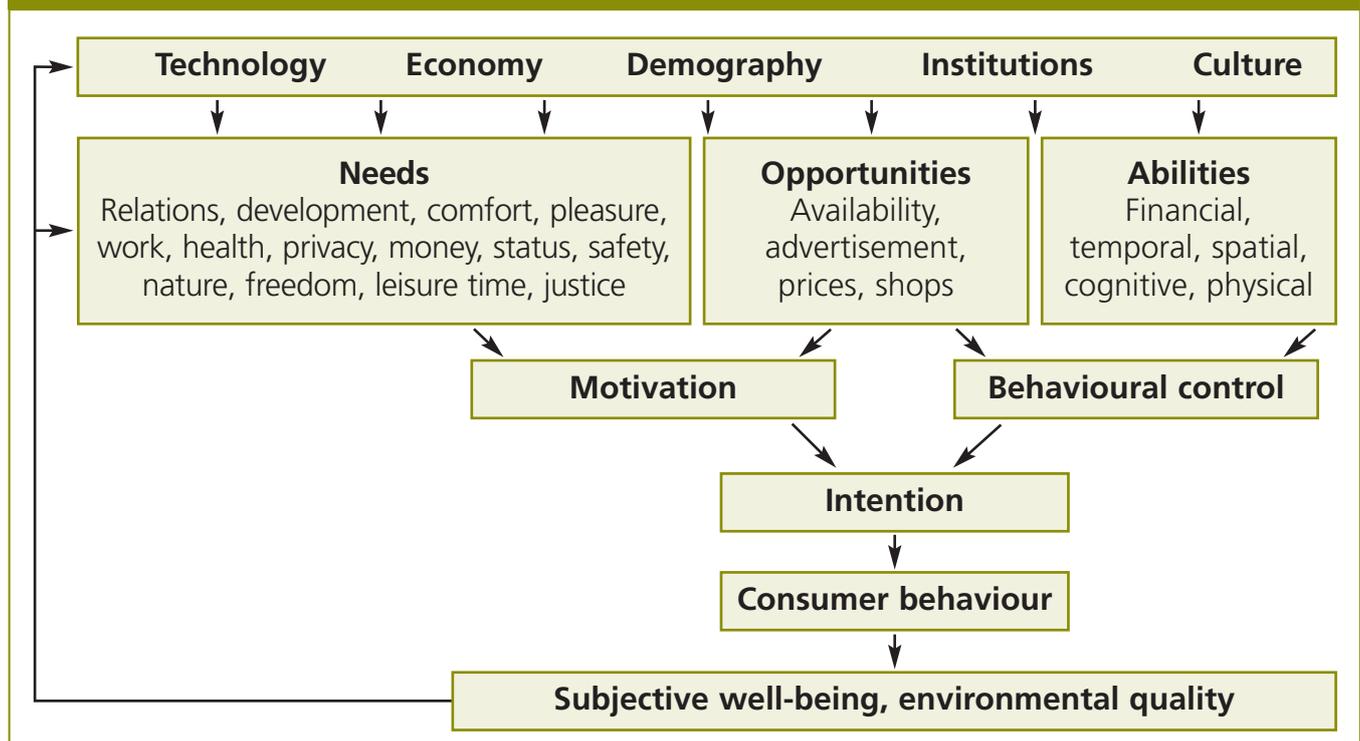
Larger Organisations

Larger organisations (in both the private and public sectors) feature extensively in the literature on organisational change – and sometimes in the context of sustainability. Examples of organisational change are often featured as case studies, spanning big multi-nationals (e.g. Unilever, BP, GM) and less large UK businesses (e.g. B&Q, and Interface Ltd – itself the subject of a case study in Section 3 of this study).

Tudor's studies for the University of Exeter into the NHS in Cornwall (Tudor et al., 2004) reveal some multi-level barriers to pro-environmental change in the NHS, which could be useful in understanding the organisational changes needed within large organisations more widely. Within the NHS, environmental concerns are seen as secondary to reducing cost inefficiencies; most Trusts had not written sustainability principles into their policies.

On a management level, the research found that there was insufficient co-operation (let alone collaboration or networking) between NHS sites and with potential partners; in the context of waste management, numerous opportunities for shared processes, greater efficiencies, and more recycling of resources were being missed. No environmental leadership or training activities were being presented to front-line staff and few exhibited any pro-environmental behaviours. Environmental issues were considered 'someone else's problem' and not part of job descriptions.

Figure 5: 'The Needs-Opportunities-Abilities model of consumer behaviour', reproduced from Gatersleben & Vlek (1998)



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Considering models of individual behaviour alongside theories of organisational change serves to emphasise further the complexity of the challenge of designing policies for pro-environmental change. This supports Gatersleben and Vlek's Needs-Opportunity-Ability (NOA) model (see Figure 5), which identifies external forces of needs and opportunities that motivate consumption. Conversely, opportunity and ability limit consumption, whilst 'drivers' at the societal level set the wider context for individual and organisational courses of action.

The inference from such models is that policy-makers will need to adopt a 'whole systems approach' in influencing environmental behaviours. This means that, in addition to and alongside policies and programmes targeting individuals and organisations, actions are needed to encourage broader societal change in order to support and reinforce new behavioural norms.

2.6 The 'whole systems' approach

There is a substantial body of evidence relating to change at a 'whole-system' or societal level. In the course of this study, three distinct theoretical strands for whole-system change were identified namely:

- i) systems thinking (incorporating network theory);
- ii) systemic (i.e. process) models; and
- iii) theories of policy-making.

There are large areas of overlap between these three strands and also considerable synergies with the literature pertaining to theories of organisational change. It is, however, important to recognise that 'whole systems' are not simply collections of organisations, but rather 'nested networks' characterised by feedback in all directions (both between organisational units and at different organisational levels). Networked organisations take on a life of their own, such that specific systems and ultimately society as a whole is more than the sum of its parts.

In simple terms, 'systems thinking' offers a way of understanding how large organisations or networks of organisations can work dynamically to bring about lasting, large-scale societal behaviour change. It takes a wider view than many organisational theories; instead of looking at business units or individual teams, it considers structures, processes, interactions between processes and between processes and practices across whole systems of delivery.

Systems thinking is particularly good for understanding whole processes based around interactions between problems and the issues they present, and the bodies that are involved in those different networks on many levels. By recognising that networks have lives of their own (which by definition make them networks, not collections of elements), systems thinking shows that networks are complex, nested (and thus mutually reinforcing), and changing over time.

The inter-relations within networks are depicted as non-linear 'feedback loops', showing the circular and reinforcing impacts across their different levels, and over time. It is interesting to note in the context of this commentary that the approach to change adopted by systems thinking (enacting the principles of action learning) involves constructing diagrams to show the reciprocal cycles of influence in a process, as opposed to "*emulating models*" (Senge, 1992). It is in this vein that Chapman (2004) calls for policy to be designed according to systems thinking principles, rather than by operationalising theoretical (scientific) behaviour change models.

The principal type of feedback loop used in systems thinking is that of 'reinforcing feedback', in which the initial stimulus or intervention (either positive or negative) is amplified through circular

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repetition. It is the circular nature of feedback that contributes to making predicting outcomes across whole systems so difficult; instead of working in a linear way, where one factor adds on to another, reinforcing feedback increases in effects exponentially.

Importantly, systems thinking represents feedback as dynamic, occurring variably over time. One implication of this process is that change programmes involving whole systems invariably occur over long timescales (just as systems thinking stands back to take an abstracted view, so it also takes a long view). Senge notes that it is this temporal dimension of complexity ('dynamic complexity') that change programmes most commonly overlook, dealing instead with 'detail complexity' (in the scientific method, by breaking down the complex problem). Systems thinking highlights the extent to which complex systems are not static, and require constantly evolving approaches across open-ended timescales, such as can be generated through cycles of action and reflection.

The systems thinking literature tends not to focus specifically on encouraging pro-environmental change, but much of the pro-environmental change literature demonstrates systems thinking. An Australian study examining the integration process of Urban Water Management Systems provides a good example of this (Brown, 2004).

Identifying the failure of socio-technological approaches to 'greening' water management systems, the focus of Brown's research was on the structures, processes, personnel and management practices of 45 Sydney-based water management organisations. Her research sought to establish the extent to which each organisation had adopted Integrated Urban Water Management (IUWM) practices, specifically in relation to their handling of waste water. What resulted from the study was a stratification of organisations into five types according to their level of achievement and representing a continuum of change towards IUWM. These phases were:

i) Project Phase

IUWM is low priority and treated as peripheral to core business.

ii) Outsider Phase

IUWM is treated solely as an environmental issue and delegated to an isolated group of project officers who look outside the organisation for support.

iii) Growth Phase

The environmental group has achieved external recognition and participates in external stakeholder networks; this leads to an increase of momentum for IUWM internally, but it is still pursued through ad hoc projects.

iv) Insider Phase

The organisation has good IUWM processes and results and some departments collaborate in these processes. In this phase organisations tend to contain prominent IUWM champions, who also work hard at networking with diverse external partners; their work is increasingly regarded internally as 'cutting edge'.

v) Integrated Phase

IUWM is one of many sustainability processes to be thoroughly integrated within the organisation; such processes are based on multi-stakeholder participation within and beyond the organisation (strong *community governance* is apparent). The organisation prizes learning, but at the same time is critical of the political and regulatory context within which its change processes occur.

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Even from this brief overview of Brown's research, it is clear that action learning, 'change champions' and inter-organisational working are all essential to the achievement of integrated water management within organisations. The research also found that different organisations were more or less successful depending on the extent to which they were operating within 'nested networks' across the whole water management system.

It is also interesting to note that, in identifying that more than a third of the organisations she surveyed were only at the first phase stage of change, Brown found 'single sphere interventions' (or incremental change processes) would be inadequate to deliver the required level of integration in the available timescale. As such, she recommended that a transformational approach would need to be adopted.

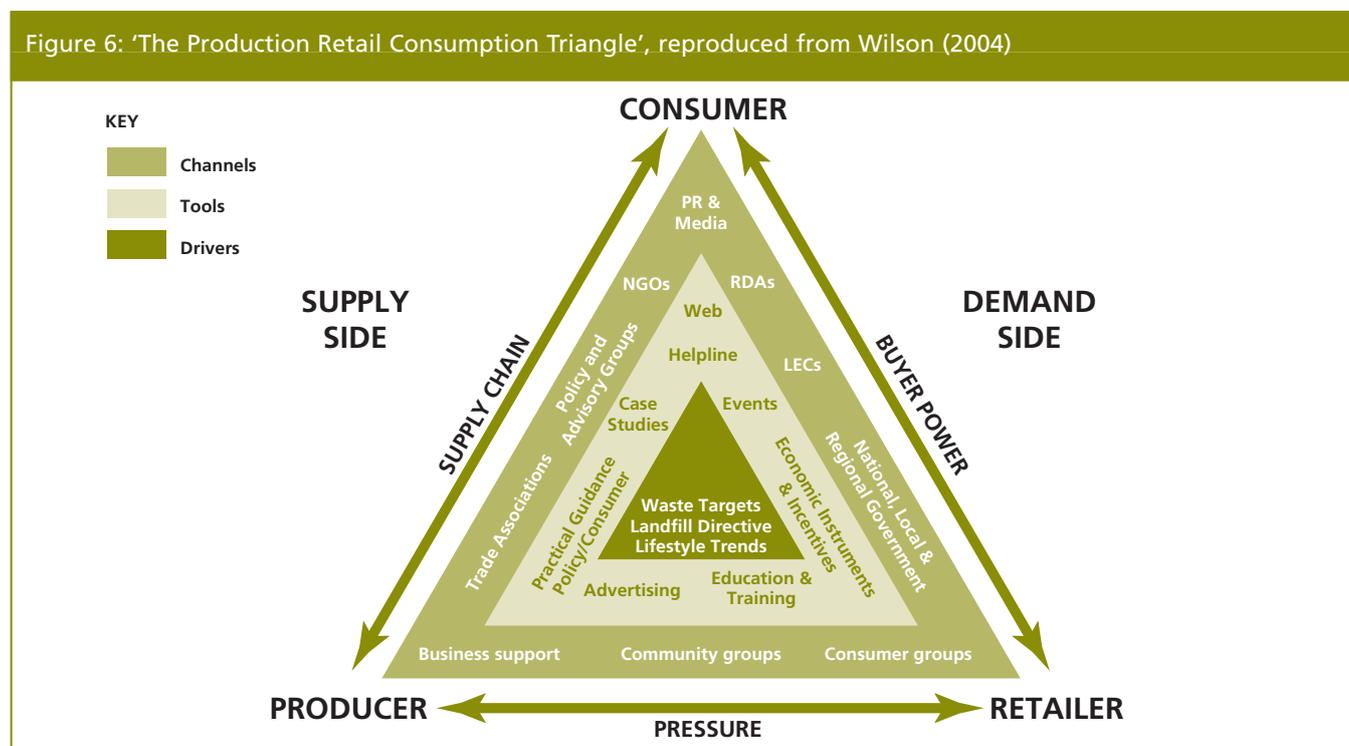
This useful example demonstrates how a systems thinking approach to the analysis of policy problems can help identify appropriate contextualised policy responses that are sympathetic to the varying circumstances of different target audiences.

Context specific models of pro-environmental change

Different parts of the literature provide examples of where whole systems approaches have been successfully applied in context-specific models of pro-environmental change.

UK Framework for Waste Prevention

Work on the UK Framework for Waste Prevention by the National Resource and Waste Forum working group included the development of a waste-specific model of supply and demand interactions. The resulting 'Production Retail Consumption Triangle' appears in Figure 6.



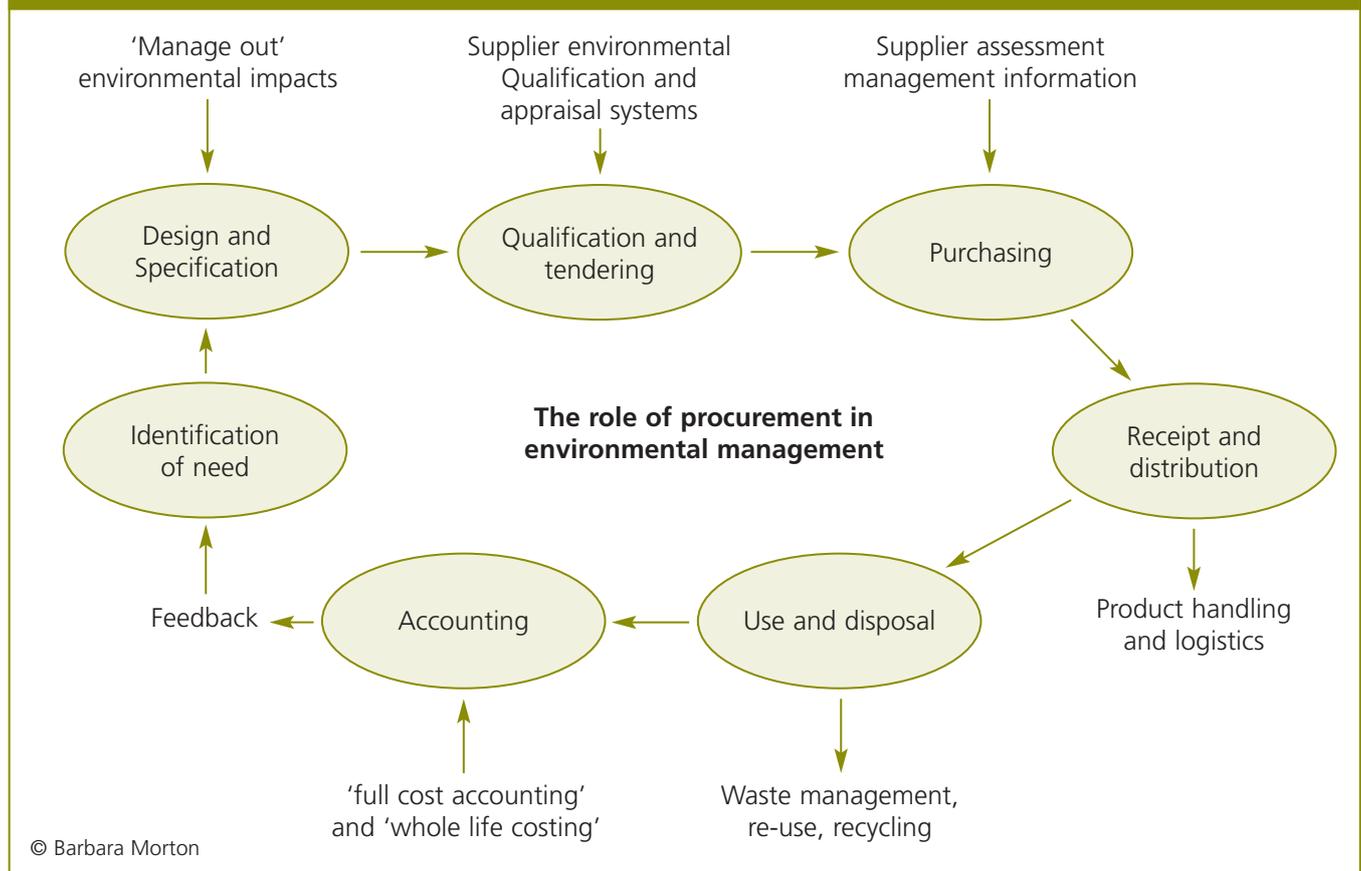
The model shows the many measures and channels which impact on each audience group, and contribute to the interactions between them.

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Green Supply Chains

Morton (2002) advocates a flexible approach to environmental purchasing, in acknowledgment that no one model will fit all organisations. She identifies six key stages in the purchasing process at which pro-environmental principles should be observed. These stages are depicted in a process model which Morton used in her training activities for Business in the Community and the Chartered Institute of Purchasing and Supply (see Figure 7).

Figure 7: 'The role of procurement in environmental management', reproduced from www.sscf.info by permission of Barbara Morton



Unlike other process models described in this report, this diagram operates from a single perspective, that of the 'customer' organisation. The other associated organisations in the supply chain (suppliers, contractors, partners) are not depicted. Nonetheless the model shows the cyclical nature of procurement; as well as being circular or iterative it identifies an all important separate 'feedback' stage. Morton stresses that communication throughout the purchasing process, and between all partners in the supply chain, is essential for optimal benefits to be achieved.

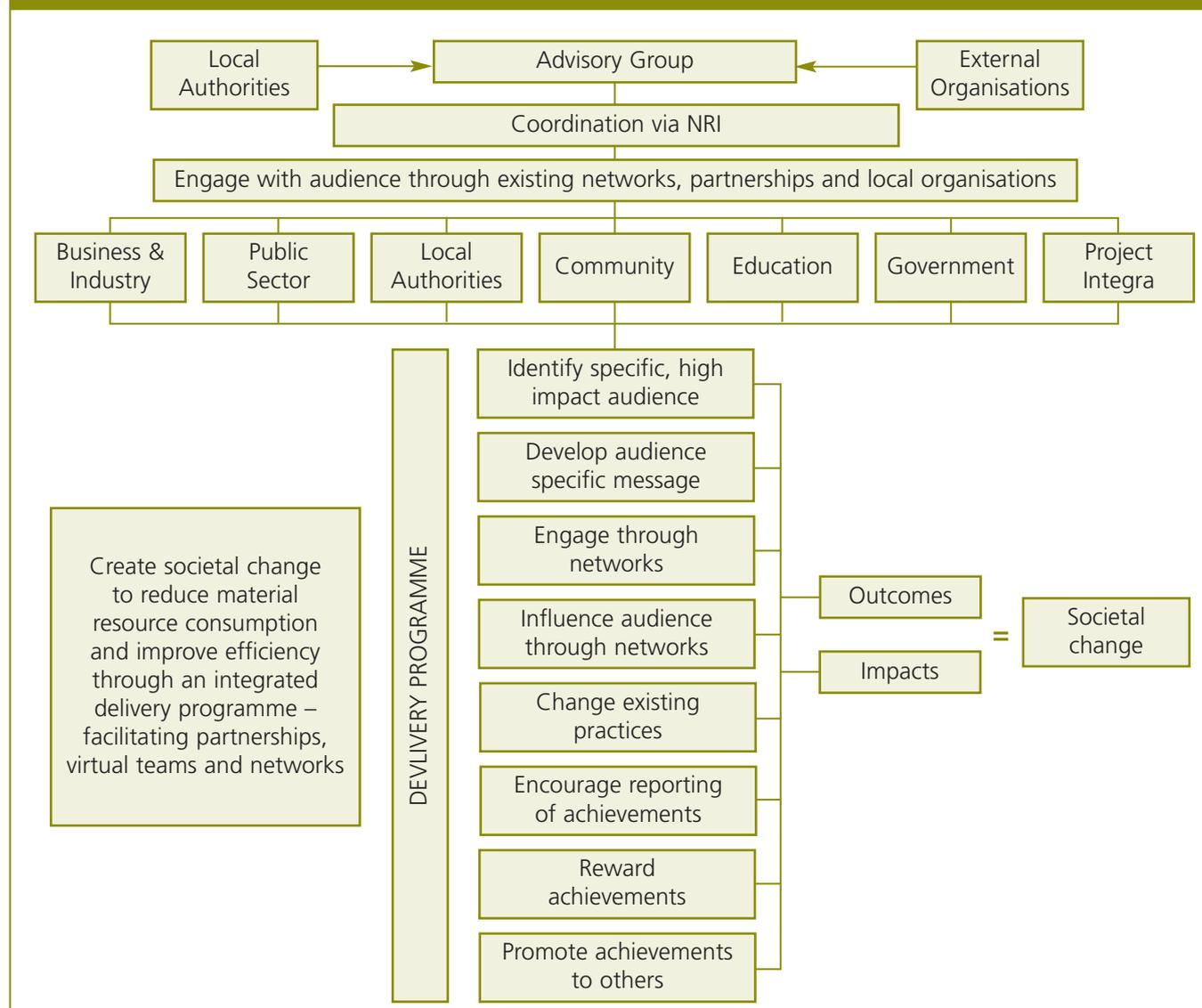
Natural Resource Management

Hampshire County Council's Waste Minimisation Strategy (2005) provides another good example of wider systems thinking. It describes itself as "a philosophy" document. Consistent with this non-prescriptive approach, the strategy is the output of a very large-scale "stakeholder process". Rather than proposing solutions to be implemented, the document offers a set of guiding principles and desired outcomes (to this extent bridging the gap between reflective practice and current policy practice).

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The Strategy embodies a life cycle approach to waste, expressed in a local context. The central idea is to minimise the amount of natural material extracted from the ground (Hampshire is an area rich in aggregates) while also minimising the amount of waste sent to landfill by end users. Hampshire County Council's 'More from Less' philosophy overlaps with their earlier Natural Resources Initiative (NRI) which aimed to increase community action for efficient resource use. The Initiative is described with the aid of an *Integrated Process Chain Delivery Model* (see Figure 8).

Figure 8: 'The integrated process chain delivery model', reproduced from Hampshire County Council et al. (2005)



It is clear from the myriad organisations identified on the flow chart that driving community engagement is envisaged as a whole society undertaking. The Strategy states: "All sectors must play their part if we are to respond to the challenges we face". It is also notable that the ultimate outcome of the process, beyond even driving community action, is to "create societal change...". From one perspective, this is an ambitious target; from another it describes how local-level behaviour change can be approached from a whole society (systems) perspective, moving from the outside in.

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A Total Market Approach

The Social Marketing Practice developed a model for balanced policy-making for sustainability in a working paper for Defra (Sharp, 2005). The model is derived from the 'Production Retail Consumption Triangle' (see Figure 6), produced by the National Resource and Waste Forum working group (to which Sharp was an advisor). As with that waste triangle, this model argues for better interactivity between the market and the consumer, based upon the looped relationship between supply and demand. Interestingly, the model exists in two variants, one showing the ideal ('balanced') system (see Figure 9a), and the other the current ('imbalanced') system (see Figure 9b). The balanced model is characterised by strong feedback, whereas the imbalanced model has weaker interactions, stemming from lopsided policy interventions, which are predominantly supply-side.

Figure 9a: 'Interdependence of policy, market and consumer relationships – Balanced Approach', reproduced from Sharp (2005)

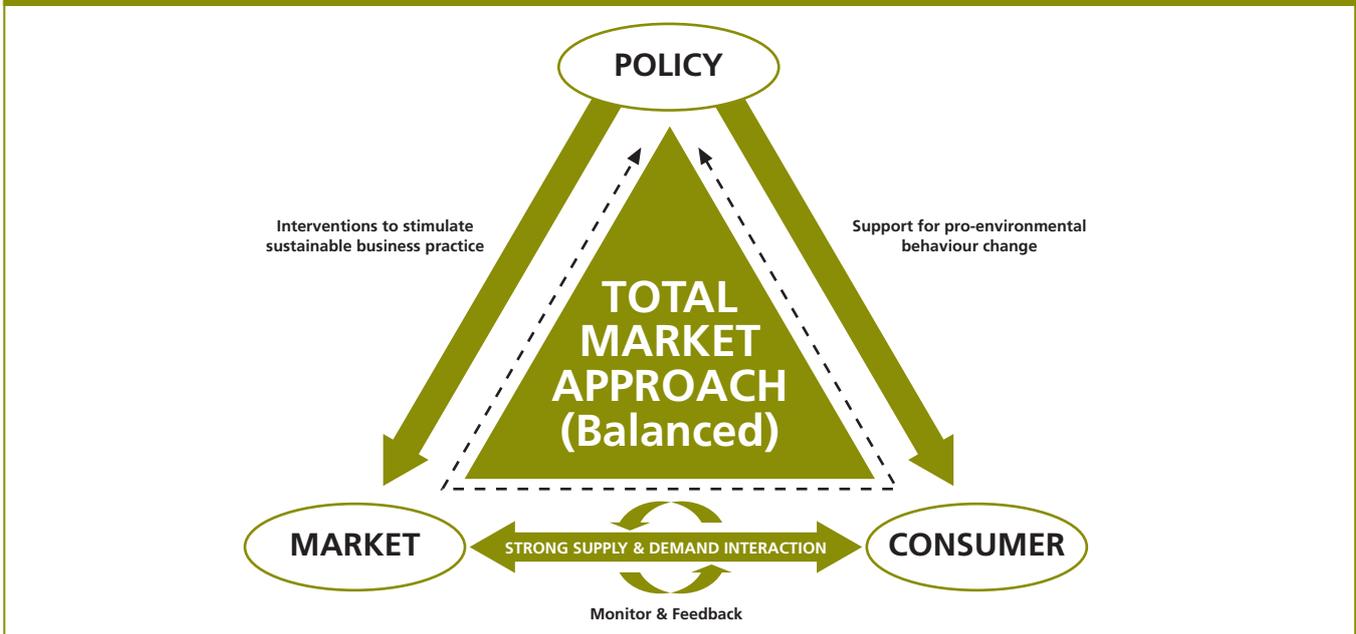
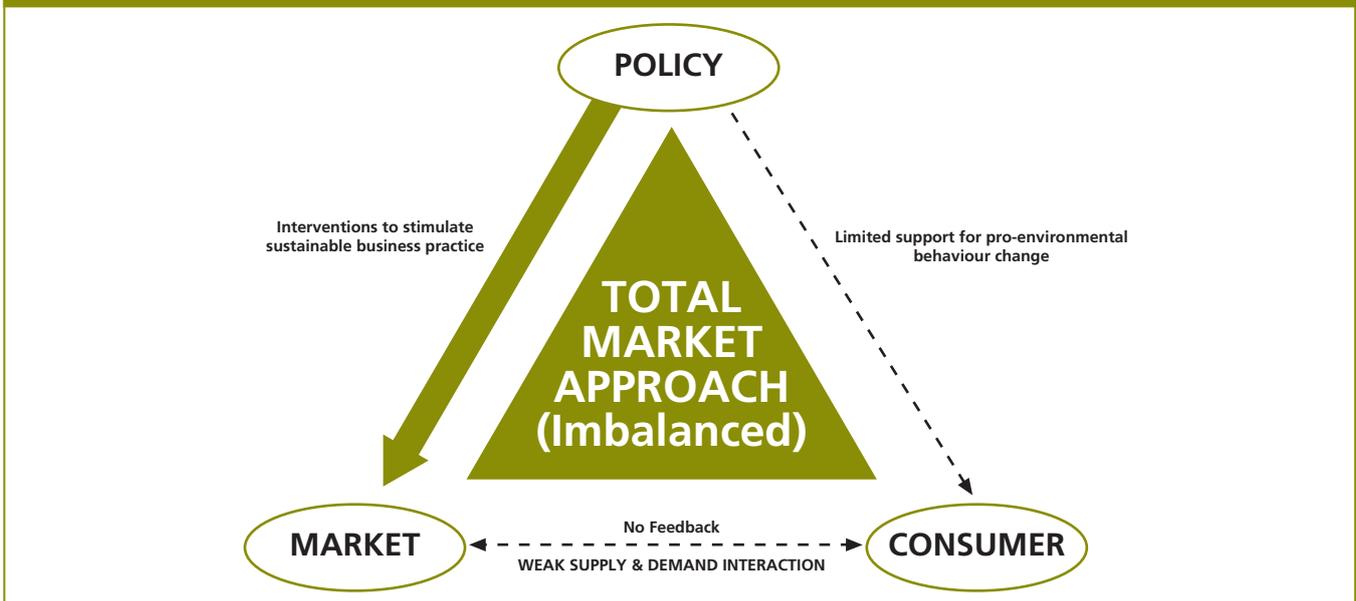


Figure 9b: 'Interdependence of policy, market and consumer relationships – Imbalanced Approach', reproduced from Sharp (2005)



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The main implication of these models is that policy-makers should have a consistent behavioural goal in mind, which they should observe when operating with individuals and organisations simultaneously.

Applying systems-thinking to policy-making

Chapman (2004) summarises some of the implications of a systems approach for policy-making; these can be interpreted as follows:

- don't prescribe solutions from the centre, but rather gather them up from local contexts (don't look for a single *"silver bullet"*);
- abandon command and control assumptions about policy-making and adopt participative ways of working throughout the process, including the agreeing of targets and evaluative measures;
- identify outcomes through a process of discovery, reflecting on experiences and examine both intended and unintended consequences, rather than simply evaluating against pre-determined measures;
- reconsider the role of the 'evidence base' in policy-making – question assumptions about problems and proofs, and use evidence only in context;
- innovate, implement and review policy continuously – it could take a year to see what has worked (at the end of which, abandon what has not);
- greet failure as an opportunity to build feedback – *"While failure is unacceptable, learning is not possible – with the paradoxical result that failures will continue"*; and
- engage stakeholders throughout the learning cycle of action and reflection, as well as through the delivery process and share control with them.

He concludes that the explicit aim of policy-making shaped around systems thinking would be to create a learning Government; better delivery would fall out as a result. Vitally, Chapman calls for the feedback loop between policy design and delivery outcomes to be fully joined up (or 'closed'). Without this loop, the opportunity for constant learning and innovation is lost, and current policy-making practices tend to treat the design and operations functions of Government as separate. Whilst current policy-making can share the goal of better delivery, the systems approach is a long way from traditional policy practice.

Chapman suggests that the role of Government policy is to stipulate the direction of the intervention and the limits to it (including budgetary), and then capture the learning from the experience. The central design and delivery functions are determined by the change 'actors' and delivery partners themselves. Finally, the evaluation process also is devolved to the network partners, in so far as they suggest appropriate measures to the Centre and together negotiate on that basis. In this way, centralised targets are not set, and policy is not designed mechanistically as a way of hitting those targets.

2.7 Common themes for better policy-making

To our knowledge, 'whole systems' literature has not previously been considered alongside either individual socio-psychological understandings of pro-environmental behaviour change or theories of change towards more pro-environmental practices in organisations. Nevertheless it is important to acknowledge that this study does not represent a comprehensive review and synthesis of these three vast and diverse bodies of literature. This could be an important task for future pro-environmental change research, as much could be learned from more integrated interpretations of these different knowledge bases.

Despite its limited coverage, however, this synthesis of theory at the three levels of individuals, organisations and whole systems has identified common themes for better policy-making for encouraging pro-environmental behaviour change.

- Behaviours are complex, and non-linear. Each behaviour comprises many factors, many of which need addressing simultaneously to facilitate change. Thus interventions should combine multiple types of instrument in a 'package' of measures (e.g. infrastructure, fiscal measures, and information). It is suggested that interventions first address external factors (most notably infrastructure and pricing) and then internal factors (e.g. psychological or attitudinal).
- Different audiences behave differently, and require differentiated interventions; interventions should be context-specific (in terms of the behaviour in question, the setting for that behaviour etc.).
- As well as working on multiple factors, interventions need to work on multiple levels – ultimately addressing society as a whole in order to achieve long-term normative change.
- 'Feedback' is vital to driving and sustaining change; instead of understanding the changed behaviour to be the end of the process, interventions should build in 'feedback loops' i.e. opportunities to feed learning from the change process back in to subsequent behaviours. Feedback should also be accounted for between individuals and organisations in networks, and across society as a whole. A holistic perspective on facilitating change should be adopted.
- The audience for a change intervention should not be regarded as a passive target whose behaviour is to be changed, but as 'actors' who are themselves at the heart of the change process.
- Individuals are vital to delivering pro-environmental change, not just for themselves (on the level of individuals) but also within organisations and networks as 'agents for change' (both as managers and 'change champions'). Engaging and nurturing key individuals may be more effective in bringing about system-wide change than targeting the behaviour of all individuals.
- Actors and other partners (more commonly referred to within policy discourses as stakeholders) should be involved in the change process from as early a point as possible. They should not merely support the delivery of the end policy, or be affected by it. At the very least, they should be researched in context to establish what variables in a behaviour change theory are significant from their perspective. Ideally, a total partnership working approach should be adopted in which change partners are involved from the start in defining (and redefining) the problem through a continuous cycle of action and reflection – from which learning and innovation will result.

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- Policy-makers should attempt to close up the current gap (or 'feedback loop') between policy design and delivery outcomes. The effect of this better co-ordination would be reciprocal: policy would be designed in the light of past experience, and desired outcomes and targets would be set more appropriately (ideally through negotiation with delivery partners and change 'actors' themselves).
- Policy-makers should not regard behaviours as mechanisms with buttons which can be pressed in the right combination in order to generate change. Behaviours are complex, and undertaken by individuals in the context of groups and wider networks (which together make up complex systems). As such, setting targets or accurately predicting outcomes is likely to be difficult.
- Where an intervention addresses multiple behaviours simultaneously, those behaviours should be clustered together as the audience sees them, not as they are arranged in Government departments or delivery units.
- Returning to individual behaviour change, it should be noted that the widely discussed (social-psychological) models of behaviour do not demonstrate how to bring about behaviour change. They allow the reader to understand which variables determine an end behaviour and how. However, they also commonly show the factors in generic behaviours (e.g. all pro-social behaviours) rather than behaviours in context (e.g. recycling glass). Finally, they are derived from studies of multiple individuals, yet they average out the findings into one 'best fit' model of human behaviour. Policy-makers utilising such models should refine them in the relevant context prior to implementation as theory shows that policy changes will not affect all individuals equally.
- It should also be noted that, putting the literature on individuals together with the literature on systems underlines that there are many factors impacting on individuals' behaviours from other levels (e.g. organisational and societal) which may prevent change from occurring, however appropriately a policy is designed on the individual level. It is the inter-relations between these factors and levels that argue for a systems approach to encouraging behaviour change. By stressing that organisations and networks are "*complex adaptive systems*" in which change processes must be embedded both horizontally (i.e. within an organisation) and vertically (i.e. between organisations), systems thinking can offer new possibilities for effective processes of pro-environmental policy-making.

To sum up, the lessons arising from theory highlighted in this section combine the widely recognised with the emerging. The discussion of individual behaviour change stresses the complex (and non-rational) nature of most social behaviours (including the pro-environmental), and highlights three well-known 'internal barriers' to behaviour change: agency, norms, and habit.

In addition, the commentary features pro-environmental behaviour-specific individual models, which together stress how vital context is (in terms of audience groups and behaviours) when attempting to understand or encourage behavioural outcomes. The three internal barriers to individual change can be used to suggest that multi-level change is required if lasting individual change is to be brought about; organisational and whole system (societal) change is approached from that well-trodden direction.

However, systems change in itself is shown to offer significant potential for a new approach to policy-making for pro-environmental change. Systems thinking principles are consistent with a

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total partnership working approach but they also call for simultaneous (or integrated) multi-level change processes. In this way the commentary finds that consistent principles of complexity, feedback and learning, and partnership working apply to pro-environmental behaviour change at all levels.

Ultimately the commentary shows change to be circular; change theories at all levels are filled with loops (both feedback loops, and double loop learning), cycles (of action and reflection) and non-linear models. In addition, change is understood as progress over time, and not as a single event. These conclusions should underline for policy-makers the multi-levelled, circling, and often slow process of pro-environmental change, which they seek to encourage.

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In order to move beyond theoretical and modelled understandings of pro-environmental change, our study included analysis of fourteen key policy interventions that have aimed to deliver such change.

3.1 Establishing evaluation criteria and methodology

In a report on *Understanding Policy Options* for the Home Office, Ledbury *et al.* (2006) identify a useful set of broad criteria for evaluating policy options. These overarching criteria for what constitutes 'good policy-making' by the Home Office provide a useful general background context for the evaluation of current policies for pro-environmental change and have helped to guide our analysis.

As a first step, the report recommends that policy action can only be justified on the grounds of two higher-level objectives, namely:

- i) **efficiency** – if there are unexploited opportunities to increase the welfare of society; and/or
- ii) **equity** – to address unequal outcomes within the market.

The report notes that the performance of policies against these objectives may often be contradictory (e.g. improving efficiency may reduce equity) and policy-makers may need to make a trade-off between these two overarching goals.

Over and above these two key policy aims, the report recommends that policy evaluations such as the one undertaken for this study, should consider the following:

- policy effectiveness against objectives – failure to understand the context within which a policy is being introduced, and its impact on behaviour, is likely to lead to ineffective and perverse results;
- cost – those of both Government and third parties and compared with a 'do nothing' scenario or the cost of failing to intervene;
- side effects – might the policy produce or exacerbate a market failure or negatively impact on other areas of policy delivery;
- impact on international competitiveness – the competitiveness of UK firms, particularly small and medium enterprises (SMEs);
- additionality – any impacts resulting from an intervention need to be additional to what would have happened without that intervention;
- distribution (e.g. geographical and socio-demographical).

Consistent with the 'whole-systems' approach recommended by the previous chapter, the analysis also considered the structure and process of each of the evaluated policies. This included consideration of:

- i) the broader context in which each policy is set;
- ii) the intended target audience;
- iii) the theoretical underpinnings informing the overall policy approach; and
- iv) the extent to which the policy is vertically and horizontally integrated with other policies and delivery mechanisms (i.e. between sectors, at every level of behaviour for all relevant target audiences).

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It was also agreed that for a policy to be included within the review it needed to have been operational for a sufficient period to be effective and for some evaluation of its performance to be undertaken. It was also necessary for policies to be recent enough to secure additional qualitative observations of their performance by policy officers responsible for their implementation and delivery. This suggested an implementation timescale of approximately ten years, from circa 1993/4 to circa 2003/4.

It is clear that over this ten-year period, across all areas of delivery, policies have become increasingly sophisticated and multi-faceted. There is also a far greater tendency for policy development to be guided by a supporting evidence-base and informed by consultations with target audiences and key delivery stakeholders. This is largely in response to Government's recognition that many of the problems it now faces, such as social exclusion, climate change, social cohesion, etc., are persistent, habituated and highly intractable.

There is general recognition amongst policy-makers that the Government is going to have to involve and educate both the public and delivery agencies if it is to achieve significant outcomes in terms of its policy performance. There also appears to be acceptance, at least amongst some policy circles, that policy responses need to be cross-departmental, holistic and well-integrated at all levels of the delivery chain to tackle these issues effectively.

With these observations to the fore, our evaluations aimed not only to consider policy performance against stated policy aims, but to also consider policy outcomes against high-level targets and objectives for environmental improvement, as set out in the UK Sustainable Development Strategy (HM Government, 2005).

3.2 Typologies of policy instruments

For ease of analysis, the fourteen policy instruments under review were grouped into four categories, namely:

1. **economic** – policies that change prices/costs or budgets within which actors operate;
2. **regulatory** – policies that set restrictions on activities;
3. **social/voluntary** – policies that provide information, education and/or advice; and
4. **other** – policies that directly provide infrastructure or aim to stimulate technological innovation.

This typology is based on that recommended by the OECD (2000). Policies are categorised according to the main levers and mechanisms they employ. The following section summarises the four key types of policy instrument as described by the OECD typology (2000). The categories are not designed to be exclusive in that an instrument may (and most often will) combine several levers to affect behaviours. It will be seen from the review that, in practice, many policies use levers that fall into more than one of these categories. Many of these instruments are also interdependent, for example legislation is needed to set taxes, regulation to ensure the disclosure of information, etc. This section does not set out to exhaustively review the instruments but provides some key exemplars as relating to environmental behaviour change.

Clearly, alternative categorisations can be used and expressing categories in different ways will tend to place greater emphasis on different aspects of the instrument's design and intention (for example its levers, or the delivery process, or the agencies involved). There are merits in considering the different attributes of instruments in all these ways.

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3.3 Economic instruments

Economic instruments describe a broad set of interventions including taxes and charges; subsidies and incentives; tradable permits and quotas; awards, licences and franchises; and loans, guarantees and insurances. They can be used to encourage pro-environmental behaviour (e.g. subsidies and tax credits) or to discourage behaviour that is environmentally harmful (e.g. quotas and taxes). Generally speaking economic instruments are used to introduce price signals to consumers and producers and to act as a reminder of the external costs and benefits of goods and/or activities (OECD, 2002).

Table 1 describes the main types of economic instrument that are generally available to Government. Some of these instruments are however more appropriate to pro-environmental behaviour change than others and the following sections discuss this specific angle in more detail.

Table 1: Variants of economic instruments		
Variant	Description	Examples
Taxes	The Government raises the price paid by the consumer or costs faced by industry	<ul style="list-style-type: none"> Fuel duty
Charges	Government charges for services that are consumed	<ul style="list-style-type: none"> Policing at football matches
Subsidies, tax credits and vouchers	The Government reduces the price paid by the consumer or the costs faced by industry	<ul style="list-style-type: none"> Pre-school education voucher R&D tax credits
Benefits and grants	Similar to subsidies but often used when the emphasis is on who receives the subsidy rather than the goods/services that are being promoted (grants and benefits can be ring-fenced or can be use for any expenditure)	<ul style="list-style-type: none"> Education maintenance allowances Incapacity benefit Warm Front Scheme (Home Energy Efficiency Grant)
Tradable permits and quotas	Systems under which a right to produce a good/service (or by-product) is created and a market is created to allow companies to buy or sell these rights	<ul style="list-style-type: none"> Carbon emissions trading scheme
Award and auctioning of franchises and licenses	System under which the right to produce a good/service is sold	<ul style="list-style-type: none"> Radio spectrum of mobile phones Airport landing slots
Government loans, loan guarantees and insurance	Government directly provides loans and/or provides a subsidy for the loan (e.g. through guarantees or insurance)	<ul style="list-style-type: none"> Student loans Export credit guarantee

Source: Ledbury *et al.* (2006: 12)

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Only one solely economic instrument was reviewed by this study and, as this was the UK Emissions Trading Scheme, it is not representative of more traditional economic instruments. Emissions trading is an interesting policy measure because it combines economic incentives with disincentives; companies who have achieved reductions in emissions are able to profit by selling surplus permits to other companies who have a deficit of permits. It is also popular because it emulates the market.

UK Emissions Trading Scheme, 2002 – present

The UK Emissions Trading Scheme began in April 2002, with 33 companies or 'direct participants'. Each company bid for annual cumulative emissions reductions targets, set against a 1998-2000 baseline, in return for a share of the £215 million (bidders were limited to receiving no more than 20% of the total budget). The scheme had three aims, (i) to secure cost-effective reductions in Green House Gas (GHG) emissions; (ii) to give UK companies early experience of emissions trading and a competitive advantage before the proposed launch of the European Union Emissions Trading Scheme (EU ETS) in 2005; and (iii) to encourage the establishment of emissions trading centres in London.

Most of the other policies evaluated were using economic incentives in combination with other complementary measures, such as information provision or regulation, in an attempt to target all aspects of a given behaviour. This suggests that policy-makers are already aware of theoretical and modelled understandings of environmental behaviour change and the need to take a multi-instrument approach.

Clearly, as the review has not undertaken evaluation of the full range of economic instruments available to Government for encouraging pro-environmental change, it offers only a partial insight into the effectiveness of these instruments. Environmental taxes (such as the Climate Change Levy), local charging schemes (such as congestion charging), allowances (such as the Pensioners' Warm Allowance), the removal of environmentally harmful subsidies (such as the Company Car Tax Allowance) and other fiscal measures all have a role to play in a 'package of measures' for pro-environmental change.

The evidence that is available to us suggests that in developing economic instruments for pro-environmental change policy-makers should:

- be aware that taxation and tradable permits will only be most effective where marginal benefits and external costs are known with certainty;
- ensure that they are sending clear and consistent pricing messages to their target audiences and be wary of perverse incentives and associated market failures;
- recognise that businesses may choose to absorb the cost of environmental taxes and charges, thus nullifying their impact on consumer behaviour (e.g. compensation carbon tax on aviation fuel through price reductions in tourist packages). Nonetheless, in the longer-term this may still bring about a change in producer behaviour;
- be aware that lack of public acceptance of an additional charge may serve to undermine the intervention both now and in the future (e.g. the Fuel Tax Escalator);

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- consider whether beneficiaries of subsidies and/or grants would have behaved in a similar way over time without need of the intervention;
- recognise the full administrative cost of these policies, both to the Government and/or third parties when enforcing compliance;
- avoid placing an excessive burden on the most vulnerable individuals in society and/or reducing the competitiveness of organisations, especially SMEs; and
- consider the cost to the economy of any subsidies, credits, vouchers and benefits over and above the actual cost of administering these.

3.4 Regulatory instruments

Economic instruments are likely to be most effective in securing improved environmental outcomes when combined with regulatory standards (a physical standard is set to reflect an acceptable level of behaviour and then a tax levied to raise the price level to achieve the standard). This combination approach can be particularly effective where the relationship between environmental damage and the source of that damage is unclear (non-linear or discontinuous). Where there is a lack of environmental and social data, however, standard setting is often criticised as being arbitrary and possibly unfair.

Environmental regulations are routinely used to influence business. Additionally, regulatory limitations or constraints on both product ownership and use can enable policy-makers to directly influence behaviour change. Due to its intrusive nature and the costs of implementation and enforcement, such direct regulation is relatively rare for the individual consumer. Quantitative restrictions or bans, though also limited in use, are often applied in response to health and safety concerns or when tangibly maintaining or increasing the quality of a product or service (OECD, 2002). Rather than direct regulation, policy-makers may choose to encourage self-regulatory activities, for example, by the use of codes of conduct, minimum standards or voluntary agreements not backed by regulation that individuals or organisations agree to abide by.

Table 2 opposite describes the range of regulatory instruments that are available to policy-makers.

Our review evaluated three regulatory policies targeted at pro-environmental change, as follows:

- i) the EU Common Fisheries Policy (CFP);
- ii) the Green Claims Code, and
- iii) the Market Transformation Programme (MTP).

Common Fisheries Policy – Total Allowable Catches, 1983 – present

Total Allowable Catches were introduced in the European Community (now the European Union) as part of the Common Fisheries Policy (CFP) in 1983. The goal is to reverse the decline of fish stocks and create a more sustainable fishing industry. Member States share fishing opportunities in the form of quotas amongst their fishermen, fixing the maximum quantities of fish that can be caught from a specific stock over a given period of time.

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Table 2: Variants of regulatory and legislative instruments

Variant	Description	Examples
Price and market structure regulation	Laws or rules that: i) set out the prices companies can charge for particular goods/services; ii) set out how companies can organise themselves and their relations with other companies	<ul style="list-style-type: none"> • Rail fare regulation • Competition laws
Production and consumption regulation	Laws or rules relating to how products are produced – these can cover: characteristics of product/service, how the product/service is produced, who can produce a product/service etc.	<ul style="list-style-type: none"> • Planning rules • Compulsory motor insurance • Licensing laws
Standards setting regulation	Rules which set minima/maxima for particular characteristics of goods/services and production techniques	<ul style="list-style-type: none"> • Trading standards • Health and safety
Prescription and prohibition legislation	Rules which state what an agent must/must not do	<ul style="list-style-type: none"> • Criminal acts • Banning tobacco advertising
Rights and representation legislation	Rules which provide agents with rights and/or representation	<ul style="list-style-type: none"> • Human rights legislation
Codes of practice	Codes of practice are similar to voluntary agreements in that they are agreed within communities (usually industries) – codes of practice tend to be consumer focused (are presented to consumers) and can be certified by the OFT	<ul style="list-style-type: none"> • Banking code
Co-regulation	Between the extremes of voluntary agreement and regulation there are points in between – co-regulation is voluntary codes of practice with significant Government involvement (statutory backing)	<ul style="list-style-type: none"> • Advertising Standards Agency • HSE Approved Codes of Practice • Soil code
Voluntary agreements	These are rules (not backed up by regulation) which a community (industry, area) agrees to abide by – often there are no formal sanctions	<ul style="list-style-type: none"> • Advertising standards • Corporate Social Responsibility initiatives • [Behaviour contracts]

Source: Ledbury *et al.* (2006: 13)

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One of the lessons that policy-makers appear to have learned from the development and delivery of regulatory instruments over time has been the need for greater involvement of target audiences early in the development of regulatory policies. This helps to reduce the perception of unfairness, improve compliance and improve policy effectiveness against targets. Comparison of the CFP and the MTP demonstrate the importance of this lesson.

The Market Transformation Programme (MTP), 1996 – present

The Market Transformation Programme (MTP) supports sustainable consumption and production, in particular policies and delivery programmes, which encourage competition and innovation in the environmental performance of traded goods and services. The aim of the MTP is to support the development and implementation of UK Government policy on sustainable products, with the strategic focus of improving the availability, take-up and use of products that are more energy-efficient and less environmentally damaging over their life-time. The MTP facilitates the delivery of effective Europe-wide standards via measures such as mandatory energy labelling, mandatory energy efficiency requirements and voluntary industry agreements. The MTP aims to lift the barriers and constraints to the diffusion into the market of the most energy efficient products available.

Our evaluation suggests that regulatory instruments, although often burdensome to deliver and costly to enforce, have an important role to play in both encouraging pro-environmental behaviours (mostly at the organisational level) and in establishing and reinforcing new social norms. Once again, the limited evidence from our evaluations of existing regulatory policies appears to be consistent with the messages of the theoretical review.

- Regulatory policy is often administratively difficult and costly to enforce, so it is better to introduce it in situations where the majority of the target audience is willing, ready and able to comply and in combination with pricing policies to correct failures in the market.
- Compliance is more likely where stakeholders are actively engaged in the development and enforcement of regulatory measures. A participatory approach is particularly essential at the initial policy development stage, but there should also be opportunities for stakeholder feedback and reflective learning built into the delivery process.
- It is important to understand the overall process in which regulation is occurring; target audiences are not mechanisms with buttons to be pressed and may act perversely to undermine regulations if they do not support their intention.
- Regulatory policies need to be context specific and will generally be ineffective in complex scenarios or where there are mixed messages.
- There is particular value in creating a learning process between Government, producers and consumers in the introduction of regulatory policies. The problem of market failure in a given system of delivery needs to be recognised by all the actors participating in that exchange and solutions to the problem identified collaboratively. Long-term behaviour change is more likely to occur where this is the case.
- Regulation alone will not encourage longer-term change or establish new social norms and needs to be supported by information, fiscal and other incentives, supporting infrastructure and incentives for technical innovation.

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3.5 Social and voluntary instruments

In the OECD typology, ‘social/voluntary instruments’ describe policies that are designed to influence consumer and producer knowledge and, in turn, consumer and producer willingness to behave pro-environmentally. Governments and businesses act as ‘editors’ of the choices available to consumers (Steedman, 2005: 2). Information dissemination, public awareness campaigns, voluntary initiatives, labelling schemes (as opposed to regulation on labelling schemes), open forum debate and discussion and participatory decision-making fora all constitute social or voluntary instruments (OECD, 2002).

Table 3 identifies the different ways in which policy-makers can inform the wider public.

Variant	Description	Examples
Provision of information	Information is provided to the public	<ul style="list-style-type: none"> School league tables Crime statistics
Public education campaign	These are often used to raise awareness of particular issues and present basic information	<ul style="list-style-type: none"> Safer sex campaigns Crime reduction campaigns
Reporting and disclosure requirements	Government imposes regulations which require agents to provide information – these regulations may cover issues about the information including frequency and detail	<ul style="list-style-type: none"> Company accounts FOI
Labelling	This is similar to reporting and disclosure requirements – manufacturers are required to state information on products in a particular format	<ul style="list-style-type: none"> Nutritional information Energy labels on fridges
Advisory service	An expert provides information and advice to a person or business	<ul style="list-style-type: none"> Connexions (advice for young people) Citizens Advice Bureau NHS direct
Representation service	An expert is appointed to act on behalf of a person or business	<ul style="list-style-type: none"> Ombudsman

Source: Ledbury *et al.* (2006: 11)

Our study evaluated four policies with environmental information dissemination and awareness raising as their core objectives. In the case of EAF, financial incentives were provided alongside information and advice to target audiences. The four policies were:

- i) UK Energy Efficiency Centres (EECs);
- ii) BioWise;
- iii) Environmental Action Fund (EAF); and
- iv) Public Sector Food Procurement Initiative (PSFPI).

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The examples targeted different levels of behaviour: EECs target individual behaviours within households, BioWise aims to promote the development and take-up of bio-technology within industry, EAF is designed to assist the Voluntary and Community Sector, and PSFPI aims to influence the procurement practices of larger public sector organisations.

BioWise

BioWise was a major UK Government Programme funded by the DTI. It aimed to improve the competitiveness of UK industry through the use of biotechnology and to support the development of the UK biotechnology supplier industry. A range of delivery mechanisms was adopted to achieve this, including independent advice, publications, information events, information provision to biotechnology suppliers and funding for user-led projects.

A recent National Consumer Council study of EECs (Steedman, 2005) has been highly critical of the Centres, identifying them as the least popular sources of information with the public and suggesting that most people do not actively seek out environmental advice. Nevertheless, between them the 47 Centres that are now operating have handled over 7 million customers since 1993 and 35% of homeowners are aware of the Advice Centres (Jigsaw Research cited in Darnton, 2004).

EAF provides an example of Government working far more interactively with the key stakeholders, although it is perhaps not as fully devolved as 'action learning' theorists would recommend.

Environmental Action Fund, 1992 – present

The Environmental Action Fund (EAF) is a Defra funding scheme which helps voluntary and community sector groups to further the Government's sustainable development objectives within England. Grants awarded to groups range from £25,000 to £250,000 per year (£75,000 and £750,000 over the three year grant period). As part of the eligibility criteria groups have to find eligible matching funding and ensure that a work plan is agreed with Defra containing well-defined objectives, measurable outcomes and clear timescales.

A 2001 consultative evaluation with participants of EAF funded projects, found the Fund difficult to 'penetrate', overly bureaucratic, stringent and 'unforgiving' in its application/short-listing process. Participants criticised it for having insufficient lead times on applications, whilst at the same time being late in giving notification of application results. In response, Defra now works with each funded group to help formulate an annual work plan, making sure outcomes are explicitly stated. A constructive working relationship is encouraged and in some cases project management support is provided. Defra gives constructive criticism, provides feedback and helps to identify new opportunities for the organisation or group. Quarterly reports provide the framework for this support activity.

One of the key lessons emerging from our theoretical review, however, has been that policy-makers need to recognize that feedback is a two way process and that policy-makers also have lessons to learn from practice. There is clearly a need to move beyond a position that suggests that

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better information and public understandings of the problem by target audiences are all that is required to encourage pro-environmental behaviours. Nevertheless, instruments that aim to improve public knowledge about the environmental effects of their behaviours are an important part of a broader policy package. The key points emerging from our policy review in relation to the development and implementation of social and voluntary policy instruments are outlined below.

- Consumers are more likely to seek out information on well-publicised topical issues. They need clear and simple messages and should be able to see fairly immediate and tangible benefits from their changed behaviours.
- The people who are currently less likely to seek out environmental information come from lower economic income groups (D and E), are younger (15-24 year olds) or older (65%+) and generally have less access to the internet.
- Different industrial sectors need specific advice tailored to their own activities and needs and the ways they perceive their own market activities.
- Policy-makers need to be more responsive to feedback from target audiences and should incrementally adapt their information programmes to better accommodate their needs.
- Research has demonstrated that engaging target audiences in the design and presentation of environmental information and change programmes increases the likelihood of their impact on actual behaviours.
- The limitation of information-based and educational programmes needs to be recognised and confronted by policy-makers. They work best as a package of measures, which include clear pricing mechanisms and regulatory standards.

3.6 Other (infrastructure, indicators and targets) instruments

The policy instruments that fall under the 'other' OECD grouping include state of environment assessment and goal setting, development of indicators, incentives for environmentally superior technological innovation and diffusion, and infrastructure provision.

Table 4 overleaf lists the main instruments falling within this category.

Our study evaluated five instruments falling under this broad category of 'other', as follows:

- the England Rural Development Programme Rural Enterprise Scheme (RES);
- HM Government Sustainable Development Strategy Headline Indicators;
- Framework for Sustainable Development in the Government Estate;
- the Waste Minimisation and Recycling Fund; and
- Warm Front (incentives for innovation).

It should be noted the evaluated policies did not cover all aspects of the 'other' category, for example, none covered goal setting.

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Table 4: Variants of other instruments

Variant	Description	Examples
Goal setting and guidance	The Government in consultation with key stakeholders undertakes an evaluation of the current state of the environment against future targets and sets appropriate goals and targets for behaviour change with supporting guidance	<ul style="list-style-type: none"> • UK Sustainable Development Strategy • Planning guidance notes
Provision of infrastructure	This can be either direct provision or via a devolved agency	<ul style="list-style-type: none"> • Jubilee Line Extension • Door-step recycling facilities
Use of indicators	Measurement of performance against objectives and target outcomes at any level of policy delivery	<ul style="list-style-type: none"> • UK Sustainable Development Strategy • Local authority PSAs • Quality of Life Indicators
Incentives for innovation	These usually take the form of subsidies and grants (as described in Table 1)	<ul style="list-style-type: none"> • See Table 1

Infrastructure provision

Warm Front was designed to address a shortfall in the provision of infrastructure for pro-environmental behaviour change at the household level backed-up with advice to consumers. The Programme has suffered from a conflict between eligibility and effectiveness; many of those living in the least energy efficient homes and suffering from the greatest fuel poverty are ineligible for assistance (this is for a variety of reasons including their benefit claimant status and residential circumstances). One interesting element of the scheme is that it clearly demonstrates how positive environmental outcomes can be achieved without the need for a change in the attitudes of end users. It should be noted that the actual energy savings resulting from the Warm Front programme have not been recorded and these could be minimal due to suppressed demand. The Fuel Poverty Strategy set a target that the Warm Front Scheme should have assisted 800,000 vulnerable households by 2004. This meant that the Scheme's effectiveness has been monitored by take-up rather than by overall energy savings or savings by each property. The aim of maximising the number of homes receiving help has also tended to sway assistance to the most accessible households rather than those most in need of assistance (NAO, 2003).

Warm Front, 2000 – present

Warm Front provides infrastructure and advice to help combat fuel poverty. The Scheme provides grants for insulation and heating to homes in the owner-occupier and private-rented sector for people at risk of fuel poverty, as well as advice on how to lower fuel bills. The policy's explicit aims are primarily social (i.e. to combat fuel poverty), however, improving people's use of insulation and heating in order to conserve more energy has marked environmental benefits. Before 2000 the scheme was called the Home Energy Efficiency Scheme.

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Use of indicators

When indicators have strong cross-departmental commitment, are measurable and have transparent links with performance they can be powerful influencers of strategic decisions by decision-takers within Government and Local Authorities and practitioners. Performance-based indicators serve to concentrate the minds and resources of policy-makers and their delivery agencies. There is a plethora of guidance relating to the development of robust and accountable indicator development coming from both Central Government and non-governmental organisations.

HM Government Sustainable Development Strategy Headline Indicators, 1996 – present

The UK Government first produced a set of Headline Sustainable Development Indicators in 1996. A new strategy was produced in 1999, along with a new set of indicators. It is hoped that these will be seen as a mechanism for improving accountability in Government performance on sustainability and that they will be regarded in the same light as more traditional performance measurements such as GDP. The key delivery mechanism is effective communication and dissemination of the indicators in order to hold Government to account, raise awareness of the issues involved in sustainable development and to provide a benchmark for achieving change.

The UK experience suggested there was an element of naivety when the first headline indicators were published. They were anticipated as great drivers of change, but were mostly only summaries of the current position of UK policy in relation to its environmental performance: largely unchanged. One problem was that the indicators were being monitored at such a high level of geographical aggregation that it was impossible to recognise or influence lower level (Local Authority or neighbourhood) or sector-by-sector performance. One notable exception was the UK wild bird population indicator which successfully influenced policy development with Defra.

Widespread communication has proven to be one of the biggest challenges of the UK headline indicators. Once the headline indicators were effectively communicated to the public, the Press felt able to report on them and have been seen to use them as a benchmark of Government performance and accountability (albeit most usually negatively).

There have been criticisms by NGOs, academics, environmental campaign organisations and the Voluntary and Community Sector that the Government's indicators suggested a 'bona fide list', an indicator set to override all others, in what is actually a developing area of knowledge. This problem has been partly addressed as the initial set of headline indicators have been incrementally updated and revised as and when more relevant and/or robust data has become available, demonstrating Government's willingness to respond to external influences.

Participatory approaches

There is evidence to suggest that policy-makers are beginning to see target audiences as actors at the heart of the change process. There is increased emphasis in some of the more recent policies, for example, the Rural Enterprise Scheme, on devolving responsibility to actors closer to the

3. Identifying appropriate policy instruments

problem or allowing the target audience for an intervention considerable responsibility for achieving change.

England Rural Development Programme (ERDP) – Rural Enterprise Scheme, 2001 – present

ERDP is consistent with wider Government policies on diversification, tourism and improved food marketing. The scheme aims to encourage diversification of the rural economy in a sustainable way and more sustainable land management, with a particular emphasis on farmers. Its delivery mechanism is a Capital Grant to fund one-off projects, for which farmers bid competitively.

With this increased emphasis on the private sector finance, devolved delivery and involvement and empowerment of the Voluntary and Community Sector groups, the pressing need for effective formalised 'feedback loops' to drive and sustain change at both the development and delivery stages of policy is increasingly apparent. More emphasis should also be placed on creating mechanisms for constant policy revision and improvement.

An initiative such as the Emissions Trading Scheme might have benefited from this kind of process, highlighting potential pitfalls such as companies setting modest targets or non-CO₂ emitters having a clear market advantage, before the scheme's implementation. Undertaking consultation on a problem, however extensive, is not the same thing as demonstrating shared ownership of a problem and a shared understanding of the challenge in hand.

Given the breadth of this catchall set of 'other instruments' for influencing environmental behaviours and the extremely limited scope of our case study evaluations, it is difficult to draw any robust recommendations for future policy-making. A few observations should be noted.

- Indicators need to be measurable and transparently linked to target outcome behaviours. To achieve this they need to be capable of disaggregation both at the sector and spatial level and to communicate clearly the desired direction of change to target audiences.
- Indicators will only be effective as instruments of behaviour change if they are well publicised and secure the 'ownership' of those agencies responsible for their performance delivery.
- Indicators should concentrate on desired outcomes (levels and extent of behaviour change against targets) rather than simply counting outputs (throughput of customers/uptake).
- It is essential for policy-makers to ensure that indicators take account of 'whole system' performance and do not serve to provoke perverse behaviours.
- Provision of infrastructure and the development and take-up of technological innovation is essential for achieving large-scale behaviour change at both the household and organisational level. This should be integrated with awareness raising activities, standard setting and appropriate pricing signals.
- One key problem for policy-makers with policies designed to assist infrastructure provision is ensuring its effective and efficient use by end users. Particular care should be taken to ensure equity of access to both facilities and accompanying information concerning eligibility. Extra efforts may be needed to ensure that traditionally 'hard to reach' groups and sectors are given proper access.

3.7 Adopting a 'whole system' approach

The OECD report argues for a new approach to policy, offering policy parameters that focus on *structure*; use of *life-cycle strategy and analysis*; and an *integrated, cross-sector policy approach that offers consistent messages to consumers* (OECD, 2002: 93-4). From our review, there appears to be an increasing acceptance amongst policy-makers that behaviours are complex and thus require a multi-instrument approach. The Environmental Action Fund, in providing internal assistance (information and support) to Voluntary and Community Sector initiatives, as well as external funding, is a good example of this.

However, there is less evidence of movement away from mechanistic views of behaviour and in turn regarding policy interventions as a set of coherent levers to be pulled in order to generate change. An intervention such as the CAP Set-Aside Scheme, essentially a production control measure, exemplifies this mechanistic approach, providing a financial incentive (the lever) for a targeted behaviour change (setting aside a certain percentage of arable land).

Where a package of measures has been designed to address multiple behaviours, there is little to suggest any consistency in policy intention across the different Government departments. For example, policies that offer greater parental choice in the selection of schools (which are known to generate increased car travel) are offered simultaneously with policies that aim to encourage reduced car use. Policy recipients are left in a position where they do not know which behaviour is being supported.

There are few policy measures that can purport to have adopted a robust and thorough approach to all four corners of the UK Government Sustainable Development 'Diamond Model' (enable, encourage, engage, exemplify). Often one corner might provide the foundation to a policy measure, while another might only be partially addressed. A policy measure like the Rural Enterprise Scheme encourages pro-environmental behaviour by offering grants to farmers to fund schemes that diversify their output. There is however little emphasis on building skills that will take best advantage of the financial impetus.

Even where policies aim to address consistently multiple factors, utilising a range of tools, there is little evidence of systematic intervention across all three behavioural levels (individual, organisational, systemic) to ultimately addressing society as a whole in order to achieve long-term normative change.

3.8 Equity, distribution and other side effects

Environmental justice is a key theme within the UK Sustainable Development Strategy and it is clearly important that policy-makers ensure that policies at least avoid disproportionate negative financial and environmental outcomes for the most vulnerable in society and where possible reduce inequalities of outcome. Equity concerns are particularly associated with environmental taxes and charges, which can also negatively impact on the competitiveness of small businesses. Compliance is likely to be lowest where policies are perceived as unfair, or poorly targeted, and where alternative options do not appear to be available.

When evaluating the likely equity of a policy outcome, it is important to consider both exposure to negative environmental externalities and its effect on opportunities to access goods and services.

3. Identifying appropriate policy instruments

Any increase in the overall cost of a product or service will be most likely to impact on the activities of groups at the margins, who may experience greater social exclusion as result of being financially prevented in continuing to participate in that activity. In the past, people on low incomes have tended to be less able to access environmental information and less able to participate in pro-environmental behaviour as a result of policies that have failed to consider their particular needs.

It is also important to consider the wider distribution of policy outcomes, both in terms of their geographical spread and across the different market sectors. Some sectors, for example the building trade, have been demonstrably less responsive to environmental policy directives than others.

Finally, past policies have demonstrated all sorts of unforeseen side effects, such as the discarding of catches by fishing fleets in response to species-based quotas leading to an increase in the proportion of 'at risk' species.

3.9 Lessons for future policy-making

The policy review for this study has been limited in both depth and scope: it has selected a small sample of fourteen policy instruments and attempted to qualitatively assess their effectiveness. These individual instruments often form part of a wider programme of delivery, which this study has not been able or required to assess. Our assessments have been based on the available evidence from two key sources: published and internal evaluation reports and the views of policy officers who have been observers of the delivery of these programmes. The study can, therefore, offer only a partial and subjective evaluation of the success of these policies and should in no way be taken to be a representative of the wider picture.

For this reason, we recommend that further work may be needed to fully understand to what extent policies lead to behaviour change. This may require undertaking systematic, quantitative evaluation of key programmes and policies. These should ensure evaluation of the following seven key variables:

- i) their impact on pro-environmental outcomes (effectiveness);
- ii) the spatial distribution of these outcomes;
- iii) the impact on social equity;
- iv) the impact on business competitiveness;
- v) the cost effectiveness of the intervention; (compared with a 'do nothing' scenario or the cost of failing to intervene);
- vi) perverse side effects and impacts on other areas of policy delivery; and
- vii) additionality.

Defra needs to ensure more effective and consistent data collection and collation and measurement of performance to assist this important reflective process. In future, the appropriate formal evaluation structures should be put in place at the stage of policy-development. These may need to be adapted in the light of actual performance on the ground.

3. Identifying appropriate policy instruments

Over and above this recommendation for future research, the policy review suggests that there are some further lessons that policy-makers can draw from past experience.

1. Policies for pro-environmental behaviour change need to pull in one direction and convey a consistent message to target audiences and the public in general if they are to achieve any degree of success. This consistency needs to apply across Defra policies and with those coming from the EU, and (possibly more importantly) to those being developed by other Government departments.
2. Policy instruments appear to be most effective when they tackle all aspects of behaviour at all levels. This suggests that it is rarely appropriate to use a solely economic, regulatory, social/voluntary or 'other' approach. Policy-makers will usually need to develop 'packages' of measures to tackle the 'whole system' of behaviour. Defra must work collaboratively with other departments to achieve the level of policy integration that will be required to achieve visible and sustained improvements to environmental outcomes.
3. Policies appear to be more effective when they take a participatory approach with both delivery agencies and end users during their formulation, implementation and evaluation. Negotiating the shape and intention of a policy (and how it can best be monitored and evaluated) with target audiences helps to build legitimacy and raises the chance of its success.
4. To be effective, policy measures usually need to be highly context specific. Devolving responsibility for policy development and delivery to locally accountable bodies (Local Authorities, business and industry, the Voluntary and Community Sector) generally can help to ensure their local appropriateness and can also help to build their legitimacy. Care should be taken to ensure that the relevant skills, resources and capacities are available within these organisations to take on these additional duties.
5. Policy-making appears to be more effective where there is a genuine reflexive learning process between Government, consumers and producers. Target audiences are more likely to adapt their practices in the interests of seeing a policy work when they have been involved in its formulation.
6. Points 1-5 suggest that policies will be more effective when Government provides the overarching strategy for change and identifies headline targets and milestones and then devolves as much responsibility for policy design and implementation to organisations that are closest to the end behaviour they are intended to affect.
7. There is a value in Government having 'first-mover' advantage on policies and leading by example, both within the UK and abroad. Local Authorities and other organisations are willing to follow the Government's lead where the guidance is clear and the value of doing so obvious. The UK Emissions Trading Scheme is one example of this, allowing organisations and businesses to adapt to a voluntary trading scheme, before the set-up of an EU mandatory scheme.

4. Drawing lessons from 'real world' examples

In an attempt to gauge the impact of pro-environmental policies on the ground, the study also included desk-based evaluations of fourteen detailed case studies of 'real world' initiatives. They were selected (in agreement with Defra) because they are generally perceived to have delivered changes in environmental behaviour at either the individual, organisational or societal level. The selection also aimed to represent a range of different approaches to influencing behaviour, the different actors involved and the huge range of delivery scales. They consider projects that involve hands-on work with individuals, through those that aim for organisational change, to schemes that aim to affect the UK's performance in relation to international agreements.

The case studies have also aimed to capture actual practice across the seven different areas of policy delivery identified in the project methodology, namely: sustainable production, sustainable consumption, resource use in the home (energy); tackling waste, engaging different stakeholders, helping farmers (and fishers) produce more sustainably, and sustainable procurement.

The fourteen case studies were as follows.

1. Interface Europe Ltd. – a large carpet-manufacturing firm that has sought to integrate sustainability into all aspects of its operations.
2. Suffolk County Council's tender for road construction work, which specified use of on-site recycling and local materials.
3. Global Action Plan Ecoteams – groups of households working together with support to monitor their environmental impact and make improvements.
4. West Sussex Real Nappy Initiative – a programme to increase use of non-disposable nappies.
5. World Wide Fund for Nature (WWF) ranking of electricity companies in terms of their response to global warming.
6. Lambeth Borough Council's Private Landlord Energy Award Scheme (PLEASE), which offers grants and interest free loans for private landlords to improve the energy efficiency of their properties.
7. BedZed - Beddington Zero Energy Development – a 100 unit combined housing and workspace development incorporating environmentally friendly design.
8. Envirowise work to reduce waste in businesses – an information and support programme to help businesses reduce waste and environmental impact available for all UK businesses.
9. Envision project with secondary school pupils designed to engage 15-19 year old school pupils in developing social and environmental projects.
10. BTCV Environments for All – 4 outreach projects in the four countries of the UK offering programmes to try and get more people from excluded groups involved in all aspects of BTCV's work.
11. East Anglia Food Links – a not-for-profit co-operative of food producers and buyers in the East Anglia region that aims to develop a sustainable local food economy.
12. Marine Stewardship Council Fish Certification Scheme, which helps fisheries worldwide produce more sustainably, rewarding good practice through a certification scheme.
13. Sustainable Hospital Food Procurement Pilot Project, which undertook work with four hospitals in London to increase the proportion of local and/or organic food used in their catering.
14. Three London borough recycling services, combining various approaches, based on doorstep collections.

4. Drawing lessons from 'real world' examples

As can be anticipated of 'real-world' examples, the case studies are complicated and as such often do not neatly follow theoretical models of environmental behaviours, although each tends to illustrate or embody a number of different principles discussed by the theory. Similarly, not all the observed pro-environmental actions have been provoked by an identifiable policy instrument, whereas others can more clearly be traced back to legislative or regulatory changes, economic or other incentives offered by Government or changes to physical or cultural infrastructure provision.

4.1 Changes at the level of individuals

The case studies appear to validate a number of emerging theories about individual pro-environmental behaviour change but also serve to refine and in some instances refute current thinking. For example, the BedZED case study (see Box 1) provides a classic example of where change is achieved by changing the context within which an individual acts without any attempt to influence their attitudes.

Box 1: Beddington Zero Energy Development (BedZED)

Description and background/history

BedZED, the Beddington Zero Energy Development, is an environmentally friendly, energy-efficient, development of 100 housing and work units built on a former sewerage works site in Beddington, Sutton. The development includes a childcare facility and green space, including private gardens. BedZED has been designed with the aim of minimising environmental impact, including carbon dioxide emissions. It is carbon-neutral – i.e. designed not to add any net increase in carbon dioxide into the atmosphere, and is the first large-scale development of this kind in the UK. It's environmental design features include:

- where possible building materials were selected from natural, renewable or recycled sources and wherever possible bought from within a 35-mile radius of the site;
- a combined heat and power unit able to produce all the development's heat and electricity from tree waste (which would otherwise go to landfill);
- energy-efficient design – with the houses facing south to make the most of the heat from the sun, excellent insulation and triple-glazed windows;
- a water strategy able to cut mains consumption by a third – including installing water saving appliances and making the most of rain and recycled water;
- a green transport plan which aims to reduce reliance on the car by cutting the need for travel (for example, through internet shopping links and on-site facilities) and providing alternatives to driving such as a car pool; and
- recycling bins in every home.

The development was a partnership project between:

- BioRegional, a charity that works to develop practical local sustainability projects led the development of the project;
- the Peabody Trust, who financed the initiative and brought a long-term commitment to innovation in construction, quality accommodation and strong communities;

4. Drawing lessons from 'real world' examples

- architect Bill Dunster who had carried out previous work on zero-energy housing;
- Sutton council, the land-owners, who are committed to sustainability in the borough, including promoting energy conscious developments;
- Ellis & Moore, and Arup – consulting engineers;
- Gardiner and Theobald – Quantity Surveyors and Construction management.

Behaviour change outcomes achieved

Measured results include:

- 88% reduction in space heating compared with the national average;
- 57% reduction in hot water usage;
- 25% reduction in electricity use;
- 50% reduction in use of mains water; and
- 65% reduction in fossil fuel car mileage.

They have also achieved:

- 100% renewable electricity supply;
- 100% waste water recycling;
- a full green transport plan; and
- heating requirements of BedZED homes are around 10% that of a typical home.

Additional environmental savings were achieved in the building of the development, including:

- 15% (3,404 tonnes) of the construction materials used at BedZED were reclaimed or recycled;
- 52% of the construction materials used were sourced from within a 35 mile radius of the construction site;
- choosing timber over uPVC window frames for the BedZED scheme saved nearly 800 tonnes of CO₂ emissions, some 12.5% of the total embodied CO₂ for the scheme; and
- careful selection of construction materials reduced the total environmental impact of the BedZED development by approximately 25%.

Legacy

BedZed has stimulated debate and is often cited as an example of sustainable building. It is of particular interest because it is a large-scale development that has taken a comprehensive approach to sustainable housing. It incorporates the latest environmental design and technology and other sustainability principles like mixed tenure and live/work units. It has acted as a focus for interest in sustainable housing developments and has attracted visits from many major developers. It represents an important step forward in that it is a practical demonstration of how many different environmental improvements can be incorporated into a large-scale working housing development that can be used by mainstream residents.

4. Drawing lessons from 'real world' examples

Conversely, it demonstrates that, while this approach may be effective at this individual level, it is extremely limited in the level of actual 'whole-system' change in the global environmental impact it can achieve. If the over-arching aim of building energy-efficient housing is to reduce carbon emissions then such schemes would need to be replicated on a macro scale to have any effect. If the over-arching aim of scheme is to demonstrate best practice and encourage other social housing developments to build energy-efficient housing, then there is some evidence to suggest that it may also be having some impact in this respect, although this is obviously very minimal given the scale of the project and the scale of the problem.

Perhaps surprisingly few of the case studies illustrate one of Gardener and Stern's principles for policy-makers wanting to influence environmentally significant behaviours; namely that it is important to take into account the perspective of the people whose behaviour you are trying to change, and preferably to involve them in designing the intervention. In many instances, policies are still following an 'information deficit model', whereby experts attempt to inform or train environmental awareness.

Interestingly, the GAP Ecoteams project (see Box 2) has tried organising groups that do not have a trained facilitator running them and have found that this approach is more effective than when using a trained facilitator. This highlights the important and often over-looked tension for policy-makers between providing leadership to achieve change on important environmental problems, versus allowing people to lead the agenda themselves (and thus securing ownership of the problem amongst the policy targets but in so doing perhaps achieving less significant change).

Box 2: GAP Ecoteams

Description and background/history

Ecoteams is a project run by the environmental charity Global Action Plan (GAP). Ecoteams are a small number of individuals or households (usually 6-8) brought together for a four-month programme during which they monitor the environmental impact of their everyday lives at home (including water, electricity and gas use, waste produced, transport used and shopping habits). The team gets together for brief meetings once a month during which they discuss different aspects of their domestic environmental impact and how to reduce it. Each member monitors and records their gas, water and electricity usage, and other environmental impacts on a weekly or monthly basis and feeds this back to the group via an Ecoteams support worker or group coordinator. The coordinator / worker also feeds back the communal progress of the group. Participants discuss their progress, share information and advice, and encourage each other to improve their environmental performance.

The project began as a pilot that ran for three years in Nottinghamshire, and has now been expanded to cover other areas. Ecoteams are run in two different ways:

- facilitated teams are led by a Global Action Plan worker who runs each meeting, leads discussions, provides information and feeds back on progress; or
- a more recent approach that has been tried and proven successful is for teams to operate without trained facilitators. In this case teams are recruited through workplaces, including Local Authorities and businesses. They are given one day's training. They then are left to run themselves and report progress back to GAP.

4. Drawing lessons from 'real world' examples

Un-facilitated Ecoteams have been found to work very well, often better than the facilitated teams. One potential explanation, put forward by the national Ecoteams coordinator at GAP, is that in peer-led teams participants feel more 'in it together', and less intimidated by 'greenies' (committed environmental workers), than in the groups led by GAP workers. They have found it easier to attract 'non-greenies' (i.e. people who are not so obviously used to environmental action already) to the non-facilitated groups.

Behaviour change outcomes achieved

The national Ecoteams coordinator reported some new initial results from an ongoing analysis of the achievements of around 800 Ecoteams. On average they had achieved:

- 27% reduction in residual waste;
- 22% increase in recycling;
- 28% reduction in electricity usage; and
- 20% reduction in gas usage.

There are currently a number of initiatives to evaluate the impact of the Ecoteams in more detail, including:

- a Defra funded evaluation of the initial Ecoteams pilot project; and
- a project working with the New Economics Foundation to evaluate the qualitative, social and environmental benefits of Ecoteams, such as engagement with the issues.

GAP is starting to collect demographic data about Ecoteam participants so they can get a better understanding of the types of people they are reaching through the programme.

4.2 Organisational level changes

Both the Interface (Box 3) and BTCV Environments for All (Box 4) case studies illustrate organisational change. In both cases, change was driven from within the organisation and targets and monitoring helped drive the process. In the case of BTCV, the motivation for change came from within the organisation, while in the case of Interface, the organisation decided to change as a result of the changing context in which they were operating – for example, growing interest in environmental business practices and pressure from customers.

Box 3: Interface Incorporated

Description and background/history

Interface Incorporated is a multinational carpet tile manufacturing company. The company was founded in 1973 as a joint venture between a British company and American investors. In 1994 the company's entrepreneurial chairman and founder was asked to think about the company's environmental impact by senior managers. Some customers had started to ask questions about the company's environmental credentials and it was a time when

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4. Drawing lessons from 'real world' examples

environmental and sustainable development issues were increasingly registering with Government and business. Interface's chairman was asked to give a speech providing a vision for an internal task force that was being set up to review Interface's environmental position. Until this point the chairman had heard of sustainability but did not know what it was. In the course of writing his vision speech the chairman was given a book on sustainable business that inspired him and converted him to the cause of sustainability. He realised that his business, in which he had a huge personal stake, had a large environmental footprint and accepted the idea that the business needed to take some responsibility for this. The speech succeeded in setting a challenge for Interface to embrace sustainability, and the top management set about developing a comprehensive vision for the business and the means to achieve it. The move to embrace sustainability was driven by this acceptance of the need for the business to take responsibility for its environmental impact, along with more pragmatic drivers. In particular, the fact that reliance on petrochemicals was unsustainable in the long term and the potential for differentiation and competitor advantage that environmental business could offer. The vision that the chairman and senior management developed was a radical one that set the goal for Interface to become a restorative business (i.e. ultimately restoring the natural environment rather than extracting from or damaging it). The goal to be restorative involved changing the way that Interface worked internally, but also using their influence to affect others.

Behaviour change outcomes achieved

By 2005 the following outcomes had been documented:

- cumulative avoided costs from waste elimination activities since 1995 total over \$262 million;
- total energy consumption per linear yard of manufactured fabric is down 19% since 1996;
- improved efficiencies and conservation efforts have reduced the total energy required to manufacture carpet by 36% since 1996;
- almost 11% of our total energy consumption comes from renewable sources;
- green electricity is used as part of an overall strategy to increase the use of renewable energy – three facilities currently have photovoltaic arrays onsite, and six facilities purchase certified green electricity;
- on an absolute basis, Interface has reduced total carbon dioxide emissions by 52% since 1996 – this reduction has been achieved through improved energy efficiency, increased use of renewable energy and a major landfill gas project at their LaGrange, Georgia facility;
- water intake per square meter of carpet is down 81% in modular carpet facilities and down 41% in broadloom facilities from 1996 due to conservation efforts and process changes such as eliminating the printing processes at some locations;
- the ReEntry program diverted 66 million pounds of material from landfill between 1995 and 2004. In 2004, over 17 million pounds was diverted from landfill and used in recycling (60%), energy capture and conversion (37%), and repurposed (3%);

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4. Drawing lessons from 'real world' examples

- in early 2004, Interface was included in the Global Finance list of the "World's Most Socially Responsible Companies";
- product innovations including bio-mimicry, recycled content and recyclable, using natural materials;
- other initiatives such as offsetting carbon dioxide emissions from employee travel to work.

Legacy – lasting impacts and seeding of further activities

Interface aims to influence others in order to develop a restorative business. The company's chairman delivers lectures and works to make the case for sustainable business to others. Their chairman has been involved in advising the US Government on sustainable business practices. They have also worked to try and engage their employees with sustainable development. They pro-actively work with their suppliers to try and engage them with sustainability and improve the environmental impact of the materials they buy. They use their environmental credentials to sell their products and provide consumers with the choice to purchase environmentally friendly products. They have been acknowledged as an example of how business can become more sustainable, and cited as a case study for others to learn from.

BTCV illustrates an approach that best fits with the theory of incremental change – the company put in place a team to change one aspect of their organisation. The case of Interface however seems more closely akin to the theory of transformational change, as it involved senior management in the company reviewing all aspects of their business and setting out to fundamentally change the way in which it operates.

Box 4: BTCV Environments for all

Description and background/history

Environments for All is a three-year programme being run by BTCV with the aim of increasing involvement from under-represented groups in environmental action. The programme was developed by BTCV to further their overarching aim of maximising the potential of voluntary action for the environment. Traditionally, environmental volunteering has been largely restricted to certain sectors of the population. BTCV had already developed their work from a purely environmental focus to begin to engage with social issues. Although they had carried out some work with marginalised communities, they were keen to significantly expand the range of people who get involved with environmental volunteering in order to expand their impact over the long-term.

BTCV's 2000-2004 strategic plan set the aim of 'expanding the boundaries of conservation volunteering' by changing and adapting the ways in which it works.

The Environments for All project was developed to begin to address this under-representation of 'significant proportions of the UK population' in environmental volunteering by piloting and developing work with Black Minority Ethnic and other excluded communities in pilot areas of the UK. The project set out to:

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4. Drawing lessons from 'real world' examples

- engage marginalised groups with environmental volunteering by providing opportunities appropriate to different excluded communities;
- identify and disseminate good practice in order to spread lessons through BTCV and the wider environmental sector; and
- encourage the involvement of people from BME communities in the running and management of BTCV.

Behaviour change outcomes achieved

The project involved internal reporting and evaluation, and the Black Environment Network has carried out an external evaluation of the project. This included questionnaire surveys with project staff and target communities, and a final report of the project and assessment of its success.

The following outcomes are reported.

- In ethnic minority and other marginalised communities where the Environments for All outreach teams have been working, there has been a significant increase in the awareness of BTCV (or Conservation Volunteers Northern Ireland, CVNI) and the general environment sector.
- There has been a significant increase in the numbers of people from marginalised groups involved with environmental projects.
- There has been an increased number of BTCV/CVNI staff working with these target groups.
- Environments for All staff have gained skills and knowledge in relation to reaching, and working with, marginalised groups. They have received relevant training such as conflict management within community groups and lone working practices. Volunteer officers have been trained in the Environments for All ethos.

The following percentage changes over the life of the project are reported:

- directly managed volunteers who are BME = change from 7 to 10%;
- directly managed volunteers who are unemployed = change from 27 to 28%;
- directly managed volunteers who are disabled = change from 3 to 17%;
- millennium volunteers who are BME = change from 26 to 15%;
- millennium volunteers who are unemployed = change from 9 to 16%;
- millennium volunteers who are disabled = change from 7 to 10%;
- community work with BME groups = change from 22 to 27%;
- community work with unemployed = change from 31 to 48%;
- community work with disabled = change from 3 to 13%.

Areas where the project has been less successful include:

- there has been little, or no, increase in diversity in the staff or management of BTCV/CVNI; and
- the level of involvement of excluded groups in environmental projects has not been to the extent where groups can continue and sustain their involvement independent of support.

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4. Drawing lessons from 'real world' examples

Legacy

- The ethos and experience of the Environments for All projects (namely, putting people first in nature conservation) is being communicated within BTCV and to communities and the wider environment sector including wildlife trusts, local councils, water authorities and environmental agencies.
- The Integration of the ethos of the Environments for All projects into other BTCV projects has created new partnerships and new networks.
- BTCV project officers from outside the programme have been involved in the Environments for All projects and they have learnt new skills.
- Other organisations are approaching BTCV for training, and have approached the communities engaged by Environments for All, to ask people to participate in other projects.
- Other projects have been developed by BTCV as a result of the programme. For example, E-merge is a new multi-media training project arising from the Environments for All projects.
- The success of the Environments for All projects has given BTCV positive publicity, changing its image as a 'white, middle-class, male' organisation.

4.3 Whole-systems change

A number of the case studies illustrate the principle of achieving environmental change through a whole systems approach. Thus, instead of relying on one intervention with one stakeholder, a number of the case studies have taken a systematic approach to trying to change environmental behaviour. For example, East Anglia Food Links (see Box 5) works with producers, processors and consumers of food, as well as the systems for distributing it, in order to try and make the food system more sustainable.

Box 5: East Anglia Food Link

Description and background/history

East Anglia Food Link (EAFL) is a not-for-profit co-operative that works to develop a more sustainable and local food system across the East of England. It aims to represent all parts of the sustainable food chain from producers to consumers and independent retailers. The organisation works through many projects and partnerships influencing all aspects of the food chain, including:

- support for producers to produce more organic food, and to market it successfully;
- work with processors to increase their use of organic and local food;
- education and promotion of sustainably produced local food;
- developing regional and local markets for local sustainable food;
- development of farmers markets in the region and working with public and private sector buyers; and
- promoting and catalysing the development of local food initiatives and providing training and support services to help them continue in the long-term.

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4. Drawing lessons from 'real world' examples

EAFL grew out of another regional project called Farmers' Link, a not-for-profit organisation working in the East Anglian farming community to promote sustainable agriculture and rural development and to develop links between rural communities in the UK and in other parts of the world. EAFL was originally an idea developed by one of Farmers' Link's working groups in the mid 1990s. The working group involved representatives from a broad range of rural interest groups including farmers and agricultural scientists. They identified producer-consumer relations as being one of the key areas for developing sustainable agriculture and rural development, and this led to the development of EAFL. EAFL's founder, Clive Peckham, was working at Farmers' Link and had a key role in the development of the organisation. EAFL's official aims are to:

- promote environmentally and socially responsible food production;
- encourage the development of community based local food economies; and
- develop interactive links between producers and consumers.

Behaviour change outcomes achieved

The organisation has had an impact on the environmental behaviour of many different target groups in a variety of ways. For example East Anglia Food Links:

- has helped support farmers to switch to organic production – for example, with the development of Eostre Organics a successful producer co-operative;
- was one of the leading organisations calling for sustainable food in schools and hospitals in the late 1990s – this is now a widely accepted goal and part of Government policy;
- founded Food Links UK which promotes and supports the local food sector nationally;
- has been working with and supporting caterers and retailers in the region to get them buying more local and sustainable food;
- supports the development of farmers markets and other opportunities for consumers to access organic and local food; and
- runs a sustainable public procurement project that is working to increase the sustainability of public sector procurement in the region.

Legacy

The organisation has given rise to many other initiatives, including:

- a successful organic farmer's co-operative – this model is being looked at by others;
- EAFL founded, and continues to play an active role in, Food Links UK; and
- EAFL helped establish a Europe-wide sustainable food network called AlimenTerra.

East Anglia Food Links have also been involved in developing thinking and practice on sustainable local food, and sustainable food procurement in the public sector. EAFL was the first organisation to bring the idea of sustainable food procurement onto the agenda in the UK at a time when it was not widely talked about. They organised the first sustainable food procurement conference in the UK.

4. Drawing lessons from 'real world' examples

The Sustainable Hospital Food Project (Box 6) and the Marine Stewardship Council (Box 7) have both worked with buyers and producers in order to increase the sustainability of the food supply chain. A number of these examples illustrate the idea of influencing both consumers and 'the market' (producers) that was put forward in balanced policy-making model developed by Veronica Sharp for Defra (Sharpe, 2005).

Box 6: Sustainable hospital food project

Description and background/history

The Hospital Food project is a two-year initiative to increase the amount of local, seasonal and organic food used in four London hospitals to 10% of routine catering. The project was co-ordinated by Sustain, the alliance for better food and farming, in partnership with the Soil Association.

The project developed from an initial idea by the Soil Association and Sustain. The Soil Association commissioned a study at one London hospital (St George's, Tooting) to look at the potential to integrate more local and organic food into hospital catering. The study involved interviews with the hospital's catering manager who said that they would be interested in more local and organic food, but would need help to incorporate it in practice. The job of supplying more local organic food would face a number of serious barriers including: very tight budgets; time constraints; complexity of public procurement rules; and the practicalities of, for example, changing menus, finding suppliers and negotiating new contracts. It would not be feasible for the catering manager to overcome these on her own and so the report concluded that someone needed to be employed to do the work involved in helping the hospital buy more local organic food.

Following this report a detailed proposal for a pilot project with four London hospitals was developed by Sustain and funded by Defra and the Kings Fund. Defra funding came from a grant designed to support producers to market quality agricultural produce. The Kings Fund was interested in the potential health benefits of feeding patients more fresh food.

A number of hospitals were approached to take part in the pilot, mainly through informal contact at conferences and meetings, and existing contacts and networks. The four hospitals chosen represented a mix in terms of existing approaches to catering, degree of engagement with the issues, and potential for change.

- Ealing General:
 - 444 patients,
 - spends £2.92 per patient per day on food;
 - catering entirely contracted out to a large catering company who buy their food in bulk – in 'cook chill' form – from a large food manufacturing company (cook chill involves bulk cooking of food off the premises that is chilled and then re-heated at the hospital);
 - hospital had not considered sustainable development as part of their food procurement before;
 - hospital did not think it feasible to change patient meals so the pilot focused on the staff restaurant.

Cont.

4. Drawing lessons from 'real world' examples

- Royal Bethlem and Lambeth hospitals:
 - 319 beds with contracted out catering and cook – chill meals;
 - spending on meals not disclosed;
 - Lambeth hospital joined the scheme in the second year and cooked its meals from fresh ingredients at the hospital.
- Royal Brompton hospital:
 - 250 beds;
 - purchase fresh ingredients from wholesalers and give food priority in the hospital with a committed catering team and;
 - £3.50 per patient per day spent on meals;
 - wanted to involve both patient and staff food in the initiative and catering staff were willing to work with smaller suppliers.
- St. George's hospital:
 - approximately 1100 beds;
 - £3.53 spent per patient per day on food;
 - meals purchased frozen from a manufacturer and cooked in kitchens on the wards, plus fresh fruit and vegetables purchased from a wholesaler;
 - central kitchen prepares meals for staff on site;
 - decided to focus on staff meals for the project;
 - hospital was trying to apply sustainability to its operations, but did not have a policy on local or organic food.

The project also engaged the NHS Purchasing and Supply Agency (PASA) early on. This agency acts as a co-ordinating centre for purchasing and supply in the NHS, and develops policy. It also runs framework contracts on a national basis for products and services that the NHS needs, including running national and large-scale food procurement contracts. They were therefore an important partner.

Behaviour change outcomes achieved

A calculation of savings in food miles (distance travelled by food from production to consumption) as a result of the shift to purchasing local organic produce showed that before the project the total distance travelled by 1 kg of a selection of fruit and vegetables used in the hospitals was 65,077 km (e.g. apples from Chile and New Zealand, beef from Botswana and Argentina, tomatoes and potatoes from Holland). After the project, the same products were being supplied to the hospitals with a total of 665 km / kg. This represents a saving of over 36,000g of carbon dioxide emissions per kg for the food that the project managed to replace at the hospitals.

The project has succeeded in supporting small producers to develop systems and accreditation to meet the standards necessary to supply hospitals and other large food buyers.

Cont.

4. Drawing lessons from 'real world' examples

The project has succeeded in engaging wholesalers and large suppliers, and changing their buying behaviour. For example, one wholesaler involved in the project is now supplying more locally grown fruit and vegetables to all other customers, as well as hospitals, due to the positive response from customers.

Legacy – lasting impacts and seeding of further activities

- The project has developed a database of suppliers who meet the standards necessary to supply hospitals and who are operationally able to do so.
- The project established a 'replication network' comprising people working in sustainable public procurement, which is actively spreading learning from the project. For example through an event for 15 hospitals from around the UK.
- The Soil Association is developing a code of practice on organic food preparation to help make it easier for hospital staff to incorporate organic food into their catering.
- The project has engaged suppliers in looking at the practicalities of buying more local and organic produce.
- The project has led to further projects, for example further work on wholesaling local and organic produce in London is planned by Sustain.
- The project is included in the draft London Food Strategy, which includes a proposed action to expand the scheme if it is deemed successful after evaluation.
- The project has responded to requests for help from a range of other organisations that want to make their food procurement more sustainable, including:
 - the Houses of Parliament;
 - the Metropolitan Police; and
 - 4 other hospitals.

Box 7: The Marine Stewardship Council Fish Certification Scheme

Description and background/history

The Marine Stewardship Council (MSC) is a not-for-profit organisation that has developed an environmental standard for sustainable, well-managed fisheries. The organisation runs an international certification programme that certifies and labels seafood products that meet these standards.

The MSC was set up by the multinational Unilever, together with WWF in 1997. The idea for the organisation came out of talks about how to assure the long-term sustainability of global fish stocks and the integrity of the marine eco-system. This issue was of concern to Unilever as they are the world's largest buyer of seafood and were worried about the long-term sustainability of their business. WWF were interested from an environmental / conservation point of view.

The MSC began its work by conducting a two-year consultation process with stakeholders from around the world to establish an environmental standard for seafood and fishery certification. They originally based this standard on the UN's Food and Agriculture

4. Drawing lessons from 'real world' examples

Organisation's (FAO) Code of Conduct for responsible fisheries. However over the years their standard and accreditation has evolved in response to criticism from some other environmental organisations. The organisation became independent in 1999 and has operated independently ever since.

The Marine Stewardship Council's vision is to *"enhance responsible management of seafood resources, to ensure the sustainability of global fish stocks and the health of the marine ecosystem" and "safeguard the world's seafood supply by promoting the best environmental choice"*.

The MSC web site states:

"In a bid to reverse the continued decline in the world's fisheries, the MSC is seeking to harness consumer purchasing power to generate change and promote environmentally responsible stewardship of the world's most important renewable food source" (MSC Homepage, 2005).

MSC's principal aims are to:

- increase the overall sustainability of the world's seafood supply;
- increase the percentage of the global seafood market certified to the MSC Standard; and
- increase awareness of the MSC eco-label.

Behaviour change outcomes achieved

The organisation is still fairly new but some of the major UK food retailers have paid for their supply chains to be certified so that they can sell MSC accredited seafood products. The fact that they have paid for this process and think it is worth stocking these products is an important endorsement and outcome:

- a number of major retailers, including Sainsbury's, Tesco and Waitrose, have undergone supply chain certification allowing them to stock MSC certified fish;
- Sainsbury's has commitment to source 100% of the wild-capture seafood it sells from sustainable sources;
- 50 seafood products on the UK market are MSC certified;
- 300 seafood products are MSC certified in 24 countries around the world; and
- many retailers have included the MSC in their sourcing policies and encourage their supply fisheries to seek MSC certification.

Legacy

- The MSC has been involved in developing the UN Food and Agriculture Organisation's (FAO) guidance for setting up an eco-label for seafood.
- The Australian Government has recently issued guidance that MSC certification is acceptable in place of their own domestic standards for seafood.
- The MSC hosts a 'European Commercial Group' meeting twice yearly that is attended by up to 50 representatives from major retailers, processors and foodservice operators from across Europe to discuss the MSC and how to develop work on certifying sustainable fisheries and seafood.

4. Drawing lessons from 'real world' examples

Clearly, the case studies cover a wide range of approaches to influencing environmental behaviour, from fairly straightforward single interventions, to integrated whole systems approaches. The whole-systems approach can either involve working to influence the behaviour of more than one stakeholder at the same time (for example producers and consumers), or taking an integrated approach to changing a single behaviour of a single target group (for example use of non-disposable nappies).

4.4 Replicating good practice

A common and wholly appropriate policy response to successful behaviour change initiatives is to want to replicate them elsewhere. Unfortunately, there is insufficient evidence from this study to judge properly the effectiveness of the different policy approaches in provoking pro-environmental behaviour change, the level and extent of that change or the adequacy of that change in light of global targets. This could be an area for future Defra research.

The limited evidence that is available suggests that it will be easier to replicate the more straightforward projects than the more complex 'whole systems' approaches. Previous research experience with small-scale local sustainability projects found that the process of capacity building and community development were key to their successful development. Even where the funding and a 'successful' model is available, time is needed to replicate an initiative elsewhere, as each new group of actors will need to go through their own unique action learning experiences and projects will need to be refined and redesigned according to their needs.

With this caveat firmly in place, at the practical level, a complex 'whole system' approach (e.g. to waste minimisation) can often be broken down into simpler functioning components, for example, develop responsive approaches according to groups of target audiences and their behaviours and/or activities (e.g. households, Local Authorities, producers).

Sometimes practical examples of behaviour change may be difficult to replicate as they have developed in fairly unique circumstances. For example the Interface circumstance, where an individual with considerable influence in the organisation became 'converted' to the idea of sustainable business practice and determined to adopt a comprehensive and revolutionary approach to implementing it. This precise situation may be unlikely to recur in many companies, but many of the same characteristics and circumstances may arise in different combinations within other organisations. Where similarities are identified, lessons can be adapted and transferred to these new but sympathetic circumstances.

4.5 Ensuring policy-making supports the dynamism of 'real world' initiatives

Our study does not have the scope to allow any meaningful comparison of the fourteen cases in terms of their effectiveness in delivering improved environmental outcomes, and in any case this may be a pointless exercise as they differ so fundamentally in scope, aims and methods. The theories of behaviour change discussed in Section 1 would suggest that some approaches should be more successful than others, for example more integrated approaches may be more likely to be successful.

4. Drawing lessons from 'real world' examples

Targeting different audiences

In practice, there seems to be little difference in approach or method for changing the behaviour of individuals or organisations. For example:

- providing information – both for businesses through Envirowise, and to consumers through the MSC sea food labelling scheme;
- measuring progress – for example BTCV Environments for All, and GAP Ecoteams;
- hands-on support and facilitation – for example, Envision programme, BTCV Environments for all and Sustainable Hospital Food project; and
- financial incentives – for example Lambeth PLEASE and the West Sussex Real Nappy initiative.

Those approaches that were identified as being uniquely applied in the incidence of one audience could easily have been adapted for use with an alternative audience. For example:

- ranking company performance to create competition to drive change could also apply to the performance of community and voluntary activity; and
- providing infrastructure within local authority schemes could equally be beneficial to industry or the community sector.

The only approach that appears to be totally specific and non-transferable between these categories is tender specification, which by definition can only influence the behaviour of a contracting business.

Financial support

Stable finance is clearly an issue for most community based initiatives, for example, nearly half of the funding for Envision comes from Government sources and this has had the added benefit of giving confidence to the project managers who now feel able to work with Government departments to share learning. The Marine Stewardship Council's commercial manager also reported that receiving funding from Defra had acted as an important endorsement of their work. Unpublished research into support for local environmental initiatives found that even small amounts of funding can help catalyse and justify the development of new community projects (The LSE Win Win project final report to the Esmee Fairbairn foundation (Elster, 2004).

Legislation support

Initiatives are more likely to succeed where there are clear legislative guidelines supporting their activities. For example, the Lambeth PLEASE project was ultimately driven by the Home Energy Conservation Act, and is funded by the Home Energy Conservation Action 2000 programme. This helped to ensure that the scheme was prioritised within the local authority's delivery programme and secured the support of local politicians.

Providing leadership

Pilot schemes can be used to secure wider policy buy-in. For example, the London Mayor's draft Food Strategy proposes that the Sustainable Hospital food project be expanded to every hospital in London if it is found to be successful.

4. Drawing lessons from 'real world' examples

Joint working

Initiatives are more likely to achieve success where policy-makers work interactively with target audiences. For example, Envision is now working with the Government's Learning and Skills Agency to share learning about engaging young people with active citizenship.

Helping set the right context

It is important that target audiences understand the policy intention and process in a wider context. For example, the WWF ranking of power companies project was developed by looking at the maximum savings in CO₂ emissions power companies could achieve within the current policy context. Targets for CO₂ reduction and the fact that Government is taking this issue seriously also helps create a supportive context for the development of behaviour change projects by other bodies.

4.6 Responding to the magnitude of global environmental challenges

The environmental problems we face, such as global warming, are pressing, huge and often fairly poorly understood. It is important to address the question of how appropriate and relevant interventions to influence environmental behaviour change are, and how far they can contribute, when faced with such massive and important problems.

It is beyond the scope of this study to go into detail, but it is possible to highlight the following issues from the case studies considered. Further research into the scope of practical environmental initiatives to contribute to significant environmental change is likely to be difficult to conduct, but is important if we are to have a better idea of the significance of our current efforts. Many of the projects we evaluated are taking place in the context of a much wider effort. For example, WWF is running an international campaign to reduce the carbon dioxide emissions of power companies; GAP Ecoteams and BTCV Environments for All are operating in the context of literally tens of thousands of small scale sustainability projects taking place across the UK, often led by local community groups.

Even projects that have little environmental impact themselves could help change social norms, or people's attitudes, which in turn can help contribute to broader societal changes in behaviour – for example the Envision programme probably achieves fairly modest environmental impact but engages young people and helps them develop a sense of agency that, in theory at least, may make them more likely to take action throughout their lives. Research into this mechanism is likely to be complex but may produce some interesting results.

5. Conclusions and emerging lessons from the review

This review has drawn together the contemporary evidence-base on models of individual environmental behaviours and theories of how these may be used to understand behaviour change with organisational theory and systems thinking. It has used the common themes arising from this synthesis to qualitatively evaluate fourteen policy programmes that are currently directed towards encouraging pro-environmental behaviour at the individual, organisational or 'whole systems' level in the UK. It has also examined fourteen 'real world' UK initiatives that work to encourage and facilitate individuals, organisations or wider society to behave in more environmentally positive ways. This analysis of the grassroots evidence-base has gone some way in helping to identify the extent to which theoretical and modelled understandings of pro-environmental behaviour are consistent with actual behaviours in practice.

5.1 Conclusions

To our knowledge, this is the first time that such a far-reaching review has been attempted. Clearly, it has not been possible to comprehensively review and synthesise the entire existing evidence-base. However, this synthesis review has facilitated the identification of a number of common themes, which should help to advance policy thinking in this area.

Putting the literature on individuals together with the literature on systems underlines that there are many organisational and societal factors impacting on individuals' behaviours. These may serve to prevent change from occurring, regardless of how appropriately a policy is designed on the individual level. It is the inter-relations between these multiple factors and organisational levels that support the argument for a 'whole systems' approach to encouraging behaviour change.

By stressing that organisations and networks are "*complex adaptive systems*" in which change processes must be embedded both horizontally (i.e. within an organisation) and vertically (i.e. between organisations), systems thinking can offer new possibilities for effective processes of pro-environmental policy-making. Systems thinking principles are consistent with a total partnership working approach but they also call for simultaneous (or integrated) multi-level change processes.

In this way, the consistent principles of complexity, feedback and learning, and partnership working apply to pro-environmental behaviour change at all levels. At the individual level, it has been noted that the social marketing techniques widely used by practitioners attempting changes in health behaviours may offer a useful and practical way forward.

Ultimately, the theoretical review demonstrates change to be circular; change theories at all levels are filled with loops (both feedback loops, and double loop learning), cycles (of action and reflection) and non-linear models. In addition, change is understood as progress over time, and not as a single event. These conclusions should underline for policy-makers the multi-levelled, circling, and often slow process of pro-environmental change, which they seek to encourage.

Clearly, both the review of current policies and the practical initiatives review for this study have been limited in their depth and scope. Only a small sample of policy instruments and initiatives were evaluated and the available secondary evidence is often weak. The study can, therefore, offer only a partial and subjective evaluation of the adequacy of current policy and should in no way be taken to be a representative of the wider picture. For this reason, we recommend that further research is needed to understand fully to what extent policies lead to behaviour change. This may require undertaking systematic, quantitative evaluation of key programmes and policies.

5. Conclusions and emerging lessons from the review

With this caveat in mind, the policy review appears to demonstrate increasing acceptance amongst policy-makers that behaviours are complex and thus require a multi-instrument approach. However, even where policies aim to address consistently multiple factors, utilising a range of tools, there is little evidence of systematic intervention across all three behavioural levels (individual, organisational, systemic) to achieve long-term normative change.

Furthermore, where a package of measures has been designed to address multiple behaviours, there is little to suggest any consistency in policy intention across the different Government departments. For example, policies that offer greater parental choice in the selection of schools (which are known to generate increased car travel) are offered simultaneously with policies that aim to encourage reduced car use. Policy targets are left in a position where they do not know which behaviour is being supported.

Unfortunately, there is insufficient evidence from this study to judge properly the effectiveness of the different policy approaches in provoking pro-environmental behaviour change, the level and extent of that change or the adequacy of that change in light of global targets. The limited evidence that is available suggests that it will be easier to replicate the more straightforward projects than the more complex 'whole systems' approaches.

Previous research experience with small-scale local sustainability projects found that the process of capacity building and community development were key to their successful development. Even where the funding and a 'successful' model is available, time is needed to replicate an initiative elsewhere, as each new group of actors will need to go through their own unique action learning experiences and projects will need to be refined and redesigned according to their needs.

With this caveat firmly in place, at the practical level, a complex 'whole systems' approach (e.g. to waste minimisation) can often be broken down into simpler functioning components, for example, develop responsive approaches according to groups of target audiences and their behaviours and/or activities (e.g. households, Local Authorities, producers). This is consistent with a social marketing approach.

5.2 Lessons for future policy-making

The key lessons for future policy-making arising from this review are identified under the sub-headings below.

Dealing with complexity

Behaviours are complex, non-linear and affected by many factors, many of which need addressing simultaneously to facilitate change. Different audiences behave differently, and most behaviours are context-specific (in terms of the behaviour in question, the setting for that behaviour etc.).

Policies that aim to encourage pro-environmental behaviour need to reflect these complexities. They should combine multiple types of instrument in a 'package' of measures (e.g. infrastructure, fiscal measures, and information). It is suggested that interventions first address external factors (most notably infrastructure and pricing) and then internal factors (e.g. psychological or attitudinal).

5. Conclusions and emerging lessons from the review

As well as working on multiple factors, interventions need to work on multiple levels; ultimately addressing society as a whole in order to achieve long-term normative change. Where an intervention addresses multiple behaviours simultaneously, those behaviours should be clustered together as the audience sees them, not as they are arranged in governmental departments or delivery units.

Recognising the importance of local context and accountability

To be effective, policy measures usually need to be highly context specific. Devolving responsibility for policy development and delivery to locally accountable bodies (Local Authorities, business and industry, the Voluntary and Community Sector groups) can help to ensure their local suitability and can also help to build their legitimacy. Care should be taken to ensure that the relevant skills, resources and capacities are available within these organisations to take on these additional duties.

Creating an interactive and reflective policy-making environment

The audience for a change intervention should not be regarded as a passive target whose behaviour is to be changed, but as 'actors' at the heart of the change process. Ideally, a total partnership working approach should be adopted in which change partners are involved from the start in defining and redefining the problem through a continuous cycle of action and reflection, from which learning and innovation will result.

'Feedback' is vital to driving and sustaining change; instead of understanding the changed behaviour to be the end of the process, interventions should build in 'feedback loops' i.e. opportunities to feed learning from the change process back in to subsequent behaviours. Feedback should also be accounted for between individuals and organisations in networks, and across society as a whole. A holistic perspective on facilitating change should be adopted.

Policy-makers should attempt to close the current gap between policy design and delivery outcomes. The effect of this better co-ordination would be reciprocal: policy would be designed in the light of past experience, and desired outcomes and targets would be set more appropriately (ideally through negotiation with delivery partners and change 'actors' themselves).

Providing a consistent message and approach

Policies for pro-environmental behaviour change need to pull in one direction and convey a consistent message to target audiences and the public in general if they are to achieve any degree of success. This consistency needs to apply across Defra policies and with those coming from the EU, and (possibly more importantly) to those being developed by other departments.

To achieve the level of consistency and integration that will be required to achieve visible and sustained improvements to environmental outcomes, Defra will need to collaborate more actively, with other departments across Whitehall, as well as with the relevant external agencies (Environment Agency, Highways Agency, etc.) and with other key delivery agencies.

Defra also needs to ensure more effective and consistent data collection and collation and measurement of performance to assist this important reflective process. In future, the appropriate formal evaluation structures should be put in place at the stage of policy-development. These may need to be adapted in the light of actual performance on the ground.

4. Drawing lessons from 'real world' examples

Supporting the champions of change

Individuals are vital to delivering pro-environmental change, not just for themselves (on the level of individuals) but also within organisations and networks as 'agents for change' (both as managers and 'change champions'). Engaging and nurturing key individuals may be more effective in bringing about system-wide change than targeting the behaviour of all individuals.

The Voluntary and Community Sector are already successfully delivering practical initiatives for encouraging and supporting pro-environmental behaviours. These demonstrate that projects are more likely to succeed where there are clear legislative guidelines to support their activities. It is important to ensure that target audiences understand the policy intention and process in a wider context.

Organisations (both business sector and community) are more likely to act if they have been involved upstream in its design and target setting and where they are held responsible for ongoing performance, monitoring, evaluation and refinement. As with individual behaviours, it is more likely that success will be achieved at the organisational level through economic incentives in the market, the removal of barriers and the provision of supportive physical and cultural infrastructure for change. Stable finance is clearly an issue for most community-based initiatives; even small amounts of funding can help catalyse and justify the development of new community projects.

Avoiding inequitable and unjust outcomes

It is clearly important that policy-makers ensure that policies at least avoid disproportionate negative financial and environmental outcomes for the most vulnerable in society and where possible reduce inequalities of outcome. Equity concerns are particularly associated with environmental taxes and charges, which can also negatively impact on the competitiveness of small businesses. Compliance is likely to be least where policies are perceived as unfair, or poorly targeted, and where alternative options do not appear to be available.

When evaluating the likely equity of a policy outcome, it is important to consider both exposure to negative environmental externalities and its effect on opportunities to access goods and services. Any increase in the overall cost of a product or service will be most likely to impact on the activities of groups at the margins, who may experience greater social exclusion as a result of being financially prevented in continuing to participate in that activity. In the past, people on low incomes have tended to be less able to access environmental information and less able to participate in pro-environmental behaviour as a result of policies that have failed to consider their particular needs.

It is also important to consider the wider distribution of policy outcomes, both in terms of their geographical spread and across the different market sectors. Some sectors, for example the building trade, have been demonstrably less responsive to environmental policy directives than others. Finally, past policies have demonstrated all sorts of unforeseen additional side effects, such as the discarding of catches by fishing fleets in response to species-based quotas, leading to an increase rather than the intended decrease, in the proportion of 'at risk' species.

4. Drawing lessons from 'real world' examples

Responding to the magnitude of global environmental challenges

It is important to remember that the environmental problems we are all facing today and in the future are pressing, huge and often fairly poorly understood. The appropriateness and relevance of policies to encourage pro-environmental behaviour should be viewed in light of these massive and important global challenges. More far-reaching, targeted and effective policy action is needed than is currently evident. Behaviour change takes time and measures need to be put into place now to influence societal change and respond to environmental pressures.

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