

## **UNDERSTANDING BEHAVIOUR CHANGE**

### **How to apply theories of behaviour change to SEWeb and related public engagement activities**

**Katrin Prager, James Hutton Institute**

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## Foreword

This report is written to help partners involved in the development of Scotland's Environment Website (SEWeb) to better understand what motivates behaviour and how behaviours can be influenced. A draft of this report was presented to and discussed with a small group of SEWeb partners on 22 March 2012, and subsequently revised. The final report is to be presented at the workshop on "What can theory tell us about behaviour change through policy and SEWeb" (planned for June 2012). An Annex will capture the feedback received and any output generated at the workshop in order to complement the report.

The theories discussed here are also applicable to the broader suite of environmental policies since environmental protection and improved environmental management, through communication, policy and planning, often ultimately requires changes in behaviour for effective implementation. The aim is to achieve policy impact and to make a lasting difference on the ground, based on an understanding of the principles of behaviour change.

The aim of the research programme underlying the public engagement work stream of the SEWeb project is to test the hypothesis that **better on-line information about the environment (both in terms of what information people need and how they need it presented) supports the move to increased engagement in debating environmental priorities, monitoring the environment and taking action to protect it** (or, put differently, the ultimate purpose of the provision of environmental information is to stimulate behaviour change to better appreciate, use, manage and protect the environment).

## 1. Introduction

*“Policy development in the context of behavioural change is notoriously difficult.”  
(Jackson, 2005, 3)*

*“The sheer complexity of human behaviours and motivations makes it very hard to predict with certainty what the impacts of policy interventions on people’s behaviour are going to be.” (Jackson, 2005, 119)*

The importance of influencing behaviour in order to achieve positive policy outcomes is increasingly recognised and has led to a number of reviews and reports. Some of these cover the use of behaviour change models in general (Darnton, 2008b) while others focus on behaviours relevant to specific contexts such as climate change (Southerton et al., 2011), sustainable consumption (Jackson, 2005), or the impact of volunteering on environmental behaviour (Hine et al., 2008).

Behavioural theories and models of behavioural change cannot bring about behaviour change, nor can they predict with certainty what changes in behaviour will occur. Nevertheless, they can inform policy makers, implementers and others involved in trying to bring about change about the issues to consider and the likely success of initiatives and interventions. This report aims to aid the understanding why and how behaviour change occurs and what the factors and conditions are that drive behaviours.

As Michie et al. (2008) note, “theory provides a helpful basis for designing interventions to change behaviour but offers little guidance on how to do this”. The authors go on to develop an extensive list of behaviour change techniques (with definitions) and link the techniques to theoretical constructs. However, even though they outline the possibility of developing a comprehensive, reliable taxonomy of techniques linked to theory, there still is no guidance on how a policy maker or anyone else wishing to influence, for example, environmental behaviour would pick the relevant techniques. This report tries to provide readers with a better understanding of the mechanisms and processes that underlie human behaviour in order to then decide on which approaches are suitable to achieve behaviour change.<sup>1</sup>

Before embarking on a discussion around what theories of behavioural change can tell us about the best way to influence behaviour, those wishing to change behaviour need to answer the following questions:

1. **Whose behaviour** should be changed?
2. **What behaviour** should be changed?
3. **What change** do we wish to see and how can we tell that it has happened?

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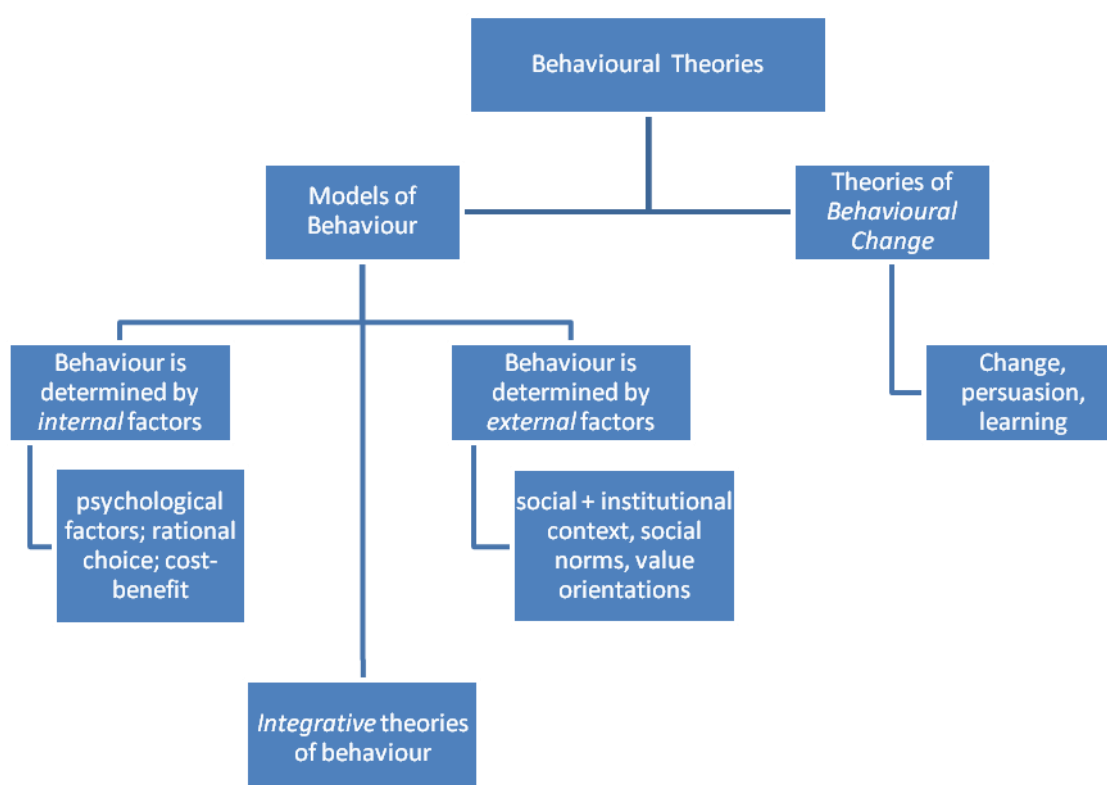
<sup>1</sup> Recent notions in a number of government bodies and agencies have been to avoid the term ‘behaviour change’ because it is associated with a top-down, psychological imperative, something imposed by government (Paul Tyrer, by email, 19 March 2012). Therefore, I preferred the term ‘influence’ over ‘change’ but this could not be done consistently because the body of theories is explicitly built around the term ‘behaviour change’.

#### 4. **Why** should these behaviours change?

There are a few highlights from a broad range of theories<sup>2</sup> that need to be kept in mind whenever designing tools or policy interventions to influence behaviour. As Kathryn Mearns (2012) pointed out, behaviour is very resistant to change:

- People are creatures of habit, and we try to achieve maximum gain with minimum effort;
- Information and exhortation are among the least effective ways of influencing behaviour (Bandura, 1977; Campbell, 1963), even if people are informed about health risks (e.g. smoking, obesity);
- We are focused on the short-term not the long-term (immediate survival was critical for our ancestors; in contrast, the very gradual, slow pace of environmental change represents a cognitive barrier (Kollmuss and Agyeman, 2002));
- We do not necessarily respond well to *being told* what to do (related to ideas of personal freedom/rights especially in Western societies (Branson et al., 2012)).

It is important to distinguish between two types of theories. Some theories and models are well suited for a heuristic (comprehensive, conceptual) **understanding** of behaviours. They are able to capture the wide variety of different factors<sup>3</sup> that influence choices and behaviours and fulfil a conceptual role. However, these complex models are not necessarily good for **empirical testing**. They are too complex to allow for obtaining quantitative evidence about real attitudes and behaviours.



<sup>2</sup> Note that the terms theory, model, theoretical construct, theoretical framework are often used interchangeably. This report generally uses the terms employed by the respective authors.

<sup>3</sup> Choices are influenced by moral, normative, emotional, social factors, as well as facilitating conditions and the force of habit, and the (so-called) rational deliberations and intentions (Jackson 2005, 105)

**Figure 1: Overview of behavioural change theories** (figure by K.Prager)

When starting to look at the theoretical grounding for behaviour change, another distinction can be observed. On the one hand, there is a wealth of models of behaviour that explain why people make certain decisions and display certain behaviours. They focus on describing **existing behaviour**, e.g. how intentions, attitudes, values and other factors shape behaviour (Figure 1, left side). On the other hand are theories that focus on how to **change behaviour** from one behaviour to another, more desired behaviour (Figure 1, right side). This second set of theories draws on a number of behavioural models in order to explain how to change behaviours. In practice, both kinds of theories can help identify points of policy interventions or how to target initiatives aimed at influencing behaviour.

Models of behaviour (left side of Figure 1) can be split into those focusing on individual perspectives explaining behaviour as determined by internal factors (dominant in psychology), and those focussing on behaviour determinants external to the individual (dominant in sociology, economics, political sciences). More recent theories try to incorporate internal and external factors, subsumed under 'integrative theories of behaviour'. The latter are particularly useful since behaviour change needs both, attention to influencing individuals' behaviour and changing the conditions and drivers which influence behaviours.

## 2. Social-psychological theories of behaviour and change

Tim Jackson (2005), in his review of evidence on consumer behaviour and behavioural change, lists a total of 22 different theories and models that explain people's behaviour. Andrew Darnton (2008a) reviews over 60 social-psychological models and theories of behaviour. Darnton's focus is broader and looks at all kinds of behaviour change while Jackson's review takes the perspective of consumer behaviour, marketing and advertising. The relevant theories also apply when the aim is to get people involved in monitoring and environmental action.

### 2.1 Rational Choice

Rational choice theory is often not recognised as one coherent theory but it is a widespread way of thinking about behaviour and it is also deeply entrenched in institutions and policies of modern (Western) societies. It draws on the intellectual underpinnings of classical economics. Rational choice theory claims that people behave in such a way as to maximise the expected benefits to ourselves as individuals from our actions. Shortcomings of this theory are that it assumes we have complete information about the costs, benefits and impact of our actions. Further developments of this theory to apply to non-purchasing behaviour include the notion that choices are influenced by both, financial and non-financial costs and benefits to the individual. In addition, the literature suggests that "only a limited proportion of pro-environmental behaviour can be regarded as flowing from fundamentally self-interested value-orientations" (Jackson, 2005, 32). Examples are altruistic, pro-social and biopheric<sup>4</sup> value orientations that explain why some pro-environmental behaviours still occur even though they incur private costs to those who engage in them.

There has been a tendency among rational choice theorists to denigrate habitual behaviour as irrational, however, others point out that habits have considerable benefits to human functioning

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<sup>4</sup> Concern for the biosphere

(e.g. I don't need to think about every situation anew but rely on what has worked in the past) and can be considered part of procedural rationality.

## 2.2 Theory of Reasoned Action & Theory of Planned Behaviour

Both, the theory of reasoned action and the theory of planned behaviour date back several decades and have been continuously developed. Although critics argue they are outdated, the more recent theories of behaviour change still draw on some aspects of these two theories.

The theory of reasoned action is perhaps the best-known social-psychological attitude-behaviour model and incorporates external factors (normative social influences) on behavioural intention (Ajzen and Fishbein, 1980). The theory of planned behaviour (Ajzen, 1991) adjusts the earlier theory to incorporate the actor's perceived control over the outcome of his/her behaviour. The underlying assumption is that humans are rational and make systematic use of available information.

Note that this theory looks at **intentions** rather than actual behaviour. The theory describes the relationship between attitudes – intentions – behaviour of an actor, and assumes that changes in awareness and intention lead to action. The 'intentions to behave' are explained from attitudes, social norms and perceived control. One strand of research emphasises the gap between intention and behaviour (cf. Courtenay-Hall and Rogers, 2002)<sup>5</sup> while another strand challenges the extent of the gap between value/attitudes and action (Maio, 2011). As Maio points out, the problem is not that values and actions fail to correspond, but rather that values often fail to **predict specific behaviours** very well.

## 2.3 Value-Belief-Norm Theory & Theory of Interpersonal Behaviour

A premise of Stern's value-belief-norm theory (Stern et al., 1999) is that pro-social attitudes and personal moral norms are significant predictors of pro-environmental behaviour. This means that, people who undertake environmental action have at least some altruistic or moral reason for doing so, or they are motivated by self-serving interests (e.g. I may not care about the impact of my actions on others but may care about the expectations of others on me not to act in anti-social ways).

Stern's model starts from values, which form the basis for beliefs, which in turn underlie norms which dictate behaviour. This means that depending on my values (altruistic, biospheric, egoistic) I am more or less likely to accept that my behaviour impacts on the environment (I am aware of possible consequences and ascribe a certain responsibility to myself and my behaviour). Depending on these beliefs about the impact of my behaviour I form a personal norm which then determines my behaviour, e.g. whether I become an active member in an NGO, support environmental policies or change my private sphere behaviour (e.g. recycling).

Evidence shows that a person with altruistic values is more likely to activate a pro-environmental norm, whereas self-enhancement (egoistic) values tend to be negatively correlated with pro-environmental norms and actions (Stern, 2000). The theory further suggests that behaviour depends

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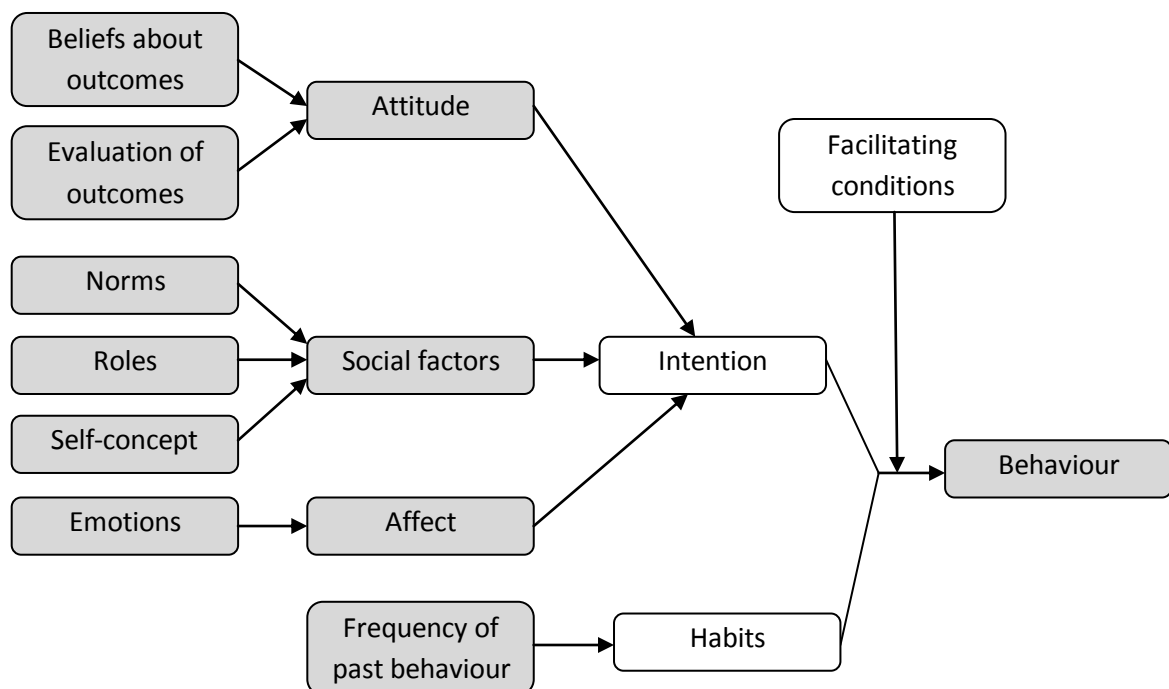
<sup>5</sup> These authors also explore numerous other gaps such as the 'conscious - non-conscious gap' (tied to reason and habit in moral agency) or the 'direct action - indirect action gap' (tied to privatizing environmental morality).



critically on the salience of specific beliefs and values in specific contexts, and that different value orientations can co-exist in the same individual and may all influence behaviour.

Problematic is the weak correlation between personal norms and indicators of pro-environmental behaviour found in empirical studies. This means that while values are of some importance in motivating (or predicting) environmental action, the situational and contextual factors play a considerable role (see also Maio 2011).

Stern (2000) attempted to integrate internal and external factors influencing behaviour in 'attitude-behaviour-context' models. Although he acknowledged that in addition to the three factors (attitudes, contextual factors, personal capabilities) the role of habit must be included, he did not develop a theory to reflect this. Looking at the body of available theory we find that Triandis' theory of interpersonal behaviour is an example where the behaviour-mediating role of habit is considered (Triandis, 1977). He also offers an explicit role for affective factors on behavioural intentions, and highlights the facilitating conditions which must allow intentions to become realised (Figure 2). This extends previous models (but note that this does not necessarily mean chronologically preceding models).



**Figure 2:** Triandis's Theory of Interpersonal Behaviour (source: Jackson 2005, 94)

## 2.4 Persuasion theory

### 2.4.1 Beginnings

Early beginnings of persuasion theory claim that successful persuasion hinges on three key elements (Hovland et al., 1953):

- The credibility of the speaker (the source);
- The persuasiveness of the arguments (the message); and
- The responsiveness of the audience (the recipient).

The model assumes that exposure to information leads to a change in attitude which in turn leads to a change in behaviour. Many past and recent public information campaigns are based on this 'information-deficit-model' where the underlying assumption is that people do not have enough (or the right) information, so if we provide more information this will enable them to change their behaviour (or make 'the right' or reasonable decisions). Although it sounds plausible, empirical evidence fails to support this hypothesis and significant limitations of this linear model have been recognised (McKenzie-Mohr, 2000; Petty et al., 2002)<sup>6</sup>. On the contrary, evidence suggests that learning (i.e. change in behaviour) can occur without any change in attitudes, and that attitude (and behaviour) change can occur without any assimilation of the persuasion message (further references in Jackson, 2005, 106).

Despite the limitations of this theory, the importance of the key elements still appears in behaviour, in particular land manager behaviour. For farmers it has been shown that the source of advice (e.g. the farm advisor and the organisation they belong to) and the persuasiveness of the arguments are just as important in taking up advice as other factors (Juntti and Potter, 2002; Silgo and Massey, 2007; Vanclay, 2004).

### 2.4.2 Elaboration Likelihood Model

The Elaboration Likelihood Model is one of the most influential recent persuasion theories (Petty and Cacioppo, 1981, 1986). It suggests that there are two types of psychological processes involved in attitude change, one taking the route of central processing and one taking the route of peripheral processing.<sup>7</sup>

If the target audience's motivation or ability to engage with the message is low, the peripheral route will be employed. This may either lead directly to a behaviour change, or first to an attitude change which is then followed by a behaviour change.

In cases where an individual is highly motivated and pays mindful attention, the message will be passed through the central processing route. If this route is taken, an enduring attitude change (leading on to behaviour change) is more likely.

A number of recommendations for **successful persuasion** can be taken from this theory:

- It is important to use personally involving messages (as this is more likely to lead to utilisation of the central processing route) with an emotional and imaginative appeal

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<sup>6</sup> McKenzie-Mohr found in their experiment that the social marketing strategy led to a reduced watering of lawns by 54%, whereas it increased by 15% over the same period in the information-only control group.

<sup>7</sup> More detail in Jackson (2005), pages 107f.

- The message should be immediately relevant and direct
- Use a single, well-placed message and one that is very positive (in particular in our message-dense environment, and in order to increase the likelihood that the target audience will utilise the central processing route)
- Persuasive appeals must employ highly credible sources (see also the key elements of early persuasion theory)
- Use commitments (bumper stickers, badges, loyalty schemes) to signal involvement
- Identify 'retrieval cues', i.e. things that will help people bring the persuasive message to mind and remind them (references in Jackson, 2005, 109)

In general, this demands very careful attention to the target audience, knowing their needs and demands as well as what might constitute barriers for them to translate attitudes into behaviour.

## 2.5 Social learning theory, and what motivates people to learn

"The key lesson from theory and the related empirical evidence base is that social learning is a powerful avenue of behavioural change" (Jackson, 2005, 112). Social learning theory highlights the critical role that governments play in providing leadership on environmental behaviours. Failure to exemplify the behavioural changes that policy wishes to see will significantly undermine any information and persuasion campaigns. For example, if agencies are not perceived to be serious about saving paper and water, why should Joe Public care to do so?

Social learning theory (Bandura, 1977) stresses that

- We **learn by trial and error**. Whether we receive a reward or a punishment will determine how we decide to behave the next time round. Rewards can be financial and non-financial, they can come in the form of material goods or in the form of satisfying altruistic motivations (see rational choice in Section 2.1).
- We **learn by observing** how others behave (we learn by imitation but also by counter examples, e.g. parents, peers, those portrayed in the media) and by modelling our own behaviour on what others do and what we see around us.

Note that stealth marketing (involving strategies such as viral marketing and celebrity marketing) draws heavily on ideas of social learning theory. For example, identity-related buying behaviours (cars, appliances) but also whether or not to become involved in environmental activities "are influenced by those on whom my identity is modelled and by those from whom I am hoping to distinguish myself" (Jackson, 2005, 111). While policies aiming to further environmental action can surely learn from these kinds of approaches they also raise difficult ethical and moral issues, e.g. to what extent policies can prescribe what is 'right' now, what choices are 'good' or to what extent individuals are entitled to make free choices.

Related to the point made at the outset or the report that 'people do not like being told what to do' are insights by Kaplan and Kaplan (1989) on the **information processing and problem-solving** propensities of humans. People are motivated:

- To know and understand what is going on: they hate being disoriented or confused;
- To learn, discover and explore: they prefer acquiring information at their own pace and answering their own questions;

- To participate and play a role in what is going on around them: they hate feeling incompetent or helpless.

In a similar vein, Albert Bandura developed a **social cognitive theory** throughout the 1980s and 1990s which explains human behaviour through a mix of cognitive, vicarious, self-regulatory and self-reflective processes geared towards human adaptation and change (Bandura, 1986), not just as reactive organisms shaped by environmental forces or driven by inner impulses. In outlining principles for behaviour change Bandura emphasises self-efficacy which is derived from a) performance accomplishments (mastery), b) vicarious experience (feelings based on the experience of someone else), c) verbal persuasion, and d) physiological states (Bandura, 1997).

While these considerations indicate that online information portals such as SEWeb may incentivise people to learn and discover, they also highlight the challenge of how to involve people. It is likely that people do not feel they can participate and play a role in the website, or the way they are being involved does not appeal to them. A website could be seen as remote, theoretical and non-personal while a share of the population may prefer hands-on, practical approaches with the opportunity for socialising.

Importantly again, in addition to the observation that information on its own rarely leads to attitude or behaviour change, an overload of information may lead to feelings of confusion and helplessness rather than providing orientation or increasing the feeling of control (Kaplan, 2000; Levin, 1993). So while we would hope that increasing the levels of information e.g. about environmental problems will make people become more active in protecting the environment, they may actually be overwhelmed and be paralysed by not knowing where to start or doubting whether they can make a contribution at all (further references in Jackson, 2005, 113). This reasoning draws on the 'perceived behaviour control' construct in the theory of planned behaviour.

## 2.6 Community-based Social Marketing & Adoption Theory

It is helpful to make a distinction between influencing 'one-off behaviour' and 'routine behaviour'. One-off behaviour is related to a decision which needs to be made only once such as the decision to buy an energy-efficient refrigerator or participation in an event to clean up the local park. Routine behaviour is much more difficult to influence (see also discussion on 'breaking bad habits' in Jackson (2005)). A promising approach to encourage pro-environmental behaviour change is community-based social marketing.

**Community-based social marketing** is an approach to policy design which begins with understanding the barriers that people perceive when attempting to engage in a given activity, and integrates the importance of social norms and community engagement in changing behaviours (McKenzie-Mohr, 2000). It follows four consecutive steps: 1) selecting behaviours and identifying barriers; 2) designing a programme to overcome barriers to the selected behaviour; 3) piloting the programme; and 4) evaluation.

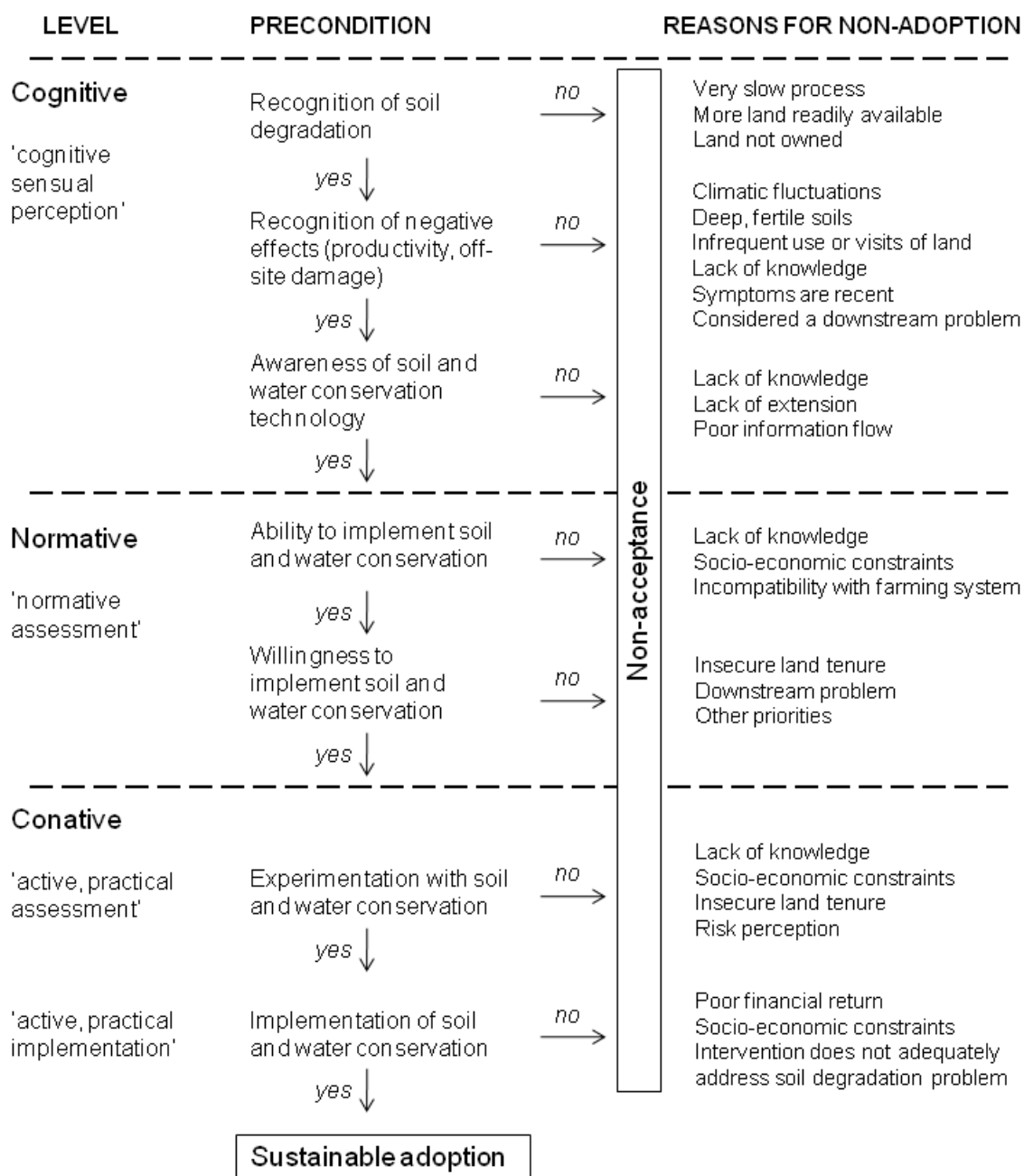
It is important that rather than attempting to promote all possible behaviours to achieve a certain (e.g. environmental) goal, the first step is to identify the barriers to such behaviour, and then to select a specific behaviour to promote. The selection of the behaviour to promote could, for example, be based on what resources are required to overcome the barriers: if this turns out to be too costly or too resource-intensive, another behaviour might be selected.

This approach resembles the '**process of adoption**' described for land manager adoption of soil and water conservation practices (Prager and Posthumus, 2010). The decision making and behaviour in particular of farmers has been widely studied and it is recognised that personal, social, cultural, economic (market), and institutional (policy) factors are influential. A precise ranking of the relevant factors is not possible as their influence will vary across individuals and their context, as well as over time and with the specific behaviour to be promoted.

Figure 3 depicts the process for a farmer or other land manager in relation to soil degradation problems. However, it can also be applied to thinking about how to achieve behaviour change among the public. The first phase is the awareness of a problem and possible solutions. The individual's perception of a problem is at the beginning of the process. Take the example of a part-time working mother of two children. She is convinced that playing outdoors is important for the children's healthy development. Therefore, she takes her children to the local greenspace which has a burn running through it but she is annoyed with the amount of rubbish. Only if she perceives the problem as urgent, and is concerned about negative consequences if the problem is left untreated (e.g. her children getting cuts from broken glass bottles), will she consider acting on the issue. The issue must also be relevant to the individual's current well-being (the mother wants to be sure her children are safe). Only if these conditions are met will the mother be willing to invest her time in searching for a solution.

The second phase is that the individual is not only willing but also assesses that he/she is able to act. The mother must be aware of options (possible behaviours) that she considers suitable to mitigate the problem. If she is convinced that cleaning up the park is the council's responsibility but the council have not responded to her letters, she might give up here. If, however, the mother knows a local community group and gets along well with some of the members she might raise the issue there and the group might organise monthly clean-up days.

The third phase comprises trialling and adopting the new behaviour. Because the mother has the support of her husband on the weekends and is happy to help out, the whole family decides to join one of the clean-up days (trailing behaviour). If they find that the timing is right and does not interfere with other commitments, they like the company of the other people, and the weather is pleasant, they will be much more inclined to join in again. The family may need to adapt existing routines (e.g. get up slightly earlier to have breakfast before the clean-up day, or shift the visit to the grandmother) to be able to adopt the new behaviour. If they have regularly participated, and see that their effort makes a difference (the park is clean and the council agrees to provide support), this environmentally beneficial activity will become permanently adopted. It would help in sustaining this behaviour if additional activities (e.g. the school using the park or helping with the clean-up, a subgroup starting to monitor water quality or wildlife in the park etc.) are linked up.



*Note: The arrows do not imply that one precondition necessarily follows the previous one. Rather, the individual needs to “pass” the group of preconditions at each level and finish positively in order to proceed. In real life, there may be loops, short-cuts, back stepping or interruptions of the process.*

**Figure 3:** Levels and preconditions of the adoption process (Source: Prager and Posthumus 2010)

It is important to realise that this is not a linear process but can be interrupted, discontinued, show overlapping phases, or follow iterative loops depending on whether the conducive factors are met. The process of adoption highlights the importance of removing potential barriers to the desired behaviour as well as the difficulty of predicting the behaviour of every individual due to the enormous amount of factors and their complex interaction in determining decisions and subsequent behaviour.

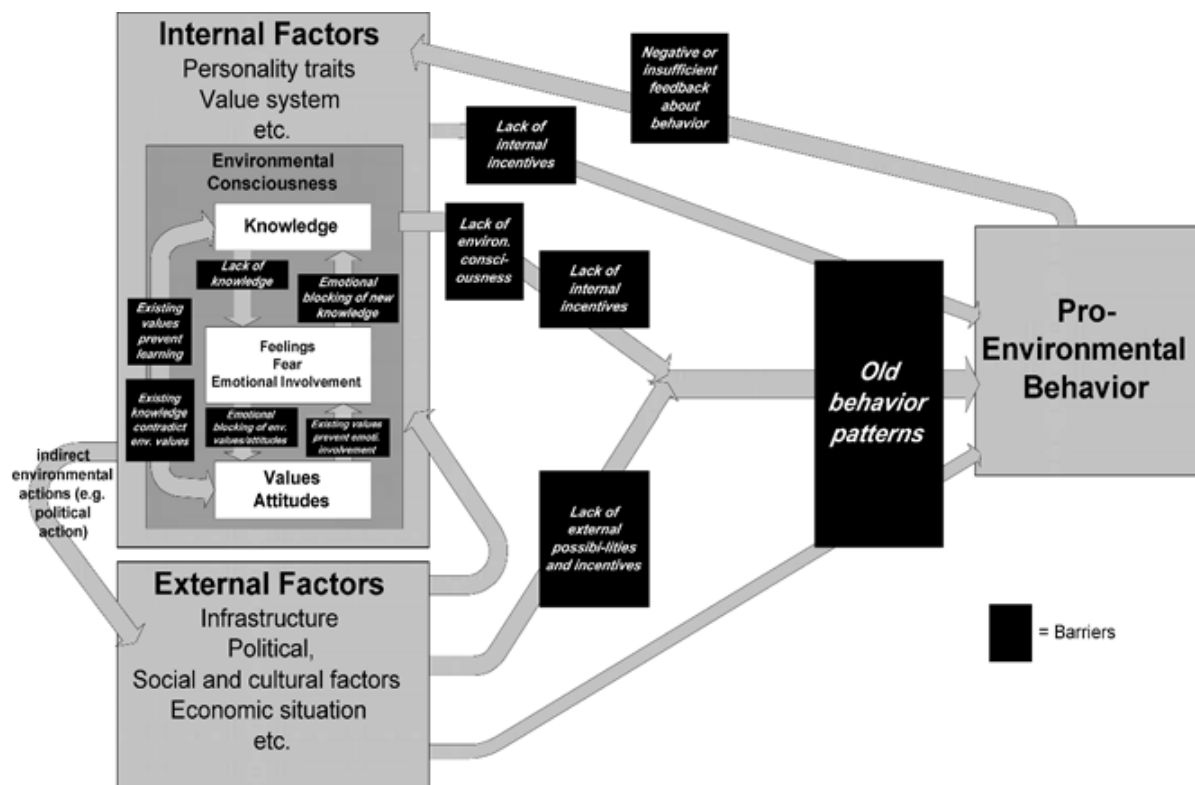
This model of adoption suggests that an understanding of the issue (and assessing it as urgent and relevant) comes first, and is a prerequisite to becoming engaged in environmental action. However, there are also arguments that being engaged in environmental protection will increase understanding of the issue. The reality is likely to be a mix of both.

For completeness, we should note a contribution from sociology called **practice theory**. Sociologists tend to refer to practices rather than behaviours, and through this terminology they put the emphasis on the origins of human conduct in the *structures* of society, rather than in the *agency* of individuals (Giddens, 1984). Practice theory describes “how practices are recognisable entities which exist as concepts in their own right; individuals simply reproduce the practices. While practice theory is an emerging area of study, models are being developed to describe the elements which come together in a practice” (Darnton, 2011, 220). One of these models is Shove’s model of the three elements in a practice: Materials, Meanings and Procedures. In practice theory, individuals are effectively ‘off the model’, and the practice itself, and the elements which comprise it, is the proper area of enquiry (*ibid.*, 220-221). For the case of transport behaviour, materials would include cycling infrastructure or all weather gear, meanings would include the car as a status symbol or reviving the need for daily fresh air and exercise, and procedures would include road skills and scheduling.

Ultimately, practice theory suggests there may be no need to target individuals directly – instead, altering the materials, procedures and meanings which make up the elements of the practice to be changed (Darnton, 2011). This focus on the practice, i.e. the context rather than the individual, resonates with Uzzell’s argument that for effectively influencing behaviours we need to focus on the conditions that drive behaviours rather than the behaviour itself (Uzzell, 2012).

### 3. Summary

As Kollmuss and Agyeman (2002) conclude from their extensive review, all models/ theoretical frameworks have some validity in certain circumstances, which indicates that the question of what shapes pro-environmental behaviour is such a complex one that it cannot be visualized through one single framework or diagram. They nevertheless make an attempt at a comprehensive model (Figure 4).



**Figure 4:** Model of pro-environmental behaviour (source: Kollmuss and Agyeman (2002), 257)

In addition, the following list (based on Michie et al. (2004) as presented by Mearns (2012)) tries to sum up the key determinants of behaviour change:

- Social/professional role and identity
- Knowledge
- Skills
- Beliefs about capabilities (self-efficacy; mastery)
- Beliefs about consequences
- Motivation and goals
- Memory, attention, and decision processes
- Environmental context and resources
- Norms and social influences
- Emotion
- Action planning (crossing the intention/behaviour gap)



## 4. Recommendations

### 4.1 How can policy influence behaviours

From reviewing both the theories and evidence related to behaviour change, the following points should guide the development and implementation of any policy that is intended to change behaviours – or better even, the conditions that drive behaviours:

- Know your target audience – different types of people react to different kind of incentives.
- Know what behaviour you want to change towards which other kind of behaviour; or know what kind of actions you want people to get involved in.
- Consider which factors are likely to influence behaviours and shortlist which key influencing factors the policy/ intervention will target. Identify what has worked in the past.
- Find innovative ways of governance: rather than informing people and telling them what to do, take them on board, include them as partners in deciding on which conditions that drive behaviours should be changed and how best to achieve this.

For a more complete cycle with learning from monitoring and evaluation feeding back in to the development of the intervention see Darnton's (2008b) nine principles for developing interventions based on models of behaviour and theories of change (list in Appendix 1).

In particular the last point, finding innovative ways of governance, is likely to require a change in the mindset of people. Note that Ryan et al. (2001, 646) stress that volunteers "are not free labour" but people with a deep commitment to their work who will keep being involved in environmental activities if their needs are fulfilled (such as meeting learning opportunities and other benefits that they gain from their involvement). For organizational policy and planning, they recommend considering the different needs people have at different times, and that there are many diverse motivations to consider.

Returning to the four core questions posed at the outset and the general observations on how policy can influence behaviour, there is a need to define whose behaviour and what behaviour SEWeb or policies want to influence in which way, and why. I strongly recommend that space is provided for discussions to take place among SEWeb partners to clarify these points. Once partners arrive at a shared understanding for at least some aspects of change that SEWeb wants to achieve, this will be a valuable – and in fact, an essential – basis for the assessment of the project's impact.

Table 1 shows random preliminary suggestions selected from the literature, recent debates and an initial session with SEWeb partners (22 March 2012). Note that the more precisely these four points can be defined, the easier it will be to identify characteristics of the target audience (who), to provide justification and incentives for behaviour change (why), and to measure whether the policy or tool was effective in achieving the 'ideal' behaviour (what, change to).

**Table 1:** Starting points for thinking about what kind of behaviour change is aimed at

Who	What	Change to	Why
<ul style="list-style-type: none"> <li>• All primary school children in urban areas larger than x inhabitants</li> <li>• All pensioners living in single households</li> <li>• All people living in district x and commuting further than y km to their work place</li> <li>• Rural properties with septic tanks</li> <li>• Businesses that manufacture x in rural area y</li> <li>• All members of NGOs involved in monitoring spread of invasive species x</li> </ul>	<ul style="list-style-type: none"> <li>• Garbage separation (recycling)</li> <li>• Participation in local events organised by x and targeted at improving water quality</li> <li>• Buying behaviour for electrical appliances</li> <li>• Choice of transport</li> <li>• Environmental citizenship</li> </ul>	<ul style="list-style-type: none"> <li>• Neatly separate their rubbish into 4 different bins and put out once a fortnight</li> <li>• Participate in one clean-up event per month</li> <li>• Buy only refrigerators with energy efficiency rating A or B, only when their previous fridge breaks down</li> <li>• Increased share of people cycling to work</li> <li>• Become a member of an environmental NGO</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce landfill</li> <li>• Increase identification with local environment</li> <li>• Learn about species</li> <li>• Reduce electricity consumption</li> <li>• Reduce money and resources that need to be spent on the upkeep of roads, reduce noise and air pollution</li> <li>• Membership of environmental NGOs is assumed to improve the environment</li> </ul>

In addition to these four points, early feedback from SEWeb Partners indicated that another useful question to ask would be “What kind of information do people need in order to allow them to change their behaviour?”

#### 4.2 How can SEWeb influence behaviours

The recommendations specified for policies also apply to how we can look at SEWeb and its capacity to influence behaviours. Returning to the research programme underlying the public engagement work stream of the SEWeb project there are a number of insights to be drawn from this report.

The evidence in the literature points to the sobering fact that provision of environmental information – especially if this is the only tool employed – is not effective in influencing behaviours. However, better on-line information about the environment may support the move to increased levels of environmental action and monitoring undertaken by the interested public. Although some theories support this assumption, it is difficult to prove empirically. Some suggestions have been made in the research strategy accompanying the LIFE+ project, e.g. people that participate in the focus groups can be asked for their contact details and then follow up calls at mid-term and at the end of the project can be used to track any changes in behaviour. This would not, however, prove empirically that it was the exposure to environmental information on SEWeb. Participants can be asked during phone calls what they think has caused them to become involved in/ continue to be involved in environmental action.

An alternative to measuring individual-level interventions (which are likely to be the most easily evidenced) by observing individuals' actions or asking them to respond to surveys, is the approach to seek out where behaviour change has occurred, and a new behaviour has become normative in society. Following this alternative approach leads us to a narrative – for instance, the story of how recycling became normative (Darnton, 2011). This narrative will include numerous elements such as EU legislation, fiscal measures and market mechanisms, innovative recycling practices and new institutions, and the high visibility of the new infrastructure strongly bringing in social norms. Such a narrative format can show how an array of measures and stakeholders come together during the process of social change – but cannot account empirically for their relative influence (ibid.). Darnton (2011, 221) also cautions that “while such narratives are arguably the most accurate way of assessing what works in policymaking for behaviour change, they do not respond well to calls for cost-benefit analysis of interventions (...) If a systemic understanding of behaviour is applied, empirical support for particular approaches is likely to prove illusory; but we must also guard against the danger that what we can measure becomes the sum total of what we aim to achieve”.

We should be realistic in our expectations of what SEWeb can achieve. If the website is embedded into a broader, albeit coherent and focussed suite of actions, chances are higher to stimulate behaviour change to better appreciate, use, manage and protect the environment. Although ‘quick fixes’ exist (‘nudging’ people) and this option is attractive, it is likely to only lead to temporary and superficial behaviour change. Genuine behaviour change is more likely if the conditions that influence behaviours change. People need to have the opportunity for social learning, for example if they can get involved in a combination of easily accessible and attractive local events, if positive feedback is reinforced from various sources, if there are rewards for volunteering, combined with a feeling of ‘doing the right thing’ and making a difference (Appendix 2).

Key points that should shape any approach include:

- Make it easy to become involved;
- Ensure that incentive structures and institutional rules favour such activities;
- Enable access.

Practical ideas taken from these key points are, for example:

- Organise events so that they fit into the daily routines of the target audience;
- Provide contact details so people can get in touch with questions (and make sure phone and emails are answered promptly);
- Ensure website surfaces are intuitive and easy to use, e.g. for entering environmental information, for following links to events (and be aware that a share of the population will neither have access to nor have an interest in using websites);
- Develop devices (e.g. mobile phone apps) that people can use for recording sightings which feed data directly into a database without people having to make extra efforts at entering data manually;
- Make it feel like playing; introduce reward system (e.g. points for number of recordings which can be swapped for a discount on xyz, or gold stars in iSpot for a certain number of species identified correctly).

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## Appendices

### Appendix 1

Darnton (2008b) develops nine principles for developing interventions based on models:

1. **Identify the audience groups and the target behaviour.** If faced with a complex behaviour break it down into its component behaviours and/or adopt a systems thinking approach
2. **Identify relevant behavioural models.** Draw up a shortlist of influencing factors
3. **Select the key influencing factors** to work on. Use these to design objectives in a draft strategy for the intervention
4. **Identify effective intervention techniques** which have worked in the past on the influencing factors selected
5. **Engage the target audience for the intervention** in order to understand the target behaviour and the factors influencing it from their perspective
6. **Develop a prototype intervention** based on the learning from working with the actors. Cross-check this against appropriate policy frameworks and assessment tools
7. **Pilot** the intervention and monitor continuously
8. **Evaluate** impacts and processes
9. **Feedback** learning from the evaluation

### Appendix 2

#### An example of which components SEWeb could incorporate and how the impact could be evaluated

This section outlines an example of a behaviour which SEWeb may wish to promote (environmental action and monitoring), including a procedure for measuring and documenting impact. This example considers many of the lessons that might be drawn from theory and suggests how to incorporate them in a practical example.

- **Who:** targeting the general public across all of Scotland, although the approach may inherently focus on towns and cities more than rural and remote areas with very low population density
- **What:** the behaviour addressed is the individual's involvement in a set of environmental actions including monitoring
- **Change to:** we want to increase the frequency of this behaviour, expressed by the percentage of a random sample of the population who state they have been involved in at least one environmental action in the past 12 months
- **Why:** the underlying assumption is that by experiencing the environment, taking care of it, we increase the individual's concern for the environment which will influence their behaviour in other environmentally relevant aspects of their life.
- **Information needed:** The SEWeb website needs to provide easily accessible information about environmental activities taking place including where, when, which objective etc.

The mechanism employed is that people are offered a choice of which environmental action they want to get involved in (e.g. all available as links from the SEWeb site), i.e. people are not told what they should do but encouraged to choose for themselves (potentially from a list but not limited to), and to be creative in identifying other environmental actions which might benefit the environment.

Process:

1. Appeal to schools, NGOs and other interested parties to become involved in a survey to take place in their locality. They would agree to carry out a baseline, mid-term and ex-post survey of a random sample of the public. This survey will measure the percentage of people in the survey who say they have taken part in at least one environmental activity (e.g. litter pick, monitoring or recording activity, tree planting). The aim is to increase this percentage across the mid-term and ex-post survey.
2. Required: initially high publicity to make as many people as possible aware of the competition and to get as many towns/ organisations as possible to participate. Follow on publicity on progress, keeping the campaign fresh in mind, promote awards/prizes to be gained.
3. The process is set up so as to introduce an element of competition among localities to see who can get the highest increase in the percentage of people involved in environmental action (e.g. double it over the three years)
4. Questionnaire includes the following questions:
  - Have you taken part in at least one environmental activity/event in the past 12 months?
  - If yes, which one? (respondents must be able to name the event)
  - Has SEWeb helped you to find out about it?
  - Would you like to provide your email (or alternative contact details) to have a follow up interview in 12 months? (Follow up interviews with respondents will allow to track individual's behaviour – rather than an average percentage – over time)
5. The organisation (school, NGO etc) who agrees to conduct the survey would need to agree to also conduct the mid-term and ex-post survey, using the same methods, in order to allow comparability and validity of results.

The following ideas put forward in theories are taken into account:

- *Not telling people what to do*: people can suggest what environmental activities they were involved in, whether or not these count can be decided based on a prepared list or assessed once the data is fed back to SEWeb partners
- *Make it fun*: include elements of game and competition
- *Let people explore and take charge*: enable school children to do the survey and promote environmental action among their peers so as to increase 'their' percentage
- *Immediacy and relevance*: focus on environmental action in people's own locality (but not restricted to) so likely for people to see benefits if involvement increases. They can also decide to run campaigns for specific events of their choice
- *Removing barriers*: develop tool to allow survey input to be directly into handheld device which then needs simple synchronising with SEWeb server or develop app for phone

- *One message*: Do your bit for your local environment – become involved and make a difference!
- *Link to other organisations and activities*: e.g. to NGOs and their activities, or to eco-schools – perhaps participation in this could earn them another green flag?
- *Immediate rewards*: anyone could blog and post their contributions on the facebook site (as set up by students of Stirling Secondary School who took part in Space Unlimited workshop), selected posts could feature on SEWeb site, be put out to the media (radio, newspaper, to promote ‘success stories’ and the fun factor

Associated benefits: There are also other expected benefits which we will not be able to measure in the scope of SEWeb, e.g. when schools or others start organising their own events; or when the people conducting the survey (e.g. young people) learn how to do research (the survey), when people learn how to use technology (app, handheld tool), or when people can potentially be involved in analysis and dissemination activities.

There are a number of issues that need clarification before this particular example could be put into practice:

- Who is a trusted sender of the message (e.g. SEPA, SHN, other SEWeb partners)?
- Is the message relevant to the audience? (It will not be relevant to all people equally but they have the option to make it relevant)
- Will people conducting the survey need any training? What could go wrong in the data collection and analysis?
- Is there a risk of manipulating results (e.g. double counting, faking responses)?
- Is there a risk of negative consequences of the competitive element? Might remote rural areas feel disadvantaged?
- Which environmental actions should be on the initial list? Who would approve additional actions and what criteria should be used?
- Is it expensive or time-consuming to develop the app/ handheld tool?