



Research Report

# Behavioural policy 'nudges' to encourage woodland creation for climate change mitigation



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# Behavioural policy 'nudges' to encourage woodland creation for climate change mitigation

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# Summary

It can sometimes prove difficult to engage landowners and land managers in woodland creation schemes, and this affects prospects for meeting national woodland planting targets and associated climate change mitigation objectives. Although reluctance is often attributed to the low financial attractiveness of such schemes, wider factors – including long-held cultural views on changing land use and perceptions of the urgency of tackling climate change – can also be important.

This report examines evidence provided in studies by the government's Behavioural Insights Team and others and uses this evidence to investigate how 'nudge' type policies might be applied to encourage woodland creation for climate change mitigation. Nudges are ways of influencing people's choices without limiting the options, or appreciably altering their relative costs. They cover a range of interventions, including changing the way choices are presented or framed, the default option, the environment in which choices are made, and highlighting successes and choices made by others. A range of approaches are reviewed including 'nudge', 'ask', 'steer' and 'think' but for simplicity they are combined together as 'nudge type approaches'.

This report also takes account of recent work investigating why woodland creation is not being undertaken at a rate needed to meet existing national targets and the prospects for increasing it. It draws upon a recent evidence review of the motivations, decision making and behaviour of British landowners and their agents, and their apparent lack of interest in woodland creation, and interviews with stakeholders concerning prospects for creating 'productive woodland' in Scotland. The report helps identify different types or primary objectives of landowners and land managers, and the different approaches that may be needed for them – including consideration of the extent to which traditional 'cultural polarisation' between farmers and foresters could be overcome by re-framing woodland creation in terms of climate change mitigation.

Key findings of this study include:

- There is a range of nudge type approaches which could be used to encourage woodland creation for climate change mitigation. These include addressing perceived barriers to woodland creation, and encouraging private woodland creation by highlighting successes and by the public sector leading by example.
- Nudge type approaches can also prime target audiences with woodland creation success stories and through demonstration sites; this may be particularly effective at key moments, such as following media coverage of climate change.
- Intervention points, where nudges could be used, were identified in relation to five different stages of 'motivational readiness' of individual landowners, land managers and investors: pre-contemplation, contemplation, preparation, action and maintenance.
- Implementation of nudge type approaches should be tailored towards different types of landowners and land managers, and stages of decision making.
- A combination of different nudges may need to be applied as a series of steps in conjunction with other policy instruments.
- Nudges have limitations (e.g. some effects may only have a fleeting influence on choices). Nonetheless, the policy impacts of nudges may be prolonged where, as in the case of woodland creation, choices relate to long-term land use, or they lead to a cultural shift in landowner or land manager perceptions away from a focus solely on agricultural activities.
- There is also a need to consider related approaches such as 'ask' and 'think' in the context of existing regulatory frameworks and climate change policy.
- Wider nudge type approaches and information dissemination may be needed to overcome popular misconceptions and fatalistic attitudes affecting willingness to create woodland or undertake other mitigation activities. They may also be required in overcoming optimism bias and highlighting the urgency of mitigation activities if the international target of limiting average global temperature rise to no more than 2°C above pre-industrial levels is to be met.





# Introduction

Evidence indicates that woodland creation is generally a cost-effective method of climate change mitigation compared with a range of alternatives (Valatin and Price, 2014). It can also be cost-effective in reducing downstream flood risk (e.g. see Nisbet *et al.*, 2011) and thereby help society adapt to climate change.

It can sometimes prove difficult to engage landowners and land managers in woodland creation schemes, and this affects prospects for meeting national woodland planting targets and associated climate change mitigation objectives. Although reticence is often attributed to the low financial attractiveness of such schemes, wider factors – including long-held cultural views on changing land use and perceptions of the urgency of tackling climate change – can also be important.

Insights from behavioural economics have indicated that individuals are influenced by a number of cognitive factors in making decisions and that certain ‘nudges’ may help guide choices in a particular direction.

## What constitutes a nudge?

Thaler and Sunstein (2008) define a nudge as ‘any aspect of the choice architecture\* that alters people’s behaviour in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid’. However, other definitions also exist – including the broader definition of Hausman and Welch (2010) as ‘ways of influencing choice without limiting the choices or making alternatives appreciably more costly in terms of time, trouble, social sanctions, and so forth. They are called for because of flaws in individual decision making, and they work by making use of those flaws’.

The practical examples described in the ‘Evidence of nudge type approaches being applied’ section on page 4 of this report also cover ‘steer’, ‘ask’ and ‘think’ approaches (see ‘Behavioural insight approaches and applicability’ on page 3 for definitions), but for simplicity they are combined together as ‘nudge type approaches’.

## Why nudge?

There is a recognition that ‘all government policies include, to a greater or lesser extent, some element of intended behaviour change’ (The House of Lords, 2011) and the magnitude of this influence can be considered on a continuum of intervention, ranging from unobtrusive monitoring to the elimination of choice (Table 1).

Although it is recognised that woodland creation in the UK is underpinned by regulations and supported by financial incentives, and thus operates across a range of areas covered by Table 1, this report focuses on how changes could be made within the areas represented by the four rows in the bottom right of Table 1 (termed ‘choice architecture’ or ‘nudges’) – including issues relating to background information, framing and setting.

Nudges are relatively unobtrusive influences on individual decision making and choices. A benefit of using a nudge is that (unlike regulation) it is not dictatorial and does not require additional financial incentives or disincentives, instead guiding decision making and choices.

The view that background information, framing and the setting in which choices are made plays a role in shaping preferences differs from the standard conception of decision making adopted in economics. Nudge type approaches draw upon insights from behavioural economics that show people’s ability to make decisions is constrained by their ability to obtain and process information. Understanding the influence of mental shortcuts, habits and cognitive factors – including the role for learning, is needed to increase the likelihood of policies succeeding (John *et al.*, 2011).

\*Choice architecture is the background information, framing and setting in which choices are made.

**Table 1** Table of interventions, indicating a continuum that ranges from strong influence through regulation in the top rows of the table to more subtle influences in the bottom rows of the table (from The House of Lords, 2011).

|                                                                        | Interventions category  |                                         | Examples of policy interventions                                                                                                                                                                                                    |                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------|-------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regulation of the individual                                           | Eliminate choice        |                                         | Prohibiting goods or services e.g. banning certain drugs                                                                                                                                                                            |                                                                                                                                                                                                                                                |
|                                                                        | Restrict choice         |                                         | Restricting the options available to individuals e.g. outlawing smoking in public places                                                                                                                                            |                                                                                                                                                                                                                                                |
| Fiscal measures directed at the individual                             | Guide and enable choice | Fiscal disincentives                    | Fiscal policies to make behaviours more costly e.g. taxation on cigarettes or congestion charging in towns and cities                                                                                                               |                                                                                                                                                                                                                                                |
|                                                                        |                         | Fiscal incentives                       | Fiscal policies to make behaviours financially beneficial e.g. tax breaks on the purchase of bicycles or paying individuals to recycle.                                                                                             |                                                                                                                                                                                                                                                |
| Non-regulatory and non-fiscal measures with relation to the individual |                         | Non-fiscal incentives and disincentives | Policies which reward or penalise certain behaviours e.g. time off work to volunteer                                                                                                                                                |                                                                                                                                                                                                                                                |
|                                                                        |                         | Persuasion                              | Persuading individuals using argument e.g. GPs persuading people to drink less, counselling services or marketing campaigns.                                                                                                        |                                                                                                                                                                                                                                                |
|                                                                        |                         | Choice architecture (Nudges)            | Provision of information                                                                                                                                                                                                            | Providing information in e.g. leaflets showing the carbon usage of household appliances<br><br><i>*Regulation to require businesses to use front of pack nutritional labelling, or restaurants to provide calorific information to menus</i>   |
|                                                                        |                         |                                         | Changes to physical environment                                                                                                                                                                                                     | Altering the environment e.g. traffic calming measures or designing buildings with fewer lifts<br><br><i>*Regulation to require businesses to remove confectionery from checkouts, or the restriction of advertising of unhealthy products</i> |
|                                                                        |                         |                                         | Changes to the default policy                                                                                                                                                                                                       | Changing the default option e.g. requiring people to opt out of rather than opt in to organ donation or providing salad as the default side dish.                                                                                              |
| Use of social norms and salience                                       |                         |                                         | Providing information about what others are doing e.g. information about an individual's energy usage compared to the rest of the street.<br><br><i>*Regulation to require companies to provide information about average usage</i> |                                                                                                                                                                                                                                                |

\*Demonstrates how regulation of business might be used to guide the choice of individuals, thus distinguishing it from regulation which restricts or eliminates the choice of individual.

## Methodology

Our study built on the findings from a research report on insights from behavioural economics for ecosystem services valuation and sustainability (Moseley and Valatin, 2013) and used a web-based search to identify examples of the application of nudge type approaches that could perhaps be transferred to encouraging woodland creation for climate change mitigation. The first search for evidence was done using the search engine Google. Then, an exploration of academic search engines was used to find journal articles that focused on theory, rather than application, of nudge type approaches. The terms 'steer', 'ask', 'think' and 'nudge' were used during the searches (the 'Behavioural insight approaches and applicability' section on page 3 gives more information on the differences between the four approaches). Each result providing evidence of the application of a nudge type approach was examined to determine which elements of the approach used might have applicability to woodland

creation. Where a particular approach such as 'think' or 'ask' could be identified (e.g. by the use of a process, such as asking citizens to 'think') the specific approach is named. Where this cannot be done, the generic term 'nudge type approaches' is used in this report.

We then explored the application of the nudge type approaches in relation to the five stages of 'motivational readiness' categories that characterise individuals making decisions as described in the Stages of Change model (Prochaska, Diclemente and Norcross, 1992). Further consideration is given to the attitudes, motivations and willingness to plant trees of different types of landowners and land managers, and the development of a new typology of them relevant to woodland creation for climate change mitigation.

# Results

The first two subsections of the results define nudge type approaches and their applicability, then report evidence of nudge type approaches being applied successfully. The third and fourth sections consider appropriate intervention points and different landowner and land manager types.

## Behavioural insight approaches and applicability

Although nudge is a commonly recognised term for describing approaches to influence decision making, as it can have short-term effects and does not actively engage the individual, three related approaches (steer, ask and think) were also included in this study. This section provides brief descriptions of each of the approaches, though it is worth noting that a large proportion of the published evidence in the 'Evidence of nudge type approaches being applied' section on page 4 comes from the Behavioural Insights Team, who have employed nudge in their trials, rather than ask, think or steer. Table 2 summarises the differences between the approaches.

**Nudges** are ways of influencing people's choices without limiting the options, or appreciably altering their relative costs.

**Steer** (Grist, 2010) suggests that enabling individuals to understand the way humans make judgements can empower them to feel more confident about their own decision making. In this way, it is suggested that individuals can steer their instinctive (automatic) behaviour, through learned habits, towards better decisions.

**Ask** approaches aim to complement behavioural economics approaches by asking the target audience to articulate their

objectives and the behaviours they can adopt to achieve these (the 'ask' element). For example they may be asked – are there changes you have wanted to make? what would make a better neighbourhood for you? what steps can you take? (Ampt and Ashton-Graham, n.d.). The ask approach suggests that a combination of conversation and/or coaching leads to higher uptake and longer lasting change.

**Think** asserts that citizens, given the right context and framing, can think themselves collectively towards a better understanding of the problems and solutions (John, Smith, and Stoker, 2009). The approach is based upon discussion and deliberation. Where existing choices are characterised by lack of attention to the viewpoints of others, public agencies can create conditions in which these are more fully taken into account. Think approaches can also help address potential concerns with nudge associated with lack of legitimacy and with ethical issues including paternalism and being viewed as manipulative (John *et al.*, 2011).

A briefing paper (DEA/Involve, 2010) reviewing the approaches of nudge and think, along with 'shove' (which restricts, by law, the choices individuals can make, e.g. makes something illegal) concluded that:

- 'Nudge' is effective for specific, limited shifts in behaviour such as recycling.
- 'Think' is effective at building support and legitimacy for the big, transformational changes that we need in society, such as decarbonising the economy. 'Think' can be particularly powerful in building people's ability and motivation to participate in and drive those transformational changes.
- 'Shove' often helps to create the conditions under which 'nudge' is most effective.

**Table 2** Differences between nudge type approaches. Stage/time of application descriptions refer to the five stages of motivational readiness, explained in the 'Intervention points for woodland planning' section on page 6.

| Approach     | Active or passive | Input required                              | Potential application              | Time of application                     |
|--------------|-------------------|---------------------------------------------|------------------------------------|-----------------------------------------|
| <b>Nudge</b> | Passive           | Low-input                                   | Initial decision making            | Pre-contemplation, action               |
| <b>Steer</b> | Active            | Questioning own judgements                  | Challenging preconceptions         | Pre-contemplation, contemplation        |
| <b>Ask</b>   | Active            | Discussion                                  | Encouraging engagement in changes  | Contemplation                           |
| <b>Think</b> | Active            | Collective discussion over a period of time | Collective discussions, evaluation | Contemplation, preparation, maintenance |

## Evidence of nudge type approaches being applied

This section focuses on evidence from the use of nudge type approaches in non-woodland contexts. All the studies listed were undertaken in the UK, unless mentioned otherwise. Many studies, particularly those undertaken by the UK government's Behavioural Insights Team (also called the 'Nudge Unit'), draw upon the findings from the MINDSPACE report on behavioural science (see Dolan *et al.*, 2010). The elements focused upon in the MINDSPACE report are shown in Table 3. These elements were further developed and grouped into a framework of four categories represented by the acronym EAST (Easy, Attractive, Social and Timely; Halpern, 2013; see Table 4). The available evidence noted on the following pages is presented in an order based on this framework, and also includes 'exemplify', a form of commitment where influential organisations lead by example.

**Table 3** MINDSPACE elements from Dolan *et al.* (2010)

|                    |                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------|
| <b>Messenger</b>   | We are heavily influenced by who communicates information                                               |
| <b>Incentives</b>  | Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses |
| <b>Norms</b>       | We are strongly influenced by what others do                                                            |
| <b>Defaults</b>    | We 'go with the flow' of pre-set options                                                                |
| <b>Salience</b>    | Our attention is drawn to what is novel and seems relevant to us                                        |
| <b>Priming</b>     | Our acts are often influenced by subconscious cues                                                      |
| <b>Affect</b>      | Our emotional associations can powerfully shape our actions                                             |
| <b>Commitments</b> | We seek to be consistent with our public promises, and reciprocate acts                                 |
| <b>Ego</b>         | We act in ways that make us feel better about ourselves                                                 |

**Table 4** Categorisation of behavioural economics elements into easy, attractive, social and timely groups. Source: Halpern (2013). All the MINDSPACE categories are included implicitly, with the exception of 'Ego' which is represented by personalisation.

|                   |                                                                  |
|-------------------|------------------------------------------------------------------|
| <b>Easy</b>       | Defaults, simplification, remove friction                        |
| <b>Attractive</b> | Salience, messenger, personalisation, affect, incentive design   |
| <b>Social</b>     | Norms, networks, reciprocity, active commitments, eyes and faces |
| <b>Timely</b>     | Priming, framing, key moments                                    |

## Easy (Making it easier to do things)

### Defaults and prompted choices

- Many people tend to 'go with the flow' of pre-set options (Dolan *et al.*, 2010), so providing a set of options that benefits both the individual and society seems sensible. For example, a commonly held view is that organ donation is a good thing to do, but often people have not registered as they have not got around to it. One approach to increase registration is to introduce a 'prompted choice', where individuals have to make a choice when completing a form (e.g. applying for a new driving licence). This has been successfully applied to organ donation registration in several US states; for instance in Illinois donor numbers increased from 38% to 60% when all driving licence applicants were asked to decide whether or not to register as a donor (Abadie and Gay, 2006).

### Simplification

- Many people dislike form filling. One approach to make the completion of forms easier for individuals is to pre-populate forms. This both saves time and reduces errors. For example, college enrolment rates for high school seniors in two US states rose by eight percentage points (from 34% to 42%) as a consequence of pre-populating application forms and providing help to complete the form (Bettinger *et al.*, 2012).
- A trial at Jobcentre Plus in Loughton, Essex, to get people back into work, reduced the traditional paperwork involved at initial meetings. Instead they used proactive commitment devices (essentially, an agreement to a course of action that might not otherwise be chosen but that produces a desired result) which involved asking a jobseeker what they were planning to do in the next two weeks, and at what specific time. This introduced an anchoring effect which makes it more likely the jobseeker will follow through. Jobseekers in the treatment group were 15–20% more likely to be off benefits within 13 weeks than those in the control group (Behavioural Insights Team, 2012b).

### Remove friction

- Despite huge subsidies and information demonstrating that insulation pays for itself within months there has been very low uptake of loft insulation schemes in the UK. The problem (or barrier) was identified as the hassle of clearing an attic before it can be insulated. A pilot trial in 2011, where insulation firms offered to clear the lofts and dispose of unwanted junk at cost increased uptake

fivefold, even though there was an increased cost to the customer (Behavioural Insights Team, 2011).

## Attractive (If you make things attractive to people, they are more likely to act)

### Salience

- Adjusting the format of forms can help make them clearer and action more likely (e.g. by highlighting key messages you can draw people's attention to important information, or actions required of them). This approach has been applied (along with social norms) to increase tax compliance by doctors and dentists in the UK, resulting in a 14% increase in responses. The voluntary disclosures were worth over £1 million and also reduced resources required for follow-up letters (Behavioural Insights Team, 2012a).

### Messenger

- Individuals can be heavily influenced by who communicates information. Prior to the launch of the Green Deal, which helps people make energy-saving improvements to their homes, the Department of Energy & Climate Change (DECC) set up a network of local energy efficiency 'champions', who would commit to promoting the benefits of energy efficiency improvements within their community (Behavioural Insights Team, 2011).

### Personalisation

- Using personal language and messages (e.g. adding hand-written instructions on sticky notes with the author's initials), has been demonstrated to double response rates to questionnaires (Behavioural Insights Team, 2012a). The Ministry of Justice trialled personalised text reminders to pay fines. Messages that began with the recipient's name led to a 10% increase in people making a payment compared to a standard text reminder.

### Affect

- Strong emotional feelings can have a big effect on decision making and feelings of disgust are particularly strong. To address high levels of diarrhoea in Ghana, an advertisement showed mothers and their children walking out of bathrooms with a glowing purple pigment that contaminated everything they touched. This created a sense of disgust and led to a tripling in the percentage of people washing their hands after using the toilet (Nudge blog, 2008).

## Incentive design

- Installation of energy efficiency measures is characterised by immediate up-front costs and long-term financial benefits, and this often results in inertia as humans tend to discount future energy saving and focus on the short term. The Behavioural Insights Team and DECC explored how to increase the uptake of the government's Green Deal by offering short-term incentives. Two approaches were used: the first offered a one-month council tax holiday, while the other offered vouchers redeemable at Homebase and Argos (Behavioural Insights Team, 2011). The results of the initiative will be published on the Behavioural Insights Team website.

## Social (Tell people what others are doing)

### Social norms

- We are strongly influenced by what others do (Dolan *et al.*, 2010). By describing what most people are doing (descriptive norms), people are made explicitly aware of other people's good behaviour. This has been demonstrated to be effective in encouraging recycling, energy and water efficiency, and reducing littering (Schultz *et al.*, 2007).
- There is evidence that referring to the social norm of a particular area has an even greater effect. For example, publicising the fact that 9 out of 10 people in their local area pay their taxes on time led to a 15% increase in payment of taxes in that area of Britain (Behavioural Insights Team, 2012a).
- Trials have been undertaken to determine how people refer to social norms through the comparison of their energy use and CO<sub>2</sub> emissions in relation to their neighbours (Behavioural Insights Team, 2011). An analysis of random controlled trials of 600 000 households in the USA, where residents were supplied with a report comparing their energy use with their neighbours, suggested an average reduction in energy consumption of 2.0% (Allcott, 2011).
- The introduction of free-to-use bicycles in London increased the social norm of cycling and led to a reported increase in bicycle sales (Behavioural Insights Team, 2010).

### Networks

- A trial to test the effect of varying levels of discount for energy efficiency products, depending on how many people opt in to the offer, was undertaken in two Greater

London local authorities. Apart from introducing a small financial incentive, the aim was to create a signal that others are taking up the offer and form a social norm. Discounts ranged from 10% for two households, to 15% for three households and 25% for five households, thus giving people incentives to encourage others in their local community to take up the offer with them (Behavioural Insights Team, 2011).

## Commitment (and exemplify)

- The Behavioural Insights Team worked with the NHS and Boots UK to develop a smoking cessation programme. The programme encouraged positive behaviour (stopping smoking) through combining incentives with a commitment in the form of a signed 'contract' where participants keep or lose rewards depending on whether they pass regular smoking tests. The study cites evidence suggesting that people entering into a commitment with another individual or group are more likely to respond in a positive way (Behavioural Insights Team, 2010).
- To demonstrate the government's commitment to reducing its own carbon emissions, the Prime Minister committed central government to cutting emissions from its office estate by 10% between 14 May 2010 and 13 May 2011. The 10% target was 'significantly exceeded' (Behavioural Insights Team, 2011) and the government is now seeking to reduce emissions by 25% by 2015.
- DECC invited organisations to make a public commitment to reducing their impact on the environment, as part of a new green Responsibility Deal (Behavioural Insights Team, 2011). Many individuals, businesses and other organisations (e.g. Royal Mail, O2, Adidas) have signed up to the 10:10 project ([www.1010uk.org](http://www.1010uk.org)) to pledge to reduce their carbon emissions by 10% in a year.

## Timely (Make things timely and relevant and key decision-making points)

### Priming

- Individuals are influenced by subconscious cues. At a transit station in Singapore people are primed just before they decide between taking the stairs or the escalator. This has saved power and helped people develop healthy habits. The escalator is switched off when not in use, and this has two effects. The first is that the usual sound and movement is absent and the habitual attraction towards the escalator is numbed. The second is that anyone unfamiliar with the power-saving facility may think the escalator is not working. The individual is primed into

choosing the stairs over the escalator and this has led to an increase in stair use at the station (iNudgeYou, 2012).

### Framing

- Many people assign financial decisions into different 'mental accounts' even though this may financially disadvantage them (e.g. a savings jar for a holiday while there is an outstanding credit card debt). This behaviour can be used to influence how government payments to individuals are spent. For example, if the label 'Winter Fuel Payment' is used, individuals are almost 14 times as likely to spend the money on fuel than would have been the case had their incomes been increased in other ways (Beatty *et al.*, 2011).

### Key moments

- It was suggested that the salience of smoking cessation interventions could be enhanced by 'increasing the profile of support and rewards in the critical period two or three days into the programme, when the negative effects of withdrawal are especially pronounced' (Behavioural Insights Team, 2010).
- Behaviour change is considered most likely at key 'moments' in people's lives such as leaving home, having children, moving home and retiring (Thompson *et al.*, 2011). Furthermore, evidence suggests that inheritance is a key moment in the lives of farmers, at which point significant change can occur and they may be open to new opportunities (Lawrence and Edwards, 2013).

## Intervention points for woodland planting

Woodland creation by a landowner or land manager involves a process of awareness, consideration and decision making. Within this process a number of intervention points can be identified, where nudges may be applied to influence the attitudes of landowners and land managers to woodland creation.

In the following tables we draw upon an adapted version of the Stages of Change model (Prochaska, Diclemente and Norcross, 1992), a widely applied cognitive model which identifies five stages of 'motivational readiness' categories that characterise individuals making decisions. These stages, are defined as:



1. Pre-contemplation  
Landowner or land manager is not considering, or is unaware of, woodland planting as an option.  
The landowner or land manager who is aware of woodland planting has no intention to change behaviour in the foreseeable future.
  2. Contemplation  
Landowner or land manager is aware of woodland planting as an option. Serious consideration of change in land use (from non-forestry to forestry).
  3. Preparation  
Landowner or land manager is making a commitment to plant.
  4. Action  
Landowner or land manager plants (i.e. modifies their land use to include planting).
  5. Maintenance.  
Landowner or land manager works to maintain the planted area and realise benefits.
- The rationale behind a staged model is that individuals at the same stage should face similar problems and barriers, and thus can be helped by the same type of intervention. For each stage of intervention, Table 5 indicates (i) behaviours or actions associated with these stages, (ii) insights from behavioural economics and (iii) suggested 'interventions' that the Forestry Commission or others could make using findings from behavioural economics/nudge type approaches.

**Table 5** Points of intervention for encouraging woodland creation (planting) indicating the different stages for landowners or land managers and how insights from behavioural economics can suggest potential interventions by the Forestry Commission or others. Insights from behavioural economics elements within the EAST framework are shown in bold text.

| STAGE ONE – PRE-CONTEMPLATION STAGE                                                                           |                                                                                                                                                                      |                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Behaviours and actions                                                                                        | Insights from behavioural economics                                                                                                                                  | Potential interventions                                                                                                                                                                                                                    |
| Increasing information about woodland planting (includes benefits of planting)                                |                                                                                                                                                                      |                                                                                                                                                                                                                                            |
| Reading and seeing information about planting (e.g. TV and radio; press; specific communications or leaflets) | <b>Priming</b> – people behave differently if they have been 'primed' by certain cues beforehand, e.g. words, sights. Anchoring – relies heavily on an initial value | Associate positive images and words with woodland creation, (e.g. protects us from flooding, and helps to cool our planet/environment). At the same time avoid negative associations which may 'anchor' future views on woodland creation. |
|                                                                                                               | <b>Framing and simplification</b> – can facilitate information processing                                                                                            | Produce simple materials and use tables rather than text                                                                                                                                                                                   |
| Conversations with peers, family and others.                                                                  | Context and learning – collective discussions aid familiarisation with issues and process                                                                            | Encouragement and facilitation of opportunities for group discussions about woodland planting at land management events (e.g. game fairs). Ideally led by peers.                                                                           |
| Experiencing (and expressing feelings about) planting                                                         |                                                                                                                                                                      |                                                                                                                                                                                                                                            |
| Seeing planting in practice (e.g. on neighbouring land)                                                       | <b>Social norms</b> – people make choices based upon the perceived or informed view of others.                                                                       | Increase awareness and acceptance of woodland planting (seeing woodland creation occurring on peers' land has the potential to affect social norms).                                                                                       |
| Encountering planting or planting messages at events (e.g. country fair)                                      | <b>Exemplify</b> – leading by example                                                                                                                                | Highlight planting for climate change mitigation, particularly within region                                                                                                                                                               |
| Cultural or inter-generational predisposition against planting                                                | Cultural polarisation, mental accounting – land may be mentally assigned as for farming and not for woodland                                                         | Promotion of woodland planting as part of integrated land management/whole farm plans. Collaborate with non-forestry colleagues, (e.g. National Farmer's Union, Catchment Sensitive Farming).                                              |
| Assessing how planting affects physical environment and carbon balance                                        |                                                                                                                                                                      |                                                                                                                                                                                                                                            |
| Consideration of carbon and wider impacts or benefits (e.g. landscape, biodiversity) of planting              | <b>Priming, salience, framing</b> – Information presentation                                                                                                         | Tailor presentation material to landowners or land managers, (e.g. small farm concerns, estate owners, investors). Also consider the context (setting), and tailoring discussions to the individual or group.                              |

**Table 5** continued

| STAGE TWO – CONTEMPLATION                                                                       |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Behaviours and actions                                                                          | Insights from behavioural economics                                                                                                       | Potential interventions                                                                                                                                                                                                                                                                                                                                |
| Re-assessing how one feels and thinks about planting, especially with respect to own objectives |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                        |
| Seeking clarification of benefits of planting relative to own goals                             | Loss aversion – incentives                                                                                                                | Emphasis of top-up grant availability as a time-limit may encourage take up to avoid missing out                                                                                                                                                                                                                                                       |
|                                                                                                 | <b>Networks</b> – using social networks to encourage collective behaviour                                                                 | Provide a higher level of grant if a threshold of applicants is reached                                                                                                                                                                                                                                                                                |
|                                                                                                 | Hyperbolic discounting – a requirement for more compensation in the near future than for longer time periods                              | For some landowners or land managers lump sums are preferred but for others, smaller, regular payments mirror the pattern from agriculture. There is a need to match the psychological preferences of landowners or land managers, as undertaken through the annual payments of the Farm Woodlands Scheme and Farm Woodland Premium Scheme.            |
|                                                                                                 | <b>Reciprocation</b> – people reciprocate help                                                                                            | Approach the situation from the landowner or land manager's perspective and ask what their land management objectives are and how forestry can help, (e.g. biomass for fuel; shelter for livestock/crops giving greater yield; increasing biodiversity). If offered help the landowner may then be more likely to agree to engage as a reciprocal act. |
| Considering visual aspects of planting                                                          | Information presentation and <b>salience</b> including visualisations (GIS map) of new woodland, contribution to climate mitigation, etc. | Tailored material, framed to emphasise climate change mitigation and other benefits                                                                                                                                                                                                                                                                    |
|                                                                                                 | Revisiting/reconsidering previous generational attitudes towards planting.                                                                | Use novel techniques (e.g. visualisation and metrics of the effects of woodland creation) within forestry and woodland advocacy events (aimed at those considering planting).                                                                                                                                                                          |
| STAGE THREE – PREPARATION                                                                       |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                        |
| Behaviours and actions                                                                          | Insights from behavioural economics                                                                                                       | Potential interventions                                                                                                                                                                                                                                                                                                                                |
| Makes a commitment to plant                                                                     |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                        |
| Identifying available and appropriate land for planting                                         | <b>Commitment</b> – through public 'promises', e.g. 'we should have more woodland'                                                        | Encouraging public pledges to create woodland for climate change mitigation (publishing pledges on a public or landowner or manager website).                                                                                                                                                                                                          |
| Register land (if applying for grant)                                                           | Mental accounts – for different areas of land                                                                                             | Allocation of land for woodland investment or labelling of grant support                                                                                                                                                                                                                                                                               |
| Plan (including species selection)                                                              |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                        |
| Seeking reassurance from peers and family                                                       | Learning effects – people's values and attitudes can change when information is exchanged in a constructive way                           | Facilitate learning and knowledge exchange, rather than just providing materials                                                                                                                                                                                                                                                                       |
| Applying for (and securing) planting grant                                                      | <b>Defaults and prompted choices</b> – people will go for the default option                                                              | Make woodland creation the default grant option to steer landowners or land manager towards a particular purpose (e.g. climate change mitigation).                                                                                                                                                                                                     |
| Identifying contractor or planting stock supplier                                               |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                        |



**Table 5** continued

| STAGE FOUR – ACTION                                                               |                                                                                             |                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Behaviours and actions                                                            | Insights from behavioural economics                                                         | Potential interventions                                                                                                                                                                     |
| Arranges woodland planting                                                        |                                                                                             |                                                                                                                                                                                             |
| Engage contractor (or agent) or obtain trees and plant                            | <b>Networks</b> – information, presentation and framing                                     | Support landowner and land manager organisations pooling/sharing information and expertise on woodland planting and maintenance.                                                            |
| Undertake forestry or woodland management training                                | <b>Remove friction</b> – remove any ‘sticking points’ that may deter individual from acting | Offer a tree planting extension service at cost to landowners and managers                                                                                                                  |
| Dealing with sceptical or otherwise negative ‘others’ likely to question planting | <b>Framing, simplification</b> – making it easier                                           | Where criticism is related to ‘an onerous application process’, reduce the bureaucracy burden for applicant through simplifying and pre-populating forms and supporting the role of agents. |
| Communicate benefits of planting to ‘others’ likely to question planting          | <b>Social norms</b>                                                                         | Communicate woodland creation as the preferred social norm                                                                                                                                  |
| Join forestry or woodland organisation                                            | <b>Networks</b> – to support and help individuals in woodland creation                      | Help people create or join groups that can share woodland creation experiences                                                                                                              |
| Engage in local forestry or woodland initiatives                                  |                                                                                             |                                                                                                                                                                                             |
| Engage in and view planted ground to see benefits                                 | <b>Social norms</b>                                                                         | Encourage view of having woodland as the preferred social norm                                                                                                                              |
| Collect grant payment                                                             |                                                                                             |                                                                                                                                                                                             |

| STAGE FIVE – MAINTENANCE                                                                                        |                                                                                                                                                                                                   |                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Behaviours and actions                                                                                          | Insights from behavioural economics                                                                                                                                                               | Potential interventions                                                                                         |
| Maintains woodland planting                                                                                     |                                                                                                                                                                                                   |                                                                                                                 |
| Review plans                                                                                                    | Maintenance of woodland planting as a <b>social norm</b> . Maintenance of woodland created, desire to plant new woodland and promotion of woodland creation to other landowners and land managers | Encourage landowner or manager to become a ‘woodland champion’ to reinforce woodland planting as a social norm. |
| Conduct inspections                                                                                             |                                                                                                                                                                                                   |                                                                                                                 |
| Conduct vegetation management and thinning operations or contract vegetation management and thinning operations |                                                                                                                                                                                                   |                                                                                                                 |
| Consider further planting (to increase/maximise benefits)                                                       |                                                                                                                                                                                                   |                                                                                                                 |
| Leading local planting discussions or initiatives                                                               | Reinforce woodlands and woodland planting as a <b>social norm</b>                                                                                                                                 | Promote landowner or manager as ‘woodland champion’ to other landowners or land managers.                       |
| Demonstrating planting to peers                                                                                 | <b>Networks</b><br>Using social networks to encourage collective behaviour                                                                                                                        |                                                                                                                 |
| Harvest wood products                                                                                           | <b>Reciprocation of support</b>                                                                                                                                                                   |                                                                                                                 |
| Allow use or provide access (to enable further/wider benefits to be realised)                                   |                                                                                                                                                                                                   |                                                                                                                 |

## Landowner and land manager types

A number of studies have attempted to segment landowners or land managers in relation to their apparent attitudes and motivations for woodland management and/or willingness to plant trees. In principle, landowners and land managers can be subdivided in several ways. Dandy *et al.* (2013) highlight the need to select categories that support the objectives of the segmentation, and with this in mind we have developed a new typology that we consider meets the aims of this study.

Existing typologies tend to place landowners or land managers along a continuum, from small-scale farmers for whom short-term grant surpluses can provide sufficient incentives to create woodland for multiple objectives, to inward investors who buy and plant entire farms in order to maximise long-term timber revenues (Stubbs, 2011, Lawrence and Edwards, 2013, Quick *et al.*, In Prep). Adapting this approach, the following indicative typology was chosen. These descriptions need to be seen as generalisations: there are many intermediate types and exceptions within each group.

- **Farmers.** Their land is likely to be managed for multiple objectives including non-market benefits; trees, if planted, would be integrated into farming and other land uses. Farmers are often relatively cash poor and hence responsive to woodland creation grants and prospects of short-term income (woodfuel, amenity); future timber revenues from planting are likely to be of little interest. They are a diverse group, including hill farmers, profitable farmers on prime agricultural land, tenants and crofters, and 'hobby' farmers and community groups who are relatively new to land management.
- **Estate owners/managers.** Traditional estates are similar to farms in that any woodland creation would need to be integrated into land managed for multiple benefits. However, estate owners typically differ from farmers in the larger size of landholding. There may be greater access to capital from other parts of the enterprise (e.g. farming) which can subsidise forestry operations, and a greater willingness and ability to plan and manage land for longer-term objectives, to benefit from increasing the capital value of the estate, and from tax relief. Timber revenues are likely to be an important factor in decisions, as are the uncertainties associated with future timber prices and climate change. As well as privately owned estates, non-governmental organisations (NGOs) and public agencies (including the Forestry Commission) also

plant new woodland, typically for environmental or social benefits.

- **Inward investors.** These are cash-rich institutional investors (including pension funds and multinational companies) who allocate perhaps 5–10% of their portfolio to forestry. They typically buy and plant whole farms or estates with the sole objective to maximise internal rate of return primarily from conifer timber sales. Woodland creation grants help, and will influence precise forest design, but are not essential to the overall decision to plant. Such investors may benefit from publicising the incidental public benefits of woodland creation (e.g. carbon sequestration) in reports and websites but are unlikely to accept significant financial losses through delivering these benefits.
- **Socially responsible investors (or impact investors).** This is a small but growing category of investors with a similar profile to the 'inward investors', who fund planting schemes (typically owned and managed by others) that have tangible public benefits (again, particularly carbon sequestration, but possibly also landscape and biodiversity) so that they can publicise it (e.g. in corporate social responsibility statements in annual reports).

It would be possible to divide these categories further, in particular 'farmers' which includes a diversity of people and enterprises from marginal hill farmers to large-scale farmers on prime agricultural land. In principle, sub-groups could be defined according to key factors that influence decisions to plant trees, such as access to capital, overriding management objectives, scale of operation, existing woodland cover, tenure arrangements etc. However, the lists of interventions given in Tables 5 and 6 (demonstration sites, events, guidance etc) apply equally to most or all of the examples within each of the four groups, and there is little to be gained by introducing further subdivisions in the typology. Later on, once we begin to refine the descriptions of interventions and think about delivery, it will become easier to be more explicit about the precise target groups and how best to define them to meet particular objectives.

Having said that, one further distinction – the history/ experience of woodland creation – is helpful to understand the links between landowners or land managers and types of intervention listed in Tables 5 and 6. Arguably, this factor cuts across all four groups, creating a total of eight categories. It also maps closely onto the Stages of Change model. Thus, landowners or land managers with no history of planting are more likely to be at the pre-contemplation and contemplation stages, while those with previous

experience of woodland creation are more likely to be at the preparation, action and maintenance stages.

The category of landowners or land managers with no previous planting experience could be extended to cover potential land managers who are considering, or could be encouraged to consider, buying a farm or estate to plant trees.

In principle, these eight categories could be mapped against each of the interventions for each stage of change in Table 5. However, for simplicity, just the four main groups (farmers, estate owners/managers, inward investors and socially responsible investors) have been mapped onto the broad types of intervention summarised in Table 6.

Other characteristics of landowners and land managers may also be important to account for in designing successful policies to stimulate woodland creation by, for example, targeting different interventions to groups most likely to change their behaviour (e.g. due to a longer-term outlook) from those thought least likely to. Although understanding local conditions is key, a synthesis of recent evidence suggests some factors (e.g. education and farm size) may be more frequently associated with adoption of farming practices that reduce existing negative externalities and increase positive ones, while others (e.g. age) are more frequently associated with lack of adoption. However, this evidence is mainly based upon American and African case studies (from a study by Knowler and Bradshaw (2007) – reported in OECD (2012, Fig. 2.1, p. 18)).

To the extent that people tend to discount changes they consider will not make a significant difference, or resist new information that contradicts their ideological beliefs (Repetto, 2008), interventions could be differentiated according to existing attitudes towards climate change and environmental conservation. To increase their perceived relevance to individual landowners and land managers, interventions might also be differentiated according to the existing proportion of the farm that is woodland, and the potential for expansion and to contribute to wider community goals such as downstream flood risk reduction.

As farmers also take account of views of others – whether family, friends or the local community – wider interventions targeting rural attitudes on the importance of woodland creation for climate change mitigation may also be needed. This may be especially the case where wider issues (e.g. commercial deer stalking on neighbouring land and maintaining public access) are viewed as creating significant barriers to woodland creation.

# Discussion

This section considers the application of nudge type approaches to woodland creation for climate change mitigation and makes suggestions for evaluating the success of the approaches.

## Potential application of nudge type approaches to woodland creation for climate change mitigation

The examples in the 'Evidence of nudge type approaches being applied' section on page 4 suggests possibilities for applying nudge type approaches to encouraging woodland creation for climate change mitigation. Table 6 summarises

the evidence, suggests applications and indicates which landowner or land manager types are likely to be influenced.

**Table 6** Summary of evidence and potential application to woodland creation for climate change mitigation.

| Element                              | Behavioural insight                                                   | Evidence                                                                                                                  | Application to woodland creation                                                                                                                                                              | Landowner or land manager type                                                       |
|--------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Defaults and prompted choices</b> | Individuals are asked to make a choice as part of an application form | Applying behavioural insights to health – requirement to choose or decline organ donation                                 | Adding woodland creation (with an emphasis on climate change mitigation) to application forms for grants for land management .                                                                | Farmers, estate owners                                                               |
| <b>Simplification</b>                | Make it clearer and easier                                            | Applying behavioural insights to reduce fraud, error and debt – simplify forms                                            | Consider design of information and application forms, pre-populating application forms                                                                                                        | Farmers, estate owners or managers, inward investors, socially responsible investors |
| <b>Remove friction</b>               | Identifying and removing actual or perceived barriers                 | Behaviour change and energy use – loft clearance service for insulation installation                                      | Identify any 'sticking points' in the bureaucratic and physical process of woodland creation and offer a service to deal with them.                                                           | Farmers, estate owners or managers, inward investors, socially responsible investors |
| <b>Salience</b>                      | Drawing attention to key points                                       | Applying behavioural insights to reduce fraud, error and debt –highlight key messages                                     | Consider design of information and application forms, highlighting key messages                                                                                                               | Farmers, estate owners or managers, inward investors, socially responsible investors |
| <b>Messenger</b>                     | We are heavily influenced by who communicates information             | Behaviour change and energy use – identify community champions, to promote the benefits of energy efficiency improvements | Encourage landowner or land manager to become a 'woodland champion' to reinforce woodland planting as a social norm.                                                                          | Farmers, estate owners or managers, socially responsible investors                   |
| <b>Personalisation</b>               | Personal messages increase response rates                             | Applying behavioural insights to reduce fraud, error and debt – hand-written messages or personalised texts               | Add hand-written instructions and contact details to information packs and application forms                                                                                                  | Farmers, estate owners or managers, socially responsible investors                   |
| <b>Affect</b>                        | Using strong feelings to prompt decisions                             | Creating strong feelings to promote healthy behaviours – using emotive advertising to increase hand washing               | Highlighting regions or business types with a high carbon footprint and emphasising the negative environmental effects (thereby highlighting the opportunities offered by woodland creation). | Farmers, estate owners or managers, socially responsible investors                   |
| <b>Incentive design</b>              | People focus on short-term rewards                                    | Behaviour change and energy use – vouchers and council tax holidays to incentivise government's Green Deal                | Provide short-term incentives for woodland planting such as helping to meet other management objectives (e.g. improving adjacent habitat).                                                    | Farmers, estate owners                                                               |

Table 6 continued

| Element                            | Behavioural insight                                                                                         | Evidence                                                                   | Application to woodland creation                                                                                                                                                                                                                                                                | Landowner or land manager type                                                       |
|------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Social norms</b>                | Tell people what others are doing so that people are made explicitly aware of other people's good behaviour | Behaviour change and energy use – energy use in relation to neighbours     | Communication of woodland planting by peers and within locality. Use of an 'injunctive norm' will reinforce that this is pro-social behaviour and avoid the 'boomerang effect' where individuals with a 'good' rating move to a 'poorer' social norm. See 'Applying positive messages' section. | Farmers, estate owners or managers, socially responsible investors                   |
| <b>Networks</b>                    | Using social networks to encourage collective behaviour                                                     | Behaviour change and energy use – group discounts                          | Harness social networks to promote woodland creation through restructuring grant payments to pay increasing rates once threshold levels of woodland creation achieved.                                                                                                                          | Farmers, estate owners or managers                                                   |
| <b>Commitment</b>                  | Public commitments makes following through more likely                                                      | Applying behavioural insights to health – smoking 'contracts'              | Encouraging public pledges to create woodland for climate change mitigation (publishing pledges on a public or landowner/land manager website).                                                                                                                                                 | Socially responsible investors                                                       |
| <b>Exemplify</b>                   | Encourages individual's desire for reciprocity and fairness                                                 | Behaviour change and energy use – reducing government department emissions | Encouraging woodland creation through example and by public commitments                                                                                                                                                                                                                         | Farmers, estate owners or managers, socially responsible investors                   |
| <b>Priming</b>                     | People are influenced by subconscious cues                                                                  | Changing behaviour for stairs and escalators                               | Prime target audiences with woodland creation success stories and demonstration sites                                                                                                                                                                                                           | Farmers, estate owners or managers, inward investors, socially responsible investors |
| <b>Framing and mental accounts</b> | People assign decisions to different mental accounts                                                        | Labelling winter fuel payments                                             | Promoting woodland creation as part of integrated land management – including options for agroforestry and/or as an investment for a retirement fund.                                                                                                                                           | Farmers, estate owners or managers                                                   |
| <b>Key moments</b>                 | Timing interventions at critical points                                                                     | Applying behavioural insights to health – smoking support                  | Increase engagement with landowners and land managers following events linked to climate change and publication of high profile (e.g. Intergovernmental Panel on Climate Change) climate change reports, and at key life stages when open to change (e.g. inheritance).                         | Farmers, estate owners or managers, socially responsible investors                   |

## Removing barriers to woodland creation

Barriers to woodland creation by private landowners or land managers are well researched and arguably well understood (e.g. Lawrence and Dandy, 2014). They include issues concerning:

- grants and other financial incentives, including the bureaucracy associated with grant applications;
- the advisory system, dominated by agricultural advisors and agents often with a limited understanding of forestry or interest in promoting it;

- opposition to woodland creation encountered during the consultation process, especially for larger productive schemes; the related problem of a perceived lack of political support for forestry compared to farming (Lawrence and Edwards, 2013).

Nudge type approaches potentially help overcome all of these barriers. Current interventions to encourage woodland creation already incorporate many approaches that could be described as 'nudge', albeit through the use of different terminology. An example is the idea of 'removing friction'. It is very well understood that the bureaucracy around grant applications hinders woodland creation (Forestry Regulation Task Force, 2011), with bodies such as Confor lobbying to streamline the process and reduce the uncertainty

associated with the regulatory process. Arguably, behavioural economics has less to contribute to this area of intervention. However, important insights do appear to emerge from the analysis, highlighting aspects that are often overlooked in current efforts to encourage tree planting. Five are outlined below.

- The idea of ‘prompted choices’ highlights how forestry and farming grants have been administered through separate systems within the Common Agricultural Policy: the Single Farm Payment (SFP), the main source of grants for farmers, was under Pillar One, while the funding for woodland creation grants was administered as part of the Rural Development Programmes under Pillar Two. Many farmers are reported to operate solely with grants from SFP, and ignore the forestry measures, which would require them to engage with an additional level of unwelcome bureaucracy. Possibly, woodland creation would be encouraged if both farming and forestry options were included in the same administrative procedure.
- The importance of the ‘messenger’, ‘social norms’, ‘networks’ and ‘priming’ nudges highlights the need for a more in-depth, interactive kind of outreach work with landowners and land managers, especially farmers and estate owners. Demonstrations and advice provided through trusted intermediaries (e.g. leaders of agricultural machinery rings and cooperatives), rather than reliance on a unidirectional knowledge transfer approach through traditional forestry agents, could enhance sharing of knowledge and social learning. This may help break down the barriers between farming and forestry.
- The notions of ‘commitment’ and ‘exemplify’ apply particularly to the category of socially responsible investors. Policymakers could have a considerable potential impact on woodland expansion by supporting this expanding group of investors to sell a positive green message to their stakeholders, shareholders and customers.
- The idea of ‘mental accounts’ helps us to rethink our engagement with farmers and estate owners, by highlighting the fact that land use across any given landholding is rarely homogeneous – farmers apply different objectives and decision-making criteria to different parts of their estate, with small pockets of woodland creation integrated into the farm seen to deliver desirable non-market benefits. One key to effective engagement is to understand how different parts of the farm contribute to the overall enterprise, both economically and culturally, and hence to ‘think like a farmer’ rather than a forester or policymaker.

- The importance of ‘framing’, combined with knowledge of the motivations behind woodland creation, suggests ironically that in some cases the best way to promote tree planting could be to downplay the benefits of climate change mitigation, which are realised at a global scale, and highlight the local or personal benefits. These benefits might include short-term cash surpluses on grants or short-term benefits from the production of woodfuel. In other cases, and of particular relevance to nudge type approaches, appealing to the idea held by many farmers and estate owners that they are custodians of the land, with a duty to enhance local biodiversity, amenity and landscape, may prove most fruitful.

## Implementation and evaluation

This section considers the implementation and evaluation of the nudge type approaches. The MINDSPACE report (Dolan *et al.*, 2010) suggests a process of engagement, which fits well with encouraging woodland creation:

- Explore – whose behaviour you want to change
- Enable – start from where people are
- Encourage – through interventions
- Engage – deliberation
- Exemplify – demonstrate and lead by example
- Evaluate – find out what works

This report has explored a typology of landowners and land managers and has identified the stages where interventions may be the most effective. These interventions need to be tested and supported by deliberative approaches and through the Forestry Commission and others demonstrating best practice. Evaluation of the interventions will provide evidence and support the application of the most effective interventions. Ideally this would be based upon randomised control trials, but much could be learned by application with trial areas.

## Implementation issues

For the interventions described here to be effectively implemented, there are a number of issues that should be considered:

- While an attempt has been made to identify approaches that can be broadly applied, these are likely to require tailoring to the different landowners and land managers and the different stages, rather than a ‘one size fits all’ approach.



- A series of steps is likely to be required and these will vary depending on the type of landowner or land manager. For example, encouraging woodland creation for climate change mitigation for estates and small landowners may require a combination (or sequence) of passive nudges to increase general awareness, followed by more active behaviour. For large companies facing a cap on carbon emissions (a shove), subsequent nudges to encourage woodland creation for climate change mitigation are likely to be more successful where woodland creation is framed as an alternative to reducing emissions. Nudges include social norms (as this behaviour becomes viewed as the acceptable choice).
- Although this report focuses on encouraging woodland creation for climate change mitigation, it is recognised that individuals decide to create woodland for a wide range of reasons. Promotion of the wide range of benefits that woodland creation can offer a landowner or land manager (e.g. shelter for livestock, flood and diffuse pollution mitigation, recreation) will help to provide the appropriate nudge to persuade landowners and land managers to plant.
- One of the important findings from the MINDSPACE report is that individuals are heavily influenced by who communicates the information (the messenger) and this has been demonstrated to be important in, for example, encouraging individuals to pay tax (Behavioural Insights Team, 2012a). Further work is required to identify potentially important individuals, networks and organisations through which 'nudge' policies could be applied and championed – including via non-forestry organisations such as nature conservation bodies and the National Farmers Union. This type of approach was used by DECC to set up a network of local energy efficiency 'champions' ahead of the Green Deal launch. These people would commit to promoting the benefits of energy efficiency improvements within their community (Behavioural Insights Team, 2011).
- Criticism of nudge approaches suggests that some effects that are rapid and perhaps subconscious, such as priming, salience and affect, have only a fleeting influence (Dolan *et al.*, 2010), but during this short period of time a decision or behaviour may have changed.

## Applying positive messages

Although there has been low uptake of woodland creation grants, the message that certain landowners or land managers do not plant trees or that farmers are set against woodland planting should be avoided. This reinforces

perceptions (priming) and may create a social norm 'boomerang effect' where it is acceptable not to engage in woodland planting because no one else is. This effect can be countered by using an injunctive norm (Cialdini, 2003), for example applying the statement 'many landowners would like to plant more trees' after the descriptive norm.

## Evaluation

The Behavioural Insights Team evaluated the effectiveness of interventions by comparing how people responded to a given set of different choices, including a control (usually the existing situation). For example, trials of new UK tax office letter formats were considered simple and cost-free interventions. In the (2012–13) financial year alone, it is estimated that the new letters have helped bring forward around £210 million of tax revenue. At UK government's Civil Service Awards on 21 November 2013, the trials won the Innovation award (Behavioural Insights Team, 2013). The interventions suggested in this report aim to follow the nudge principles of being low cost, and many focus on the 'how', 'when' and 'who' of engagement. In order to evaluate the woodland creation interventions suggested here, similar trials to those undertaken by the Behavioural Insights Team would be required. The ease of implementation, cost and potential effectiveness of interventions need to be considered and discussed with the Forestry Commission prior to application.

## Parallels with other initiatives for climate change mitigation

There are overlaps between encouraging woodland creation and the development of the government's household Renewable Heat Incentive which, prior to its launch in October 2012, aimed to consider how behavioural insights should influence the design of the policy. The Behavioural Insights Team suggested further investigation of a number of areas, including examining:

- differences in householders' intentions and their capacity to engage with schemes;
- how much people consider payments made in the future rather than paying immediately;
- how different householders account for various risks and hassles when weighing up the costs of changing heating;
- what value householders place on 'being green' that mean they might act anyway;
- whether householders find doing nothing the more attractive or easy option, and whether some additional incentive or support will be needed to trigger uptake.

# Conclusions

This Research Report has provided evidence of where nudge type approaches have been explored and has considered how they can be applied to woodland creation for climate change mitigation for the different types of landowners or land managers. It has also highlighted that influencing landowners or land managers, particularly those who have not planted woodland before, is a dynamic process within which a number of intervention points can be identified. While suggestions are made for the application of these interventions, further thought needs to be given to how they can be implemented, monitored and evaluated.

Popular misconceptions (e.g. of simply warming Britain to a Mediterranean climate) or fatalistic attitudes (e.g. of the negligible influence of individual choices) may currently affect willingness to undertake climate change mitigation activities. Wider nudge type policies and information dissemination may be needed to overcome these misconceptions or attitude. Such policies may also be required in overcoming optimism bias and highlighting the urgency of mitigation activities in order for the international target of limiting average global temperature rise to no more than 2°C above pre-industrial levels to be met.

The Behavioural Insights Team studies tested different approaches to evaluate their effectiveness. There is a similar requirement to undertake experiments or studies of encouraging woodland creation to determine whether these approaches will make a difference and provide a sound evidence base for woodlands and forestry.

The Behavioural Insights Team recommend a 'test, learn, adapt' approach: behavioural economics insights are tested in their context, lessons are learned regarding which aspect is working (or not), and then the approach is adapted to yield even better results next time.

It is important to address information overload through advisors/advisory services helping out (someone doing the paperwork), and better design of information and forms. The language used should be accessible.

A large proportion of the available evidence presented here focuses on nudge, rather than ask, think or steer approaches. This may be because of the high profile of nudge approaches and because this has been the focus of the Behavioural Insights Team, who have designed many of the trials undertaken. Another obvious aspect is that the deliberative nature of ask and steer approaches is likely to require more resources. However, it is clear that deliberation

('engage' within the MINDSPACE model) is an important aspect of encouraging woodland creation and further work is needed to identify where these approaches can be used together most effectively.



# References

- ABADIE, A. and GAY, S. (2006). The impact of presumed consent legislation on cadaveric organ donation: a cross-country study. *Journal of Health Economics* **25**(4), 599–620.
- ALLCOTT, H. (2011). Social norms and energy conservation. *Journal of Public Economics* **95**(9–10), 1082–95.
- AMPT, L. and ASHTON-GRAHAM, C. (n.d.). *Ask is the new nudge: lessons from effective behaviour change projects*. Presentation.
- BEATTY, T.K.M., BLOW, L., CROSSLEY, T.F. and O'DEA, C. (2011). *Cash by any other name? Evidence on labelling from the UK Winter Fuel Payment*. IFS Working Paper 11/10. Institute for Fiscal Studies, London.
- BEHAVIOURAL INSIGHTS TEAM (2010). *Applying behavioural insight to health*. Cabinet Office Behavioural Insights Team, London.
- BEHAVIOURAL INSIGHTS TEAM (2011). *Behaviour change and energy use*. Cabinet Office Behavioural Insights Team, London.
- BEHAVIOURAL INSIGHTS TEAM (2012a). *Applying behavioural insights to reduce fraud, error and debt*. Cabinet Office Behavioural Insights Team, London.
- BEHAVIOURAL INSIGHTS TEAM (2012b). *New BIT trial results: helping people back into work* [Internet]. BIT blog 14 December 2012. [www.behaviouralinsights.co.uk/blogpost/new-bit-trial-results-helping-people-back-work]. Accessed August 2014.
- BEHAVIOURAL INSIGHTS TEAM (2013). *Behavioural Insights tax trials win Civil Service award* [Internet]. BIT blog 22 November 2013. [www.behaviouralinsights.co.uk/blogpost/behavioural-insights-tax-trials-win-civil-service-award]. Accessed August 2014.
- BETTINGER, E.P., LONG, B.T., OREOPOULOS, P. and SANBONMATSU, L. (2012). The role of application assistance and information in college decisions: results from the H&R Block FAFSA Experiment. *The Quarterly Journal of Economics* **127**(3), 1205–42.
- CIALDINI, R. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science* **12**(4), 105–9.
- DANDY, N., AMBROSE-OJI, B., HANDLEY, P. and WATTS, K. (2013). *Land Management Networks Project. Work package 2 final report: Network analysis and segmentation*. Forest Research, Farnham.
- DEA/INVOLVE (2010). *Nudge, think or shove? Shifting values and attitudes towards sustainability. A briefing for sustainable development practitioners*. A briefing building on a House of Lords roundtable organised by the Development Education Association and Involve.
- DOLAN, P., HALLSWORTH, M., HALPERN, D., KING, D. and VLAEV, I. (2010). *MINDSPACE: Influencing behaviour through public policy*. Cabinet Office/Institute for Government, London.
- FORESTRY REGULATION TASK FORCE (2011). *Challenging assumptions, changing perceptions*. Forest Regulation Task Force.
- GRIST, M. (2010). *Steer. Mastering our behaviour through instinct, environment and reason*. RSA Action and Research Centre, London.
- HALPERN, D. (2013). *Applying behavioural insights*. Glasgow, 29 May 2013. Presentation.
- HAUSMAN, D.M. and WELCH, B. (2010). Debate: to nudge or not to nudge. *The Journal of Political Philosophy* **18**(1), 123–36.
- INUDGEYOU (2012). *The stairs to fitness* [Internet]. [www.inudgeyou.com/health-nudge-the-stairs-to-fitness]. Accessed 19 December 2013.
- JOHN, P., SMITH, G. and STOKER, G. (2009). Nudge nudge, think think: two strategies for changing civic behaviour. *Political Quarterly* **80**(3), 361–70.
- JOHN, P., COTTERILL, S., MOSELEY, A., RICHARDSON, L., SMITH, G., STOKER, G. and WALES, C. (2011). *Nudge nudge, think think: experimenting with ways to change civic behaviour*. Bloomsbury Academic, London.
- KNOWLER, D. and BRADSHAW, B. (2007). Farmers' adoption of conservation agriculture: a review and synthesis of recent research. *Food Policy* **32**(1), 25–48.
- LAWRENCE, A. and DANDY, N. (2014). Private landowners' approaches to planting and managing forests in the UK: what's the evidence? *Land Use Policy* **36**, 351–60.
- LAWRENCE, A. and EDWARDS, D. (2013). *Prospects for new productive woodland in Scotland: insights from stakeholders*. A report to Forestry Commission Scotland. Forest Research, Roslin, UK.
- MOSELEY, D. and VALATIN, G. (2013). *Insights from behavioural economics for ecosystem services valuation and sustainability*. Research Report, Forestry Commission, Edinburgh.
- NISBET, T.R., MARRINGTON, S., THOMAS, H., BROADMEADOW, S. and VALATIN, G. (2011). *Slowing the flow at Pickering*. Final report to Defra of FCERM Multi-objective Flood Management Demonstration Project RMP5455. Defra, London.
- NUDGE BLOG (2008). *How the Febreze marketing campaign reduced disease in Ghana* [Internet]. [http://nudges.wordpress.com/how-the-febreze-marketing-campaign-improved-public-health-in-ghana/]. Accessed 19 December 2013.
- OECD (2012). *Farmer behaviour, agricultural management and climate change*. OECD Publishing, Paris.

- QUICK, T., SMITH, S., JOHNSON, M., EVES, C., LANGLEY, E., JENNER, M., RICHARDSON, W., GLYNN, M., ANABLE, J., CRABTREE, B., WHITE, C., BLACK, J., MACDONALD, C., and SLEE, B. (In Prep). *Analysis of the potential effects of various influences and interventions on woodland management and creation decisions, using a segmentation model to categorise sub-groups*. Defra, London.
- REPETTO, R. (2008). *The climate crisis and the adaptation myth*. Working paper 13. Yale School of Forestry & Environmental Studies, New Haven.
- PROCHASKA, J.O., DICLEMENTE, C.C. and NORCROSS, J.C. (1992). In search of how people change – applications to addictive behaviors. *American Psychologist* **47**(9), 1102–14.
- SCHULTZ, P., NOLAN, J., CIALDINI, R., GOLDSTEIN, N. and GRISKEVICIUS, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science* **18**(5), 429–34.
- STUBBS, B. (2011). *Barriers to woodland expansion*. A discussion paper for the Woodland Expansion Advisory Group. WEAG paper 15a. Woodland Expansion Advisory Group, Edinburgh
- THALER, R.H. and SUSTEIN, C.R. (2008) *Nudge: improving decisions about health, wealth, and happiness*. Yale University Press.
- THE HOUSE OF LORDS (2011). *Science and Technology Select Committee report. Behaviour change*. United Kingdom Parliament, London.
- THOMPSON, S., MICHAELSON, J., ABDALLAH, S., JOHNSON, V., MORRIS, D., RILEY, K. and SIMMS, A. (2011). *'Moments of change' as opportunities for influencing behaviour*. A report to the Department for Environment, Food and Rural Affairs. Defra, London.
- VALATIN, G. and PRICE, C. (2014). How cost-effective is forestry for climate change mitigation? In T. Fenning (ed.), *Challenges and opportunities for the world's forests in the 21st century*, Springer, Netherlands, 297–339.



Evidence indicates that woodland creation is generally a cost-effective method of climate change mitigation, when compared with a range of alternatives. However, engaging landowners and land managers in woodland creation schemes can sometimes prove difficult, and this affects prospects for meeting national woodland planting targets and associated climate change mitigation objectives. Although reluctance to plant woodland is often attributed to the low financial attractiveness of such schemes, wider factors – including long-held cultural views on changing land use and perceptions of the urgency of tackling climate change – can also be important. Insights from behavioural economics indicate that individuals are influenced by a number of cognitive factors in making decisions and that certain ‘nudges’ may help direct choices in a particular direction. Nudges are ways of influencing people’s choices without limiting the options, or appreciably altering their relative costs. There is a range of nudge type approaches that could be used to encourage woodland creation for climate change mitigation. These include addressing perceived barriers to woodland creation, encouraging private woodland creation by highlighting successes and by the public sector leading by example. Implementation of nudge type approaches should be tailored towards different types of landowners and land managers, who may vary in their attitudes, motivations and willingness to plant trees.



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