

Policy brief on barriers to up-take of practices

Sutherland, L-A., MacLeod, K., Kuhfuss, L., Blackstock, K., Martinat, S.

Summary:

Land-based businesses tend to be ‘path dependent’ – following a steady trajectory. That is, farmers regularly make incremental changes along this pathway. This is a sensible approach to business development. Major transitions are restricted by land managers’ ‘room for manoeuvre’, including: land capability, potential markets, household skills, and the financial and other resources available. ‘Barriers’ also include market uncertainties; lack of capital, skills and knowledge; risk of social judgement; and disbelief that a new approach is achievable or will have the desired outcome. Land holdings which are struggling financially are the least able to invest in new business directions. Older farmers without successors will be looking to scale down.

In general, there are **two primary ways to overcome these barriers:**

- supporting major transitions through interventions aimed at trigger points;
- encouraging incremental changes by modifying the context of decision-making.

Working with trigger points is more challenging but has the potential to have much greater impact.

- Triggers include succession, major alterations in holding income (e.g. subsidies, market shifts, off-holding employment), and disease outbreaks (e.g. foot and mouth, BSE).
 - **Post-covid recovery and the current increase in fuel and fertilizers are potential triggers.**
 - **Farmers with successors will be actively seeking options to ensure the future viability of their farm business. Supports which enable succession typically enable behaviour change.**
- Following trigger events, land managers actively appraise their options, representing a key period for influencing change through targeted supports. Land management decisions are influenced not only by what land managers see as important for the holding’s development, but also by social norms and practical limitations. **Supports from advisory services and other actors can be particularly high impact when farmers are actively identifying their options.**
- Land managers may not be able to identify a viable alternative or implement it successfully. They may then revert to the original pathway or exit the industry. **Orienting supports towards implementation is therefore key.** If a new approach has been successfully implemented, becomes part of the holding’s new trajectory (i.e. a durable transition has occurred).
- Some land managers are more innovative and risk averse than others. Pioneers are actively experimental and may not require a trigger to make a major change. Early adopters will respond the most quickly to trigger events, and often inspire their peers. However, targeting supports towards early adopters (i.e. ‘opinion leaders’), could be seen to disadvantage the land managers most in need.
- **Supply chain actors, such as supermarkets and suppliers can strongly incentivise or restrict transitions** through their procurement standards and processes.
- Education alone is unlikely to lead to major transition processes; land managers need to be motivated to actively consider their options and have the resources and capabilities to make the transition work.

Incremental changes can be facilitated by **making the changes easy to adopt, attractive and timely.**

1.0 Introduction

A roadmap to address **the Global Climate Emergency requires major changes in the way how land in Scotland is managed**. We need to be clear in highlighting that it will bear the costs across society that will be unequally distributed. This issue was reflected in the [Scottish Government's Climate Change Plan Update Report](#) (December 2020), the [Implementation Plan for the Scottish Forestry Strategy](#) (February 2019) and [Scotland's Third Land Use Strategy](#) (March 2021). The land use sector is similarly recognising the importance of these objectives, through initiatives like [Farming for a Better Climate](#), and the [Farming for 1.5°C Independent Inquiry](#) on farming and climate change in Scotland.

In this policy brief, we will briefly discuss possible barriers to up-take of practices in Scottish agriculture. We firstly explain the concept of **path dependency and lock-ins in land management** and **how the change in decision making can be triggered and supported**. Then, we highlight **the role of advice**, and the role of **the private sector** in enabling transition. We conclude with stressing **how incremental shifts can be incentivised**.

2.0 Path Dependency, Barriers to Change and Room for Manoeuvre

It is well established within the academic literature that **land-based businesses tend to follow a steady trajectory, that is, to be 'path dependent'** (e.g. Barnes et al. 2016, Sutherland and Calo, 2020, Barnes et al. 2022). This reflects the characteristics of land-based production. Most of the commodities produced on land take months or years to reach the market, during which time market trends can shift. In addition, contemporary commercial farms typically involve considerable investment in land, infrastructure and equipment to support the production of specific commodities (i.e. 'sunk costs') which can be lost in the transition to new commodity production. Agricultural commodity markets are recognised as fluctuating over time, typically rebounding at some point. Farmers have learned that it is more pragmatic to stay the course than to risk 'chopping and changing' (Sutherland et al. 2012b). Agricultural commodity production is also embedded in the skills and knowledge associated with production (Sutherland and Calo, 2020), and the identity of farmers (e.g. as skilled producers of particular commodities), similarly leading to inertia within the sector. Lock-in can also be institutional and political (e.g. agricultural subsidies and regulatory frameworks can encourage or discourage particular directions of travel, Waylen et al. 2015).

Private forestry is similarly path dependent, in large part because of the length of time it takes for newly planted trees to reach maturity. In addition, non-management of forests is often seen to be the best course of action by private woodland owners (Lawrence and Dandy 2014). Private forest owners in the UK are frequently non-commercial in their orientation, acquiring forests for amenity and other reasons, and are therefore unlikely to be impacted upon by changing timber and forest product markets, and may be oblivious to government incentive programmes.

Path dependency thus reflects the 'room for manoeuvre' of their holding. Larger holdings are typically recognised as having a greater range of opportunities open to them, in part because of the assets they have available to them (Wilson 2008). Larger farmers are more likely to be able to afford in diversification activities, for example, whereas smaller-scale farms are more likely to invest labour off-farm to address financial issues. **Major transitions are restricted by land managers' 'room for manoeuvre'**: for example, land capability, potential markets, and the financial and other resources available to the land manager (Calo et al. 2022). Path dependencies have clear potential to limit large scale adoption to meet a net zero target (Barnes et al. 2022). Supply chain actors, such as

supermarkets and suppliers can strongly incentivise or restrict transition processes through their procurement standards and processes.

Legal and policy conditions also influence path dependencies. For example, agricultural land is subject to reduced business tax rates, and inheritance tax concessions. Farmers will therefore be hesitant to undertake activities which jeopardise these favourable tax conditions. This is a particular issue for enabling new entrants to join the agricultural sector (Prince et al. 2022): farmers are reluctant to tenant their land for fear of losing access to agricultural subsidies. Research within the Women in Agriculture Task force found that **knowledge of tax laws was variable amongst farmers and often erroneous** (e.g. the belief that it there were tax benefits if the senior farmer to retain ownership until his or her death) (Shortall et al. 2017). This approach can delay investment in holding development and the pursuit of innovative actions for decades prior to this event.

In this policy brief, we review literature which addresses how this path dependency can be worked with or overcome and identify barriers to take up practices.

2.1 Triggering Change in Decision-Making

Sutherland et al. (2012a) developed a conceptualisation of **'triggering change' in farmer decision-making**, based on a series of UK research studies on agri-environmental behaviour. These studies demonstrated that change in farming trajectories often results from major events. These events ranged from disease outbreaks - to farm successors joining the business - to successive years of unprofitable farming. The model was further developed through the H2020 [AgriLink project](#), which assessed the role of agricultural advice in on-farm innovation processes across Europe.

The Triggering Change Model featured as a primary approach in the AHDB review of Farmer's Decision-making behaviour (Rose et al. 2018). The Triggering Change Model is based on social psychology theory, particularly Petty and Cacioppo's Elaboration Likelihood Model (ELM). The ELM posits that **most decisions are made automatically, with very little active reflection**. These decisions tend to **lead to minor shifts in behaviour**, which are informed by peer groups and the actions or advice of respected others. **Major changes to behaviour occur more rarely but are accompanied by active processing of alternatives** – individuals actively weigh up their options and seek new knowledge to address particular problems, needs or opportunities. If an identified behavioural shift appears to have potential, the decision-maker begins the process of testing and implementing the new opportunity. Businesses are particularly vulnerable during this time, as new investments in infrastructure and knowledge are being made. If the alteration is successful, the new behaviour becomes path dependent, that is, part of standard practice. If it is unsuccessful in some respect, then it is modified or other options evaluated. Recent research by Konečná and Sutherland (2022) suggests that **for innovations which are rapidly changing (particularly digital innovations), farmers may engage in co-construction of innovations during this implementation stage**.

Up-dated Triggering Change Model

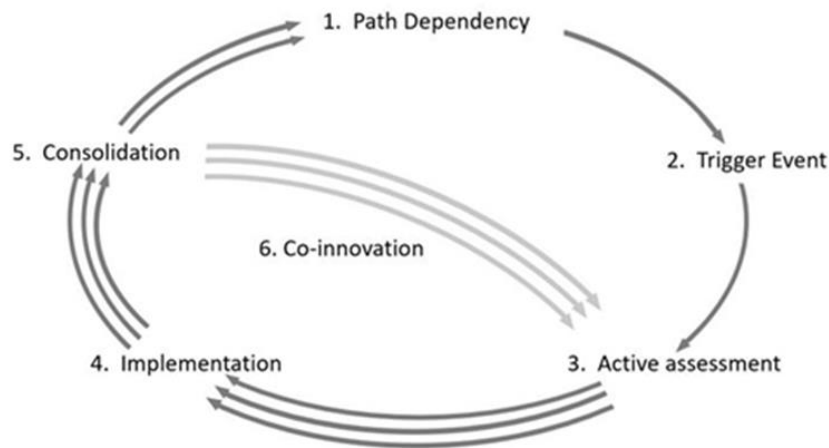


Figure 1: Triggering Change Model Updated in the H2020 AgriLink Project (2021)

Source: Sutherland (author)

The implications of the Triggering Change model are that **there are specific windows of opportunity for influencing behaviour**. For example, some of the respondents in the Triggering Change paper converted to organic farming following the BSE outbreak in the UK: the incident made them question how they were feeding and treating their livestock. Others had experienced low milk prices for and sought a premium price for their product. Unfortunately, this coincided with the introduction of organic conversion subsidies in England, which subsequently depressed organic milk prices.

In relation to environment and climate actions, land managers who are seeking to enrol a successor can be expected to actively consider options to expand the business. Renewable energy production in particular can be undertaken as a means of 'future proofing the farm', to increase farm income to support an additional household (Sutherland and Holstead 2014). **Policy initiatives could usefully increase incentives during periods of widespread unrest in the agricultural sector** (e.g. when major changes to agricultural subsidy structures are being introduced) or in the wake of low commodity prices or disease outbreaks. Currently, the unprecedented rise in fuel and fertiliser prices is expected to be triggering change in farmer decision making; that is, **the present circumstances are likely to be a good time to influence change.**

2.2 Planning to Make Changes

Once farmers have identified a need to make a change, they typically start to plan. Rose et al.'s 2018 review of farmer decision-making identified the Theory of Planned Behaviour as one of the most popular conceptual approaches for understanding change processes within the agricultural sector. Within Scotland, it has been applied to up-take of agri-environmental measures (Sutherland 2010) and on-farm renewable energy production (Sutherland and Holstead 2014). The Theory of Planned Behaviour is underpinned by similar academic concepts as the Triggering Change Model. Both approaches emphasise that **major changes are planned and made consciously**, that is, they **involve active consideration and evaluation of options by the decision-maker(s)**.

The Theory of Planned Behaviour identifies three primary sets of factors which condition the intention to make a change: **i) attitudes towards a behaviour, ii) perceived social norms and iii) perceived behavioural control.** Attitudes reflect what a decision-maker hopes could be achieved (or not) through the new behaviour. Social norms comprise what the decision-maker believes that other people will think of the behaviour. Perceived behavioural control is the decision-maker's perception of their own ability to implement the behaviour and achieve the desired effect. In Sutherland and Holstead (2014)'s Aberdeenshire study, for example, farmers were generally positive towards renewable energy production, but the potential negative responses of neighbours (i.e. social norms) and the difficulties and costs associated with gaining planning permission and access to the grid made many of them unwilling to pursue wind energy installations. Only medium to large-scale farms had the resources to risk direct investment in a wind turbine. **To successfully encourage up-take, all three of these factors must be addressed.**

2.3 The Role of Advice

Land managers have access to a wide range of sources of information and advice on decision-making. This includes advisory services, farming organisations, NGOs, industry professionals (e.g. veterinarians), financial services, regulators and researchers, who often collaborate to encourage innovation (e.g. Scotland's monitor farms programmes). Recent **digital transformations** (particularly social media and the internet) **have enabled land managers to access a wide range of knowledge across geographical boundaries.** On the other hand, as was evidenced in the case of advisors supporting the adoption of precision farming, these advisors are frequently based in commercial companies, which mostly tend to target large farms (Townsend and Noble 2022). These commercial companies are most interested in selling their products, and sometimes do not provide assistance after the product has been purchased. Small-scale farmers, part-time farmers and younger farmers often struggle to access professional advice. **Public funding for advisory services could usefully target emergent gaps: to support the provision of up-to-date advice on topics to farmers who have difficulty accessing advice, and to prevent unnecessary dropping by supporting the implementation of innovations** (Sutherland et al. 2022).

Research sponsored by Forest Research found that **lack of information and advice is a major barrier to decision-making for private foresters**¹. Trusted and influential sources of advice include: other woodland owners, forestry agents and consultants, organisations such as Royal Forestry Society, the Forestry Commission and Forest Research. **Advice and information on dealing with climate change is difficult to access and apply** – the report finds that owners and managers find advice confusing or **inappropriate for small-scale holdings.**

The James Hutton Institute has led and contributed case studies to a number of European funded projects on advice and farmer learning (FP7 PRO AKIS, H2020 PLAID, H2020 NEFERTITI, H2020 AgriLink). Recent research in the H2020 PROAKIS project demonstrated that **farmers draw on different sources of information for different topics** (Sutherland et al. 2017). Provision of advice on how to access government subsidies, particularly agri-environmental funding, is a primary activity of agricultural advisory services across the UK. However, there are also a range of other advisors associated with conservancy trusts, charities and national park authorities. Information on production and new technologies tends to be led by the producers of associated technologies, as these companies

¹ <https://www.forestresearch.gov.uk/documents/7124/FCRN036.pdf>

are typically the experts in their innovation's use and implementation. Sutherland et al.'s (2017) study of the knowledge networks of **newcomers to crofting** demonstrated that they **tend to rely on farming neighbours and peers** for production advice, and Highlands and Islands enterprise for diversification advice, approaching agricultural advisory organisations primarily to facilitate access to subsidy funding (including agri-environmental scheme applications).

Research by Prager et al. (2016) in PROAKIS demonstrated that **the privatisation of agricultural advice in the UK and throughout Europe has made it easier for 'better clients' - larger or more intensive farms – to access advice**. Key informants in the linked Sutherland et al. (2017) study estimated that **less than half of crofters access agricultural advice**. There is evidence from across Europe that **small-scale farmers have been disadvantaged by the privatisation of advisory services**, because larger farms are more lucrative customers for private service provision (Labarthe and Laurent 2012).

Privatisation of advice in Europe has raised questions about **the trust of farmers in different sources**. Research by Sutherland et al (2013) found that advisors build up trust with farmers over time; although input suppliers may be reliant on customer sales, many inputs are purchased on an annual basis, giving an impetus for suppliers to offer sound advice and associated service. **Farmers may be less likely to trust advisors from environmental NGOs, who may be perceived as putting environmental agendas over the needs of the farm**.

Research from the AgriLink project demonstrated that sources of information also differ in relation to when the innovation is taken up. **Pioneers tend to have few sources of knowledge, and draw on sources which may be geographically distant**. Local agricultural advisory services rarely have access to this type of information, but are more important for later adopters, once the information is more commonplace and adopters are seeking independent sources of advice.

The H2020 PLAID project focused on peer-to-peer learning processes. The project developed the first found that **on-farm demonstrations primarily tend to be attended by men** (Sutherland et al. 2021). Women and younger farmers were less likely to participate. The PLAID project developed a novel 'virtual demonstration' approach, which has been further developed during the covid-19 pandemic. **On-line approaches enable more egalitarian participation in demonstration and training events** (for land managers with good internet access), removing barriers caused by geographical distance and the time required to travel.

The PLAID project identified **the important role of agricultural advisors in bringing together diverse actors within the land management sector to exchange information** (e.g. through monitor farm programming). The project also demonstrated the importance of agricultural education for producing a culture of 'lifelong learning' in the agricultural sector. Research into the Scottish Monitor Farms, conducted by Prager and Creaney (2017) found that group-based extension could be quite successful. Their analysis showed that **the more structured the group extension approach and the more detailed the programme targets, the more likely it is to achieve the expected outcomes**. General 'awareness raising' sessions, where participants are passive (i.e. not engaged in discussion) are less likely to have an impact.

Major changes to land management in Scotland will involve a cultural shift. An important entry point is the educational system. Review of educational curricula in the H2020 NEWBIE project suggested that **training in agri-environmental management remains minimal at secondary and post-secondary levels**. Many farmers undertake agricultural education; educational achievement in general is correlated with positive environmental attitudes.

2.4 The Role of Private Sector Actors

Some of the **strongest influences on land manager behavioural are industry actors, who have a direct influence on the financial options open to land-based businesses.** Supply chain actors, particularly supermarkets and processors, can have an enormous impact through their procurement practices. For example, work by Barlagne (2019) on the Scottish potato sector demonstrated that supermarkets and processors strongly restrict the new variety of potatoes which can be produced. Processors and supermarkets set the acceptable sizes, appearance and volume of produce, which farmers must then achieve. Their marketing strategies influence consumer demands. **The need to conform to these standards inevitably influences how the associated land is managed.** To date, there has been limited investigation of the role of these supply chain actors in relation to these types of actions.

2.5 Not all Land Managers are Innovative

Rogers' (2003) seminal 'diffusion of innovations approach', initially published in the 1960s, distinguishes five cohorts along a bell curve of adoption: pioneers (innovators), early adopters, early majority, late majority and laggards. Innovators take the greatest risks, but often fail – it is the early adopters who are seen as leaders by their peers and are often influential on them. Rogers' approach has a number of problems (for example, not all innovations are necessarily beneficial or adopted at the same rate, it does not take into account a holding's resources or co-innovation processes, land managers may fall into different categories at different points in the lifecycle and for different types of innovation) but is useful for recognising how innovations can be approached differently by different people. In particular, early adopters are important opinion leaders, heavily influencing and often acting as formal or informal advisors to later adopters. However, targeting potential opinion leaders for support can be seen as discriminatory against land managers who need the most assistance to innovate. Roger's distinction of innovators, and early versus late adopters is still commonly referenced in relation to contemporary innovation processes.

2.6 Nudges: Incentivising Incremental Shifts

The UK Government's Nudge Unit was established in 2010 to apply behavioural science to public policy. Nudge-based approaches seek to influence the architecture of choices – to make desirable choices easy, attractive, social and timely (['EAST'](#) - Service et al, undated). To date, the Nudge Unit has addressed environmental behaviours broadly (e.g. reducing food waste by removing trays from cafeterias so that customers limit purchases; increasing recycling by introducing large numbers of colourful containers which are easy to locate and use). In this section we describe the basic EAST nudge principles with examples of how these could be applied in the land use sector.

EAST in application to land management change.

- **Making a behaviour easy involves make it the default action**, reducing the hassle factor and simplifying messages. Automatic enrolment in agri-environmental measures, reducing the transaction costs of participation and simplifying the terms and conditions would fit this criterion.

- **Making behavioural changes attractive draws attention to them.** Signposting successful agri-environmental activities can draw community attention to these actions. Current financial rewards of agri-environmental action tend to be calculated to offset the costs of participation; different reward structures could be successful but less expensive (e.g. lotteries). Sutherland et al. (2016) found that **seeing the positive environmental impacts of agri-environmental scheme engagement was more strongly co-related to planned agri-environmental action than positive environmental attitudes**, suggesting that making these outcomes more visible or understandable to farmers could be influential.
- **Making new behaviours social includes showing that most people perform the desired behaviour, fostering network development to facilitate collective action and encouraging people to make a commitment to others.** Scotland is already working with peer-to-peer learning through the monitor farm programme. England has introduced collaborative agri-environmental measures, which have the double benefit of encouraging collective action and the environmental gains of activities undertaken across multiple holdings.
- **Making new behaviour timely means prompting people when they are likely to be most receptive**, considering the immediate costs and benefits and helping people to plan their responses to events. The Triggering Change Model demonstrates the time periods during which land managers are more likely to make major changes. Offering additional assistance with the immediate costs of change and help with planning at this time is likely to be particularly effective.

Reports from the Nudge Unit demonstrate that nudge approaches can be highly successful for enabling incremental shifts (e.g. increases in desired behaviours of 5 to 10%).

Barnes et al. (2013) utilised a form of nudge thinking to distinguish between ‘nudges’ and ‘budes’ for management of water quality. They defined nudges as non-regulatory and non-fiscal interventions, whereas budes were regulatory restrictions on actions (specifically Nitrate Vulnerable Zones). They found that **farmers much preferred nudge approaches, but recognised that these voluntary changes have some limitations, particularly if farmers do not see their actions on farm as influencing pollution levels**. They argue for a mix of nudge and budge-based approaches. Both yielded incremental outcomes.

European research has been developing on ‘nudging’ farmers. Kuhfuss et al. (2016), in French research, found that **‘nudging’ farmers by conveying information on other farmers’ environmental practices appeared successful as a means of maintaining long-term benefits of agri-environmental schemes**. Chabé-Ferret et al. (2019) similarly found that providing farmers with weekly information on water consumption was effective at reducing the water consumption of farmers who irrigate the most, but appeared to have increased consumption for farmers who had not consumed water at all. Nudges – like all incentives – may not have the desired effect.

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For further information, please contact:

Lee-Ann Sutherland (lee-ann.sutherland@hutton.ac.uk)



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Riaghaltas na h-Alba
gov.scot