



Inclusive design of post-Brexit Agri-Environmental policy: Identifying and engaging the 'Harder to Reach' stakeholders **A Quick Scoping Review**

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Inclusive design of post-Brexit Agri-Environmental policy

Identifying and engaging the 'Harder to Reach' stakeholders

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Executive Summary

As the UK leaves the EU it will also leave the EU Common Agricultural Policy (CAP), which will be replaced by a new UK agricultural policy. This will change the way farmers and land managers are subsidised in the UK. Defra have indicated that the new Environmental Land Management scheme (ELM) will be underpinned by ‘payments for public goods’. Defra intends to provide stakeholders with a greater say in how the new ELM scheme will materialise and subsequently aims to achieve the ‘co-design’ of ELM. In order to do this effectively, Defra needs to understand the stakeholder landscape, particularly the ‘harder to reach’ farmers and land managers who may be left behind by the changing policy. The objective of this report is to develop an understanding of ‘harder to reach’ famers and land managers, in the form of an evidence review.

The terminology ‘Hard to Reach’ is not easily defined and it has received some criticism due to the stigma and prejudice that can be associated with the term. However, whilst acknowledging those concerns, for the purpose of this study, we use the expression ‘harder to reach’(HTR) as an adjective to describe individuals that are less engaged with Defra through a wide variety of factors and negative past experiences, that reduce their incentive to participate, and therefore may be difficult for Defra to engage with for the co-design and uptake of ELM. Without developing an understanding of HTR individuals within the industry, Defra risks only engaging with the ‘usual suspects’; the more engaged sector of the farming community who are more willing to volunteer their time and engage with the policy. This could result in negative impacts for farmers and land managers, the environment and wider policy goals.

HTR farmers and land managers are a heterogeneous group of individuals that have an array of different reasons that deem them HTR for Defra. The reasons that individuals do not communicate or engage with external sources can be a combination of practical as well as behavioural, attitudinal, and personal barriers. These are summarised in the table below and explored in more detail in the report. Both the practical and behavioural aspects of both the sender of information, Defra, and the receiver, farmers and land managers, can combine together to perpetuate any negative perceptions both parties have of one another, affecting the relationship between them as a whole, and increasing the likelihood that individuals will become HTR.

Practical Barriers	Page	Summary
Time and Income Constraints	26-28	“ <i>too busy</i> ” part-time farmer, off-farm work, time spent on short term planning, lack of capital to invest
Administration and Bureaucracy	28	Too complicated, leads to frustration, spend too much time on admin, seek advice only for short term administration issues
Technology	28-30	‘Digital Divide’, tech illiteracy, internet connectivity issues
Remoteness	30	Less engagement, further away from neighbouring adopters, broadband issues

Behavioural Barriers	Page	Summary
Trust	31-36	Lack of trust in external sources, lack of trust in government, lack of relationship building, negative experiences, sceptical
Social Capital	36,37	Few networks, lack of relationships, low bonding, bridging, linking, don’t receive information from others
Risk	37,38	Financial risk, present bias, nature not reliable
Perception	38,39	Negative perceptions of government agencies, not viewed or view self as ‘real’ farmer, perceived lack of incentive
Priorities	39-41	Short term finances, off-farm work, ‘public’ not a priority, “ <i>tidy</i> ” farm
Inconsistency	41,42	Inconsistent message, contradictory information, policy fatigue, high turnover of agency staff

Different practical as well as behavioural, attitudinal, and personal barriers can be an issue for many different farmers and land managers as HTR individuals do not belong to a homogenous group. However, there are certain farmers that are highlighted repeatedly in the literature as more likely to be HTR. These are summarised below along with the typical barriers that they face.

Type	Potential Barriers
Older farmers	<ul style="list-style-type: none"> • Risk • Lack of development plans • No succession plans • Less technologically literate
Smaller farm/ land managed	<ul style="list-style-type: none"> • Risk • Do not perceive themselves to have enough 'public goods' • Not seen as 'real' or 'good' farmer • De-select themselves as don't view themselves as 'real' farmers • Ignored by Defra or extension services • Management schemes/new technology not practical
Part-time farmers/ off farm work	<ul style="list-style-type: none"> • Less time • Not viewed as 'real' farmers • Do not wish to invest in the farm • Lack of development plans
Remote farmers	<ul style="list-style-type: none"> • Fewer networks/contacts • Lack of internet & broadband • Less visibility to innovations in practice • Less technologically literate
Farmers Under Pressure	<ul style="list-style-type: none"> • Too busy with on-farm work • Stressed and resentful • Lack of trust in government • Fewer networks and contacts • Negative view of public • Environment not their priority

In the last section of the report the following solutions to engagement and communication with HTR farmers and land managers were drawn out from the literature.

Solutions	Page	Summary
Multiple Communication Channels	43,44	Face-to-face, over phone, mailings, magazines, online and offline content, collaborations with other stakeholders
In-depth, Proactive Approach	44,45	Face to face, workshops, farm walks, on farm demonstration (<i>not just well managed ones</i>), development of trust, long-term commitment to relationship building
Tailoring to the Farmer	45-48	Farm specific, understand local context, tailor to their objectives and priorities, convey incentives,

Technology Development	48,49	Invest in infrastructure, make open education resources and software available, make technology accessible and user friendly, make communication easier, provide training to farmers and land managers, use as a relationship building exercise to build trust
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The solutions and recommendations identified from the literature, along with the practical and behavioural barriers, fed directly into the following nine recommendations for Defra. Defra have addressed some of these key concerns already within their most recent ELM Policy discussion document (Defra, 2020) and if they are able to continue to commit resources to understanding and accommodating the concerns of the HTR farmers and land managers it is likely that a more fully representative co-design process could be achieved which would be inclusive of a greater diversity of farmers and land managers.

Recommendations

1. Develop understanding of HTR farmers’ and land managers’ objectives and priorities in local area

Understanding HTR farmers’ and land managers’ objectives, motivations and priorities will allow Defra to tailor their messages about ELM and its co-design effectively. This report and the other HTR empirical research can provide useful insight into different attitudes and objectives of farmers and land managers but developing an understanding of the local context of an area will be important to provide a more personalised message.

2. Tailor approaches to farmers and land managers

Use the knowledge gained about farmers’ and land managers’ motivations to tailor messages about ELM and co-design towards their farming objectives. Put an emphasis on the specific issues that concern them in messaging about ELM and in co-design activities.

3. Communicate incentives for farmers and land managers effectively

Explain the benefits that farmers and land managers gain from being involved in the co-design of ELM and of ELM as a whole. These benefits should range from financial incentives to farming goals and objectives. Make sure farmers and land managers understand why it is worth

their time and effort to participate and that the benefits of the scheme outweigh the risks to the farm business.

4. Be Consistent

Maintain consistency in messaging, policy, and relationships to avoid contradictory information and policy fatigue which can be confusing for farmers and land managers. Being consistent with the advisors that engage with farmers and land managers in a local community will allow trust and relationships to be built.

5. Use multiple communication channels

Use a variety of communication channels to increase the likelihood of HTR farmers and land managers receiving information. These can include mailings, magazine articles, online content, offline content, apps, websites, over the phone communication, face to face communication, on-site visits, farm demonstrations, farm walks, attendance at events, participatory activities. A variety of communication methods can cater to farmers' and land managers' different preferences and levels of trust in external information whilst also taking into account issues around rural broadband and digital literacy that some may face.

6. Collaborate with organisations to inform them of messaging

Inform other stakeholders of the messages and the activities available such as: extension services, vets, suppliers, farming clubs and farming organisations. This will help keep a consistent message, prevent contradictory information, and increase the likelihood of farmers and land managers receiving the information from a trusted relationship.

7. Use an in-depth proactive approach and build trust over time

More in-depth, face to face communications will build relationships and trust between farmers and land managers, and the government. A longer term, in-depth approach, built on mutual respect and shared goals will more likely lead to long-term attitudinal change rather than only short-term behavioural change. Visiting farmers and land managers on-site at times that are convenient to them will make it easier to reach HTR individuals.

8. Consider inclusivity in activity planning

Consider the social dynamics in communities and between different networks of people prior to planning engagement activities. Some shy, HTR farmers and land managers may be put off by the thought of discussing issues in front of larger, progressive ‘successful’ farmers who may be more outspoken. Prior to larger activities consider joining group discussions with more socially homogeneous groups first which can be less intimidating whilst also building relationships with like-minded individuals (bonding capital). After these discussions consider joining heterogeneous groups of farmers together and then networks with different stakeholders to develop their relationships with individuals across different aspects of society (linking and bridging capital).

9. Narrow the Digital Divide and use technology developments to an advantage

Develop the technology infrastructure in remote, rural locations to improve online communication channels. Consider introducing open access resources and software in a range of levels from basic to advanced. These could include online libraries with information on chemical inputs and crop health, or software that farmers could use to map out their farm and ELM design. For those that require it, training in the use of these technologies, whether on-site or using training centres, will provide an opportunity for them to develop skills that may be useful for them as well as building a relationship between the farmer and government. However, there must be an understanding that some farmers and land managers may not wish to use the technology and Defra must be flexible in providing them with practical resources and solutions to farming issues in an offline format.

1. Introduction

Brexit represents one of the biggest opportunities for policy change in the UK. The future of Brexit has remained unclear since the result of the referendum in June 2016, and in recent times the effects and halt on society caused by the COVID-19 pandemic has also raised uncertainties on the path and timescales of Brexit. However, what remains certain is that the policy that governs the UK agricultural sector will change. Defra has made it clear since the inception of Brexit that when the UK leaves the EU, it will also leave the EU Common Agricultural Policy (CAP) and that the CAP will be replaced by a new UK agricultural policy. The changes to UK agricultural policy have been highlighted by the government, media and other stakeholders as a positive aspect of Brexit, with a more focussed approach around land ecosystems and environmental protection (Defra, 2018a; Defra, 2018b; Harvey, 2019; Tsouvalis, J and Little, R. 2020; WWF, 2018.). As explained in the ‘Health and Harmony’ consultation document published in 2018 (Defra, 2018a) the new policy will be “*underpinned by payment of public money for the provision of public goods*” such as wildlife habitat protection, flood prevention, improving air quality, soil protection and tree planting.

The CAP has received many criticisms, not only for its effects on markets, land prices and over-production (Bateman and Balmford, 2018), but also its impact on the environment, with the policy catalysing the intensification, specialisation and homogenisation of agricultural practices (Lowe *et al.*, 1998). Through added measures such as cross-compliance, greening payments, and the development of funding for Agri-Environment Schemes (AES), the CAP has attempted to diminish the negative impact of the agricultural industry and reward farmers for environmental protection measures. However, these measures have received criticisms in their administration, integration and budget distribution and some have argued these environmental protection measures added to the CAP have been overemphasised in policy discourse to alleviate any environmental concerns (Erjavec and Erjavec, 2015). So far, the environmental aspects of the policy have been too small and incremental to have any real effect and ultimately, the underlying premise of supporting food production is still prevalent within the CAP (Erjavec and Erjavec, 2015). Farmers and other stakeholders within the industry have indicated that previous schemes have been too prescriptive, undermining farmers’ and land managers’ knowledge, which in some cases has resulted in scheme failures and a lack of voluntary uptake (Lyon, 2019).

In contrast, Defra has indicated that the new system of payments to farmers and land managers for public goods, provided by the 'Environmental Land Management' scheme (ELM), will allow farmers and land managers greater scope for innovation and flexibility in how they achieve the delivery of public services (Defra, 2018a). The Environmental Land Management scheme, as outlined in the UK Government '25 Year Environmental Plan' (HMG, 2018), will be implemented as an 'Environmental Land Management Contract' that could span several years, between the farmer or land manager and the government (Defra, 2018c).

Defra intends to provide stakeholders with a greater say in how the new ELM scheme will materialise and subsequently aims to achieve the 'co-design' of ELM, involving a variety of stakeholders (Defra, 2018a). The objectives of co-design are to ensure that the policy works for all stakeholders; farmers, land managers, government, taxpayers as well as the environment, to engage as many people as possible in the scheme, encourage uptake and to ensure the scheme works in practice and is therefore more likely to gain support (Tsouvalis and Little, 2019a). In order to engage as many people as possible in co-design, Defra needs to understand the stakeholder landscape, including those people that are deemed 'harder to reach' by the government and the extension services (Tsouvalis and Little, 2019a).

There are many people that are not included in research, surveys or other aspects of participation due to an array of practical, behavioural, attitudinal and personal barriers or indeed the fact that the engaging organisation fails to set up adequate processes of two-way knowledge exchanges which puts people off from participating; therefore making them 'harder to reach' (Bonevski *et al.*, 2014). The terminology and concept of 'Hard to Reach' individuals, has been since the 1950s to reference individuals that were difficult to reach for extension services particularly in the social and health care sector. The concept has since been researched in a variety of different sectors from medicine, social science, social marketing and policy, (Brackertz, 2007) with research intending to develop a clearer understanding of who and why people fall into this category and what can be done to better approach and engage them. Despite the necessity to understand individuals that are less represented or engaged in research, policy and outreach activities, the term 'Hard to Reach' and associated literature have received criticisms due to the terminology leading to generalisations of people, treating them as a homogenous group and attaching a stigma to the phrase which can be prejudicial (Whitnell, 2004). Whilst some literature has used the term 'Hard to Reach' as a noun often to define a homogenous group, we use the term 'harder to reach' (HTR) as an adjective to describe

individuals that are less engaged with Defra through a wide variety of factors and negative past experiences, that reduce their incentive to engage

Without developing an understanding of the 'harder to reach' within the community, Defra risks only engaging with the 'usual suspects'; the more proactive and engaged sector of society who are more willing and able to volunteer their time to the cause. This will result in an overrepresentation of the 'usual suspects' and a bias towards a specific sector of the industry in the co-design of ELM (Bonevski *et al.*, 2014). This could result in negative impacts for farmers and land managers, the environment and wider policy goals.

The purpose of this report is to develop an understanding of the current theories, research, and evidence base around HTR stakeholders and more specifically HTR farmers and land managers, in the form of an evidence review. This evidence review also supplements a simultaneous HTR report which is based on empirical research (interviews and a workshop) (Hurley and Hall *et al.*, 2020). The two reports are part of, 'Inclusive design of post-Brexit Agri-Environmental policy: Identifying and engaging the 'harder to reach' stakeholders', funded by The University of Sheffield QR Allocation for Evidence-Based Policy-Making and forms part of a wider ESRC-funded Governance after Brexit project, 'Agri-Environmental Governance Post-Brexit: Co-production of policy frameworks' (ES/S007830/1), involving the Universities of Sheffield and Reading. The aim of this project is to provide Defra with knowledge, understanding and recommendations on engaging with the HTR, to support policy makers, and to assist in ensuring inclusivity in the co-design of ELM so that the needs and requirements of all stakeholders are met.

1.1 Research Aims and Objectives

With the above in mind the research aims for the HTR project which are formed from both the evidence review report and the qualitative empirical research report include:

- Identify and locate (socially, geographically) the 'harder to reach' stakeholders for ELM through desk-based research and expert interviews.
- Understand why they are harder to reach and identify the main barriers to engagement.
- Identify channels to reach these potential participants and ensure their views / experiences / needs and response to agricultural and environmental policies are represented in research and stakeholder engagement.

- Support policy makers in utilising this research to inform their development of the ELM policy.

More specifically the research objectives of the evidence review in this report include:

- Understand the breadth of literature on the topic
- Provide some background information for workshops and interviews
- Develop an understanding of who the ‘harder to reach’ are and why they are harder to reach
- Develop some effective solutions to engaging with ‘harder to reach’ individuals and provide recommendations for Defra

2. Methodology

2.1 Evidence Review

Traditional narrative literature reviews are useful in developing the background and scope of a study area; providing context and an understanding of the theory as well as acknowledging prior research in order to set the scene for a new research project. However, traditional literature reviews do not follow a strict systematic methodology and therefore can include selection bias and the impossibility of repeatability (Uman, 2011).

Alternatively, systematic reviews, which follow a strict methodology, have a more rigorous approach when analysing the available literature on a subject, removing strong selection bias and adding the ability of repetition (Uman, 2011). Systematic reviews can be used to realise the scope of available literature, understand the definitions and concepts of the study area, and can answer predefined research questions.

In addition to the very rigorous approach of systematic reviews, other evidence review types such as ‘Quick Scoping Review’ (QSR) and ‘Rapid Evidence Assessments’ (REA) have been developed. These methods give some flexibility in methodology to allow for considerations in time or resource constraints of research projects (Collins *et al.*, 2015). Guidelines on evidence review types are provided by Collins *et al.*, 2015 (Figure 1)

Based on the time constraints of this project (2 – 3 months) this report followed the methodology of a QSR. Though less resource and time intensive than full systematic reviews, QSRs are still helpful in meeting policy evidence requirements through providing an

understanding of the volume of evidence available, answering research questions and understanding the impact of potential policy interventions (Collins *et al.*, 2015). This is achieved by searching published data and additional sources from the grey literature or from expert recommendations, creating a map of the evidence and providing an informed conclusion. Typically, a QSR is restricted by not providing a critical appraisal of the evidence base. However, it is acknowledged that evidence reviews can be subsequently upgraded to allow for more thorough analysis if future budgets allow (Collins *et al.*, 2015)

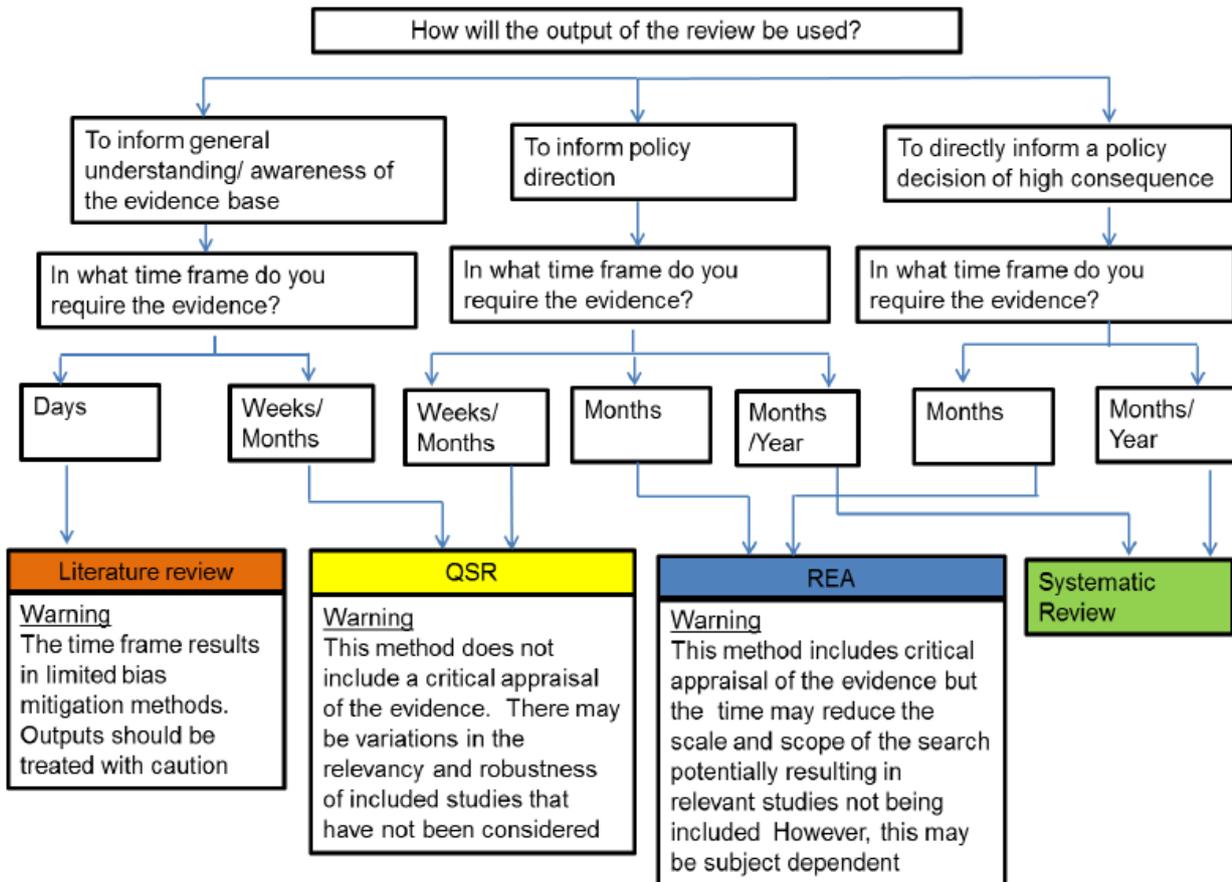


Figure 1. Flow diagram to show the different requirements of evidence reviews taken from Collins *et al.*, 2015

The main objectives of this QSR are the points raised by Munn *et al.*, 2018:

- Identify types of evidence in a field
- Clarify key concepts / definitions
- Examine how research is conducted on a certain topic
- Identify key characteristics or factors related to a concept
- Precursor to systematic review
- Identify knowledge gaps

Following the guidance of Collins *et al.*, 2015, a protocol was developed with the project team and outlined using their provided template. The key areas of methodology are highlighted in the following sections.

2.2 Research Questions

Following from the research aims and objectives of the HTR project, the scope, and capabilities of a QSR and an initial assessment of the literature, the following key research questions were defined:

- Who are ‘harder to reach’ farmers and land managers?
- Why are they ‘harder to reach’?
- How do we engage them?

These key questions helped to frame the search string, exclusion and inclusion criteria and thematic analysis of the final literature database.

2.3 Search Strategy

Scopus was the site chosen for data extraction based on its large database, its use in studies published in peer-reviewed journals, and ease of use. Though it is preferable to use more than one data extraction source to account for possible gaps in the database, this was not possible due to time constraints. In addition to the sources provided by Scopus, expert recommendations were given by the project team and other industry experts. These were also sorted and included subject to meeting inclusion criteria.

The search string was developed using two key themes as starting points; ‘Hard to Reach’ terminology and synonyms, and ‘Farmer/Land manager’ related terminology and synonyms. The keywords developed from each theme were separated by the Boolean operator ‘OR’ and the two separate search strings joined by the operator ‘AND’. The search string (Table 1) also contained the limitation of studies written in English. As this was a quick scoping review rather than a systematic review, a variety of resources were contained in the database in order to assess the scope of the current literature, giving a broad overview on the type of information available on HTR farmers and land managers. The only limitation made was the exclusion of whole books, based on the practicalities and time constraints of the project. This search string generated 417 results on 24th February 2020 and was marked to a saved list which was then used to work from and carry out the process of elimination. Files that were removed from the

saved list were marked at each stage so a record of what was included but also what was excluded could be kept.

Table 1. Search String Scopus

TITLE-ABS-KEY ("Hard to reach" OR "Hard-to-reach" OR "Difficult to reach" OR "Difficult-to-reach" OR "Hard to access" OR "Difficult-to-access" OR "Hard to contact" OR "Hard-to-contact" OR "Hard to action" OR "Hard-to-action" OR "Not in contact" OR "Left Behind" OR "Laggard")

AND TITLE-ABS-KEY (“Farm” OR “Farmer” OR “Farming” OR “Agriculture” OR “Landowners” OR “Land Manager”)

AND (LIMIT-TO (LANGUAGE , "English"))

2.4 Selection Criteria

The inclusion and exclusion criteria are highlighted in Table 2. A date restriction or resource type criteria was not included in this study to allow for the scoping of the literature available. A discussion was had with the project team about the efficacy of study papers from the Global South, and whether they provided any relevant information that related to HTR farmers and land managers in the UK and to developed agriculture systems. It was decided to retain these studies as they provided novel and useful insights relevant to this research related to technology and the ‘Digital Divide’.

The inclusion and exclusion criteria below were developed and added to throughout the course of the review process as the understanding of the literature base expanded. New themes also emerged. All criteria used were recorded and discussed with the project team to ensure full transparency of the review process.

2.5 Data Extraction and Analysis

Once the final database was curated, a map of the evidence was created to understand the type of data available: research design, populations, geographical context, interventions applied, and outcomes measured.

The evidence was initially read, then key notes and summaries developed to help the researcher become familiar with the work and to support the rest of the team with their qualitative empirical research. Papers were then read again and coded, picking out key areas that answered

the objectives and research questions. Clear themes and subthemes emerged and were organised to show the crucial concepts. Some key quotes were extracted from the data to provide supporting evidence and summaries of the concepts being discussed.

Table 2. Inclusion and Exclusion criteria for evidence base

Stage	Inclusion	Exclusion
Original Search Sources	Search String English Book Chapters, Articles, Reviews All Dates	Non-English Books
Phase 1 Exclusions on Title, Keywords, Abstract	Farming/Agriculture/Land manager HTR individuals	Focus on medicine, migrants, other industries HTR terminology in the wrong context (relation to physical)
Phase 2 Exclusions on Title, Keywords, Abstract	Policy Development Engagement, Co-production, Outreach Focus on Social Science	Unrelated to policy or forms of agricultural management Does not discuss aspects of engagement within the study population Focus on physical or Natural Science
Phase 3 Exclusions based on Whole Document	HTR defines a sub-group of people within farming Context can relate to reaching and engaging with farmers and land managers in UK Full final text available	‘Left Behind’ ‘Laggard’ used to refer to a whole industry, region or in the wrong context Context does not allow for fair comparisons to be drawn. No access to full text (7)

3. Results

3.1 Systematic Map of Evidence

The Scopus search yielded 417 potential articles which after the removal of documents using the exclusion and inclusion criteria described (Table 2) was narrowed down to 22 sources (Figure 2). These 22 sources were supplemented with 8 resources obtained from expert

recommendations, bringing the total number of resources used for the thematic analysis of this quick scoping review to 30 (Figure 2).

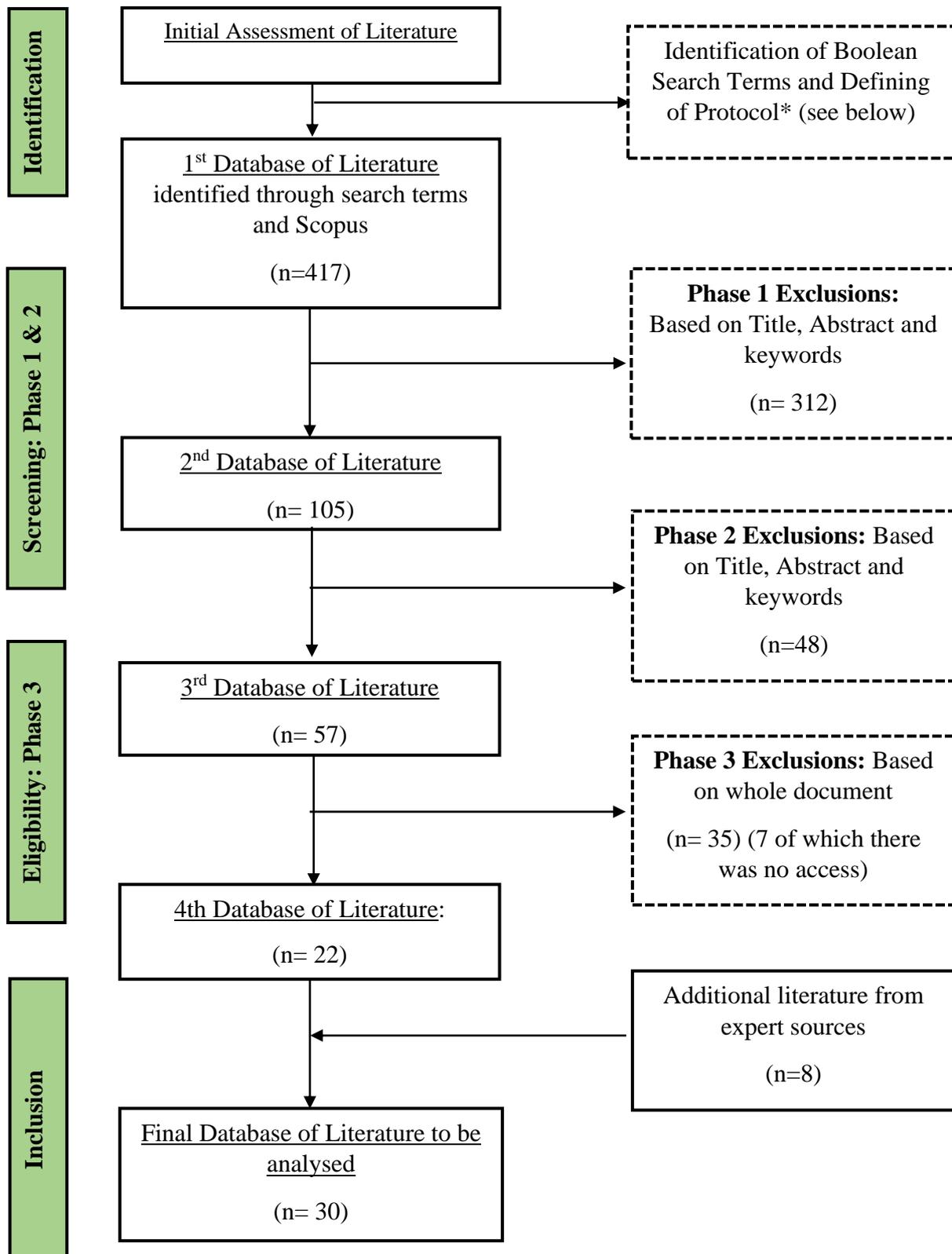


Figure 2. Flowchart diagram to represent the review process and show the results from the Scopus search as well as inclusions and exclusions at each stage.

As this was a quick scoping review rather than a systematic review, a variety of resources were contained in the database in order to assess the scope of current literature, giving a broad overview on the type of information available on HTR farmers and land managers. Table 3 shows the breakdown of resource types and the research methods used.

Table 3. Breakdown of source types (a) and methodologies used (b)

a) Source Type	Number
Empirical / Primary	21
Theoretical / Review	6
Grey Literature	2
Book Chapter	1

b) Research Approach	Number
Qualitative	10
Quantitative	5
Both	6

A variety of research methods were used from workshops, demonstrations, interviews, participatory approaches, case study analysis and surveys. The number of study participants also ranged considerably from 5 – 1600 as participant numbers were highly dependent on the research methods used. More qualitative, time intensive approaches such as interviews and workshops used fewer participants with a mean average of 41 participants, whereas studies that focussed on survey methods averaged 599 participants. The final database of articles also contained a wide variety of study locations from across the world (Table 4).

The literature base did contain some studies that referenced different types of land managers (other than farmers), however the majority of the literature focussed on HTR farmers. The purposes and setting of each study varied, with many discussing more than one topic in relation to engaging farmers, land managers and HTR individuals to achieve an outcome or to address a problem. Many papers discussed a range of these topics, Figure 3 outlines the different issues that were addressed in each paper and the numbers of papers that specifically focussed on these areas.

Table 4. Breakdown of study locations in Global North (a) and Global South (b) (where the literature has referred to countries or nations as ‘developed’ or ‘developing’ here ‘Global North’ and ‘Global South’ are used as the more modern convention used by the World Bank and other organisations)

a) Global North	Countries
Europe (13)	UK (5), Ireland (2), Netherlands (2), Russia (1), Greece (1), Italy (1) EU mix (1)
North America (5)	USA (4), Canada (1)
Australasia (2)	Australia (2)

b) Global South	Countries
Africa (4)	Kenya (2), Nigeria (1), Tanzania (1)
Asia (2)	Philippines (1), Thailand (1)
Mixed (3)	Mixture of Global South (3)
Global (1)	Global Scale (1)

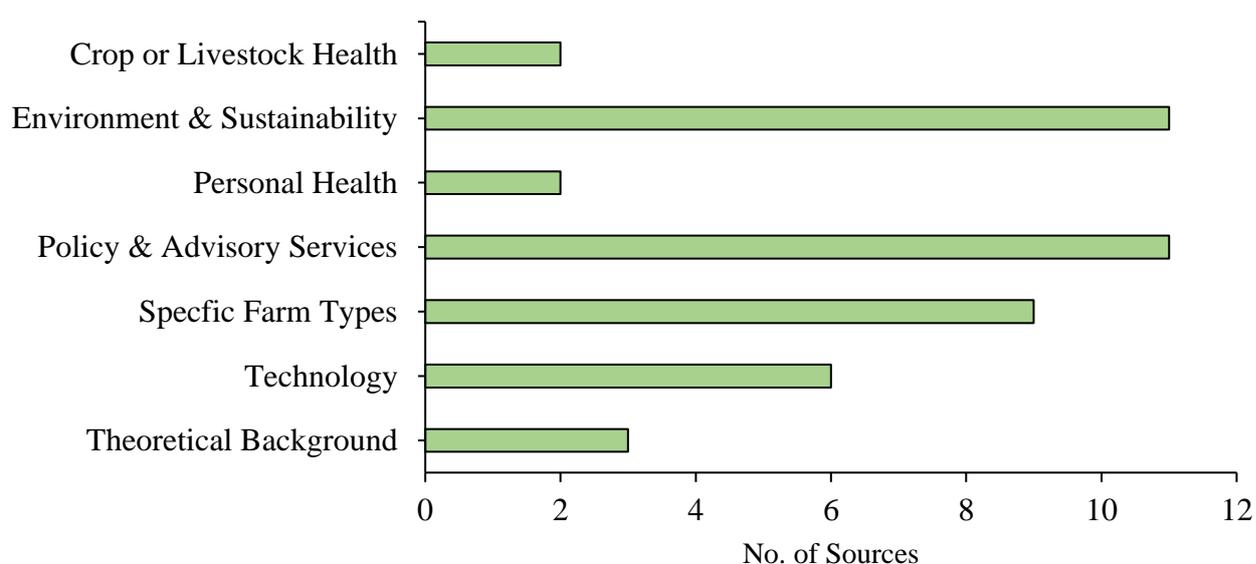


Figure 3. Key issues that were addressed in the resource papers. Though some papers discussed nearly all the issues in some facet, this chart indicates the one or two key issues that were addressed in each paper in addition to ‘harder to reach’.

3.2 Thematic Analysis

Key areas that address the objectives and research questions of this study were drawn and through the coding of the papers, key themes and subthemes were developed (Table 5).

Table 5. Summary of the themes and discussion points drawn from the literature

Area	Themes
HTR Theory	Principles of concept Diffusion of Innovations Factors and Barriers Criticisms and Complexity
Practical Barriers HTR	Remoteness Technology Time constraints Income constraints Farm type/Management Difficulties with Administration and Bureaucracy
Behavioural, Attitudinal, and Personal Barriers HTR	Risk Averse Low trust in external sources Perceptions of sender and receiver Low social capital Differing priorities Lack of incentive Contradictory advice
Solutions and Recommendations	In-depth proactive approach Develop trust Farmers' and land managers' priority Adequate Incentives Make administration easier Consistency in message and contact Multiple communications Make technology easier Cooperation

4. 'Hard to Reach' Concept

4.1 Principles of HTR

'Hard to Reach' (as previously used in the literature) has been used to describe people that are difficult to contact or engage with and therefore often omitted from research, policy and underserved by extension services. The terminology has been used in a variety of scenarios including social marketing, medicine, the public sector, and research (Bonevski *et al.*, 2014; Brackertz, 2007). HTR people are said to require more time, resources, and money to engage with, and therefore are left out of policy discourse as it is not seen as cost-effective to attempt to engage with them (De Pascale *et al.*, 2017; Khanal *et al.*, 2019; Stringer *et al.*, 2020).

The omission of these individuals leads to a bias and over-representation of the more progressive 'usual suspects' and underrepresentation of those that are HTR (Bonevski *et al.*, 2014). This can negatively impact HTR individuals who lack access to services they need and consequently may become 'left behind' by society. It can also have wider policy implications, as bias in the data can lead to an inaccurate representation of a policy area and a false perception of a threat or problem (Bonevski *et al.*, 2014). In turn, this could lead to inadequate solutions to policy issues. A plethora of research has been done to identify HTR individuals and understand the factors that may contribute towards people falling into this category. The intention is to better understand who HTR people are, account for them in policy or research, and use improved methods of communication to engage those that are underserved and underrepresented.

There are complexities as well as criticisms with the terminology and definition of HTR. HTR typically refers to groups of people that have been socially disadvantaged and disenfranchised; "*homeless and transient, chronically mentally ill, high school drop-outs etc*" (Lambert, 1990). The terminology can lead to generalisations of people, treating them as a homogenous group, attaching a stigma to the phrase HTR which can be prejudicial (Whitnell, 2004). Some define HTR as those who are 'not in contact' and lack adequate amounts of information on given subjects, whereas others include those that are 'hard to action' i.e. those who have received the required information on a subject but chose not to respond (Kinsella, 2018). The complexity in the terminology and definitions makes the subject difficult and complex to address. Whilst some literature has used the term 'Hard to Reach' as a noun often to define a homogenous group, we use the term here as 'harder to reach'(HTR) as an adjective to describe individuals

that are less engaged with Defra through a wide variety of factors and negative past experiences, that reduce their incentive to engage and therefore may be difficult for Defra to engage with for the co-design and uptake of ELM. Barriers to engagement can be both due to difficulties in communication and participation or a generally poor relationship characterised between the sender of information, Defra, and the receiver, farmers, and land managers.

In the context of ELM development, Defra should engage as many people as possible in the co-design and scheme uptake for the following reasons:

- Ensure secure funding for farmers and land managers to provide public goods
- Prevent farmers and land managers from falling behind
- High coverage of land sustainably managed
- Achieve environmental goals
- Achieve rural development goals

In order to ensure that farmers and land managers have secured the support they need and that Defra have reached environmental and public goods goals they have set, it is in both parties' interest to engage with HTR farmers and land managers and not just rely on the 'usual suspects'. This emphasises the necessity for this research and an understanding of what makes someone HTR and how we can engage with them.

4.2 Diffusion of Innovations

The diffusion of innovations (DOI) principle developed by Everett Rogers in 1962 is an important topic to understand when discussing how new ideas and technology spreads in a society or industry. The theory stipulates that in any society there are four different types of people; innovators, early adopters, majority adopters and laggards, and that new ideas will be communicated through these participants over time with the laggards being the last to adopt. This model is still used by researchers to examine the dispersing of new ideas in a society and to determine the adoption categories of individuals, dependent on how long it takes them to embrace a new concept (Khanal *et al.*, 2019).

Typically, early and majority adopter categories have less barriers in the way of their engagement and implementation of new information; they are more active, and information seeking and therefore will respond quicker to outreach and communication efforts. However, laggards are the more difficult, HTR individuals, that usually require more intensive outreach programmes and more time before information is adopted. For this reason, some suggest that

it is more cost and time effective method to focus communication channels on the adopter and majority categories initially in order to ensure greater uptake of a particular scheme, in the hope that this information will be communicated throughout the society and be implemented by the laggards at a later stage (De Pascale *et al.*, 2017; Khanal *et al.*, 2019; Stringer *et al.*, 2020).

The generalisations of the diffusion principle reinforce agricultural extension services to focus on the progressive, early adopting farmers as this follows the strategy of least resistance (Röling *et al.*, 1976). However, there are shortcomings of this approach, which are explored further in a review on farmer behaviour change undertaken for the AHDB (Rose *et al.*, 2018). DOI places a dependence on early and majority adopters to communicate the innovation to others in the social system, specifically laggards. This requires strong communication channels and networks within society, as well as the desire for early adopters and opinion leaders to spend time and energy disseminating the information to others. This may not always be the case especially in farming, where some farmers can lack communication with others, have few to no social networks and social capital is low (Hall, 2008). Adopters may also have a negative perception of laggards who they may not see as ‘good’ or ‘real’ farmers, with little to offer in any reciprocal exchange, and therefore would choose not to communicate with or assist in their development (Hall, 2008; Somers, 1991; Sutherland, 2019). The diffusion principle also has an ingrained ‘pro-innovation bias’ assuming that innovations will be advantageous for all and that all innovations should be adopted by everyone (Röling *et al.*, 1976). This is not always the case within agriculture, given the variation of sectors within the industry and the differences between farmers. Furthermore, early adoption of unproven technology may turn out to be a bad decision, which means that late adopter’s benefit from their decision not to uptake. Without communication and understanding of HTR individuals, innovations may not be developed with them in mind and not be suitable for adoption by them. By only focussing on the adopter group, a greater disparity can occur between them and the laggards/harder to reach (Röling *et al.*, 1976), whereas contacting HTR individuals early in the decision-making process can prevent them from becoming left behind and even more disenfranchised from the system.

4.3 Barriers to Engagement

HTR individuals are heterogeneous and are from different demographics and socio-economic backgrounds that have an array of practical and behavioural barriers that prevent them from easily engaging with their community, industry and/or government. These can either be practical barriers such as remoteness and lack of time, or behaviour and attitude-based factors

such as lack of trust and an aversion to risk. Practical barriers are more identifiable and can be more easily overcome with market-based solutions (Pike, 2008), whereas the behavioural barriers are more complex, difficult to predict, more ingrained in the individual’s personality and will need more long term, time consuming approaches to overcome (Dessart *et al.*, 2019; Pike, 2008). Table 6 and Table 7 indicate the barriers that are discussed within this report with a summary of each. Because some barriers, specifically behavioural characteristics, are not obviously identifiable, some have attempted to match barriers to engagement with identifiable features and traits from demographic data to achieve a more targeted approach to easily identifiable groups of people. However, this can undermine its complexity; people that share a common personality or behavioural trait will not necessarily share another and therefore cannot be predicted to respond the same to all scenarios (Pike, 2008). However, throughout the report references will be made to certain types of farmers and land managers that are more prone to facing a particular barrier and therefore may be more likely HTR, in order to provide some more guidance on HTR individuals within the agriculture industry.

These points will then be summarised in chapter 8 which will draw together some of the key traits and try identifying key groups of people that are most likely to be HTR. This is done with the recognition that it is complex and generalisation and identifiable traits are not a perfect solution.

Table 6. Practical barriers that prevent HTR individuals engaging with external sources

Practical Barriers	Page	Summary
Time and Income Constraints	26-28	“too busy” part-time farmer, off-farm work, time spent on short term planning, lack of capital to invest
Administration and Bureaucracy	28	Too complicated, leads to frustration, spend too much time on admin, seek advice only for short term administration issues
Technology	28-30	‘Digital Divide’, tech illiteracy, internet connectivity issues
Remoteness	30	Less engagement, further away from neighbouring adopters, broadband issues

Table 7. Behavioural barriers that prevent HTR engaging with external sources

Behavioural Barriers	Page	Summary
Trust	31-36	Lack of trust in external sources, lack of trust in government, lack of relationship building, negative experiences, sceptical
Social Capital	36,37	Few networks, lack of relationships, low bonding, bridging, linking, don't receive information from others
Risk	37,38	Financial risk, present bias, nature not reliable
Perception	38,39	Negative perceptions of government agencies, not viewed or view self as 'real' farmer, perceived lack of incentive
Priorities	39-41	Short term finances, off-farm work, 'public' not a priority, "tidy" farm
Inconsistency	41,42	Inconsistent message, contradictory information, policy fatigue, high turnover of agency staff

5. Practical Barriers

5.1 Time

Farmers and land managers may be perceived as HTR because they do not have the time and/or the emotional energy to engage with extension services and have limited involvement with activities such as consultations, discussion groups and farm walks (Kinsella, 2018). Time constraints were referenced frequently as barriers to engagement with research. Studies found that farmers responded to calls to participation with "too busy" (Jansen *et al.*, 2010), or initially agreed to be involved in research but a lack of time or loss of interest prevented them from continuing further (Sutherland, 2019). Increased diversification and off farm work in the agricultural industry can decrease farmers' available time. Several studies found that part-time farmers and those with off farm work are more likely to be HTR (Dessart *et al.*, 2019; Dunne *et al.*, 2019; Kinsella, 2018; Sutherland, 2020) and less likely to have time to adequately participate in research and development projects without jeopardising their other sources of income (Richardson-Nqwenya *et al.*, 2018). Specifically, Kinsella, 2018 identified a group of

younger farmers with higher levels of education and combined small-scale farming with off farm work as HTR.

When farmers do spend time engaging with advisory services, the majority of time is spent on short term advice to understand and apply for current subsidy schemes rather than seeking advice on long term, innovation and development strategies that may improve their farm over time (Dunne *et al.*, 2019; Kinsella, 2018). They may already be inundated with applications and paperwork of current payment schemes, and do not wish to prioritise spare time to engage with the co-design of ELM over time on the farm or with their family (Richardson-Nqwenya *et al.*, 2018). Some older farmers may want to slow down on farm development and spend time on other activities. Kinsella (2018) found that older farmers who lacked succession plans were also HTR.

5.2 Money

Some farmers and land managers may fear that sustainable management schemes could decrease their revenue. This was noted as a major obstacle for landowner participation in carbon sequestration programs in the US, with participants citing the uncertainty of expected revenue flow as a barrier to adoption of the scheme (Khanal *et al.*, 2019). When evaluating the costs and benefits of schemes farmers and land managers may not view management schemes objectively and have a ‘present bias’, i.e. have a disproportionate weight on the immediate costs and benefits than those of the future (Dessart *et al.*, 2019). This present bias can be particularly persuasive in the case of sustainable farming practices and schemes such as ELM that may entail immediate costs in the form of new machinery or reduced yield, but with benefits that don’t occur until later in the future, whether that be payments for public goods or ecosystem benefits such as soil retention (Dessart *et al.*, 2019). Ecosystem benefits may have even less weight for the farmer as they are typically invisible gains, thus the farmer lacks a perceived direct benefit from. Some farmers and land managers may also lack the capital and resources to invest in new equipment that may be necessary for achieving sustainable management goals. Understanding the financial situation of farmers and land managers, and how they may perceive financial incentives and rewards is important when planning and discussing ELM to prevent farmers and land managers de-selecting to cooperate due to perceptions of financial risk.

It is likely that without addressing the issues that farmers and land managers face in the short term, even those that are engaged with Defra may not seek to play an active part in ELM co-design or wish to change the narrative to something more imminent to them.

5.3 Administration and Bureaucracy

Complex administration and high levels of bureaucracy are stated as some of the reasons by farmers for not liking or not involving themselves with government led schemes. They see it as time-wasting, frustrating and risky (Hall, 2008; Lyon, 2019). As discussed in the previous section, the complex nature of these schemes is highlighted by Dune *et al.*, (2019) who found in their study that 55% of farmers consulted advisory services to address a single topic and that 94% of the time this topic was regarding scheme and regulatory advice. The complex bureaucracy associated with some government schemes can negatively impact wider and longer-term policy goals such as rural development, investment, and sustainability goals.

Though Defra has indicated that ELM will reduce ‘red tape’ involved in ELM and give the farmer increased flexibility (Defra, 2020), the negative experience some farmers have of previous agri-environmental schemes and the difficulties they have had of participation in the past will have a long-lasting effect (Hall, 2008). New policy documents indicate that ELM will most likely run on a tier based system, with lower tiers being based on easier measures and more basic payments and higher tiers allowing for more innovative approaches and may use a ‘Payments by Results’ system (Defra, 2020). These three tiers will give greater flexibility to farmers and land managers, but they must be communicated effectively to avoid confusion. Additionally, the requirement for some farmers and land managers to collaborate with farming neighbours may exclude socially isolated farmers.

In addition, the increasing reliance on online applications and administration will make it difficult for some farmers and land managers to participate due to a lack of technological infrastructure or computer literacy. This leads into the next section which discusses the technological barriers for engagement in government led schemes.

5.4 Technology

In the literature from the Global South, technological constraints were recognised as a major barrier to engagement. A lack of access to and ability to use technology increases the ‘Digital Divide’ (Panganiban, 2018).

A quote from Panganiban, 2018 summarises this issue concisely:

“Those who have access, or the information “haves”, technology offers opportunities, inclusion and wealth but for those who cannot or the “have-nots”, it presents a risk of greater isolation and increased poverty” (Panganiban, 2018)

Though the Global South is at a greater disadvantage in terms of integrated technology systems than the UK, there is still a persistent ‘digital divide’ present in the Global North, especially for farmers who are in remote areas and lack consistent broadband connections (Cameron *et al.*, 2016). This has been highlighted in previous reports to Defra, including by Rose *et al.* as part of Defra’s Sustainable Intensification Platform (see Rose *et al.*, 2016) Those that are at a technological disadvantage are more likely to become HTR, specifically those with limited internet connectivity such as in the North East where there is the highest population of internet non-users and 4G no spots (ONS, 2019). Several studies found that smaller farms and older farmers were less likely to have the access to, and knowledge of, technology (De Pascale *et al.*, 2017; Machum, 2005).

Technology restrictions limit the adoption of innovations and development of on farm work but also reduce knowledge sharing and communication channels (De Pascale *et al.*, 2017; Panganiban, 2018). The digital divide will make it harder for certain farmers and land managers to receive information about government schemes and policy, communicate with government and extension services, apply and conduct administrative work for schemes and use new modernised equipment that are frequently claimed to be the answer to many sustainability issues.

The UK government has outlined a push towards scientific and technological advancement in agriculture (Gove and Defra, 2019). For smaller farms, new machinery and agri-tech may not be worthwhile or practical as the area under management is not large enough for the tech to be useful or cost-effective (Machum, 2005; Wegran 2018). Machum (2005) highlights that smaller farms are not necessarily technologically behind because they are ‘backwards’ or ‘anti-progress’ but that they do not wish to expand beyond their needs and instead want to move at a pace that is sustainable for the environment, their farm and family relations.

The ‘digital divide’ could be expanded if larger farms get preference for involvement in agri-tech programmes and demonstration days compared to smaller farmers who will be less targeted for resources in these programmes due to their lack of suitability (Wegran, 2018). The digital divide between smaller farms and larger, corporate farmers will result in the larger

farmers becoming more productive, profitable, economically stronger and gaining more political power compared to the smaller farmers, which without consideration, will be left behind (Wegran, 2018). The lack of adaptive capacity for many farmers is noted by several papers including in reviews by Fielke *et al.* (2019), Klerkx *et al.* (2019) and in a forthcoming paper by Barrett and Rose (under review), which explores farmer technology futures in the UK. This notes that Defra themselves, in the Health and Harmony consultation document, have identified the challenge of differing adaptive capacity as a result of differing levels of finances, skills, and infrastructure available to farming businesses.

Early adopters who have the access and understanding of technology as well as the capital to invest will have a wealth of opportunity available to them to be involved in ELM and other sustainable management projects. However, those at a technical disadvantage and HTR will be late to the game, that by the time they arrive may have already moved on, having to play catch up whilst the early adopters reap the benefits (Röling *et al.*, 1976).

5.5 Remoteness

Remote farmers and land managers will have several practical disadvantages that will make communication channels more difficult. Farmers and land managers in remote areas will be less accessible, have fewer local networks, struggle to attend participatory activities that are located closer to towns and cities, and are more likely to struggle with broadband connectivity issues.

Additionally, farmers and land managers in remote locations are less likely to visibly see or have access to neighbours that have participated in co-design activities or implemented innovations and agri-environment schemes on their farm (Fischer *et al.*, 1996). Being able to view neighbours in a close proximity, who have similar farming conditions, can give more confidence in applying new management techniques (Fischer *et al.*, 1996). If there are considerable geographical distances between themselves and the nearest adopter it reduces the levels of certainty about whether management schemes would work for them (Fischer *et al.*, 1996).

Those in remote locations also have fewer opportunities to meet others in society whether that is their peers, local-non farmers or government agency representatives (Hall, 2008). This will make it more likely that farmers and land managers in remote locations have fewer networks and lower social capital which makes interaction with others and involvement in participatory

activities more difficult (Hall, 2008). Targeting remote and isolated communities may be necessary to make sure they receive adequate information about ELM and the co-design process (Williams *et al.*, 2008).

6. Behavioural, Attitudinal and Personal Barriers

Behavioural traits are embedded into someone's beliefs, thoughts, and perceptions, influenced by their culture and surroundings, and can alter an individual's willingness and ability to engage. These personal and internal barriers are more complex and can be more difficult to determine and identify in an individual or group. They encompass the psychology of an individual and therefore relate to the cognitive, emotional, and social behaviours of both the receiver of information as well as the sender (Dessart *et al.*, 2019). The solutions to overcoming behavioural barriers are not short-term fixes that can be easily solved with top-down, market-based approaches, but rather they require longer term, bottom up approaches (Pike, 2008; Rose *et al.*, 2018). Understanding the perspectives of a farmer or land manager is key to understanding their ability to and motivations for them to, or not to, engage with voluntary participation in both the co-design and application of ELM.

Categorising behavioural factors is relatively arbitrary and there can be lots of overlapping between different behaviours and attitudes (Dessert *et al.*, 2019). Therefore, in this study, the behavioural factors were separated in relation to repeated codes and common themes that were generated from the literature. The key behavioural barriers identified were trust, as well as its relation to social capital, risk, perceptions, priorities, and consistency. Further information can be found in an AHDB review on farmer behaviour change (Rose *et al.*, 2018).

6.1 Trust

Trust can be defined as a person's judgements, choices, and actions about the future behaviour of other people or organisations when there is imperfect information about the actual outcomes. Placing trust involves assessing potential risks and benefits of a decision whilst acknowledging the personal or business-related vulnerability.

“... voluntarily increasing our vulnerability to others in the expectation of others virtuous conduct towards ourselves (Sztompka, 1999).”

Even where the risks feel high, trust mediates those feelings creating

“... the willingness to accept risk based upon stable, positive expectations of a partner’s intentions” (Brown, 2004: 168).

The outcomes of trust will depend largely on the level of trustworthiness of the person or organisation being trusted. Therefore, assessing the trustworthiness of the partner is an important prerequisite to making future decisions that are based on information or involvement with that partner. This is particularly important in situations of unequal power (Morrison, *et al.*, 2017) where sanctions on the more powerful agent are unavailable. In these situations, especially when little time has been dedicated to building a relationship, distrust and social distance can be the rational option (Hardin, 2004; Larson, 2004).

The importance of strong trusting relationships in the delivery of effective agri-environment schemes is well documented (e.g. Mills *et al.*, 2016; Sutherland *et al.*, 2013;). The benefits of trust include lower transaction costs (Dwyer *et al.*, 2007) and adherence to more sustainable social norms of land management with decreased opportunism (Inman *et al.*, 2018). Trust also underpins farmer collaboration (van Dijk *et al.*, 2015) and hence farmers’ willingness to work collectively at a landscape scale (Prager, 2019) to repair fragmented ecosystems and create a nature recovery network (HMG, 2018).

Trust was the key factor that influenced HTR dairy farmers in using advice and participating with study groups based on animal disease information. Using a qualitative approach Jansen *et al.*, (2010) investigated the different behavioural traits that are present in HTR dairy farmers in the Netherlands. HTR dairy farmers were identified by their vet who perceived them to be HTR based on their engagement, or lack thereof, with udder health information. Jansen *et al.*, 2010 separated dairy farmers into four different typologies based on their interview responses to questions about the dairy cow disease mastitis, and their perception of the problem, solution, and sources of information. The four typologies identified were Proactivists, Do-it-yourselfers, Wait-and-see-ers and Reclusive Traditionalists (Figure 4) (Table 8). These groups were determined based on two main dimensions; their orientation towards the external world and their trust in external sources (Jansen *et al.*, 2010).

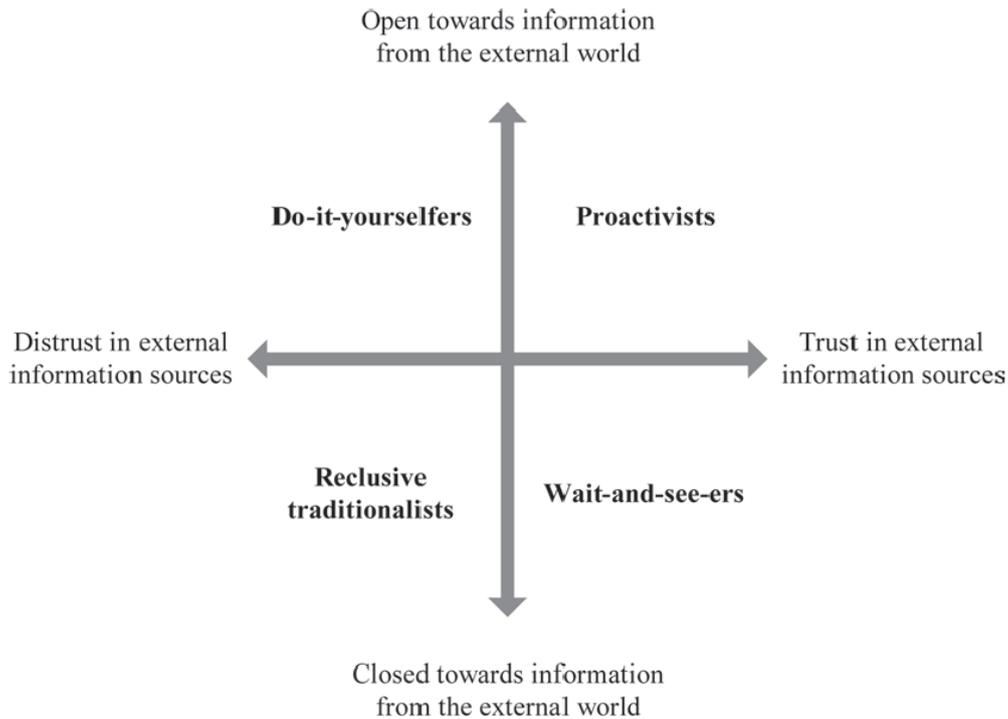


Figure 4. The classification of HTR farmers based on their orientation towards, and trust in, external sources. Figure and results taken from Jansen *et al.*, 2010)

Table 8. Summary of traits of HTR dairy farmers in Jansen *et al.*, 2010 study

Group	Traits	Reasons for lack of engagement	Preferred Information Sources
Proactivists	<ul style="list-style-type: none"> ● Outward orientated ● Open ● Well informed ● Interested ● Information sharing ● Positive relationships 	<ul style="list-style-type: none"> ● Too busy ● Already informed ● Did not need more information 	<ul style="list-style-type: none"> ● Multiple channels ● Easy access internet or letters ● One to One ● Suppliers
Do-it-yourselfers	<ul style="list-style-type: none"> ● Active ● Well-informed ● Critical to external information ● Business like relationships 	<ul style="list-style-type: none"> ● Cost related reasons ● Seek advice when necessary 	<ul style="list-style-type: none"> ● Cost-benefit information ● Experience in practice ● Demonstration days ● Colleagues
Wait-and-seers	<ul style="list-style-type: none"> ● Open ● Approachable ● Lack initiative ● Good relationships 	<ul style="list-style-type: none"> ● Too busy ● Nothing came of it 	<ul style="list-style-type: none"> ● Positive relationships i.e. Vet

Reclusive	● Inward	● Don't like interference	● Farm magazines
Traditionalists	● Self-reliant	● Lack of trust	● Mailings
	● Conspiratory		
	● Few relationships		

Although all farmers were identified by their vet as HTR in this study, many of them were still in contact with services or knew of the current information regarding mastitis (Jansen *et al.*, 2010). It was their variation in views towards the external world and trust in external relationships that made them more, or less, receptive to the information they were given. The reclusive traditionalists were the hardest group to contact with the most distrust in external information and relationships. Their attitude was illustrated with the following quote:

*“I don't like it when other people are looking into my farm business. I'm very much on my own.” (Interviewee, Jansen *et al.*, 2010)*

Table 8. summarises the findings from this study and highlights the heterogeneity of HTR groups as well as difficulties with HTR definitions. There is a selection bias present here as those that the vet defines as HTR may not necessarily be HTR by other information sources (Jansen *et al.*, 2010). Not all of these farmers would necessarily be considered HTR by the definition that HTR have limited to no contact, but were identified as such by their vet, possibly due to their lack of contact with the vet and an unwillingness to adopt the vet's advice (Jansen *et al.*, 2010). This emphasises the issues and complexity of HTR and its definitions.

Behavioural traits are often inherent in the individual, but they can also be heightened by their circumstance. Hall, 2008 found that within a longitudinal study observing a sample of 31 farmers within the Norfolk Arable Land Management Initiative (NALMI), approximately 25% of farmers could be categorised as 'Farmers Under Pressure'; working excessive hours and having a wide range of pressures from all sides of the business. This group lacked social sustainability and were under high levels of stress, lacked hope, had periods of depression, and felt resentful towards farming and their position within the industry (Hall, 2008). As well as the 'Farmers Under Pressure', 'Small Family Farmers' were also recognised as a HTR group within farming (Hall, 2008). These groups did not engage with the external world, specifically government agencies, whom they lacked trust in and avoided interaction with where possible (Hall, 2008). Both the Small Family Farmers and the Farmers Under Pressure fall under the definition of HTR which within the NALMI study represented 58% of farmers (Hall, 2008)

A US study, researching engagement with Amish farming communities, found these communities HTR due to their lack of trust in external sources (Brock *et al.*, 2018). The Amish community held strong religious and cultural beliefs, but also had many identifiable traits similar to those identified in UK HTR farmers i.e. often part-time, other off-farm work, experiencing technological restrictions, reluctant to change, reliant on practices of their elders and culture, and not trusting or wanting to associate with government (Brock *et al.*, 2018). The issue of trust was significant in this study as the Amish had a general lack of trust towards government or any extension service that they deemed had an affinity to government. This lack of trust was exacerbated by the high turnover of staff within the extension services. It was noted that it takes a significant amount of time to build a relationship; the view was it took 3 years to build a relationship before conservation goals could be established (Brock *et al.*, 2018). High turnovers of staff as well as the lack of willingness and commitment on behalf of the public sector professionals meant relationships were not developed and trust wasn't established, which hindered the engagement and policy aims (Brock *et al.*, 2018).

Similar problems were found by Hall and Pretty (2008) in their study 'Then and Now' which looked at the changing relationships of Norfolk farmers with government agencies. Farmers recalled positive relationships with government agency staff during the 1960s and 1970s citing that there was trust and respect between themselves and the agencies they dealt with (Hall and Pretty, 2008). NALMI farmers felt that their relationships with staff were open, honest and they worked together to achieve shared goals (Hall and Pretty, 2008). These farmers recalled communications to be two-way and with mostly face-to-face interactions with the staff (Hall and Pretty, 2008). This helped build a genuine, positive relationship between the farmer and government agency; many farmers could still remember the names and specialisms of staff years later. However, organisational changes that put an emphasis on 'rules' and 'compliance', as well as changes and turnover in staff in the government agencies during the 1980s and 1990s, created distance. There was a loss of long-standing trust between farmers and government agency staff (Hall and Pretty, 2008). Post 2000s, farmer relationships with agency staff had limited respect, mutual distrust and increased social and physical distancing (Hall and Pretty, 2008). Ultimately it made farmers HTR and impeded sustainable land management and wider policy goals.

6.2 Social Capital

Trust is also an integral part to social capital, which refers to the relationships, trust and solidarity that occurs between individuals, groups, and networks. It can be described as: ‘the valuable resources you get from the people you know’. High levels of social capital, characterised by rich networks of diverse people, help to exchange information and ideas to achieve mutually beneficial collective outcomes. Social capital can be separated into three types:

- **Bonding capital:** relationships between homogenous groups e.g farmer to farmer
- **Bridging capital:** relationships between different social circles and networks of heterogeneous people e.g farmers and local non-farmers
- **Linking Capital:** relationships and networks between individuals with different levels of power and influence e.g farmer and government body relationships

These different social relationships are important in influencing farmers’ and land managers’ behaviours. Farmers and land managers with a high social capital can learn and develop from their networks, will have the opportunity to collaborate with others, be exposed to new innovations and be supported in their implementation (Hall, 2008). However, in cases where individuals have low social capital, they can be isolated from their peers and government and therefore it cannot be relied on that others will influence their behaviour (Hall, 2008). Those with low social capital will also find it more difficult to collaborate with neighbouring farmers and land managers, which will exclude them from delivering higher tier ELM outcomes that rely on collaboration and local planning (Defra, 2020).

Some studies suggest that it is more valuable and effective to focus on the earlier adopters who are better suited to adaptation interventions, citing that it could be cheaper and easier to persuade a few large farmers to make positive changes and that this could have a wider impact than influencing larger numbers of small-scale farmers (Khanal *et al.*, 2019; Stringer *et al.*, 2020). The problem with this approach is that it assumes that smaller, HTR farmers and land managers will have received communications on innovations from the larger farmers and early adopters and that they are receptive to the new information. This is often not the case. Hall 2008 found that both ‘Small Family Farmers’ and ‘Farmers Under Pressure’ have a low social capital, are HTR and therefore are unlikely to receive information due to their lack of substantial networks and relationships.

HTR will require an active, qualitative approach to engagement and relationship building over time in order to increase their social capital and involvement with society. If the DOI principle is adopted and the emphasis is placed on early adopters and opinion leaders, it is likely that many HTR farmers and land managers will be left further behind. Building bonding capital will also be necessary to avoid the exclusion of socially isolated farmers and land managers in achieving higher tier ELM aims where collaboration with neighbours is necessary.

6.3 Risk

Risk tolerance is a strong influencing factor on farmers behaviour in adapting and adopting new practices. Given the volatility of the industry both in respect to income and climate, many farmers already have a low tolerance to increased risk (Dessart *et al.*, 2019). Those that are more risk averse are later to adopt new management practices and are often referred to as the ‘laggards’ in the industry.

It is important to recognise that the capacity to benefit from innovations is different depending on the farm attributes. Smaller farms with a lesser resource base run a greater risk in adopting new practices, compared to larger farms that can benefit proportionately more (Röling, 1976). Several studies within this review have found smaller farmers to be late adopters, more risk averse and HTR (Hall 2008; Machum 2005; Somers, 1991; Wegren, 2018). As mentioned in the previous section on income barriers to participation, the ‘present bias’ will play a part in the risk perception of a new management scheme. Farmers decisions may be more greatly affected by risk of yield loss which could occur by participating in ELM rather than the potential gains they may receive from reduced input costs and payments that would occur in the future (Dessart *et al.*, 2019; Pike 2008).

In initial consultation documents Defra put an emphasis on a ‘Payments by Results’ based system (Defra, 2018a). A ‘Payments by Results’ scheme could increase the uncertainty and perceived levels of risk for agreement holders. In a survey conducted on farmer opinions of post-Brexit agricultural policy, 23% of farmers (69 surveyed) did not agree with a ‘Payments by Results’ scheme with interviewed stakeholders highlighting that the variable nature of the environment could see farmers and land managers penalised for not achieving results despite their best efforts (Lyon, 2019). More recent policy documents have indicated that Defra intends on using a 3-tier system with ELM that will vary in difficulty and financial risk levels (Defra, 2020). Tier 1 would have more prescriptive, easy measures that will be paid for using basic payments on income foregone whereas Tier 2 and 3 schemes may include elements of

‘Payments by Results’ and allow farmers and land managers more flexibility (Defra, 2020). Ensuring these messages are communicated effectively so that farmers and land managers understand the financial risk levels involved will be important.

6.4 Perceptions

The term ‘perception’ was used frequently throughout the literature not just in reference to perceptions of people, but also how people perceive risk, rewards, and control. Perceptions of the farmer, the receiver of information, on external sources of information, external relationships and government can play a large role into whether they are likely to engage with them.

Some farmers have a negative perception and a lack of trust in government (Brock *et al.*, 2018; Hall, 2008;) and will avoid any interaction with them or any extension service agent who is associated with the government (Brock *et al.*, 2018). They don’t see the professional as an individual but rather as a representation of the entity they have a negative perception of. They may perceive them to have ulterior motives and divergent agendas (Brock *et al.*, 2018) which leads to an absence of shared goals and solidarity in tackling mutual problems (Hall, 2008). Some farmers are also of the view that advisory services catered to larger, more intensive farmers and therefore don’t actively engage with them (Kinsella, 2018; Wegren, 2018). This may translate into a barrier with ELM engagement, as farmers may see their farm as too small to engage in the system, or they may perceive that they have few ‘public goods’ that they could provide.

In the case of the sustainable production of biofuel within the Global South countries, Lee *et al.* (2011) found that many independent smallholders who have less resources and capital to implement sustainability standards, had a ‘perceived’ lack of incentive and reward for compliance. These smallholders did not perceive the benefits of sustainability standards to be significant for them and will consequently operate alone, feeling left behind by the industry as the rest seek to become more sustainable (Lee *et al.*, 2011). If the reasons and benefits for the farmer for participation in both the co-design and uptake of ELM are not communicated effectively and translated well, farmers may perceive participation as not to be relevant or worth their time.

It is not just the perception of others, but also of themselves and their self-identification which may affect whether farmers and land managers chose to participate in the co-design of ELM.

Several studies have found that farmers that are part-time or have small farms may not perceive themselves to be ‘real’ or ‘good’ farmers, de-selecting themselves from participation (Hall, 2008; Somers, 1991; Sutherland, 2019). This perception of ‘good’ and ‘real’ farmers v.s. ‘bad’ farmers are perpetuated by other farmers and the government. Somers (1991) found that external experts and large farmers felt that small farmers lacked “*entrepreneurial*” characteristics, are less able to adapt to changing circumstances and less able to apply integrated knowledge and logical solutions to reach their goals. The small farmers in the study were aware of this prejudice and stigmatisation, which generated feelings of inferiority, and felt that they were underestimated by extension workers (Somers, 1991). These negative perceptions of small and other HTR farmers and land managers by government bodies and extension services may consciously and/or subconsciously result in their exclusion from policy discourse and perpetuate the selection bias. Extension workers may have a selection bias to choosing progressive farmers and land managers for participation in co-design and outreach activities because they think that it will make them more likely to succeed (Röling *et al.*, 1976). Data protection legislation may also create barriers, for example the holding and sharing of contact details for HTR farmers with researchers, government agencies or even other farming charities.

Sutherland, 2019 asked an interesting question that highlights this issue:

Do samples under-represent part-time farmers, both because of unavailability and because other farmers and key informants do not see part-timers as ‘real farmers’ and therefore do not recommend them? (Sutherland, 2019)

6.5 Priorities

Due to time and income constraints farmers are unlikely to devote their time to something that isn’t a priority for them. Understanding the priorities and needs of different types of farmers and land managers is imperative to developing a message they are likely to respond to.

The Defra Farmer Segmentation Model characterised farmers based on their attitudes, behaviours, and motivations; separating farmers based on their ‘farming style’ (Pike, 2008). Farmers were separated into 5 different groups; ‘custodians’, ‘lifestyle choice’, ‘pragmatists’, ‘modern family business’ and ‘challenged enterprises (Figure 5.).

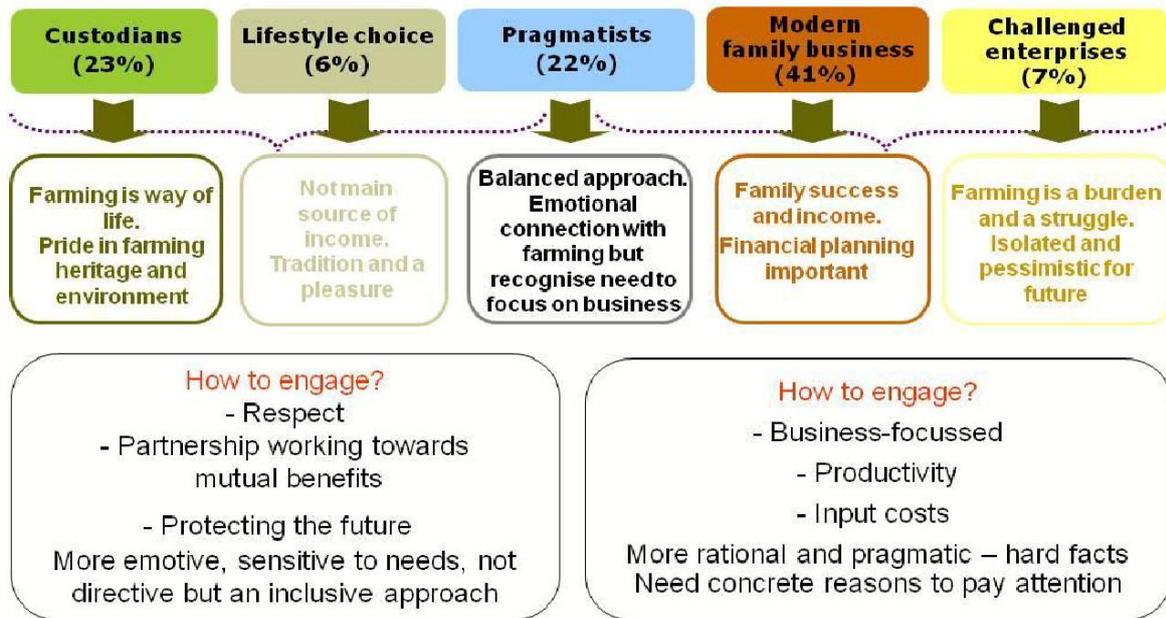


Figure 5. DEFRA farmer segmentation model separating farmers based on farming style (Pike, 2008)

These separations can help better identify the priorities and motivations of different ‘farming styles’. While some farmers, such as ‘custodians’, may respond positively to calls of environmental protection and the provision of public goods, for others such as ‘Modern family business’ and ‘Challenged enterprises’, public goods and the environment may not be their priority. They would require a different approach to get them interested in participation, targeted more towards productivity and input costs (Pike, 2008). This does not mean that other farming styles are not interested in environmental protection but that an environmental message would not be optimal in engaging them in ELM.

Specifically, some farmers may not respond well to an emphasis on ‘public goods’ due to a negative perception of the public. Hall 2008 found that farmers with low bridging social capital expressed feelings of resentment towards local people. Both ‘Smaller-Family-Farmers’ and ‘Farmers Under Pressure’ avoided interactions with the public and were less interested in providing ‘public goods’ to people that they deemed ‘better off’ than themselves (Hall, 2008: 202). Changing land management to what the public wanted was seen as a loss of face, a sign of giving in associated with a significant loss of self-esteem. In the view of one farmer:

“The more you give to the public, the more you are a loser!” (Farmer Interviewee in Hall, 2008)

A lack of acknowledgement of food production as a public good could also undermine the priorities and values of farmers.

Others may have different priorities in the management of their farm that do not match with sustainable objectives. Specifically, some farmers and land managers prioritise having a farm that is “*tidy*” and well managed to one that has wild growth and field margins which would be of benefit to biodiversity (Sutherland, 2019). Understanding these different motivations and priorities prior to calls for participation are key to understanding how farmers and land managers may react to certain elements of ELM.

6. 6 Inconsistency

A message can get lost and not be well received by an individual if there is contradictory information provided to them or the message and the sender of the information lack consistency.

Jansen *et al.* (2010) found that farmers disputed information they received about mastitis because they received contradictory information from other sources such as their vet and their animal feed suppliers. Farmers may be influenced to take different directions by information they receive from suppliers, relatives or co-workers (Dessart *et al.*, 2019), and if they have more trust and value in that relationship they will be more likely to be receptive to these sources of information than to government advisors in whom they lack trust.

Sometimes the information and advice given to farmers can be contradictory even if it is coming from the same source. This is especially relevant in agricultural policy where, in relation to the CAP, continuous incremental changes have led to increased levels of uncertainty and policy fatigue (Hall, 2008). Farmers have found that previous CAP policies contained contradictions regarding productivity and sustainable goals (Hall, 2008). These contradictions and the confusing and changing policy messages received made it difficult for farmers to engage in the process (Vrain and Lovett, 2019).

Inconsistencies can also occur when governments state that they will take a more decentralised approach but implement policy measures that are authoritarian. This message is particularly prevalent in the Global South where governments claim to adopt a policy framework that favours a decentralised, participatory approach but then push for environmental policies that restrict locals' access to farmland and natural resources (Barnaud *et al.*, 2008). In the case of the highlands of Northern Thailand, these contradictions have resulted in conflicts between

local communities and government agencies regarding land-use- and access rights in the upper watersheds (Barnaud *et al.*, 2008). Similar findings were also shown in Greece, where despite efforts to push for a decentralised approach, rural development was mainly implemented through state mandated design and implementation (Iliopoulou and Stratakis, 2011).

7. Summary of ‘harder to reach’ farmers

Table 9. Summary of the main groups of farmers and land managers characterised in the literature as HTR and the potential barriers in place to engagement

Type	Potential Barriers
Older farmers	<ul style="list-style-type: none"> ● Risk ● Lack of development plans ● No succession plans ● Less technologically literate
Smaller farm/ land managed	<ul style="list-style-type: none"> ● Risk ● Do not perceive themselves to have enough ‘public goods’ ● Not seen as ‘real’ or ‘good’ farmer ● De-select themselves as they don’t view themselves as ‘real’ farmers ● Ignored by Defra or extension services ● Management schemes/new technology not practical
Part-time farmers/ off farm work	<ul style="list-style-type: none"> ● Less time ● Not viewed as ‘real’ farmers ● Do not wish to invest in the farm ● Lack of development plans
Remote farmers	<ul style="list-style-type: none"> ● Fewer networks/contacts ● Lack of internet & broadband ● Less visibility to innovations in practice ● Less technologically literate
Farmers Under Pressure	<ul style="list-style-type: none"> ● Too busy with on-farm work ● Stressed and resentful ● Lack of trust in government ● Fewer networks/contacts ● Negative view of the public ● Environment not their priority

Practical and behavioural barriers can hinder contact with many different types of individuals and farmers; the HTR are a heterogenous group. However, there are certain types of farmers that have come up repeatedly in the research and are more prone to being HTR. These are summarised in Table 9 along with the typical barriers that constrain them.

8. Solutions

Several studies contained a strong focus on different methods to engage HTR farmers and land managers. This section will discuss the solutions and methodologies proposed within the literature, which in turn will inform our recommendations for Defra.

8.1 Multiple Communication Channels

There are many different communication channels that can be used, and farmers and land managers are receptive to different types. By using a variety of approaches and also collaborating with trusted messengers who can spread the information, the likelihood of engaging with a farmer increases.

Farmers and land managers will respond to different triggers and communication channels. Jansen *et al.*, 2010 found that ‘Do-it-yourselfers’ responded more positively to experience in practice and demonstration days, compared to ‘Reclusive traditionalists’ who were most likely to trust farm magazines and mailings. This was also highlighted by Cameron *et al.* (2016) in a study discussing the delivery of plant health knowledge to smallholders:

“Face-to-face information sharing through extension workers and agro-dealers is effective ... , a range of approaches and multiple intermediaries is more likely to reach all members of farming families and strengthen messages deliver” (Cameron et al., 2016)

By using multiple communication methods, it is more likely that the message will be heard by as many people as possible including HTR individuals. Methods of communication discussed throughout the studies include over the phone, face to face, mailings, magazines, online content, off-line content, apps and websites, television, and radio.

If external sources of information are used and they are proven to be reliable and compatible with the farmer over time then the likelihood of the farmer being receptive to future information and calls to engagement will increase (Nwanko *et al.*, 2009). Consistency is key.

Cooperation and collaboration in spreading the message will also help keep the message consistent. Informing several different actors to take forward the message such as extension services, vets, suppliers, farming clubs, NFU will also help to strengthen the message and keep consistency (see Rose *et al.*, 2018). Collaborating with different groups, organisations and actors will increase the likelihood that a farmer will receive information from a source they trust and share a relationship with (Ehlers and Graydon, 2011; Nwankowo *et al.*, 2009). These collaborators will also know the most suitable way to communicate to their audience (Ehlers and Graydon, 2011; Nwankowo *et al.*, 2009). With this in mind, developing potential mailings, brochures and magazine articles will more likely be successful if they collaborate with other farmers and land managers who may be able to provide a message that will resonate better with their peers (Ehlers and Graydon, 2011). Similarly, employing local farmers and land managers in practical demonstration days to educate their peers will make messages resonate better for them (Williams *et al.*, 2002).

8.2 In-depth, Proactive Approach

Knowledge and information don't necessarily lead to changes in behaviour (Ehlers and Graydon, 2011), especially when there are many barriers to engagement in place. A more proactive, participatory approach that is more in-depth and longer term will be required for farmers and land managers that have significant levels of barriers to participation. Face-to-face engagement can help build a relationship between the farmer and government agency workers which over time will allow for trust to be built and for the farmer to gain social capital as his relationships and networks increase (Brockett, 2019; Hall and Pretty, 2008;).

Farm walks and on-farm demonstrations are also useful in showing how a new technology or management scheme can work for them in practice (Brock *et al.*, 2018; Khanal *et al.*, 2019; Rose *et al.*, 2018; Williams *et al.*, 2002). However, a conscious effort must be made to show a variety of farms to be more inclusive. If farmers and land managers are only shown on-farm demonstrations on large, well-managed, progressive farms, smaller or under-pressure farmers will find it hard to relate to what is demonstrated, which may increase their feelings of exclusion and inferiority (Hall, 2008; Somers, 1991; Sutherland, 2019). Also off-site activities are unlikely to be useful for those with time constraints such as part-time or farmers with off-farm work, therefore on-site, one-to-one visits, would be useful as a first port of call to build the relationship (Kinsella, 2018). This will require flexibility in advisory services' working

hours to be able to visit those with time constraints in the evening or at the weekend (Kinsella, 2018).

Transfer of technology approaches typically elevate the role of science and technology but can ignore a farmer's local knowledge, problems, and priorities. Participatory approaches based on two-way conversations can be more engaging but only if farmers and land managers are treated as active engagers and not receptors of information. Barnaud *et al.* (2008) recognise that power differences amongst stakeholders can hinder participatory processes and that communication is not necessarily enough in overcoming these issues. In their study they argue that power relations need to be addressed first to avoid intensifying social inequalities and differences between heterogeneous groups in a participatory activity (Barnaud *et al.*, 2008). An initial analysis of the socio-political context of the local area can help to evaluate the situation, potential discussion points, common problems, potential triggers, and solutions (Barnaud *et al.*, 2008). Other considerations were also made in the participatory process to help alleviate issues of power dynamics and uneven participation. These included:

- Representation of all views in participatory activities
- Use of informal tools and 'game' type activities (examples in Barnaud *et al.*, 2008).
- Interviews and discussions in small socially-homogeneous groups i.e. farmers and land managers belonging to the same socio-economic category or same farming style.
- Participatory workshop with separate groups i.e. only farmers/villagers and only extension workers, prior to joining groups of different networks together.

8.3 Tailoring to the Farmer

An evaluation of the farmer's and land managers' needs, and priorities will allow messages to be communicated more effectively so that farmers and land managers understand the benefits of participation to them, not just the benefits for the government and the public. Understanding the best ways that sustainability and land management goals can be achieved within the context of the values and culture of farmers, depending on their personal situation and local environment, will likely lead to greater cooperation and understanding (Brock *et al.*, 2018; Nwankowo *et al.*, 2009; Tsouvalis, J. and Little, R. 2019b).

Direct financial incentives are sometimes necessary to compensate farmers and land managers for the cost associated with a change in behaviour (Rose *et al.*, 2018). In the context of co-design of ELM, a financial compensation may be necessary to reimburse farmers and land

managers for their time participating with co-design activities. Richardson-Nqenya *et al.*, (2018) found that agricultural research for development projects in Tanzania were beyond the reach for poorer farmers that needed to spend their time meeting daily subsistence needs. Even when project start-up costs were minimal, they could not spare their time participating in project activities without jeopardising their income (Richardson-Nqenya *et al.*, 2018). To account for this, participants were provided cash compensation for time spent attending meetings as well as financial support for start-up costs of innovations (Richardson-Nqenya *et al.*, 2018). However, it is noted in the literature that behaviour change influenced by financial incentives can be short lived especially if the financial support stops (Pike, 2008; Rose *et al.*, 2018). Therefore, conveying the greater importance and relevance to farmers and land managers of their engagement in ELM co-design will be necessary to lead to a longer term commitment to participating in the process and engaging with Defra in the future (Tsouvalis, J. and Little, R. 2019a; Tsouvalis, J. and Little, R. 2019b)

The other, more substantial financial aspect of ELM is the funding it will provide farmers and land managers for the delivery of public goods. This will likely be a driving factor for farmers and land managers to uptake the scheme, and these financial rewards can lead to a change in farmers' environmental behaviour (Pike, 2008). However, if behaviours towards land management are changed but attitudes are not, it is likely that these behaviours will be short term (Pike, 2008; Rose *et al.*, 2018). These points emphasise that although financial incentives may be necessary for both the participation in co-design activities and the uptake of ELM by farmers and land managers, adopting a more holistic approach that combines support, sustained knowledge exchange, educational activities and incorporates the objectives of farmers and land managers will be necessary to stimulate long-term behaviour change (Rose *et al.*, 2018).

To encourage adoption and take into account the concerns of small holders of sustainable biofuel production, Lee *et al.*, 2011 made the following recommendations:

- Delivery of sustainability standards in a step-by-step basis suitable to the local community context
- Adequate reward in the short-term to ensure continued participation in the long term
- Assist smallholders in land tenure, strengthening infrastructure and increasing market accessibility
- Link sustainability initiatives to rural and personal developmental benefits

In the review ‘Adaption and Development pathways for different types of farmers’, Stringer *et al.* (2020) used the three classic pillars of sustainable development as a conceptual anchor to identify adaptation and development pathways for different types of farmers on a global scale. Pathways were developed for 4 different types of farmer: ‘Conventional/Large Scale’, ‘Conventional/Small Scale’, ‘Traditional Extensive’, ‘Artisanal’. These pathways considered the adaptation and development for farmers necessary to meet global trends and ‘sustainable development goals’, whilst considering their traits and characteristics (Table 10)

Table 10. Summary of traits of 4 different types of farmer and their potential pathways to sustainable development (Table based on findings from Stringer *et al.*, 2020)

Farmer Type	Traits	Potential Pathways
Conventional, large-scale commercial	<ul style="list-style-type: none"> ● Commercially/markets/profits orientated ● Capitalist approach ● Can be environmentally insensitive ● Benefit from supermarket purchasing models. 	<ul style="list-style-type: none"> ● Novel technologies ● Payments for ecosystem services ● Removal of perverse subsidies ● Consumer awareness.
Conventional Smallholder	<ul style="list-style-type: none"> ● Usually rely on other income ● Often not commercially viable ● Unlikely to contribute to global food security. 	<ul style="list-style-type: none"> ● Increased access to credit ● Appropriate technology with training ● Infrastructure development ● Tenure reform ● Land rental markets ● Certification schemes
Traditional Extensive	<ul style="list-style-type: none"> ● Often start from strong environmental / socio-cultural perspective ● Not always profitable 	<ul style="list-style-type: none"> ● Certification Schemes ● Payments for ecosystem services ● Infrastructure investment ● New market opportunities ● Improve credit ● Collective action
Artisanal	<ul style="list-style-type: none"> ● Profit orientated ● Usually environmental emphasis ● Emphasise quality over quantity 	<ul style="list-style-type: none"> ● Urban horticulture ● Certification schemes ● Business models enabling equitable consumer access ● Increase social movements ● Chef-farmer alliances

Observing the suggestions put forward by Stringer *et al.* (2020), Defra are already moving in the right direction in terms of “*Payments for Ecosystem services*” and “*Removal of perverse*

subsidies”, but it is important it recognises the subtle differences between these different groups. Whilst conventional large-scale farmers will be enticed by novel technologies, small scale farmers will need technology appropriate for them as well as training. Pathways must contain a mixture of interventions that cater to innovation, social, economic as well as sustainability and environmental challenges. These pathways will also come with their risks and trade-offs which Stringer *et al.*, 2020 discuss in more detail. Understanding the local context by engaging with all farmers, including HTR farmers and land managers, will be crucial in developing the appropriate pathways dependent on their circumstance.

8.4 Technology Development

Technology development can act as a driving force for rural and agricultural development as well as increasing communication channels with farmers and land managers. In this evidence review the majority of literature that discussed the use of technology development as a tool for engaging with HTR communities was from the Global South. Studies from the Global South discussed a variety of different technology systems such as E-governance and communication technology (Panganiban, 2018), open education resources (Cameron *et al.*, 2016; Muniafu *et al.*, 2013) or open access biotechnology (Adenle *et al.*, 2012), and how they can be used as a means of engaging with those who are HTR. Developing technology and training for HTR farmers was used to support rural communities but also develop communication channels and networks between farmers, government, and extension services. Open access resources can encourage development, innovation and communication in a collaborative effort while reducing the costs and risks for farmers (Adenle *et al.*, 2012).

In order to narrow the ‘Digital Divide’, the Philippines’ Department of Agriculture implemented e-government to promote agricultural development, improving farmers’ livelihoods and encouraging active stakeholder participation (Panganiban, 2018). This involved a blended approach using face to face and online modules, radio programmes, SMS, and social media platforms, as well as centres and site-specific services. Farming contact centres were an integral part to the start-up of e-government initiatives because many farmers did not have connection to the internet. These farming centres were set in a more informal ‘user friendly’ setting so farmers felt more welcomed inside (Panganiban, 2018). Communal access and both the use of offline and online learning tools made learning for farmers easier. Feedback mechanisms made farmers feel like the e-governance initiatives were a collaborative effort that they had ownership over (Panganiban, 2018).

Similar blended approaches were used in other studies to develop education and practical resources to support smallholder farmers. The Plantwise programme, launched in 2011, is a global outreach and information programme that assists and advises farmers on plant health to improve food security and rural livelihoods (Cameron *et al.*, 2016). Resources include information to help tackle crop damage and pest control issues. By using a variety of both ‘generic’ solutions as well as ‘site-specific’ options that are not expensive or time consuming for farmers, they are able to roll out advice quickly whilst providing focussed advice in response to specific problem areas (Cameron *et al.*, 2016). The development of ‘Plantwise Factsheets Library’ in a mobile App allows farmers to access information easily while on site and benefits those who do not have access to computers (Cameron *et al.*, 2016). Useful adjustments to the app such as making it easy to read in bright light and making it easily updatable on poor mobile data connections make the app more ‘user friendly’ (Cameron *et al.*, 2016). Use of photos as a communication tool encouraged farmer participation and provided useful data for the programme (Cameron *et al.*, 2016).

The United States International University also developed training materials for farmers, using an open educational resource (OER) platform, to support HTR rural farmer populations in Kenya (Muniafu *et al.*, 2013). The development and improvement of the training system involved a variety of stakeholders, with research and consulting activities providing learning opportunities for the faculty, university students and the farmers (Muniafu *et al.*, 2013). Farmers responded to the training platform positively, felt that they learned a lot, and were particularly pleased about their involvement with the development of case studies as it was an opportunity for them to show their achievements, monitor their progress and show that their views mattered (Muniafu *et al.*, 2013). Though this training platform resulted in many positive outcomes, with farmers maintaining communications with other farmers about their work and progress, it was highlighted that farmers did not visit the OER website after the project had ended due to a lack of computer and internet accessibility (Muniafu *et al.*, 2013). This stresses the necessity for infrastructure and investment in rural development communities in order to allow them to progress and innovate (Muniafu *et al.*, 2013).

In the UK, developing technology infrastructure in remote, rural locations as well as providing training in the use of technology resources will improve online communication channels between HTR farmers and land managers, and Defra. Training exercises can offer farmers and land managers an opportunity to develop skills in areas that are useful for them whilst also building trust and a relationship between them and the government.

9. Conclusion

Using the quick scoping review methodology, this report analysed the literature available on HTR farmers and land managers, developing an understanding of the concept, an awareness of the barriers to engagement and the solutions to overcome these issues. Specifically, this evidence base fed into nine key recommendations for Defra to increase communication and engagement with HTR farmers and land managers in order to improve the inclusivity and representation in ELM co-design. The take home messages of this report in engaging with HTR farmers and land managers are:

- **Building trusting relationships** with farmers and land managers by using an in-depth proactive approach over time
- **Tailor ELM to suit their motivations** by developing an understanding of HTR farmers and land managers and their objectives and needs and communicating these messages effectively so they understand why co-design of ELM benefits them.
- **Support and develop technology** for farmers and land managers to reduce the digital divide, engage with them in a positive way that benefits their objectives and to increase communication channels between them and Defra.

Although this report provides a good introduction to the characteristics of HTR, a more in-depth understanding of the local contexts and farmer related priorities would be needed to accurately tailor co-design participation towards specific communities and individuals. HTR farmers were the focus of the report based on the literature available, however some papers also discussed other land managers, such as forest landowners, and similarities were drawn between the two. Further work on engagement of other types of land manager would be valuable, though many of the solutions discussed within this report are likely to be applicable.

A thoroughly inclusive co-design that represents a wide variety of stakeholders within the agriculture industry will only be possible if HTR farmers and land managers are given the opportunity and motivation to actively engage in the process. Defra have addressed some of these key concerns already within their most recent ELM Policy discussion document (Defra, 2020) and if they are able to continue to commit resources to understanding and accommodating the concerns of the HTR farmers and land managers it is likely that a more fully representative co-design process could be achieved which would be inclusive of a greater diversity of farmers and land managers. Co-design provides a great opportunity to actively

engage farmers and land managers in the design of ELM so that it suits their needs and objectives whilst also being practically appropriate. An inclusive co-design process will benefit Defra as well as farmers and land managers as it will lead to a more successful ELM design that meets the objectives of a wide variety of farmers and land managers, increasing the likelihood of uptake and participation in ELM, and in turn leading to a greater delivery of public goods.

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