Farmer attitudes and evaluation of outcomes to on-farm environmental management

Final Summary Report

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1 Introduction

The Countryside and Community Research Institute (CCRI), the Food and Environment Research Agency (Fera) and the University of Exeter were commissioned by the Department for Environment, Food and Rural Affairs (Defra) in December 2010 to explicitly explore the link between arable farmers' attitudes to environmental management, their subsequent behaviour, and the perceived and observed environmental benefits.

The role of the farmer and land manager in delivering environmental benefits (e.g. biodiversity, soil and water protection) is well recognised. There has been a long-standing public commitment to the provision of environmental benefits through a system of capital and management payments along with statutory responsibilities. For example, environmental and welfare standards are a requirement of cross-compliance for farmers receiving direct payments from Common Agricultural Policy (CAP) support schemes\(^1\); environmental regulations such as Nitrate Vulnerable Zones have led to the adoption of specific management practices through Catchment Sensitive Farming\(^2\); and Defra, in partnership with delivery agencies, provides support through a number of incentivised agri-environment schemes (AES), such as Entry Level Stewardship (ELS)\(^3\). Finally, there has been an increasing emphasis on voluntary industry-led provision through the Campaign for the Farmed Environment (CFE)\(^4\). This research is intended to improve the understanding of the effectiveness of different intervention options for the delivery of environmental objectives on arable land, and identify those factors that govern success and deliver positive outcomes. In particular, the study seeks to identify the additionality between these different approaches and any informal environmental management activities (defined as management activities that are not part of a scheme and are therefore not managed according to a set of prescriptions). It is recognised that farmer attitudes to environmental management and their subsequent evaluation of outcomes may impact the balance of formal and informal provision, the type of formal provision adopted, and the environmental benefits provided. By providing a better understanding of the link between attitudes, activities and outcomes, the right regulatory, incentivised and voluntary approaches can be used to achieve and maintain environmental benefits on farmland.

1.1 Aims and objectives

The main aim of this research was to improve the understanding of the effectiveness of different intervention options for the delivery of environmental objectives, and identify those factors that govern success and deliver outcomes. To achieve this aim, the research explored farmers' attitudes and associated behaviour towards environmental management, and identified the factors driving environmental activities. It also examined how land-managers perceive and evaluate the outcomes of environmental management. The research sought to establish the extent to which informal provision occurs and compare the management and environmental benefits of informal provision relative to that under cross-compliance, agri-environment schemes or contributing to the CFE. The research also considered how management activities and the provision of environmental benefits interact with agricultural production and the farm business.

To summarise, the key objectives for the research were to identify:

i. The factors (attitudinal, financial, etc) driving environmental activities;

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\(^1\) http://www.defra.gov.uk/foodfarm/farmmanage/singlepay/furtherinfo/crosscomply

\(^2\) http://www.defra.gov.uk/foodfarm/landmanage/water/csf/index.htm

\(^3\) http://www.naturalengland.org.uk/ourwork/farming/funding/es/els/default.aspx

\(^4\) http://www.cfeonline.org.uk/x42296.xml
ii. The perceived and observed benefits of environmental management activities;
iii. The balance of environmental management activities and benefits accruing from formal and informal provision; and
iv. The interactions between land under formal agreements and land outside of agreements.

The analytical framework used to assess the key objectives of the research is presented Figure 1.1 below.

Figure 1.1: Analytical framework for understanding link between farmer attitudes to environmental management and subsequent farmer behaviour and outcomes
1.2 Structure of the report

This report provides a summary of the main report which contains more detail on all aspects of the research. There are 5 main elements to the research project:

- A comprehensive review of the literature exploring farmers’ environmental behaviours and actions.
- An analysis of the Countryside Maintenance and Management Activities module of the Farm Business Survey (FBS) providing evidence of the general pattern across the farming population of the factors that influence the farmer’s ability to adopt environmentally beneficial farm practices and the motivations behind these activities.
- Telephone interviews with 10 expert farm advisors identifying their views on farmers’ attitudes to environmental management and the importance of different external and internal drivers affecting farmer behaviour.
- 60 in-depth, face-to-face interviews with case study farmers to identify the psychological and physical motivations or barriers to environmental management activities.
- Environmental assessments undertaken on the 60 case study farms to assess habitats and features of environmental value in relation to farmland birds, wider biodiversity and resource protection (soil and water).

The remainder of the report is divided into five sections summarising each aspect of the research. The final section provides an overview of the key findings drawing on all the evidence in the proceeding chapters and drawing out some key implications for policy-makers.
2 Literature Review

The literature review contributes primarily to the first main objective of the research project, by examining the factors driving environmental activities on mainly arable farms. The requirement was for research to:

i. uncover attitudes (the ‘what’ question);
ii. understand why such attitudes are held (the ‘why’ question);
iii. understand how attitudes on environmental issues interact with other attitudes to form a wider outlook or worldview (the ‘how’ question);
iv. explore the implications of such attitudes for environmental behaviour and action (the ‘so what’ question); and
v. understand the possibilities and processes relevant to attitude change (the ‘what if’ question).

This literature review revealed that there is a link between attitude and behaviour in the context of farmers’ environmental decision-making, although attitude is mediated by structural or constraining factors whether these are situational (related to the household or farm), or external drivers such as policy or markets. The trade-offs and balances between these factors and individual farmers’ values and attitudes is therefore of particular interest, this is characterised as the outcome between ability and willingness.

Factors affecting environmental management uptake

The factors set out below (Table 2.1) were identified in the literature as influencing farmers’ behaviour generally by constraining or acting as a barrier to farmers’ ability to undertake environmental management. Previous research has shown that explaining farmer decision-making in relation to the environment and their holdings is not reducible to single factors, so there was no attempt to relate behaviour to single factors, such as farm size or type in this project. Instead, the research analysed the interaction between the many influential factors and drivers (including attitudinal factors which influence willingness) that affect farmers.

<table>
<thead>
<tr>
<th>Table 2.1 Factors influencing environmental management uptake (Ability)</th>
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<tbody>
<tr>
<td>Farm household characteristics: personal, social and situational characteristics of farmers and household:</td>
</tr>
<tr>
<td>• Education</td>
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<tr>
<td>• Succession status</td>
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<tr>
<td>• Age</td>
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<td>• Length of residency</td>
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<tr>
<td>Farm structure: physical farm factors and the farm operation (farming system and business factors) including structural characteristics:</td>
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<tr>
<td>• Farm size</td>
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<td>• Farm type</td>
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<td>• Tenure</td>
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<td>• Dependency on farm income</td>
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<td>• Amount of non-intensively used farmland</td>
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<tr>
<td>• Bio-geographical conditions of the farmland, endowments of natural habitat</td>
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<tr>
<td>Innovation/scheme factors: nature and qualities of the scheme, practice or innovation:</td>
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<tr>
<td>• Payments offered</td>
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<tr>
<td>• The scheme duration (and the time lag involved in scheme renewal),</td>
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<tr>
<td>• Logistics (information availability and flow; follow up and monitoring)</td>
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<tr>
<td>• Eligibly</td>
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<tr>
<td>• Lack of compatibility with existing management plans and extent of adjustment required</td>
</tr>
<tr>
<td>• Perceived complexity, comprehensiveness and effectiveness</td>
</tr>
</tbody>
</table>
Values, Beliefs, Attitudes

The review showed that there is considerable debate about the extent to which attitude is a reliable predictor of behaviour and a direct relationship between participation and a positive interest in, or concern for, the environment is not always clear cut. There are, however, some key aspects concerning attitude that can be revealed in an interview which affect the farmers’ willingness to undertake environmental actions, these are listed in Table 2.2. In particular, taking a broad understanding of attitude is necessary. The link between attitude and behaviour or intended behaviour is much stronger when other determinants of behaviour, such as subjective norm and perceived behavioural control are incorporated in the analysis reflecting the importance of social norms and identity and perceived ability to participate. Questions about how the farmer thinks he/she will be affected by a change in management are important. Questions were developed for the interview survey which allowed exploration of the balance between ability and willingness to undertake environmental management and aimed to understand the significance of attitude under different circumstances.

Table 2.2 Values, Beliefs, Attitudes (Willingness)

| • Direct attitudinal variables, (feelings and beliefs towards the environment); intrinsic values and motivations |
| • Indirect attitudinal variables (farming philosophies i.e. utilitarian, neutral or conservationist) |
| • Orientations: stewardship, technological beliefs or profit maximisation |
| • Openness to new ideas |
| • Subjective norms or normative beliefs (the perceived social pressure to behave in an environmentally friendly way) |
| • Personal attitude or behavioural beliefs (the farmer’s evaluation of environmentally friendly behaviour) |
| • Perceived behavioural control or control beliefs (the extent to which AESs are perceived as easy or difficult to adopt) |
| • Belief in efficacy of their actions (level of confidence in conventional intensive farming and in environmental actions) |

Motivations

Motivations, reasons for undertaking environmental behaviour, are underpinned by values, beliefs and attitudes. Although extrinsic and intrinsic motivations can be distinguished, often these combine and are not mutually exclusive. The interviews aimed to capture how these motivations interact by asking farmers the reasons why they are undertaking or not undertaking particular activities, referring to the key points outlined in Table 2.3. It is important to explore in depth the reasons behind financial motivations as these often relate to farm continuity rather than economic gain per se.

Table 2.3 Motivations for undertaking environmental management

| Extrinsic motivations |
| • Financial incentives |
| • Profit maximisation, |
| • Security, long-term farm viability and/or risk minimisation, securing the family future and its continuity |
| • Capital investment |
| • Community image, standing within the community, respect amongst peers, |
| • Regulation (fear of penalty) |
- Recognition in wider society

Intrinsic motivations
- Personal sense of environmental responsibility and accountability
- Commitment and interest in the environment
- More durable than extrinsic

Outcomes: Durable change and learning

With respect to bringing about durable changes in attitude, there is evidence that AES participation can instil awareness, learning and positive attitudes. However, the reasons for participating in the first place are key, if motivations are extrinsic (responding to financial incentives) they are often less enduring than if motivations are intrinsic (seeking personal satisfaction). Perceived outcomes of environmental management are important in guiding behaviour, especially establishing a link between the action and its efficacy. Observed outcomes and experiences reported from scheme participants reveal that they can benefit both in terms of environmental knowledge but also with respect to their farming operation and business. Where respondents have been in a scheme these aspects can be examined in the interview.

Most of these observations are from research undertaken in the context of more formalised voluntary actions (e.g. AES participation) where financial incentives are available. Arguably farmers’ positive attitudes would play a greater role in behaviour in less formal situations where there are no financial incentives. However, farmers do respond to other motivations such as the threat of regulation and the reactions and acceptance of their peer group and do need to consider the transaction costs of implementing a new practice.
3 Analysis of Farm Business Survey

The aim of this section was to present the analysis of the 2008/09 Farm Business Survey (FBS) Countryside Maintenance and Management Activities module (Section “O”). The objectives of this analysis were to:

- Analyse the uptake of arable AES activities and informal management activities by key farm and farmer characteristics; and
- Analyse the reasons for uptake of AES and informal arable-related management activities.

The main FBS survey is based on a sample of 1,875 farm businesses, carefully balanced so as to represent all the farm businesses in England with a minimum Standard Labour Requirement (SLR) of 0.5 units. The analyses are based on a subset of the main sample, including around 1,345 FBS farm businesses that responded to the section on countryside maintenance and management and the results were re-weighted to take account of non-responses, so as to represent the overall FBS target population.

The Countryside Maintenance and Management module of the FBS questioned farmers about 27 types of environmental activity, but the analyses focused on 7 activities that relate specifically to arable production and had a sufficient number of responses to conduct significance tests. These environmental activities were:

i. Field corner management
ii. Wild bird/pollen and nectar mixture
iii. Buffer strips
iv. Overwintered stubble
v. Uncropped land
vi. Hedges: maintenance
vii. Ditches: maintenance, restoration

In summary, the analysis of the FBS Module ‘O’ section revealed that:

- Overall, participation in informal environmental activities is widespread with around two thirds (66%) of farmers undertaking some form of environmental management activity on an informal basis (i.e. outside of an AES). In addition, around four out of five farmers (79%) are members of an AES. The most common category was to undertake environmental management activity both as part of an AES and informally (45%).

- Two thirds to three quarters of the environmental activity related to arable farms is undertaken within an AES, whilst a quarter to a third is undertaken informally.

- Those farms that are most likely to manage their environmental activities informally (outside of an AES) are the small size farms, where the SLRs are part-time, the farm business incomes are low (less than £12,300), the farms are tenanted and which fall within the Challenged Enterprise segment.

- Those farms that are most likely to undertake their environmental management activities within AES are the large farms which are owner occupied, with farm business incomes over £71,600, within a mid-range age category and part of the Modern Family Business segment.
• Those farms that are undertaking just one arable environmental activity are most likely to be undertaking this informally. In contrast, those with a higher number of activities on their farm are likely to be undertaking these within an AES or a combination of AES and informally.

• When comparing the area or length of different arable environmental activities, a higher proportion of uncropped land is undertaken informally, than in an AES. A greater proportion of the other activities are more likely to be undertaken within an AES, particularly field corners, buffers strips and wild bird/pollen and nectar mixes.

• Those farms that are more likely to manage their uncropped land informally are the small to medium sized farms, with part-time or small SLR, that are at the lower end of the farm business income spectrum, are of owner-occupied or mixed tenure status, are in the older age group and are Custodians or Pragmatists.

• The primary reason given for undertaking all environmental activities under AES were financial. Those who were managing wild bird / pollen and nectar seed mixes were more likely to cite environmental reasons for doing this, whilst activities undertaken for agronomic reasons were stubble and uncropped land and undertaken for reasons outside of farmers control were ditch management and buffer strips.

• Agronomic, environmental and financial reasons were important in undertaking informal management activities. Agronomic reasons were particularly important for undertaking environmental management on overwintered stubbles and uncropped land. Environmental reasons were given in particular for undertaking field corner management, wild bird / pollen and nectar seed mixes and buffer strips.. Financial reasons were cited for undertaking ditch management activities which would relate to drainage issues and also wild bird/pollen and nectar mixes which is likely to be connected to running commercial game shoots.
4 Telephone interviews with expert advisors

This section of the report presents the results of 10 telephone interviews with a range of expert advisors (who between them had over 150 years collective expertise of environmental advisory work). Average interview duration was 50 minutes, ranging from 30-90 minutes. The aim of these telephone interviews was to draw out the advisors’ views on farmers’ attitudes to environmental management; the importance of different external and internal drivers affecting farmer behaviour and to look for evidence of wider impacts. The analysis is structured around a number of key themes that emerged from the interviews.

Environmental awareness (if not actual management) is becoming mainstreamed
The mainstreaming of environmental awareness was a common theme and often contrasted to the resistance of “fundamentalist” farmers. The mainstreaming of environmental awareness was seen to result from several factors, including the environmental ‘PR’ campaign and the introduction of ELS. In addition to the impact of awareness raising campaigns, respondents argued that attitudes have changed, for some, because of the financial value of guaranteed agri-environmental payments, while some also see the importance of the environmental benefits.

Continued existence of farmers uninterested or unwilling to engage in environmental management
Alongside the mainstreaming of environmental management/awareness, there was widespread recognition of a small group of farmers who are resistant to the environmental message. This is for a number of reasons including the hassle factor (i.e. don’t want to join a scheme and be exposed to more inspection), not wanting to be told what to do, and being entirely production-focused. On the other hand, those that have embraced agri-environmental management were often seen to be predisposed due to existing conservation or sporting interests.

Mixed views on CFE
Respondents had quite mixed views about the impact of CFE. Several thought that it is probably having an impact on awareness but were less confident that this is being translated into action on the ground. Others voiced concerns that CFE is being negatively influenced by changes in organisational infrastructure and moves in global commodity prices. Several respondents thought that progress was slow and that targets would not be met. In part, these comments reflect the need for the passage of time in environmental management, but they also revealed a frustration with the perceived emphasis on the area under management (as an indicator of success) rather than the quality of that management. On the other hand, another interviewee thought that the message about quality had been received by farmers.

Level of informal agri-environmental activity
There was general agreement that there is a considerable amount of informal agri-environmental activity undertaken. Inevitably, some of this becomes incorporated into formal AES participation, but in other instances it remains informal because of the benefits (of flexibility) that this offers the farmer. Although there was widespread agreement that there is quite considerable informal activity, it was also clear that this tends to be restricted to the easier and more convenient types of agri-environmental management.

Buffer strips
In terms of important things that farmers have learned, several interviewees pointed to farmer recognition of the importance of buffering water courses. This is probably due to a combination of measures (LERAPs, CFE, various AES, past and present, and cross-compliance).
Cross-compliance – Soil Protection Review

If the message about the importance of buffering water courses emerges from the interviews as a success story, then aspects of cross-compliance, in particular the soil protection review (SPR) can be regarded as a failure in the sense that interviewees questioned farmer understanding of and adherence to cross-compliance requirements.

In-field options

The other area of agri-environmental management that has enjoyed least success, and which the results of the interviews indicate will continue to be unsuccessful, is that of encouraging farmers to engage in in-field options. There was a difference of opinion regarding whether farmers recognise the environmental benefits of in-field options but regardless of that there was general agreement that farmers are not keen on in-field agri-environmental management. Finally, one respondent neatly summed up the multiple factors deterring farmers from engaging in in-field options. In explaining why farmers have not taken up such options he pointed to financial, management and cultural barriers. There were a few examples of farmers undertaking in-field agri-environmental management where it made good sense in terms of best farming practice.

Importance of agri-environment payments

The last theme considered was the importance of agri-environmental payments. Although considerable informal (and therefore unpaid) agri-environmental management was recognised, it is clear from the interviews that the withdrawal of agri-environmental funding would impact on both the quantity and quality of agri-environmental management. At the farm level the withdrawal of payments would have a complex impact that is difficult to map as opinion amongst the interviewees was somewhat mixed. One respondent argued that boundary feature management is highly dependent on funding while also arguing that in the absence of funding margin management would not necessarily stop but would be managed differently. Another also reasoned that a withdrawal of funds would not have a drastic impact on certain types of margin management. The more common view is that the withdrawal of funding would have a noticeable impact: One respondent felt that farmers might retain some of the smaller buffer strips but some hedges would go back to annual cutting. There was also evidence that the withdrawal of funding would impact on management input and “care and attention”.

Overall, the interviews with expert advisors revealed a mixed picture regarding agri-environmental management. The situation is certainly much improved compared to the early days of AES but some farmers are still resistant. The evidence from the interviews points to widespread informal agri-environmental management, some of which ultimately ends up being incorporated into formal schemes. However, despite over 20 years of AES, many farmers, even those who have embraced agri-environmental management, remain resistant to the idea of in-field options.
5 Farmer face-to-face interviews

Face-to-face interviews formed a key part of the research project. In-depth, face-to-face, qualitative interviews were necessary in order to identify the psychological and physical motivations or barriers to environmental management activities. To understand farmers’ behaviour there was a need to consider the different contexts in which farmers operate, the local conditions in which farmers make their decisions, and to understand the role of farming culture, focusing beyond the individual. This included:

- Farmers’ situations – their needs, opportunities and constraints;
- Behaviours, and how these may have changed over time;
- How attitudes have influenced decisions made, and vice-versa (learning by experience); and
- Perceptions and opinions of different drivers and how these affect environmental decision-making.

A ‘narrative approach’ in which the interviewee was led through questions was used with the aim of providing a deeper understanding of farmers’ attitudes to environmental management and to explore the on-farm decisions taken over the farmers career and, where relevant, in relation to any formal environmental agreements and initiatives (e.g. the duration of agri-environment scheme agreements).

The interview sample was selected from the 2011 CFE postal survey dataset. The cross-section for sampling was based on the following 3 variables:

- Combinations of formal and informal environmental management activities
- Farm size
- Region

The interview was divided into four sections. In the first section the discussion focused on gaining an understanding of how the farm was managed and the farmer’s attitudes and motivations with respect to farm business and environmental management decisions on the farm. The second section investigated the impact of environmental schemes and policies on the way the farm was managed. The third section looked at the farmer’s experiences with specific environmental management practices and was based around a mapping exercise whereby the farmer annotated a map identifying activities being undertaken as part of AES, CFE or on an informal basis. The final section elicited the views of the farmer on the environmental benefits resulting from their management activities. They were asked to score these environmental benefits on a 3 point scale reflecting the extent to which they thought the activities benefited the environment with 1 being ‘Not Convinced Of Any Benefits’, 2: ‘A Few Benefits’ and 3: ‘Significant Benefits’.

The farmer interviews were recorded and afterwards a written summary of each interview was prepared using the recording and the completed interview schedule. These data were then analysed using the Nvivo9 qualitative data analysis software programme. Direct farmer quotations and extracts from the interview summaries were used throughout the report to emphasise the farmers’ perspective on different issues. Details of the findings are provided in Section 7.

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5 As part of the formal monitoring programme for the CFE, Defra undertook a farmer survey to record any land under unpaid environmental management in 2010/11 crop year, including any actions taken as part of the CFE.
6 Environmental Assessment

An environmental assessment of the 60 case study farms was undertaken. The methodology used for assessing habitats and features of environmental value was based on a scoring system derived from a literature review, which provided the basis for selecting attributes of importance in relation to the environmental benefits of interest. Habitats and features were assessed in relation to three themes: farmland birds, wider biodiversity and resource protection (soil and water).

Information on feature quality was derived from both field measurement and management information obtained from farmer interviews. For each attribute, scoring criteria were defined on a 3 point scale for each of the habitats or features to be recorded. These scores, were assigned to high (3), medium (2) and low (1) categories based on an even distribution between categories at farm level. On every farm and for each management category, up to three examples of each feature type were assessed in the field. The findings are discussed in Section 7.

An analysis was undertaken to compare the scores on environmental benefit derived from the farmer face-to-face interviews and the environmental assessments. In particular, it focused on differences between the farmers' perceived benefit scores and the field survey observed scores.

As part of the process to integrate the environmental benefit scores from the face-to-face interviews and environmental assessments, the research team members involved in the farmer interviews and field surveys met over 3 days to discuss each farm, case by case. The three objectives of these team synthesis meetings were to develop the understanding of:

i) any mismatches between the perceived environmental benefit scores for individual features provided by farmers and the observed environmental benefits identified in the field assessment.

ii) the link between farmers’ overall willingness and ability to undertake environmental management activities and their environmental management practices: and

iii) any differences in scores between AES and informal management activities on individual farms where both activities exist.

The final output of the meetings was an agreement on a score, based on a 1-4 scale: an overall score for the observed quality of the environmental management practices undertaken on the farm; and an overall score reflecting the farmer’s willingness and ability to undertake environmental management activities based on how they responded to a number of questions in the face-to-face interviews. The discussions were recorded, transcribed and analysed using Nvivo9 qualitative data analysis software programme. This process provided a much deeper understanding of the reasons for differences in farmers' perceived benefits.
7 Overview of research findings and policy implications

The aim of this final section is to draw on all the evidence collected throughout the research project and to identify the key themes and issues that have emerged. This section draws on the findings from the five main areas of research: literature review, analysis of the Farm Business Survey, telephone survey of advisors, face-to-face interviews with farmers and the farm environmental assessments. The section is structured around the four key objectives of the research which were to identify:

i. the factors driving environmental activities;
ii. the perceived and observed benefits of environmental management activities;
iii. the balance of environmental management activities and benefits accruing from formal and informal provision; and
iv. the interactions between land under formal agreements and land outside of agreements.

7.1 Factors driving environmental activities

As discussed in the literature review, a host of factors can drive farmers' engagement in environmental activities. Intrinsic and external drivers combine to lead different motivations and clearly the picture is complex. There is a consensus that farmers are very heterogeneous and differ in their decision-making in relation to the environment and their holdings. There is considerable debate in the literature about the extent to which attitude is a reliable predictor of behaviour and a direct relationship between participation and a positive interest in, or concern for, the environment is not always clear cut. This is often because attitudinal and structural factors combine and interact to influence behaviour. The focus of this research, therefore, has been to explore the interaction between the main influential factors and drivers that affect farmers' willingness and ability to undertake environmental management activities.

Figure 7.1 Main factors influencing farmers’ willingness and ability to adopt environmental management activities
7.1.1 Key factors affecting willingness to adopt environmental management practices

This section identifies the key factors that have emerged from the research data, which influence farmers' willingness to adopt environmental management practices.

Personal interest in wildlife

Our data highlights that a long standing interest in wildlife was often a key factor influencing those with a positive attitude to the environment. This particularly related to an interest in birds. This interest in wildlife often stemmed from childhood and these farmers could recall the names of the birds of the farm. Interestingly, these farmers also tended to be more observant of changes in species occurrence and abundance on the farm. However, they viewed wildlife from a fairly narrow perspective, focusing on the higher species and not the less conspicuous species which are not part of everyday life.

Personal interest in game shoots

Our data clearly shows that those with an interest in game shoots were more inclined to have a positive attitude to the environment. Some farmers interviewed had small, informal shoots for which game strips had been established either within a scheme or informally. Others, particularly those on the large estates had larger commercial shoots. The game strips seemed to particularly appeal to the farmers, and several had enjoyed experimenting with different seed mixes in order to find food plants that would be most effective on their farm. This was one activity where farmers often took a holistic view of the farm when establishing the strips. For example, one farmer referred to locating the game strips to make wildlife corridors through the farm, others had established blocks of game cover strategically around the farm. Often these farmers when describing the benefits of the various environmental activities they had undertaken on the farm made reference to the advantages to the game birds. They were frequently members of GCWT, from which they obtain much of advice. Significantly, these farmers’ views about improving environment for game birds, often extended to broader views of improving farm environment for wildlife generally.

Farming philosophies

Farming philosophy is an important factor which often influences a farmer's willingness to undertake environmental management activities. Two important themes emerged from the farmer interviews based around the concepts of custodianship and productivity. These were not mutually exclusive groups and some of the farmers said that taking care of the land was not incompatible with productive farming. However, those farmers expressing strong views on custodianship tended to be more positive about environmental management activities than farmers who emphasised the productive nature of their farming activities.

Custodianship

During the farmer interviews, the concept of custodianship was commonly raised in discussions about the farmer’s approach to farming and how they perceived themselves as farmers. The importance of taking care of the land and farming responsibly was stressed as was handing the land to the next generation of their family in ‘good heart’. Food production was only one of a number of considerations that had to be taken into account when deciding on now the land should be managed. Taking care of the environment in terms of resource protection, wildlife and biodiversity and landscape protection was seen as an important and sometimes essential part of being a good custodian of the land. Farmers with a strong view on the importance of custodianship also generally had a positive attitude to environmental management activities. Good agronomic and environmental management were seen as
compatible and in some cases indistinguishable. These general findings are supported in the literature that also identifies the link between views on custodianship and positive environmental management.

**Productivity**

Farm productivity was also a recurring theme among the farmer interviews. Having a productive farm and that other farmers recognised it as such, was seen as a status achievement. For these farmers productivity was the main criterion by which they and their farming should be judged. Some of these farmers had an inherent, deep-seated belief that agricultural production should be maximised on productive land. This was sometimes couched in terms of needing to make a profit, but also in terms of the need to feed world with impending food shortages. There were examples where the farmer made a clear distinction between the productive parts of the farm, where the land was ploughed and the crops planted, and other parts of the farm. In such cases, environmental management activity was often seen as of relevance to the non productive parts of the farm or not at all. Some of these farmers engaged with AES but tended to choose options that did not interfere with their in-field activities.

**Social responsibility and accountability**

Findings from the farmer interviews suggest that generally a more positive attitude to environmental management prevails amongst the farming community than a few decades ago and many of the younger farmers mentioned that they thought they were doing more for the environment their father’s generation. There has been a cultural change affecting subjective norms and beliefs about environmental management on the farm. This change appears to stem from increased knowledge of and a greater sense of responsibility and accountability for the environment. This finding was supported by the advisors telephone interviews where it was acknowledged by the advisors that there had been a mainstreaming of environmental awareness. This was seen to result from several factors, including the environmental ‘PR’ campaign and the introduction of ELS which created a mass participation AES for the first time. The ‘broad and shallow’ approach was seen as being very important in raising awareness and understanding of environmental management activities across a significant section of the mainstream arable sector. It was also reported that awareness and understanding of environmental management activities had increased among arable farmers in the target CFE counties.

Evidence of this social responsibility was even found amongst those not participating in an AES. Some had come out of AES, but were continuing some of their activities and were particularly keen to highlight that they were contributing to CFE, despite not being involved in AES. A number of farmers in the survey abutted nature reserves and this motivated them to do more for the environment. They felt under an obligation (or observation) to undertake environmental management practices, in part as it contributed positively to their community image.

The influence of the farming community and broader society on farmers’ attitudes to environmental management has not been uncontested. The productivist values that dominated much of the post-war period are still an important influence on farmers. Recent discussions surrounding food security and the threat of impending world food shortages were drawn on by farmers in the interview survey to justify some of their land management practices and lack of engagement in any environmental management activities as they felt they had a social responsibility to produce as much as possible from their land. In some cases farmers reported that participation in AES was incompatible with their need to manage a productive farm.
Efficacy of actions

The literature review identified some evidence that farmers consider the efficacy of new practices when deciding about participation and studies have confirmed linkages between farmers’ belief and action, demonstrating a greater likelihood of adoption by farmers who believed that a problem existed. This view was supported by our data from the face-to-face interviews. For example, one farmer had experienced first-hand the benefits of environmental management from his role as a contractor on other farms and this had helped him with the management of his own farm. As will be discussed later, some farmers did not believe in the efficacy of the prescribed AES hedge cutting regimes and this deterred them from not only taking up this option, but in some cases, the AES itself.

7.1.2 Key factors affecting ability to adopt environmental management practices

In addition to farmers’ willingness to undertake environmental management activities, our data illustrates that there are also some important aspects that facilitate or constrain behavioural change. Key factors relate to the farmer’s financial situation, farm and household characteristics, environmental endowment, and level of environmental knowledge and advice.

Financial

The FBS survey clearly showed that the primary reason for farmers undertaking environmental management practices within an AES is for financial reasons. The farmer interviews indicated that motivations for undertaking these activities were not solely dependent on financial considerations, other factors were also important such as an interest in the environment and ease with which the AES fitted in with the farming system. Also, the FBS indicated that financial motivations were not so important for those farmers undertaking environmental management activities informally. It was also clear from the interviews that financial considerations were expressed in different ways. For some interviewees, it was about profit-maximisation, whilst others emphasised the security and stability of income provided by regular AES payments. The literature survey highlighted a group of farmers, termed ‘passive adopters’ or ‘pragmatists’, who would engage with AES for the financial benefits as long as the scheme prescriptions did not impact significantly on their farming practice or their profits. Examples of this type of farmer were found in the interview survey but there was often recognition of the potential environmental benefits that scheme participation would bring.

Some of the farmers in the interview survey looked upon environmental management as an subsidiary income stream. Often they viewed environmental management as a crop that was managed to the scheme prescriptions, but did not undertake any more environmental activity than was required by the scheme, unless there were clear agronomic reasons for doing so. These were often large farm businesses that placed an emphasis on efficiency and productivity.

The FBS analysis revealed that those farms most likely to undertake environmental management activity within an AES were the farms with high incomes, whilst the lower income farms were more likely to undertake this activity informally. The extent to which the financial situation of the farm affected farmers’ ability to adopt environmental management practices was less clear from our interview data. Certainly, one of the low scoring farmers for environmental attitude was struggling financially and was under considerable work pressure and consequently did not feel that the work required to enter ELS was worth the payments he would have received. It might have been expected that those undertaking environmental management activities to have alternative sources of income and not to be so
reliant on the farm as a source of income. Around half of those farms undertaking the most environmental activity in our survey, also relied on the farm business as their sole source of income.

**Commodity markets**

The literature suggests that commodity prices can affect farmers’ ability to take-up environmental management practices. The interviews revealed that this factor is particularly pertinent to arable farmers due to volatile cereal prices in this sector. Some farmers expressed a reluctance to tie up land in an AES in case cereal prices rise and the AES payments fail to cover the production losses encountered.

**Farm size**

The FBS analysis revealed that informal management activity was more likely to occur on small farms compared to large farms. This concurs with the farmer interviews where 56% of small farms undertaking environmental activity where implementing this activity outside of an AES, whereas the equivalent figure for large farms was 27%. Similarly, those most likely to undertake environmental activity within a scheme were the larger farms. Some occupants of smaller farms expressed the view that their size limited their options within AES and put them at a disadvantage as to gain the required points they need to take proportionally more land out of production than larger farms. In fact, a number of those farms scoring a high positive attitude to the environment, ran large, efficient arable operations or large estates, some of which were managed by farming companies or land agents or were part of a share cropping arrangement.

**Tenure**

The FBS analysis revealed that owner occupiers were more likely to undertake environmental activities informally compared to tenants and conversely tenants were more likely to undertake these activities within an AES compared to owner occupiers. There was little evidence from the interview data that tenant farmers were more unlikely to undertake environmental activities than owner-occupiers, although it was suggested that any environmental activities undertaken informally on tenanted farms was unlikely to be financially rewarded.

**Farm type and environmental endowment**

One recurring theme expressed during the farmer interviews was that mixed farming systems were more beneficial for wildlife than other systems and would produce greater environmental benefits than introducing AES options into arable systems. A related discourse focused on the difficulties of improving the environment when the existing wildlife resource was already depleted. Some felt that the environmental benefits they were delivering were easy gains because they were already located within rich wildlife areas, predominantly grassland areas. The view was that in the large, arable areas of Lincolnshire and East Anglia it is much harder to enhance the wildlife resource, particularly if, as on the fenlands, there are few features and straight ditches where there is no capacity to leave odd corners, straighten fields or leave areas of poor soil quality.

**Farmer and farm household**

The literature review identified that farmer and farm household characteristics can have an important influence on farm decision-making and the ability to adopt environmental management activity. The farmer interview survey confirmed the significance of the family life cycle and farming continuity through family succession in influencing environmental
management activity on family run farms. The survey recorded a number of cases where engagement with environmental management activities was dependent on changes in decision-making responsibilities between farming generations. In situations where farmers were approaching retirement and where no succession would take place the level environmental management activity was variable and often complicated by the delegation of decision-making responsibilities to contractors. Moreover, in some cases, environmental benefits were the result of benign neglect rather than active management.

**Environmental knowledge/advice**

Clearly, there were some farmers who were lacking the environmental knowledge or advice needed to undertake effective environmental management on their farms. This is reflected in those farms that scored more highly for their positive attitude to the environment than the observed environmental benefit score. Often these farmers were receptive to new ideas and there was considerable potential to improve the environmental value of the farm through targeted advice. Those scoring high in the environmental assessments were usually well networked with advisors and often participating in monitoring work.

7.1.3 **Farm business strategies**

As discussed in the literature review, there is increasing recognition that farmers’ management practices are dependent on their farming philosophies which in turn influence their farm business strategies. This view was also confirmed by the telephone interview with advisors that concluded that how farmers view their business affects their attitudes to the environment. The farmer interviews identified three contrasting groups whose farming philosophies clearly influenced their willingness to adopt environmental activities: those with productivist world views; those who were on an extensification trajectory; and those operating large, efficient, sustainable enterprises.

**Productivist**

The view of this group of farmers was that agricultural land should be used for food production. This was important for their own self-image as contributing to society more broadly, as well as running a profitable enterprise and their status within the farm community. This could be couched in terms of the importance of making a profit, which was seen as being synonymous with being productive or the need to produce food for a hungry world in the present or future. Environmental concerns were at best secondary, or possibly tertiary uses for quality farmland and generally a distraction from the project of farming.

**Extensifying**

This group of farmers had extensified their farm businesses for a number of reasons. They often embraced agri-environment schemes as a subsidiary source of income and were more likely to have high environmental benefit scores for their environmental activities. Reasons for extensifying their farm business, included: nearing retirement with no successor; and diversifying into other activities and therefore farming part-time. The financial returns from AES allowed these farmers to broaden their activities and make best use of the resources at their disposal.

**Sustainable efficiency**

These were often large, efficient farm businesses that were productive, but saw environmental management as a subsidiary income stream. Often they viewed environmental management as a crop that was managed to the scheme prescriptions, but did not undertake any more environmental activity than was required by the scheme, unless
there were clear agronomic reasons for doing so. They had sufficient management capacity to engage with the schemes, as well as tailor their activities to meet the minimum prescriptions required.

7.2 The perceived and observed environmental benefits of environmental management activities

Farmers’ perceptions of the outcomes of environmental management are important in guiding behaviour, especially establishing a link between the action and its efficacy. The face-to-face interviews captured farmers’ perceptions of the level of environmental benefits achieved by their different management activities. The field surveyors identified the observed environmental benefits for different management activities. The mean scores derived for each environmental feature are presented in Table 7.1.

Table 7.1 Mean perceived and observed environmental scores for individual features

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<th>Perceived scores</th>
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<td>Buffer strips - RP</td>
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<td>Field corners - Birds</td>
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<td>Game crops</td>
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<td>Pollen/nectar mix</td>
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<td>In-field features</td>
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<td>In-field trees</td>
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<td>Short-term fallow - Birds</td>
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<td>Short-term fallow - RP</td>
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<td>Arable reversion</td>
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<td>In-crop fallow plots</td>
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<td>Skylark plots</td>
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<td>Crop types &amp; rotation</td>
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<td>Stone walls</td>
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<td>Ditches</td>
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<td>MEAN</td>
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1= Not Convinced Of Any Benefits
2 = A Few Benefits
3 = Significant Benefits

AES = Managed within an agri-environment schemes;
CFE = managed as part of Campaign for the Farmed Environment;
INF = managed outside of any scheme;
OTH = not managed for the environment
7.2.1 High perceived benefits

A number of environmental features were particularly viewed by farmers as providing significant environmental benefits

Margins against watercourses: Farmers particularly understood the rationale for buffer strips against watercourse in terms of preventing water pollution and favoured these because they helped with the LERAPs form filling. This view is also supported by the advisors’ telephone interviews. For those who had established buffer strips against a watercourse under AES, many felt that they would continue even if AES finished. This also reflects the findings from the FBS analysis where environmental reasons were cited as the primary reason for undertaking buffer strips outside of an AES. The reason for this acceptance of margins against watercourses is probably due to a combination of measures, including LERAPs, CFE, various AES past and present and cross-compliance.

Game strips: During the interviews farmers frequently expressed a positive view of the environmental benefits of game strips. There was a strong belief that the game cover had not only benefitted the game birds, but also the smaller wild birds. Their view of nature very much related to the game birds and this was a reference point when they discussed their environmental management of the farm. Where lower scores were given, this was mainly reflected difficulties experienced in establishing the strips, rather than the perceived benefits to wildlife.

Skylark plots: Those with skylark plots on their farms thought that they produced significant benefits. Interestingly, this viewed contrasted strongly with those giving reasons for not undertaking in-field activities, particularly lapwing plots (in-field fallow) and beetle banks (see below).

Minimum tillage: Although not covered by the environmental assessment a number of farmers were direct drilling and practicing minimum tillage and most thought that the environmental benefits of this practice was high. This practice was done informally as there are no options with AES. The environmental benefits delivered were often viewed as being related to good farm practice and resource management benefits, for example preventing soils erosion, providing greater nesting opportunities for birds and bumble bees and greater food sources for wildlife.

7.2.2 Low perceived benefits

The farmers interviewed viewed a number of features as providing no or few environmental benefits.

Hedge management: Views about the environmental management of hedgerows were complex. Whilst hedgerows were positively valued as an environmental resource, there were negative views about AES hedge cutting regimes. There were particularly strong views about the detrimental impact of 2 to 3 year rotational cutting on wildlife. Many were not convinced of the environmental rationale for rotational cutting and some thought it was actually detrimental to wildlife as this practice opened up the structure of the hedge, reducing the availability of nesting sites and making small birds vulnerable to predators. There were also concerns about the appearance of the hedges after 2 to 3 year cuts and particularly concerns about the hedges looking ‘untidy’. Several of the farmers had not put their hedges into their ELS agreements because of the rotational hedge cutting requirements and two were deterred from actually joining ELS because of these requirements. Others mentioned that they would revert back to annual hedge cutting if their agreements came to an end.
**In-field activities:** In-field activities, such as beetle banks and in-crop fallows were unpopular with many of the interviewees. This finding is supported by the telephone interviews of advisors that concluded that many farmers, even those who had embraced agri-environmental management, remained resistant to the idea of in-field options. The farmer interviews revealed a number of reasons for this view. Firstly, interviewees talked about the in-field activities impacting on the most productive land. There was also concern that these activities would generate weeds and pests in the middle of the fields again impacting on yields. Secondly, the in-field activities were perceived to have an impact on efficiency, as they split up fields making them more difficult to manage, this was particularly cited as an issue by those with small fields. Finally, several farmers were not convinced that the in-field activities worked. Some had heard on the grapevine that skylark, lapwing plots etc. were ineffective. This finding ties in with the responses given by those who had established lapwing plots or beetle banks who appeared less than convinced of their effectiveness. A further cultural barrier explaining farmers’ resistance to in-field options, identified in the telephone interview of advisors, was concern that they would be viewed by other farmers as having a poor crop.

**Nectar pollen mix:** A number of farmers were growing pollen and nectar strips, most of which were established under HLS or ELS. One farmer had established a strip informally in an awkward area where electricity poles had been erected 10 m from the hedge, however the field survey suggested that this was a grass strip with some flowers present. Generally, these farmers liked the idea of the pollen and nectar mixes envisaging an array of wild flowers. However, most had experienced difficulties in establishing the strips that lead to overall disappointment and consequently low perceived benefit scores.

### 7.2.3 Differences between perceived and observed scores

**Buffer strips against boundaries:** Farmers’ perceptions of the environmental value of the buffer strips against boundaries were higher for those strips managed within a scheme than the observed score. By their very presence farmers often felt that the margins had an environmental value. However, these margins scored low in the environmental assessment if they were sown with a simple grass mix, rather than a diverse seed mix.

**Buffer strips against watercourses:** In nearly all cases the buffer strips against watercourses were perceived by farmers to benefit the environment due to the protection they offered watercourses from water pollution. The environmental assessment identified a number of reasons for a lower mean observed score for these features. Some were used for vehicular access or horse gallops, resulting in significant compaction, and some were mainly grass dominated resulting in poor species diversity.

**Field corners:** Field corners were generally perceived by farmers as being beneficial to the environment. However, they were viewed as a feature to be left unmanaged. As a result many of the features under AES of CFE were left uncut, whereas field corners under voluntary and other management were generally cut on an annual basis and at an inappropriate time of year.

**Game crops:** Some farmers who were managing game crops outside of an AES, felt that these were extremely beneficial for wildlife. They often scored poorly in the environmental assessment because they were sown almost exclusively with maize, rather than a more beneficial mix of crop species. Also generally AES and CFE covers were retained for longer in the spring. This is an area where more advice could improve the environmental benefits gained from game strips, although particularly where shooting is the principal driver, cost issues may prevent adoption of more beneficial mixes.
**Pollen and nectar mixes:** Overall, the pollen and nectar mixes were scored lower by farmers for their environmental benefit than other features. The farmers on the whole expressed disappointment with this feature due to the difficulties experienced with establishment. These also scored low in the environmental assessments.

**In-field trees:** Interestingly, the perceived benefit score given by farmers for in-field trees were lower for those managed under an AES than those managed informally. It appears that the environmental benefits of in-field trees are not always recognised. For example, respondents did not fully understand the environmental benefit of leaving land uncultivated under the tree canopy as illustrated by a farmer who, even though he had a high positive attitude to the environment score, had planted game crops underneath all his in-field trees.

**Arable reversion:** Farmers had a lower perception of the environmental benefits from arable reversion for those in an AES and those outside of a scheme. Some disappointment was expressed by the farmers in AES for the lack of plant diversity developed within the grassland, although the environmental assessment scored these features high for environmental benefit. A number of farmers had left arable areas to revert to grassland around certain features, such as a pond and viewed this as arable reversion.

**In-crop fallows and skylark plots:** In-crop fallows mainly took the form of lapwing plots. There was mixed views from farmers on their environmental who were undertaking these under AES, some saw them as beneficial, whilst one in particular viewed his lapwing plot as ineffective.

**Stubbles:** Over-wintered stubble is another activity where farmers’ perceptions of environmental benefit did not always match those of the observed benefits. There were mixed views from the farmers about the environmental benefit of stubbles. Some of the farmers undertaking the stubbles option within AES, in particular, were not always convinced of their environmental benefit, although others had witnessed benefits in terms of seeing more birds and hares. In the environmental assessments, AES stubbles scored higher than other management groupings across most of the attributes assessed, including herbicide use and weed cover, the length of time they were retained and stubble height. The observed benefits of informal stubble were low due to inappropriate herbicide usage, intended date of destruction and stubble height and insufficient weed/volunteer cover.

**Hedgerows:** Hedge management is an activity where farmers’ perception of environmental benefit did not match the field survey scores. As mentioned above, some farmers who may have had a long history of planting and laying hedges on the farm were not keen on the hedge cutting prescription. It was recognised that while 2 to 3 year cuts would allow for berry production, creating a better food supply for birds, there was concern that it might also allow the structure of the hedge to become more open, making the bird’s nests more vulnerable to predators. Hedge structure was not assessed to this level of detail in the field survey. Generally, the hedges managed under AES scored higher in the environmental assessments than those managed informally or not managed for environmental benefits. Hedges in AES were tallest and those not managed for the environment were shortest, although most hedges achieved a maximum height score. Uncultivated strips adjacent to hedges managed under other management were narrower than for other management categories, and 53% of these strips did not meet the cross-compliance requirements compared to 23% for AES and 20% for voluntarily managed hedges. AES hedges were cut least often and were most likely to be cut in late winter (35%), whereas most hedges under ‘other’ management were cut annually and most likely (40%) to be cut during spring or summer. Hedges under informal management had intermediate scores for these attributes.
7.3 The balance of environmental management activities and benefits accruing from formal and informal provision

Analysis of the FBS revealed that, nationally, two thirds to three quarters of environmental activity is undertaken within an AES, whilst a quarter to a third is undertaken informally (i.e. outside an AES). A greater proportion of environmental activities, particularly field corners, buffers strips and wild bird/pollen and nectar mixes are likely to occur within AES. The exception is uncropped land (excluding buffers and cross-compliance strips) which is predominately undertaken informally. This may represent areas of former set-aside land that have not been brought back into production once the set-aside scheme finished.

In general, differences in environmental scores between management types were small and often the range of scores for features on individual farms was similar for different management. Management type only resulted in statistically significant differences in overall scores for hedgerows and in-field trees. However, some individual attributes for a much wider range of features did suggest that there were actual differences in the environmental quality. Attributes assessed were a combination of management factors and field survey. Some attributes could be rapidly changed (e.g. hedge cutting time and frequency) whereas others represented the cumulative effects of indirect management over a period of many years (e.g. evidence of nutrient enrichment of cross compliance strips). Although the combination of scores for a range of attributes will identify environmental quality, there are elements which are unlikely to be influenced by a change in management in the short term.

7.3.1 AES management

A key reason for undertaking environmental management within AES, identified by both the exports advisor's telephone interviews and the farmer interviews is the steady income stream offered by AES payments. It was also suggested that the more efficient farmers were able to place the poorer yielding land into AES, although some farms, such as fenland farms with their straight edges and lack of features, have few poor yielding areas.

The environmental assessments found that overall the environmental features managed under an AES were of higher environmental quality than those outside the AES. Comparison for individual features suggested that in particular environmental quality was greater under AES compared to other management groups for pollen and nectar mixes, woodland edges, short term fallow, arable reversion, overwinter stubbles and hedgerows. Many of the attributes important in high scoring AES features related to attributes that can be easily changed (e.g. hedge cutting frequency) and those where AES prescriptions are associated with high scores (e.g. seed mix on wild bird covers). However, other attributes would not score highly if the minimum ES prescriptions were followed; for example buffer strips established with a simple grass mix (allowed under ES) would only score 1 for this attribute. These factors, combined with the fact that some attributes represent cumulative effect of management over many years, mean that meeting the minimum AES requirements does not always ensure high scores are achieved.

The quality of features entered into AES can also be a factor in determining scores. For some existing features only those in higher environmental condition could be entered into an AES. Features may not qualify for inclusion below a certain condition. For example hedges, where gaps represent more than 20% of the length, are less likely to be entered into an AES because above 20%, the length must be deducted from the length declared. Alternatively, features for which management change is not required to enter AES are more likely to be entered into a scheme, but would have a higher environmental value than features not entered. Grassland is most likely to be entered into AES options if it historically received low fertiliser rates and these grasslands will support greatest diversity.
7.3.2 Informal management

There is clearly a significant amount of informal activity undertaken on farms. Both the telephone survey of advisors and the farmer interviews suggest that this informal activity tends to be restricted to the easier and more convenient types of environmental management. Also this type of management activity is influenced by the extent to which the activity aids farm management. In particular, margins and field corners that were managed informally were considered in this way because the margins allowed occasional access for machinery and field corners helped to straighten up awkward corners.

7.3.3 CFE management

There was knowledge amongst most of the respondents that CFE was an industry-led campaign that was trying to prevent the introduction of compulsory set-aside and for some they saw it as something that they should support. Nevertheless, very few of the case study farmers interviewed had any detailed knowledge of the CFE management requirements and only two made any reference to the management guidelines. However, it should be noted that not all the farmers interviewed were in CFE target areas where the CFE is strongly promoted through a county co-ordinator. Others were also reluctant to engage with anything that they perceived as requiring more paperwork and bureaucracy, especially if this was additional to existing agri-environment scheme, cross compliance or accreditation requirements. This was the case even for those who were already managing areas of land informally for the environment.

The CFE was not mentioned in the general discourse about reasons for engaging in environmental activities and usually only entered into the discussion when prompted. On the case study farms, CFE recording was capturing existing informal management activities but CFE participation was rarely prompting additional environmental management activity. The farmer interviews also found examples where farmers were coming out of AES but were retaining some features and putting these towards their CFE contribution.

Some discrepancies appeared between what was recorded on the CFE postal survey forms and what was said in the interviews. For example, although some interviewees had ticked the box stating that they joined ELS in response to CFE, this rarely, if ever, appeared to be the case. Also some of the management activities recorded as part of the Campaign were actually ELS/HLS options.

The condition of features under CFE management was often similar to those managed under an AES.

7.3.4 Cross-compliance

The majority of the respondents viewed the cross-compliance requirements as common sense and simply good farming practice. Most believed they would continue with the cross-compliance requirements if they were no longer enforced. There appeared to be a general acceptance of the 2 m margin requirement, recognising that they provided environmental benefits as well as reducing the risk of damage to the machinery. A few respondents, however, viewed the margins as harbours of pernicious weeds and one resented taking land out of production which could be used to feed the world. The advisor’s telephone interviews also suggested that the soil protection review was less than successful, questioning farmers’ understanding of, and adherence to, these requirements.
7.4 The interactions between land under formal agreements and land outside of agreements

The FBS analysis has revealed that over 51,000 farms, almost 90% of the population, undertook some countryside maintenance and management activities. This included almost all cereal farms (98%). Clearly, it would appear that there is considerable amount of environmental management taking place on farms. Around 45% of farmers who are undertaking environmental management activities do this in a combination of both AES and informal activities. The research explored the interaction between land on individual farms managed under formal agreements and outside of agreements.

Clearly, our data shows that the situation is quite complex. The main environmental activities where there is interaction between formal and informal management within a farm are buffer strips, field corners, game crops, in-field trees, grassland and hedgerows. Where within-farm comparisons were possible, the environmental assessment found relatively few differences in environmental quality between formal and informally managed features. Farmers often referred to managing both formal and informal features in the same way and there were a number of reasons for this occurring.

Some farmers interviewed highlighted that many of the current AES options were previously managed informally. The advisors also suggested that much of the informal agri-environmental management ultimately ended up being incorporated into formal schemes, margins and field corners. Often features, such as hedges, which were of better environmental quality, were placed into AES, whilst the poorer quality hedges continued to be managed informally. Also where hedges were part of an AES, but points were not registered on the full length, some farms simply managed all features on the holding according to AES prescriptions.

Other environmentally engaged farmers did not have an AES because they did not want to be restricted by the prescriptions. Sometimes there was a lack of understanding about the importance of prescriptions, hence informal management achieved less than an AES would have done. Due to the perceived inflexibility of ELS prescriptions, some farmers who wanted to manage features slightly differently, but with similar environmental benefit, had not entered these features into and AES. One farmer, who still laid hedges, was prevented from cutting the hedge sides at the bottom each year under an AES, despite the retention of a significant food source above two metres.

With margins in particular, it appeared that some of these features were additional to the AES requirements but were being managed to the prescriptions due to the increased flexibility that this offered the farmers. Having these additional margins provided the flexibility to change the location of these margins across the farm if necessary, or in the case of a nectar/pollen mix acted as a back-up if another strip failed to establish properly. The environmental assessments found that buffer strip scores were largely similar for the different management categories within farms, which suggests that they are managed in a similar way across the farm. The flexibility of management outside of the scheme also gives the farmers the option to bring these areas back into production should commodity prices rise.

There was also evidence that on some farms, and particularly the larger farms, margins were being left wider than the cross-compliance strips and managed informally, in order to protect their SPS payments, which was viewed as an important source of income. Similarly, some larger farms were managing an extra 10% on their margins to ensure compliance with the scheme prescriptions in order to protect their AES payment.
Finally, in situations where farmers had not renewed their AES agreement, some had retained AES prescriptions for certain features, particularly margins and field corners. Frequently these features were then put forward as their contribution to CFE. In fact, this was often the reason why some farmers agreed to be interviewed to convey their view that they were still contributing to the environment, despite not renewing their AES agreement. Some were ‘between’ AES agreements, therefore, this management contributed only temporarily to informal environmental management, others intended to retain elements of their AES and consequently AES had brought about a permanent change in behaviour.

7.5 Key implications for Policy Makers

One of the purposes of this study is provide guidance for policy makers who are seeking to promote environmental management practices on farmland through their actions and initiatives. Key messages from the research are summarised below.

Key drivers of environmental activity

- The research showed that no single factor is responsible for driving farmers’ attitudes to the environment, but this is based on a complex set of factors. Farmers are not solely driven by financial motivations, other factors play a part such as personal interest in environment, game shoots, a sense of social responsibility or farming self-image. The research suggests that the key to ensuring long term farmer behaviour change is to change farmers’ mindsets so that they are willing to adopt environmental management practices. This requires internalisation of the values underpinning environmental management activities and it would appear from the farmer interviews that there is an increased acceptance within the farming community of the need to demonstrate their environmental credentials. Farmers generally appear to have a much greater sense of social responsibility for the environment than previous generations, sometimes resulting in intergenerational divergence of opinion on the farm. Policy-makers should continue to encourage and reinforce a sense of civic responsibility for environmental management amongst the farming community, particularly given the emerging discourse about the need to maximise food production to counter the threats of food security. Policy-makers have a role to play in communicating that environmental management and productive agriculture are not mutually exclusive.

- Alongside the mainstreaming of environmental management/awareness, there is still a small group of farmers who are resistant to the environmental message and who are not engaging with positive environmental practices. These farmers tended to hold strong views about maximising production from their land or are fearful of outside interference and loss of control of their management. Policy-makers should consider the cost-effectiveness of bringing these farmers into the agri-environmental fold. Further targeted advice and incentives may help change the attitudes of some of these resistant, “productivist” farmers. However, an increasing recognition of the need for a greater quality of agri-environmental management rather than simply an ever increasing quantity suggests that efforts might be best directed to those who have embraced the concept of agri-environmental management (for whatever reason).

- When discussing their personal interest in the environment, farmers referred to the impacts on the higher species that are clearly visible on their farms, such as birds, hares, deer, and butterflies. In promoting environmental activities, policy makers should focus on articulating the benefits to those species that resonate with farmers’ experiences. Also those farmers undertaking minimum tillage practices felt that they were benefitting the environment in ways that were not always recognised by policy-makers or AES.
• A number of factors were shown to restrict farmers’ ability to adopt environmental management activities, raising equity issues. Small farms felt disadvantaged by AES as their options for achieving the required ELS points were more limited than larger farms and meant more land had to be taken out of production. Also it is easier for some farms to leave areas of unproductive land due to the location of existing features and nature of the farm type. Compare a fenland farm with straight boundaries and few environmental features to a mixed farm with woodlands. Policy-makers should consider a points system that accounts for small field sizes and farms with few existing environmental features.

Benefits of individual environmental management activities

• Farmers particularly value game strips as an environmental activity, which were also felt to benefit smaller wild birds. There was evidence of experimentation with seed mixes and a holistic approach to locating these strips across the farm. However, the wildlife benefits of these strips were often limited as they were only sown to maize. There is the potential for policy makers to capitalise on farmers’ enthusiasm for game strips by promoting more diverse seeds mixed for game strips and finding ways to link game strips to providing other wider wildlife benefits.

• Farmers contest some AES prescriptions, and particularly those relating to the rotational cutting regimes for hedgerows. Some farmers undertaking positive environmental management practices on their farms strongly believed that the 2 to 3 year rotational cutting negatively impacted on hedge structure. This issue needs to be explored further as it is deterring some farmers from not only entering hedges as an option in AES, but also taking up the schemes.

• Difficulties experienced in establishing pollen and nectar strips meant that some farmers were disillusioned with the option. Their experiences of implementation did not match their vision of margins filled with wildflowers. Policy-makers should provide additional advice and guidance to help achieve successful establishment of these strips.

• A distinct view emerged that environmental activities should take place at the periphery of productive land and many farmers were in favour of environmental management on the margins of the farm where it would have least impact on agricultural production. For this reason many farmers, even those who have embraced agri-environmental management, remained resistant to the idea of in-field options. It might be argued that as few arable farmers are willing to undertake in-field options that funds and advisory efforts are best devoted elsewhere. By removing the need for in-field options, farmers may even embrace boundary and margin management more fully and enthusiastically. Conversely, it could be argued that whilst many farmers implement environmentally beneficial management of boundary and margin features on a voluntary basis, funded agri-environment schemes may be essential in persuading farmers to adopt more challenging in-field options which have been developed to benefit a different group of species, such as skylarks

• Minimum tillage was one practice that was undertaken outside of any agri-environment scheme and was viewed as providing significant environmental benefits. Concern was expressed that current AES options did not fully incorporate direct drilling practices. Consideration should be given to further integrating direct drilling practices into current AES options in order to achieve maximum environmental benefits.
• A strong view emerged that introducing livestock onto arable farms would significantly enhance the environmental value of the land to a much greater extent than trying to introduce individual environmental activities into arable fields. Policy makers should consider promoting more mixed farming in arable areas to improve environmental benefits.

**Interaction between formal and informal**

• Reasons given for undertaking environmental activity outside of a scheme were mainly agronomic. Margins, in particular, were undertaken informally as this offered greater flexibility in terms of locating the features around the farm and in terms of management, such as vehicular access. This finding suggests the need to promote environmental activities that also accommodate farm management practices.

• Whilst the CFE has raised the profile of the importance of informal activities in delivering environmental benefits, the research identified very few new activities that were implemented in response to CFE. Much of what was recorded as CFE activity was either previously managed informally or was previously within an AES. Also there was little evidence that farmers in CFE were following the CFE guidelines and a general reluctance expressed to follow guidelines for activities that are managed informally. Of greater importance to farmers is the flexibility to manage the features to fit in with their farm management, such as vehicular access or flexible cutting times on margins. If a policy objective is to improve the quality of informally managed land, then alternative mechanisms, other than guidelines are required to disseminate this information.

• The evidence from the research points to widespread informal agri-environmental management, some of which ultimately ends up being incorporated into formal schemes. This however, should not be taken as grounds for cutting agri-environmental spending based on the assumption that farmers will continue with informal management. Some would and some would not, but as the environmental assessment has shown it is likely that the quality of management would suffer with the withdrawal of the financial incentive for due care and attention. Also environmental management under AES offers some level of permanence in management, which cannot be guaranteed with informal management activities. Despite a general increase in environmental awareness that are still some farmers who would bring areas of informal activity back into production should commodity prices rise.