Economics of Co-ordination in Environmental Stewardship

Project No. DO0119

Final Report

To
Department of Environment Food and Rural Affairs and
Natural England

By
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Executive Summary

Introduction

Environmental Stewardship (ES) is the main policy mechanism used in England to deliver environmental benefits on agricultural land. These schemes have traditionally been delivered at the scale of the individual holding through agreements with the individual land manager. However, there is increasing recognition of the greater potential that may come from managing land at larger scales. In particular, conservation experts believe that large-scale restoration and enhancement action that involves shared environmental objectives and cohesive and co-ordinated delivery is likely to be of far greater benefit to biodiversity than the current 'piecemeal' impact of single farms.

The Countryside and Community Research Institute (CCRI) was commissioned by Department of Environment, Food and Rural Affairs (Defra) and Natural England (NE) to explore the financial, environmental and social costs and benefits of different approaches to delivering agri-environment schemes involving varying degrees of: 1) targeting at a landscape-scale; 2) co-ordination of intended outcomes; and 3) collaboration between agreement holders.

The project aim was achieved through 3 main objectives:

- A literature review of different co-ordination approaches delivering landscape-scale benefits, including case studies to illustrate the approaches used in the UK and globally.
- Detailed examination through 8 case studies of the financial, environmental and social costs and benefits of different approaches to co-ordination, including identification of the income foregone, additional costs and transaction costs and the personnel involved.
- Identification of the elements of co-ordination which best delivers ES landscape scale co-ordination objectives, including consideration of the circumstances where these would be appropriate and their limitations.

Methodology

Literature Review

An extensive literature review of different aspects of agri-environment landscape co-ordination delivery across Europe and internationally assessed the advantages and limitations of each type of approach and the context within which it is set. The review encompassed the following delivery approaches:

- **Group Supplements**: This is an additional payment within an agri-environment scheme (AES) covering the costs incurred by agreement holders working together to co-ordinate action across more than one holding.
- **Scheme targeting**: Targeting of an AES can include three different levels which are not mutually exclusive – 1) geographical targeting of agreements within a defined area which currently occurs in HLS; 2) prioritisation of options within agreements; and 3) location of options within agreements.
- **Training and support**: An incidental outcome of farmer group training is to encourage co-ordinated action to achieve landscape scale conservation objectives. Group learning may take the form of discussion groups, workshops, seminars and meetings, all of which provide opportunities for farmers to speak to other farmers and experts directly. These 'interactions' can encourage elements of belonging, trust, bonding and enjoyment which are all conducive to collective action.

- **Local engagement in decision making/governance/facilitation**: Local engagement refers to situations where those using the land at the local level are engaged in determining how the national and international designations and management agreements are designed and implemented.
- **Formal Group/collective agreements (voluntary)**: Collective agreements available within AES are predominantly used for facilitating commons agreements; although there is wider untapped potential for collective agreements to deliver environmental outcomes. A collective agreement allows greater discretion for requirements (or individual responsibilities) to be defined and scheme payments to vary between members.
- **Agglomeration bonus payments**: Bonus payments are given within an AES scheme for managing land in a biodiversity enhancing manner.
- **Public/private partnerships**: This is another bonus scheme involving a combination of publicly-funded AES payments with private Payments for Ecosystems Services (PES) scheme.
- **Geographically targeted auctions**: With a geographically targeted auction farmers in a targeted area are asked to bid competitively for a limited number of conservation agreements. They can either bid as individuals or jointly.

Selection of Case Studies

In conjunction with the Project Steering Group, eight case studies incorporating a mixture of delivery approaches were selected for in-depth study. These incorporated various degrees of targeting, incentive payments and governance structures.

Table 1 Selected case studies

	Name	**Main Co-ordination approach**	**Project/Scheme description**
1	Integrated Local Delivery , England (ILD)	Local engagement in decision-making	Evolved version of the FWAG Parish Approach. Facilitation used to deliver integrated management through a local management group of all stakeholders
2	Dartmoor Farming Futures, England (DFF)	Local engagement in decision-making' Collective agreement	2 pilot farmer-designed AES on commons
3	Crosby Ravensworth, England (CR)	Collective agreement	Common initially entered into CSS and now in HLS agreement
4	Limestone Country Project, England (LCP)	Spatially targeted project	Project based, habitat targeted with aim of introducing cattle grazing systems
5	SCaMP/ScaMP II, England (SCaMP)	Public/private partnership; Spatially targeted;	Funded by United Utilities, RSPB project officer signing farmers up to AES
6	Ordinance for Ecological Quality, Switzerland (OQE)	Agglomeration bonus payment	AES scheme using form of agglomeration bonus payment to encourage ecological networks
7	Northeim Project, Germany (NP)	Geographically targeted auction; local engagement in decision-making	Project with outcome-based payments ascertained through auctions
8	Desert Uplands Landscape Linkage Auction, Australia (DULLA)	Geographically targeted auction	Geographically targeted auction with connectivity

Data collection
In total, 15 telephone interviews were conducted; 8 with the case study co-ordinators or delivery agents and 7 with participating farmers. With the UK case studies additional discussions were held with relevant NE personnel. In addition, the interviewees provided the researchers with additional documentation, such as academic journal articles and projects reports to assist with the case study write-ups.

Data analysis
The analysis centred on the use of a multi-criteria performance matrix whereby sets of cost: benefit criteria were compared against a performance scale relative to a conventional, single AES. For each criterion respondents had to score the performance of the co-ordinated scheme on a scale from -5 to +5, whereby a score of zero represented no relative difference to a conventional AES. These scores were then moderated to smooth out any inconsistencies.

Research findings

Two case studies stood out as having the most cost-effective elements to their approach for delivering co-ordinated, landscape scale environmental objectives: Integrated Local Delivery (ILD) and Dartmoor Farming Futures (DFF). Whilst case studies are useful for illustrating potential issues and cost: benefits, they cannot be considered a representation of the different methods due to the different contexts in which they operate. For example, a low scoring case study may in part be biased by poor implementation, rather than a failure in the delivery approach per se. ILD and DFF most closely represented a local engagement approach, although it should be highlighted that co-ordination approaches overlap and therefore each case study is actually a mixture of several different approaches. In particular, ILD also represents a spatially targeted approach; whilst DFF highlights the use of group supplements and spatial targeting. Close examination of the scores revealed that these two approaches produced the highest savings for the government in terms of implementation costs and scored high in their ability to achieve all of the landscape-scale environmental objectives. However, as DFF is pilot, on-going costs were difficult to quantify and may have been underestimated.

Four different circumstances were identified where landscape co-ordination is required:

Core sites: Occurs where active co-ordination between farms on core sites involving multiple farmers/land managers is required and may even be critical for some sites, for example raised water-levels.

Buffering: Edge effects occur when the value of biodiversity is eroded from small protected sites. This loss can be reduced by buffering the site edges or by having larger protected sites. Therefore, active co-ordination of all, or the majority of farmers bordering a specific site, is required.

Connectivity: Required when sites are spatially isolated, thereby impacting on genetic diversity and population viability. By linking together areas to make ecological corridors and connected networks in the wider landscape, species are able to re-colonise old territories and sub-populations can interact, permitting species re-establishment, promoting genetic diversity and allowing greater adaptability. In practice, connectivity will require adjacent farms to provide similar linked management as creation/corridors/stepping stones.[1] Active co-ordination between farmers is not required but would be beneficial.

[1] See *Lawton Report*, recommendation 16.

Threshold: The marginal benefits from conservation are typically small until some threshold level of action is reached. Thus, threshold requires a proportion of farmers and land managers within an identified area to implement certain measures. Active co-ordination between farmers and land-managers is not required.

Key learning points

The study considered 3 main aspects by which co-ordinated action might be achieved: targeting, scheme payments and governance structures. The lessons learnt for delivering these are considered in turn

Targeting

The case studies highlighted the need for targeting to achieve co-ordinated action, as all of the case studies had a defined geographical target area in which they operated. To ensure cost-effective targeting a number of points were identified:

Good baseline data required to identify landscape-scale environmental objectives
Good scientific evidence and knowledge needs to underpin the selection of target areas and the desirable spatial configuration of management and the thresholds of management required to achieve specific objective. For example, the OQE required good baseline data in order to identify the key species that are characteristic of the local area, or habitats that have the potential for improvement through connectivity.

Engagement of local community in identifying targeting priorities
Local community input helps identify local priorities and ensures that schemes reflect local conditions, whilst recognising that this needs to be integrated with national priorities. The NP case study successfully used Regional Advisory Boards comprised of volunteer local representatives of government agencies, conservation organisations and farmers to express the local demand for environmental services and to define the species and habitats to be targeted in a conservation auction.

Integrated agency implementation on targeted areas can result in costs savings
Greater coordination among those agencies seeking to effect outcomes on targeted areas could yield more efficient and effective outcomes. Achieving this aim requires a shared vision and an understanding of each other's goals and interests. It involves not just those agencies that deliver environmental outcomes, but also those with economic and social goals. A key to success in both ILD and DFF is based around the premise that key national stakeholders within an interest in that area are able to integrate their advice and strategic prioritises.

Scheme payments

A number of case studies highlighted the effectiveness of using financial payments to encourage co-ordinated action and collaboration between farmers at a landscape scale.

Use of agglomeration payments for network projects
The use of an agglomeration bonus payment is particularly appropriate for achieving connectivity and threshold objectives, but perhaps less so for other landscape-scale environmental objectives. The OQE case study illustrated the success of such a payment in engaging farmers in network projects which connected parcels of land.

Use of geographically targeted auctions
Geographically targeted auctions could provide the opportunity to secure co-ordination across specific geographical areas and deliver buffering, threshold or connectivity environmental objectives. For example, accepting all bids in a spatially targeted area until a fixed budget is achieved could result in co-ordinated threshold effects with no explicit collaboration. However, as the auction approach is based on competition amongst agreement holders it may not be appropriate in situations which are trying to find landscape-scale collaborative solutions.

The outcomes required for these auctions need to be kept simple and ideally single objective, otherwise assessment metrics become very complex and costly to design and transparency is reduced. Also to work effectively, farmers need to have knowledge of their opportunities costs for undertaking the required management practices.

Use of outcome-orientated payments
The OQE network payments, and the NP and DULLA auction payments were reliant on outcome-orientated payments, that is part of the payment was dependent on achieving particular environmental outcomes. The value of such an approach is that it encourages greater engagement of the agreement holder in identifying the most cost-effective management practices to achieve the required outcomes. Appropriate outcome indicators must be developed prior to implementation of the scheme and should be transparent and administrable, to ensure that recognition is easy for both farmers and enforcers. Also rules need to be devised in the event that agreement holders fail to meet the outcome targets due to external factors outside their control, such as adverse weather conditions.

Staged payments proved popular with the DULLA incorporating an initial payment to cover any up-front infrastructure or capital costs and performance related payments at a mid-point in the contract and on completion. The NP demonstrated value in providing graduated payments to reflect the level of biodiversity benefits delivered. Providing different quality levels within the payment scheme gave farmers financial incentives to improve the quality of their grassland fields.

Private funding for landscape-scale projects
Private funding in combination with AES payments can be a cost-effective way of delivering ecosystem services at a landscape-scale. As payments from private companies are not subject to WTO rules, under the SCaMP project, United Utilities was able to offer incentive payments in the form of capital grants which could be used in combination with public AES payment and helped increase farm business viability and was crucial in engaging farmers in the programme. Private funds can also contribute to on-going payments for land management and incorporate incentives payments, such as agglomeration bonuses to achieve co-ordinated management at a landscape-scale.

Governance structures

The governance structures for a number of the case studies transferred more of the scheme decision-making to local communities and/or local landholders compared to standard approaches which can have benefits in achieving co-ordinated or collaborative action. A key element to these successful “bottom-up” approaches is effective facilitation by project/scheme staff or farmer/community leaders.

Facilitated co-ordinated action of farmer groups provides economies of scale
Facilitation involving co-ordinated action of a group of farmers in a targeted area appears to provide the greatest efficiency gains for the government and agreement holders through economies of scale. The facilitation costs are reduced significantly when there is a local acceptance towards the need for a commonly agreed way forward (as in ILD and DFF)

rather than a predetermined outcome being implemented by an external agency (as in CR). Often the costs for facilitation can be contained within the existing options for advice within ES, or by match funding from other budgets (as in ILD). The approach can include existing providers but the key individual should be known to and trusted by both local and national stakeholders.

Facilitation skills required will vary depending on local context
The key skills of the facilitator varied within the case studies. In the ILD case study, the facilitator was required to bring together the various strategic priorities that occur within the target area. In this example the national agencies and local stakeholders spent more time together, than they would in a conventional AES setting, problem solving and developing the co-ordinated approach. In the DFF example, the facilitator enabled the farmers to create the scheme design and related outcomes and was a link between Defra and NE and the farmers.

Farmer engagement approaches provide a range of landscape-scale environmental objectives
Bottom-up approaches where the farmer is involved in the design of the scheme provides the greatest opportunity for achieving landscape-scale environmental objectives. This approach provides the flexibility to respond to a range of issues as they occur on the ground within the context of a single agreement. However, in the DFF example the agreement involved designing an alternative scheme within the boundaries of existing AES schemes so the total annual payment and the type of current AES activity was already known. This suggests that locally designed schemes might be most effective if they operate within clear strategic guidelines.

Bottom-up approaches reduce monitoring and enforcement costs
Farmer-led, 'bottom-up' co-ordinated approaches, such as DFF, are more cost-effective in terms of monitoring than those that are characterised by 'top-down' drivers, such as legislative requirements, as the objectives become genuinely embedded and engagement is maximised, thereby reducing on-going monitoring and enforcement costs.

Overall summary

Voluntary approaches to delivering co-ordinated action can be viewed as lying on continuum of those that rely solely on financial payments for co-ordinated action at one end and those that focus on facilitated approaches at the other. The case studies revealed that most co-ordinated schemes would require an element of both of these approaches to differing degrees.

Where simple landscape-scale environmental objectives are sought, such as connectivity of a single habitat feature, or achieving threshold levels for a particular species, then financial payments, through agglomeration bonus payments or reverse auctions could be cost-effective approaches. Reverse auctions would be more suited to the introduction of new ES options to avoid the risk of current payment rates acting as a point of reference in the bidding process. However, as auctions introduce an element of competition between farmers they would not suit situations requiring farmer collaboration.

In situations where more complex or multiple landscape-scale environmental objectives are sought on core sites or in target areas where full landholder participation is required, such as raising water levels, a facilitated approach would be more cost effective in delivering these objectives. The costs of facilitation can be reduced by integrating the delivery with other agencies and stakeholders interested in the targeted area, as exemplified by the ILD approach.

In conclusion, if ES is to be used as a mechanism to achieve management at a landscape-scale in England, adaption of its design and delivery is required to ensure a more co-ordinated approach. A clear message emerging from the case studies is that to achieve this cost-effectively will depend on the target area and the required environmental outcomes, which will impact on the choice of using financial incentives or more innovative, facilitated approaches. This implies that ES should avoid a 'one size fits all' approach to achieving co-ordinated action. A mechanism for landscape-scale delivery that might work for an upland common might not succeed on a lowland floodplain which is trying to deliver different environmental objectives. Without this local sensitivity, ES may well fall short of achieving cost-effective co-ordinated action amongst farmers across the variety of likely target areas.

LIST OF ACRONYMS

Abbreviation	Full title
AES	Agri-environment Scheme
CAP	Common Agricultural Policy
CCRI	Countryside and Community Research Institute
CR	Crosby Ravensworth
CSS	Countryside Stewardship Scheme
DNPA	Dartmoor National Park Authority
DEFRA	Department for Environment, Food and Rural Affairs
DFF	Dartmoor Farming Futures
DULLA	Desert Uplands Landscape Linkage Auction
EA	Environment Agency
ELS	Entry Level Stewardship
ES	Environmental Stewardship
ESA	Environmentally Sensitive Area
EU	European Union
EWGS	English Woodland Grants Scheme
FEP	Farm Environment Plan
FWAG	Farming and Wildlife Advisory Group
HLS	Higher Level Stewardship
IDB	Internal Drainage Board
ILD	Integrated Local Delivery
LCP	Limestone Country Project
LFA	Less Favoured Area
NE	Natural England
NFU	National Farmers Union
NP	Northeim Project
NRM	Natural Resource Management
MAGIC	Multi-agency Geographical Information for the Countryside
MESME	Making Environmental Stewardship More Effective
NVC	National Vocational Certificate
PAH	Professional help with management plan
OQE	Ordinance for Ecological Quality
PES	Payment for Ecosystem Services
RAMSAR	Site classified under the Convention on Wetlands of International Importance
RSPB	The Royal Society for the Protection of Birds
SCaMP	Sustainable Catchment Management Programme
SPA	Special Protection Area
SSSIs	Sites of Special Scientific Interest
UELS	Upland Entry Level Stewardship
UU	United Utilities
WFD	Water Framework Directive
WTO	World Trade Organisation
YDNPA	Yorkshire Dales National Park Authority

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1 Introduction

1.1 Background

Environmental Stewardship (ES) is the main policy mechanism used in England to deliver environmental benefits on agricultural land. These schemes have traditionally been delivered at the scale of the individual holding through agreements with the individual land manager. Whilst they are reported to have delivered benefits for biodiversity (2008), there is increasing recognition of the greater potential that may come from managing land at larger scales than currently delivered through individual farm-level agreements. In particular, conservation experts believe that large-scale restoration and enhancement action that involves shared environmental objectives and cohesive and co-ordinated delivery, is likely to be of far greater benefit to biodiversity than the current 'piecemeal' impact of single farms (England Biodiversity Group, 2011). As a result, landscape-scale delivery has for the past five years or so been the main area of development for nature conservation and is reflected within the Lawton Review (Lawton *et al.*, 2010), the Natural Environment White Paper (NEWP) (Defra, 2011) and the ThinkBIG report (England Biodiversity Group, 2011). This approach overcomes the limitations of managing designated areas of land as well as bringing voluntary programmes, such as Environmental Stewardship into a coherent landscape approach for environmental management.

The Countryside and Community Research Institute (CCRI) was commissioned by the Department of Environment, Food and Rural Affairs (Defra) and Natural England (NE) to explore the financial, environmental and social costs and benefits of different approaches to delivering agri-environment involving varying degrees of: 1) targeting at a landscape-scale; 2) co-ordination of intended outcomes; and 3) collaboration between agreement holders.

The project aim was achieved through 3 main objectives:

- To conduct a scoping report reviewing different aspects of landscape co-ordination approaches and assessing the advantages and limitations of each one. This was to be achieved through an extensive literature review of a range of different co-ordination approaches delivering landscape scale benefits, including case studies of the approaches used in the UK and globally.
- Detailed examination through case studies of the financial, environmental and social costs and benefits of different elements of co-ordination, including identification of the income foregone, additional costs and transaction costs and the personnel involved.
- Identification of the elements of co-ordination which best delivers ES landscape scale co-ordination objectives, including consideration of the circumstances where these would be appropriate and their limitations.

Some clarity of definitions is required as sometime terms such as co-ordination and collaboration are used interchangeably. Both terms refer to "working together" but may vary slightly in terms of who is working together and on what. The Oxford dictionary definition of co-ordination is "to bring the different elements of (a complex activity or organization) into a harmonious or efficient relationship." Co-ordinated action therefore aims to establish a positive relationship between partnering groups. It constitutes work that involves more than one person, includes shared objectives, requires and understanding of personal roles and responsibilities, and is generally overseen by someone (E.g. co-ordinator) (Goosen, 2009). In the context of agri-environment schemes it might refer to a delivery body applying a co-ordinated approach in promoting and awarding agreements in a target area. Collaboration is different in that it is about the pursuit of a specific result and may in fact rely on co-ordinated

action. A true collaborative effort creates something new, such as a new way of doing something and is ever evolving and dynamic in nature. It requires hard work and a great deal of time and communication. In terms of agri-environment schemes, collaboration would refer to a group of landholders within a local area working together to find new ways to integrate resource management at a landscape-scale.

Many definitions of landscape-scale exist and the definition used in this study incorporates the following characteristics (Dolman et al., 2001):

- A planned/co-ordinated approach across multiple property boundaries
- An approach that addresses multiple objectives
- A clear understanding of the amount and spatial configuration of the different types of land management practice required in the area to achieve objectives
- An approach that optimises delivery of quantified objectives.

The specification for this project identified four different circumstances where landscape co-ordination is required:

Core sites: Active co-ordination between farms on core sites involving multiple farmers/land managers is required and may even be critical for some sites, for example raised water-levels.

Buffering: Edge effects occur when the value of biodiversity is eroded from small protected sites. This loss can be reduced by buffering the site edges or by having larger protected sites. Therefore, active co-ordination of all, or the majority of farmers bordering a specific site, is required.

Connectivity: Many of the UK protected sites are well managed, but geographically fragmented, forming isolated havens in a wider landscape. Spatial isolation has impacts for genetic diversity and population viability. By establishing linkages and stepping stones between these sites in the wider landscape, species will be able to re-colonise old territories and protected sites will flourish. It will also allow sub-population interaction, permit species re-establishment following local loss or extinction, promote genetic diversity and allow greater adaptability. Linking together areas to make ecological corridors and connected networks have real benefits in allowing nature to thrive. In practice, connectivity will require adjacent farms to provide similar linked management as creation/corridors/stepping stones.[2] Active co-ordination between farmers is not required but would be beneficial.

Threshold: The marginal benefits from conservation are typically small until some threshold level of action is reached. Thus, threshold requires a proportion of farmers and land managers within an identified area to implement certain measures. Active co-ordination between farmers and land-managers is not required.

1.2 Report Structure

The remainder of this report is divided into five sections. Section 2 provides details of the methodological approach adopted. The literature review of different co-ordination approaches, with the advantages and limitations of each are presented in Section 3. Details of the costs and benefits identified for each of the 8 case studies are provided in Section 4. Section 5 provides a more detailed assessment of the case study multi-criteria analysis scores and the final section draws out some key learning points for achieving cost-effective co-ordinated environmental management at a landscape-scale.

[2] See *Lawton Report*, recommendation 16.

2 Methodology

The basic framework for the methodology was outlined in the project specification, and was subsequently refined and developed by CCRI after consultation with the Project Steering group as the study progressed. The key stages in the research process were:

- Literature review of different landscape-scale co-ordination approaches;
- Selection of case studies;
- Telephone interviews with case study delivery agents and participant farmers; and
- Multi-criteria analysis of case studies.

2.1 Literature Review

An extensive literature review was undertaken of different aspects of agri-environment landscape co-ordination delivery approaches across Europe and internationally assessing the advantages and limitations of each type of approach and the context within which it is set. This literature review included a review of academic papers as well as project reports and other project documentation and was presented in an initial Scoping Report. The review focused on different approaches to the delivery of agri-environment which involve varying degrees of 1) targeting at a landscape-scale 2) co-ordination of intended outcomes; and 3) collaboration between agreement holders and encompassed the following approaches:

- Group Supplement
- Scheme targeting
- Training
- Local engagement in decision making/governance/facilitation
- Formal Group/collective agreements (voluntary)
- Agglomeration bonus payments
- Public/private partnerships
- Geographically targeted auctions

2.2 Selection of Case Studies

A short-list of potential case studies illustrating a range in the way that the issues above: targeting; requirement for and facilitation of collaboration between agreement holders; provision of advice and training' degree of local/central control are applied, was presented to the Steering Group. A summary was provided of each case study identifying the degree to which targeting, scheme payments and governance structures are used to achieve co-ordinated action at a landscape-scale. Eight case studies from this list were selected for further in-depth study, most of which incorporated more than one of the co-ordination approaches outlined above.

Whilst case studies are useful for illustrating potential issues and cost: benefits, they cannot be considered a representation of the different methods due to the different contexts in which they operate. For example, case study findings on one case study may in part be biased by poor implementation, rather than a failure in the delivery approach per se. In addition, as there is considerable overlap between co-ordination approaches it is not possible to identify a specific approach for each case study, but simply to suggest the main co-ordination approach exemplified.

2.3 Questionnaire design

Two semi-structured questionnaires were designed in consultation with the Steering Group to be used to interview by telephone the case study co-ordinators and a participating farmer. These questionnaires are presented in Appendix 1. The questionnaires incorporated closed questions which enabled qualitative cost benefit scores to be derived for each case study against four main criteria:

- Financial costs of implementation for the Government, including up-front (facilitation/co-ordination, contract negotiation, training and advice costs) and on-going costs (on-going facilitation, monitoring and enforcement costs
- Benefits in terms of meeting the four landscape scale environmental objectives outlined in the previous section (core sites, buffering, connectivity and threshold levels)
- Financial participation costs for agreement holders, in terms of income foregone, additional on-going costs and transaction costs distinguishing between the bearer of the costs and the beneficiaries
- Social and human capital development, relating to the extent of increased local engagement, environmental knowledge and farmer co-operation.

Open questions were used to obtain more detailed information to support the scores given and where possible to obtain actual implementation and participation costs. In addition, questions were asked to elicit further views on the advantages and limitations of each approach. The paper was piloted with one of the case studies and subsequently revised to clarify a number of questions.

2.4 Telephone Interviews

In total, 15 telephone interviews were conducted; 8 with the case study co-ordinators or delivery agents and 7 with participating farmers. These telephone interviews ranged in length from 40 minutes to 1.5 hours. In addition, the interviewees provided the researchers with additional documentation, such as academic journal articles and projects reports to assist with the case study write-ups. For the 5 UK case studies further discussions were held with the appropriate NE personnel to clarify the Government implementation costs.

2.5 Multi-criteria analysis

The analytical method selected to quantify the costs and benefits of co-ordinated delivery of agri-environment schemes relative to conventional piecemeal delivery took the form of a simple Multi-criteria analysis (MCA). This method is a credible alternative to monetary techniques, principally because of the participation of decision makers in the process. Such techniques include financial analysis, cost effectiveness analysis (CEA) and cost-benefit analysis (CBA), all of which rely on the application and comparison of monetary values, whether they be market or non-market values. While there are a number of advantages and limitations of MCA in comparison to these models, the primary reason for selecting MCA as a tool in this case was that it would:

- Provide a form of internal consistency and transparency across the case studies;
- Benefit from ease of use for both researcher and interviewee;
- Be realistic in terms of time and manpower given the financial and temporal resources available; and
- Is aimed at providing operation advice or recommendations for future use, which ties in with the aims of the study.

MCA also provided a structure and audit trail and was deemed more useful than relying solely upon a subjective judgement unsupported by a formal quantitative analysis. In particular, the ability to consult stakeholders and decision-makers specific to each case study to identify the most preferred option, to rank options and to apply weightings to the criteria was deemed especially useful.

The approach centred on the use of a performance matrix whereby sets of criteria are compared against a performance scale, relative to a conventional piecemeal scheme. In this case, performance is defined in terms of the costs and benefits, thus for each criterion respondents had to score the performance of the co-ordinated scheme on a scale from -5 to +5, whereby a score of zero represented no relative difference to a conventional AES. The respondents selected for interview had good knowledge of the case studies and were either the main delivery agent or main project co-ordinator.

Weightings were also applied to each criterion to reflect the relative importance of each in the analysis, thus when combined, low scores on one criterion may be compensated by high scores on another. In this case, transactions costs and landscape scale environmental objectives were given more weight than participation costs and social capital, as illustrated in the following example. Implementation costs and landscape scale objectives were deemed more important than participation costs and social capital because they are more central to the objectives of the schemes.

Table 2.1 Example of Multi-criteria analysis criteria and weights

Criterion	**Weights**	**Scores**	**Weighted scores**
1a. Upfront implementation costs			
Facilitation and co-ordination	*1.2*	+5	*+6*
Negotiating contracts	*1.2*	+3	*+4*
Training and advice	*1.2*	+1	*+1*
1b. On-going implementation costs			
Additional on-going costs	*1.2*	-1	*-1*
Monitoring and enforcement	*1.2*	+4	*+5*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	+4	*+5*
EO Benefit 2 – Buffering	*1.2*	+4	*+5*
EO Benefit 3 – Connectivity	*1.2*	+4	*+5*
EO Benefit 4 – Threshold	*1.2*	+3	*+4*
3. Participation costs			
Income foregone	*0.8*	+2	*+2*
Additional costs	*0.8*	0	*0*
Transactions costs	*0.8*	+2	*+2*
4. Social & human capital			
Community engagement	*0.8*	+5	*+4*
Environmental knowledge	*0.8*	+5	*+4*
Farmer cooperation	*0.8*	+3	*+2*
Total score		**+44**	***+46***
1a Upfront implementation costs		**+3**	**+4**
1b On-going implementation costs		**+2**	**+2**

2 Landscape scale environmental objectives		**+4**	**+5**
3 Participation costs		**+1**	**+1**
4 Social & human capital		**+4**	**+3**

The MCA calculation was supported by a qualitative analysis of the more open questions, which drew out any nuanced benefits and limitations of each case study and enabled an assessment of its applicability to ES and compatibility with WTO and EC regulations. Another use of the qualitative data was to allow interviewers the knowledge and scope to moderate the scores where they felt that the respondent's score did not match with the narrative. This was particularly useful in a number of cases where the scores and narrative were also discussed further with the Government agencies involved in the project or scheme, which occurred in around a third of all the cases. Although this represents a value judgement on the part of the researcher, subjectivity of this nature is not uncommon in MCA.

It is important to note that because the analysis did not involve monetary values it was not possible to discount relative costs and benefits into the future or to calculate net present values, as would be undertaken in a CBA. The scores are purely qualitative measures and it is assumed that, over time, costs and benefits remain constant, relative to standard, flat rate schemes, which effectively provide the benchmark for the analysis.

In a CBA it would also be possible to account for diminishing costs over time, by building in a coefficient to measure the estimated drop-off in impacts. In this case drop-off principally applies to the 2 auctions (although in other cases costs over time may be reduced through training etc), where there are high costs involved in designing the assessment metric and the information campaign and training events to inform farmers about how the mechanism works. However, as there is as yet no knowledge of how these costs would diminish if the auctions were repeated no attempt has been made to account for drop-off here. There is also a suggestion in the literature that repeated auctions can produce higher bids as landholders learn what the average bids are, so can actually be less cost-effective, if repeated (Cason et al., 2003).

3 Literature Review

A number of delivery mechanisms or co-ordination approaches have been adopted or proposed to deal with the issue of ensuring appropriate spatial arrangements of environmental measures across farm boundaries. The list of co-ordination approaches that are considered in this literature review are presented below. This includes approaches that would require co-operative submission of an AES application, and also includes those which reward connectivity, but do not rely directly on co-operative agreements. These approaches are not mutually exclusive as several can exist concurrently within one scheme.

- Group Supplement
- Scheme targeting
- Training
- Local engagement in decision making/governance/facilitation
- Formal Group/collective agreements (voluntary)
- Agglomeration bonus payments
- Public/private partnership approaches
- Geographically targeted auctions

The advantages and limitations of each approach are considered in turn, focusing, in particular, on their environmental efficiency, cost-effectiveness and institutional structures.

3.1 Application of group supplements

3.1.1 Description

A group supplement takes the form of an additional payment within an agri-environment scheme (AES) to cover the costs incurred by agreement holders working together to co-ordinate action across more than one holding. A group supplement can be applied to a series of individual agreements to require co-operation between the individual agreement holders over specific aspects of delivery, it does not require a single agreement between the delivery body and a group of land holders (e.g. of common rights holders on a common) which often requires that the group is legally constituted.

European Union (EU) rules currently stipulate that transaction costs may not exceed 20% of income foregone and additional costs, although draft proposals for the next EU Rural Development Programme (ERDP) programming period (2014-2020) state that transaction costs of up to 30% will be possible for groups of farmers. In England, the HR8 option exists within the Higher Level Stewardship scheme and is worth up to £10/ha/yr and a £5/ha/yr supplement UX1 (Natural England, 2010a; Natural England, 2010b) exists under the Uplands Entry Level Stewardship (UELS) scheme for upland common land or shared grazing. Most of these supplements are used in association with agreements on upland common land. However, the MESME[3] paper (Chaplin, 2011) also identifies a number of other situations where the group supplement has been used, including co-ordinating the management of fragmented non-contiguous sites (often small SSSIs[4]), and for the raising of water levels to create wetland habitats.

Below is one example of the use of a group supplement in AES from Europe.

[3] MESME - Making Environmental Stewardship More Effective
[4] SSSI – Site of Special Scientific Interest

Case Study – Example of use of group supplement in AES

PLAN 42 in Northern Spain- Based in Castilla y León region, including a large portion of Spain's Meseta Central and surrounded by mountainous regions. Plan 42 has, and is, promoting cultural change in pasture management systems on common land. Scrub burning has been banned since 2008 and replaced by mechanical scrub clearance. It is also supporting pasture improvement on low lying land (lime and fertilizers), and the sub-division of common land (equivalent to the fencing of hefts). The improvement of lower lying pasture was considered a 'sacrifice' for the grazing of higher SAC designated pastures that would otherwise be abandoned. The approach has revitalised the communal system, through sharing of machinery and related activity and prevented abandonment in many cases. This was a concern as there was a clear risk of high-intensity fires that would cause a considerable loss of carbon, devastate the biodiversity and pose risks to property and infrastructure. The market-based activities aimed to add value to the products from the area, including promoting collaboration between farmers and supporting the set-up of co-operative ventures. Much of the work of Plan 42 is paid for through agri-environment measures of the CAP and local community funds administered by the municipalities. The group supplement is secured for the collaboration and co-operative elements, although farmers are paid individually. Whilst there is extreme (by UK standards) rural depopulation, the aim is to maintain a high level of land management in these remote areas (Lewis, 2010).

3.1.2 Advantages of approach

Some of the advantages and limitation of group supplements identified below would be equally applicable to other approaches encouraging group action.

- Application of the group supplement enables the financial costs of working as a group to be subsidised through the agreement payments where they might otherwise be a block to continued or new group action and cohesion.

- Identifying the element of group working as a separate cost allows the application of related prescriptions allowing the agreement to focus on and stipulate elements of required group action.

- The group supplement can provide a framework for the delivery of land management guidance and training and, as a development of the bullet point above, help to retain traditional skills and lead to local employment opportunity.

- There may be a reduction of the overall delivery costs as a result of the requirement to deliver as a group.

- The use of a supplement with attached prescriptions can allow for a single deliverer to take responsibility for a particular aspect of land management, acting on behalf of the group, increasing efficiency and providing employment opportunity.

- The process of negotiating both group agreements and a series of agreements to which a group supplement is applied can result in improved social cohesion[5]. An ESA agreement undertaken by the Ireland Moor group in Wales (Mills *et al.*, 2008) provides a good example of this process and seems to have reinvigorated a traditional management structure that is expected to endure in the longer term.

[5] This advantage is not specific to group supplements but could be derived from other delivery approaches encouraging group action.

- This approach is also useful for addressing the management of, often small, non-contiguous core sites, perhaps those of a similar fragmented habitat. This is less to do with spatial co-ordination than with co-ordination of management activity and creating a critical mass.

- The approach is also useful in involving similar but fragmented land areas that individually are too small to be managed economically. These are areas that are marginal by individual farmers, but collectively significant from an environmental point of view.

3.1.3 Limitations of approach

- Initial negotiation of a group supplement requires a degree of facilitation, and this is a cost that is borne upfront with no guarantee of success. Franks *et al* (2011) found that most of the HR8 agreements reviewed were initiated by an outside agency, whether a Natural England Project Officer, a National Park officer or land agent. Their role was to help create links between farmers or to persuade farmers to join an HR8 agreement. However, this may also introduce some extra up-front resource.

- Mills *et al* (2008) found that excessive (and often un-rewarded) time can be taken up in committee matters in the securing of an agreement that includes a group supplement. The costs can be variable, in the case of Ireland Moor this was extensive for some individuals but this was acknowledged within the group and covered in the agreement. Other work on UELS suggests that this can be a 'thankless task' with high costs for some (Mills et al., 2012).

- Mills *et al* (2012) found some concern amongst chairs of formal groups dealing with AES committees that the path of least resistance was sometimes taken in order to secure agreements with group supplements and stronger guidance from agencies and Defra would reduce this concern. There is also potential that an agreement that does not suit all parties equally or is not seen as 'fair' may not be as secure in the longer-term. Mills et al (2012) suggest that guidance and perhaps case studies indicating what is expected of stakeholders would help alleviate this to some extent.

- The costs involved in drawing-up a legally binding agreement on the distribution of a group supplement can be high, which often has to be paid up-front before an agreement is secured (Mills *et al.*, 2008). It is now standard practice for group agreements to have an internal agreement that covers the distribution of monies received as well as what constitutes a breach of agreement and the sanctions against individuals if this occurs, as well as other important aspects that support the AES agreement itself.

- Difficulty in identifying financial costs and benefits.

- Difficulty in ensuring that those in receipt of the supplement do contribute to the group and to a similar degree.

- Increased risk that shared/group outcomes will be delivered and reduced control over their delivery as a result of the involvement of multiple agreements.

- Difficulty of identifying how the risk referred to above will be borne by the delivery agency, or by individual agreement holders, or through a tertiary agreement between agreement holders in receipt of the group supplement.

3.2 Application of Scheme Targeting

3.2.1 Description

The targeting of AES is one possible approach to delivering co-ordinated action at a landscape scale. The targeting of an AES can include three different elements which are not mutually exclusive:

- Geographical targeting of agreements within a defined area;
- Prioritisation of options within agreements; and
- Location of options within agreements

In the UK, geographical targeting currently occurs for HLS agreements. Regional delivery teams use target area maps in conjunction with a spatial information database (known as the Holdings Assessment Toolkit (HAT)) to develop a list of holdings that will be proactively approached for HLS agreements. HLS targeting can lead to a concentration of agreements, although this depends on the size of the target area relative to the local resourcing and number of agreements established. However, any concentration of agreements in itself does not necessarily translate to landscape-scale co-ordination, although examples of co-ordination do exist where a project-based approach to HLS delivery has been implemented based around a theme species or landscape.

3.2.2 Targeting of theme species

Phillips *et al* (2010) noted that the current HLS targeting approach in England has encouraged an increasing number of project based delivery initiatives across England for farmland birds. These are using HLS as a package to target farmland bird hotspots with the key management prescriptions needed. The use of theme species for co-ordinated targeting of agri-environment schemes has a history of success in the UK (Boatman et al., 2008). The earlier Countryside Stewardship Scheme (CSS) incorporated Special Projects which focused on particular species. Aebischer (2000) and Grice *et al*. (2007) reviewed the evidence for the impact of these CSS Special Projects on Stone Curlew and Cirl Bunting which incorporated options targeted for these birds species. Both of these special projects were deemed highly successful and exceeded Biodiversity Action Plan (BAP) targets. Similarly, in Scotland an AES with targeted, adaptive management for the Corn Buntings was found to increase breeding abundance of this declining bird species. Over 7 years the Corn Buntings increased by 5.6% per annum on those farms in the targeted AES whilst there was no significant change on farms in the general AES (Perkins *et al.*, 2011).

A good example of a project-based approach targeting a theme species is the Cornish Chough Project

Case Study: Example of targeting of theme species
Cornish Chough Project
The aim of the project was to ensure that the Cornish Choughs continued to breed, by providing the necessary habitat for them to feed and breed and protect their nests from egg collectors. When the project began in 2001, local Natural England delivery teams amended existing CSS agreements or set up new ones with Chough-friendly options, initially targeting around the area where the Chough first nested. This continued with the transition into ES from 2006, with expiring Classic agreements transferred in HLS with Chough-friendly options. Much of the area targeted for Chough also contributed towards meeting the SSSI targets. The Choughs have become integral to achieving the objectives of the SSSI, but the schemes were also used to deliver multiple benefits.

The key to this success was: -
- Having the ability to define the target area and options by possessing the necessary scientific evidence and knowledge needed for the outcomes sought.
- Having the ability to adapt existing agreements as new evidence (location of Chough breeding) came to light
- Pro-actively targeting new agreements to ensure Chough-friendly options were included, whilst still obtaining wider, multiple benefits through other HLS options within each contract.
- Taking a project based approach with a clear leader to keep an overview.
- Building excellent buy-in and co-ordinated involvement from stakeholders
- Mobilising extra support through RSPB volunteers

Some other key aspects in relation to collaborative working from this project:

- Farmers were motivated to join or amend their agreements because they wanted to help the chough specifically. In other words, having a focus and a symbol helped engage with the farming community and gave the project momentum.
- The ability to monitor and provide evidence for success as the project progressed helped generate more public support (increased the social capital of the project). The project publicised its success as it saw the birds using the coastal grassland and the winter stubbles.
- The National Trust, as landowner over much of the area, helped publicise that some of their tenant farmers that were involved in the project, adding weight to the project.
- The RSPB helped monitor the agreements (but only from the chough angle) and acted to protect new nest sites.

Source: MESME paper (Chaplin 2011)

3.2.3 Targeting of landscapes

Rather than targeting specific species, some AES are focused on defined areas which are often, but not always selected on the basis of particular biogeographic characteristics e.g. a water catchment or predominant habitat type. Landscape targeting can also involve specific habitat types and agri-environment scheme options. Such initiatives frequently employ project officers to co-ordinate and take forward activities who often work on a one-to-one basis providing advice to individuals and encouraging farmers to enter agri-environment scheme agreements. Three examples are provided below

Case studies: Examples of targeting of landscapes
Working Wetlands, Devon
The Working Wetlands project is a seven year initiative (2008 – 2015) working at the landscape-scale in three priority areas (c.65,000 hectares) in the Culm Natural Area of Devon. Numerous organisations are involved and it is led by the Devon Wildlife Trust. The project has dedicated project officers who aim to support landowners in the management of Culm habitats by providing farming and wildlife advice across farms and re-establishing areas of grassland to link up the existing fragmented sites. This is achieved through: developing strong working relationships with the landowning community; the dissemination of whole farm farming and wildlife advice; and free training events, drawing down on funding support from Environmental Stewardship and a project administered small grant award. Landowners also have access to machinery, such as mobile stocking facilities and are offered help with finding graziers or land to rent for grazing through the Grazing Links initiative.

Long Preston – Wet Grassland Project

The Long Preston Wet Grassland Project (LPWGP) started in 2004 with the aim of improving the important habitats of the Ribble floodplain between Long Preston and Settle in Yorkshire by working closely with farmers. Key aims of the project are to restore wetland habitats, to boost populations of existing wetland wildlife and to attract back species that have been lost. The RSPB employs an advisor through funding from the Environment Agency (EA) who has been assisting farmers to access agri-environment grant schemes. Over 90% of the project area is now subject to agri-environment agreements, mostly ELS, although much of the land in the floodplain (over 115 hectares) is now managed through HLS. The presence of a dedicated project officer has facilitated local workshops, farmer group meetings and other forms of public engagement through newsletters and interpretation boards. LPWGP works with farmers to show how effective wetland management can provide financial returns as well as benefitting local wildlife. Whilst the project is based on agri-environment schemes it has been successful in engaging wider sources of funding which have broadened the scope of the project and enabled greater public engagement with the outcomes and decisions. The other funding sources have provided extra resources for access and interpretation including funding an educational co-ordinator (employed by Yorkshire Dales Millennium Trust), repairs to existing footpaths and new stiles/dry stone wall repairs, plastic waymarkers and an audio trail.

Danish Hedgerow Planting Scheme

Hedgerow planting schemes in Denmark are organised by the Danish Planting Association (DPA), a private non-profit organisation, which administers the EU subsidy and acts as an umbrella body for local planting associations (LPA). The LPA organise collective planting and consists of farmers who choose to plant hedgerows in the same year within a specified local area. Each LPA is organised within a regional and national framework. The collective planting activity is organised according to so-called 'planting rounds'. Using time-schedules made by the regional groups, it is decided in which year each LPA may receive subsidies and thus plant hedgerows (currently every seventh year). When a new round of planting is to start in a local area, an information campaign is initiated by the LPA and the planting adviser. The adviser then collects the preferences of the individual farmers in a collective planting plan for the local area. The plan is formally approved by the executive committee of the LPA and hereafter sent to the county administration for approval. The scheme is generally regarded as successful as the hedges are well grown and provide both shelter and wildlife habitat. They have had a major influence on Danish agricultural landscapes. The schemes are considered to have a 'bottom-up' approach to developing applications and have strong collaborative elements. Busck *et al*, (2007) consider the collective dimension has four advantages compared to measures targeting single farm agreements.

- The approach has benefited from economies of scale[6] as farmers undertake the work together.
- The scheme is run by the non-profit DPA, so transactions costs (measured as administrative costs and controls paid for through the public budget) are low – approximately 8 % of the total budget. The remaining costs are associated with the additional payment.
- The collective approach allows for co-ordination of the plantings within a local area through a 'planting plan'.
- Collective planting projects are usually initiated and implemented in a process involving local meetings, advising and manual work done by specialized enterprises, a professional culture has evolved in relation to the scheme.

[6] Reduction in marginal costs arising from an increase in the size of an operating unit.

3.2.4 Advantages of approach

- There is evidence that spatial targeting of payments for agri-environment activities that allow for local tailoring of management prescriptions enhances the economic efficiency of payment schemes, offering the possibility of providing better value for taxpayers' money than broader, horizontal, schemes (Wunscher *et al.*, 2008). This is because spatial targeting results in payments being directed to high additionality sites which provide the most environmental value.

- Depending on the size of the target area and resources available, scheme targeting could be particularly useful in contributing to the threshold effect as it requires a proportion of farmers within an identified area to implement certain measures, but does not require active collaboration between individual farms, although collaboration could be one of the options targeted in a specific area.

- Uthes *et al* (2010) suggest that scheme targeting works best when a single issue can be identified as a primary focus. This is particularly the case where targeted application of research-based options for species recovery has been undertaken, as exemplified by Cirl Bunting, Stone Curlew and Corncrake, where action under AES has resulted in exceeding the BAP population targets (Boatman *et al*, 2008).

- Research suggests that it can be easier to engage landowners and farmers in co-ordinated conservation activities if these are focused on the recovery of a particular species as appears to be the case for the Cirl Bunting and Chough Projects. Mills *et al* (2008) found that many collective action projects stem from shared interests and goals amongst farmers. In attempting to engage farmers in collective action it may be beneficial to identify local features or resources of value that are unique and threatened and which might be protected through their actions.

- The targeting of schemes to defined areas can enable adaptive management of options to suit the targeted areas. This is important as the environmental effectiveness of schemes are maximised when schemes can change and adapt as situations change, experience is gained and knowledge develops.

- Using targeting to direct landscape scale collaborative initiatives offers more control to the delivery agents over the issues addressed and makes it easier to match national and regional environmental priorities and targets.

3.2.5 Limitations of approach

- The MESME paper (Chaplin, 2011) suggests that current UK scale mapping of conservation priorities at a national level cannot provide enough local detail to target at the local scale effectively, although a system with flexibility for local refinement and update (such as the HLS HAT) could overcome this to some extent.

- Spatial targeting of schemes or projects, like other approaches that focus on co-ordination at a landscape-scale, often entail higher private and public transaction costs than broader schemes due to greater administration efforts (Falconer, 2000). Also habitat/landscape scheme targeting in particular requires dedicated project officers to engage landowners and farmers which can be resource intensive.

- Current ES targeting is based on a “top down” decision-making approach. There is a lack of local engagement in the development of national targeting strategies, although national bodies, such as the RSPB, do help to shape national strategies.

- Spatial targeting has socio-economic distributional consequences because geo-biophysical and socioeconomic characteristics are not evenly distributed in space (Wunder *et al.*, 2008).

3.3 Application of training and support

3.3.1 Description

The use of training and support is one possible approach to encouraging co-ordinated action to achieve landscape scale conservation objectives, particularly training that takes place within farmer groups, although this outcome is often incidental to the overall aims of the training. Group learning can take the form of discussion groups, workshops, seminars and meetings and represents a formalised method of farmers speaking to other farmers and to experts directly. These events can be either ‘one-off’ and focused on a particular topic or held at regular intervals, with permanent group members.

Research suggests that the use of group learning can be an effective way of encouraging co-ordinated action between farmers and land managers. Any occasion when farmers come together on a regular basis, such as discussion groups and demonstration events, workshops, seminars and meetings will create conditions for collective action. Permanent groups, in particular can encourage the elements of belonging, trust, bonding, ‘enjoyment’ that are conducive to collective action (Dampney *et al.*, 2001). Such groups are exemplified by those in the Monitor Farm and LandCare programmes. For Monitor Farms, a Community Group (CG) is formed to concentrate on a single farm and the CG discusses all the major management decisions before they are taken, guided by the farmers stated objectives[7] (Busck A et al., 2007; Riddell, 2001). Although the emphasis is on business enhancement, these could provide a model for environmental improvement, such as the Environmental Monitor Farms established in Scotland.

Research has found that sustainable agricultural practices spread most quickly amongst farmers organised into groups, although other factors, such as local pioneers and effective extension support, were also important, demonstrating that good facilitation is central to supporting group formation and activities (Dampney et al., 2001). Learning groups can be programme or project based or part of an advisory service. Garforth et al (2002) looking at a number of case studies suggest that groups are a particularly effective way of facilitating learning, confidence-building and the assessment of management options. For example, Farmer Field Schools have been shown to be more effective in stimulating farmers' acceptance of new approaches to pest management than traditional message-based extension programmes (Gallagher, 1999).

Iterative and bottom-up group learning methods are becoming increasingly popular, particularly outside the UK. Rather than focusing on getting across a pre-determined message, these methods take the form of action-research based, iterative programmes in

[7] There are currently eight Monitor Farms in Scotland. SAC1 facilitates the projects in Easter Ross, Banff and Buchan, North Argyll, Wigtownshire, Borders and Perthshire. There are two other monitor farm projects in Bute and East Ayrshire. Environmental Monitor Farms are proposed (QMS). http://www.sac.ac.uk

which professional advisors/researchers and farmers seek to learn together the most appropriate ways of moving forward in a specific context. This approach has apparently proved effective in the development of an agri-environment measure in Lower Saxony, Germany, where farmers' ideas were directly integrated into a new agri-environment measure which created significantly higher acceptance of the measure (Prager and Freese, 2009). Capacity building exercises such as SLIM (Social Learning for the Integrated Management and Sustainable Use of Water at Catchment Scale) projects and those described by the RELU[8] programme-funded research **'**Learning and research for sustainable agro-ecosystems by both farmers and scientists' (Lyon et al., 2005) are further examples of action-research in the UK.

Skilled facilitation is fundamental in supporting group learning. Also of importance is who is running or organising the group event. This is because the identities of facilitators, particularly whether they are considered farmers or outsiders, are an important influence on how information is evaluated (Robinson, 2006; Wilson, 2004). In particular, farmers tend to put a premium on information from locally-known and credible sources (Paton and Grice, 2004; Robinson, 2006).

As different farmers respond to different stimuli it is common to advocate group events in conjunction with other interventions - multiple interventions at multiple levels. If done in conjunction with other engagement options e.g. online guidance; industry champions etc, then they can be effective in re-enforcing positive outcomes.

Below are a number of examples where training and advice to farmers has been effectively used to address environmental objectives.

Case studies: Example of training and support in AES

England Catchment Sensitive Farming (ECSF)

ECSF is a Defra led and funded initiative (in partnership with NE and EA) to address diffuse water pollution from agriculture, operating in fifty priority catchments throughout England. It aims to maintain a level of diffuse emissions which is consistent with the ecological sensitivity of the catchments through farmers limiting the use of fertilisers, protecting watercourses and promoting good soil structure.

Catchment Sensitive Farming Officers (CSFO) work in each of the catchments. ECSF relies on effective engagement with farmers and CSFO's to pass on support. CSFO's invite farmers to attend various information events, such as farm clinics, workshop, seminars and farm walks. These events provide advice and support for the farmers. Additionally, CSFO's conduct one-to-one farm visits for farm specific instructions.

An evaluation of ECSF (Defra, 2008) found that many farmers valued the face-to-face relationship they had with their CSFO. This engagement seems to be successful as 6,100 farmers received advice which translates into 15% of all farm holdings within the ECSF Priority Catchments (23% by area) and 34% within sub-catchments (45% by area). Within their response to self-completion surveys, 94% suggested that farm visits were the best way of learning about water pollution and agriculture. 80% felt that their knowledge of water pollution had increased with 90% suggesting that ECSF is the best tool to extend their knowledge on water pollution. However, despite this positive impact on knowledge there was limited acceptance that agriculture contributes to water pollution.

[8] Rural Economy and Land Use programme, jointly funded by the Natural Environment and Economic and Social Research Councils.

The Pesticide Voluntary Initiative (PVI)
PVI is a voluntary programme that aims to reduce diffuse water pollution from agriculture, and has elements of training in the delivery of the initiative. Such training is aimed at changing farmer's behaviour and practices in order to reduce the level of pesticides in water. Aspects of training have included an improvement in the training of spray operators and a series of road shows introducing better practice when applying pesticides. To reinforce the training, there was a distribution of literature focusing on greater care in sprayer filling and cleansing operations. Such literature included VI produced feedback leaflets and newsletters for farmers.

A decision tree was implemented informing farmers about appropriate times for the application of a certain chemical in terms of variable weather and hydrological conditions. This approach allowed advice to change from 'don't spray' to 'find alternatives'.
This method of advice and support has proved to be helpful in guiding the implementation and usage of sprays. This training appears to have had a positive effect on the behaviour and the use of sprays near water catchments. Modelling suggests that the contamination by pesticides pre-VI is greater than it was post-VI.

Ferti-mieux
Ferti-Mieux was a national programme in France established to encourage farmers to adopt practices to reduce water pollution, principally by nitrates, but also included phosphates and soil sediment. This voluntary 'rational fertiliser use programme' was set up in 1991 as an innovative scheme to improve water quality in French regions. It advised both arable and livestock farmers on how to use fertiliser efficiently and in a manner appropriate to the particular area in which they farmed. In each local area, where nutrient levels in water were high, farmers and their representatives could decide to create a local ferti-mieux project. A steering group of farmers, farm advisers, water companies, agricultural suppliers and co-operatives and local government officials, was set up, and employed technical advisers who visited participating farms to discuss improved fertiliser use to reduce its environmental impacts. Evaluations were made every 2 years and a Ferti-Mieux label was awarded to all farmer participants in approved groups, which could serve as a means of differentiating their products in the marketplace. In 2002, there were 51 projects in 39 French Departments, covering 1.9m hectares of land. Around 4.3% of farmers and 4.7% of the total agricultural area was covered by a Ferti-mieux project. As there were no individual contracts it is difficult to estimate the exact number of farmers that actually participated in local projects, but it is estimated that on average 70% of farmers follow the advice. Thus 3% of French farmers are likely to have changed their farming practices as a result of Ferti-mieux operations (Dwyer, 2007).

3.3.2 Advantages of approach

- A number of researchers suggest that permanent farmer groups that come together to learn can encourage a sense of belonging, trust, bonding, and 'enjoyment'; all elements that foster collective action (Dampney *et al*. 2001).

- Farmers must be convinced that they are able to resolve environmental issues through their actions in order to adopt new environmental activities. Homburg & Stolberg (2006) tested self-efficacy as a factor in predicting pro-environmental behaviour and found that where environmental issues were concerned it is collective (rather than individual) self-efficacy that determines pro-environmental behaviour. Thus not only is it important to convince farmers that there is a practical solution to the problem, but that this is probably best approached through stressing collective or group, rather than individual solutions to the problem (Dwyer *et al.*, 2007). Petty *et al.* (1992) suggest that powerful techniques for increasing feelings of self-efficacy are guided practice and specific skills

training in groups. The importance of training and support in convincing farmers of the efficacy of their actions was demonstrated with the ECSI where farmers needed to be convinced that agriculture makes a significant contribution to water pollution (Defra, 2008).

- Collective learning and training reinforces normative behaviour. Within groups, environmental messages are more likely to become embedded and will create a positive social norm (Mills *et al*, 2008)

3.3.3 Limitations of approach

- Angell *et al* (1997) suggest that the benefits of farmer groups may be limited to progressive farmers and would not necessarily be a good method for meeting all sectors of the community. They also found that success is related to the sociological character of group members and the enthusiasm of the co-ordinating advisor. Similarly, Dwyer *et al*. (2007) found that some farmers do not take part in farmer groups or networks, compared to the past when they devoted more time to social networking and regular attendance at the mart or agricultural shows. Overall, they found that those in larger farm businesses have more time to attend events and maintain social and business networks, whilst smaller livestock farms suffer particularly from a lack of time to do anything more than cope with the day-to-day business of running the farm. The incentives need to be sufficient enough that it is in the interests of the farmer to attend.

3.4 Local engagement in decision making/governance/facilitation

3.4.1 Description

Local engagement refers to situations where those using the land at the local level are engaged in determining how the national and international designations and management agreements are designed and implemented. Internationally, there have been a number of cases, especially in relation to natural resources, which have been managed sustainably in this way over the long term. As the MESME paper (Chaplin 2011) outlines, Ostrom (1990) identified 8 main design principles found amongst long-enduring common property resources (CPR) institutions: These are:

- Clear definition of areas, people and entitlement to resources.
- Rules are individually tailored to local circumstances rather than generally or universally imposed.
- Individuals affected by the rules can participate in collective-choice modifications of those rules.
- Self monitoring - Those monitoring condition of the land (or CPR), and behaviour of its participants, are either participants themselves or answerable to them.
- There are graduated sanctions for those breaking rules, and these are applied by fellow participants.
- There are low-cost local arenas to resolve conflicts amongst participants or between officials and participants.
- Minimal interference – the right to devise institutional arrangements are not subject to external interference by government authorities. The participants ‘own’ the design.
- Where CPRs are parts of larger systems, there are nested enterprises to ensure monitoring, enforcement and conflict resolution.

However the preparation of the 8 design principles for CPR was largely an arm chair exercise. Over the proceeding 15 years these principles were tested in a global set of case studies and found to be very sound, although each situation was bespoke and the resulting institutions diverse (Ostrom, 2005) and often referred to within the most recent literature as social-ecological systems (Berge and van Laerhoven, 2011). Landolt and Haller (2011) took the 8 design principles and tested them on 2 villages in the Swiss Alps, considered to be longstanding examples of stable CPRs. They found a system under strain among the upland dairy farmers for a wide variety of reasons, not all of which are covered by the summer grazing incentives.

The level of engagement in decision making is often referred to as co-management (Carlsson and Berkes, 2005) or adaptive management (Jacobson et al., 2009). Carlsson and Berkes (2005) describe co-management as being 'the result of extensive deliberation and negotiation', meaning it is very much a process rather than a fixed state. The approach suits complex situations as it focuses on a multi-objective approach that acknowledges that the State has 'multiple faces and voices' representing a range of statutory interests as well as there being a range of local stakeholders.

The research steps that Carlsson and Berkes suggest as a means of developing a co-management approach involve:

- Defining the sociological system
- Mapping the essential tasks and key issues
- Clarifying the participants
- Analysing linkages
- Evaluating capacity needs
- Prescribing remedies

(Adapted from Carlsson and Berkes 2005:73-4)

They concluded that by applying such a co-management approach underpinned by the six research steps, 'power sharing will typically be regarded as the end result of a collaborative problem solving process rather than a starting point of a co-management decision-making process' (Carlsson and Berkes 2005: 74).

Goldman *et al* (2007) offer an example of how a co-management approach might be used in the development of a landscape-scale scheme for the benefit of ecosystem services. The paper outlines why a landscape scale approach is critical for pollination, hydrological processes and carbon sequestration and that management is most effective in a co-ordinated way. The paper offers three hypothetical approaches which are the "cooperation bonus," the "entrepreneur," and the "ecosystem service district". All were aimed at promoting cross-farm co-operation to enhance service provision and, all of which are voluntary and dependant on co-operation and in order for these to be achieved they have assumed that there would be a high level of local engagement.

As the MESME report (Chaplin, 2011) outlines, the FP6 project GEMCONBIO, suggest among its policy recommendations that schemes should '*make contact with existing traditional structures*' and involve them in both management activities and governance. The linking in to existing structures as a way of securing and stabilising the approach within the community landscape, was highlighted by Dwyer *et al* (2007) in a Good Practice Guide for Defra on encouraging positive farmer environmental behaviour and Mills *et al* (2008) when reviewing collaborative groups in Wales. Nevertheless there needs to be some caution about boarding what Kasperson (2006) calls the '*stakeholder involvement express*' and Ribot (2006) makes clear that stakeholder involvement has to be meaningful, as with all decentralised approaches, they are '*only effective when there are mechanisms to represent local needs and aspirations in decision making'*.

Sutherland *et al* (2011) looked at organic farming as a proxy for a co-ordinated approach. The socio-cultural research found that different levels of trust between neighbours were influential in determining the level of collaboration. The field studies found that encouraging neighbouring farmer co-ordination can have clear environmental benefits without high economic cost. However, they concluded that even within collaborative arrangements it would be best if farmers were not required to work with specific farmers or that they are not penalised for the actions of others.

Prager and Nagel (2008) reviewed the approach in Germany where it is quite common place for local stakeholders to have some influence on the type of agri-environment measures that are implemented within the region. The paper focused on the case study of Sachsen-Anhalt and used an action research methodology to implement a participatory approach. Hughes *et al* (2011) looked at ecological restoration at the landscape scale and while not mentioning AES, explored the issue of monitoring and evaluation. They concluded that an inclusive 'open ended' approach is required that is distinct from the current approach of defined goals and targets. Monitoring should also include stakeholder attitudes as well as institutional and societal robustness.

Work by Amblard (2011) stressed the importance of networks and how the different network structural properties may affect the success of collective action for natural resource management. The role of networks would appear to have some impact on the success of schemes in France. Amblard also cites the work of Scholtz *et al* (2008) who reviewed the effectiveness of 22 estuaries in a US context that looked at co-operation outcomes and network positions and revealed the importance of stakeholders with bridging relationships (participants with links to multiple stakeholders) and the ability to access information from a number and variety of partners.

The MESME report concludes that there is currently little local engagement in scheme design, although national stakeholders have some influence. The facilitation and negotiation processes that Carlsson and Berkes (2005) and Amblard (2011) outline are not routinely available under ES, but they would seem to offer a framework to assist in this area. Some network analysis may be required to establish which approach is most likely to be effective and efficient. There are some examples that would be worth exploring as outlined in the case studies below.

Case studies: Example of local engagement in decision-making

France - Local Agri-Environmental Schemes (LAES).
These new schemes, implemented since 2007, differ from previous agri-environmental programmes targeting water pollution. First, implementation areas are chosen to match the environmentally relevant scale, such as watersheds or drinking water catchments. Second, while agri-environmental schemes were previously managed jointly by state agencies and agricultural organizations, the formal co-ordination of LAES projects is open to other local stakeholders, such as environmental associations, local governments or drinking water suppliers. Early work by Amblard (2011) suggests that the effectiveness of the partnerships established by the co-ordinators is important in the success of the LAES projects.

England - Integrated Local Delivery.
This approach developed by FWAG and evaluated by CCRI involved a case study in Gloucestershire, although around 20 further examples are included in the appendix. There is potential, but little evidence, of schemes being adapted and re-designed. In the most part existing scheme options are chosen. The establishment of a local management group that statutory agencies sit on is an innovative element. This is linked to administrative structures, such as the parish council to enhance transparency, accountability and legitimacy, as well as

ensuring long-term sustainability (Short et al., 2010). This approach is discussed in more detail in Section 4.

Dartmoor Farming Futures
The most recent project grew out of the NE funded Upland Ecosystem Pilot and is currently considering the application and appropriateness of HLS options on the Forest of Dartmoor. There is a high level of local engagement between commoners, other local stakeholders, NGOs and NE. This project is discussed in more detailed in Section 4.

Germany - The Sachen-Anhalt state had 3,010 agreement covering 162,900 ha. During the participatory events the local stakeholders (farmers groups and NGOs) agreed the objectives and other improvements to the scheme (Prager and Nagel, 2008). Also Lower Saxony, where an AES option was tested by a group of farmers and subsequently included within the menu of AES options (Prager and Freese, 2009).

3.4.2 Advantages of approach

- The environmental effectiveness of local engagement in decision-making is demonstrated in a number of locally focused initiatives, e.g. Cirl Buntings, Cornish Chough.

- The approach also has the potential to achieve connectivity at a landscape scale through a greater focus on discussion and collaboration between delivery agencies and scheme participants. This enables landscape scale activity, such as management of core sites, buffering, connectivity and reaching a threshold of activity.

- The approach embraces the idea of co-production in the delivery of public services that is currently being advocated for other areas of the public sector (Boyle and Harris, 2009; Demos, 2007). The approach incorporates the idea of encouraging users to design and deliver services in equal partnership with professionals in order to make them more effective and efficient.

- Locally supported, project-based approaches to delivery offer greater potential to involve other funding sources and link with other projects and volunteer groups. Some facilitation costs would be required at the start, but potentially little different to those available to individual participants added together. However, a key aspect of this approach is trust, which can be elusive.

- Locally supported, project-based approaches to delivery offer greater potential to involve other funding sources and link with other projects and volunteer groups. This could reduce the costs of delivering outcomes in the long term, balanced by the extra costs of more complex negotiation and co-ordination.

- Greater grass roots buy-in could lead land managers to value their actions for the environment more highly, providing a greater focus on outcomes within their agri-environment agreements, or even motivating them to go further without extra financial support.

- A move to facilitate more local discussion could have a beneficial social effect if it brings communities together. It can result in wider recognition in the community of the action undertaken by land managers, providing those land managers with an extra motivation to engage in the scheme and produce results. Knowledge that environmental actions on

farm land is valued by the community just as much as food production is a vital part of building the social capital for a scheme like Environmental Stewardship.

3.4.3 Limitations of approach

- Locally focused approaches, within a national framework, could limit the ability to address individual priority sites/features in the wider countryside. Using existing advice options within schemes can provide some of the resource but engagement may exceed this as it can be time and resource hungry.

- Lack of local community organisational structures to foster debate over environmental issues and agreement to take them forward. Establishing new structures can be costly and not sustainable in the longer term as such structures may struggle to keep going. It places a higher ongoing transaction cost on the participants. Also in some communities local land managers and community members lack the time and resources to commit to the process.

- The effectiveness of locally developed landscape-scale projects may be limited by their scale and requires a national targeting framework to ensure that resources are prioritised. Also local priorities and focus can divert resources from national targets and priorities and sometimes the focus of co-ordinated delivery has to be a compromise between national targets and local needs.

- The need for facilitation and engagement at the start could potentially mean longer lead-in times before action can happen on the ground. This needs to be factored into budgeting.

- The approach could be dominated by one or two powerful local influences – e.g. a particularly strong character or group – who could bend the project to their own ends rather than community wide benefits (especially where access to a source of money is involved).

- Managing expectations – just how much influence on the scheme should the people involved expect? (especially when dealing with national funding schemes that must also meet set national objectives)

3.5 Application of formal group/collective agreements (voluntary):

3.5.1 Description

Collective agreements are available within ES but are predominantly used for facilitating commons agreements. The MESME evaluation by Chaplin (2011) suggests that the potential to use collective agreements for wider environmental outcomes has not been widely taken up. A collective agreement allows greater discretion to scheme participants to determine the way in which requirements are defined and payment rates determined for individual scheme members. These formal collective contracts may also allow some autonomy enabling groups of farmers to determine the allocations of costs and activities amongst themselves. They have their own responsibility for the implementation, monitoring and enforcement of the terms of the contract, which requires a degree of shared responsibility and potentially a separate agreement signed by all the signatories of the formal agreement detailing individual responsibilities.

The experience of the Netherlands is often quoted as an example of collective agreements in action (Franks *et al*, 2011). However, as Chaplin (2011) points out:

a. the role of collective agreements varies and is predicated on the existence of an environmental collective; and

b. they can have collective agreements in the manner that exist in the UK but the type of collective agreement is assisted by the presence of an existing and well established environmental collective, meaning that they can receive money directly.

The effectiveness of formal group/collective agreements appears heavily dependent on the availability of facilitation, which is a need common to most landscape-scale delivery. This point is made by Mills *et al* (2008) in their evaluation of Pontbren Farmers Group, a group of 10 farmers undertaking sustainable farming practices on a contiguous block of land, near Welshpool, Powys. They found other features of the group that encouraged environmental effectiveness and cost: efficiency which could equally be applied to the application of group supplements or local engagement in decision-making:

- *Ability to find own solutions* within the group meant that the concept of change and adaptation had strong ownership.
- *Development of own implementation rules* encouraged participation as the groups placed a high value on retaining farm autonomy.
- *Flexibility in member involvement* in group activities meant members were free to be involved in activities, as suited them individually.
- *Payment systems administered by the groups* reduced agency transaction costs and enabled the group to develop their own equitable distribution of funds to members.
- *Self-regulation and monitoring* which ensured high standards of work (due to reputation effects) and low administrative costs.

Case studies: Formal Group/collective agreements (voluntary) examples

Netherlands – an experimental AES which involves collectives of farmers implementing a spatially co-ordinated site level habitat management (mosaic management) approach which includes the delayed and/or staggered mowing of fields, refuge strips and active nest protection. The aim is to have a positive impact on the numbers of the black-tailed godwit. (Schekkerman H et al., 2008)

Pontbren Farmers Group, Wales

The Pontbren Group is comprised of 10 hill farmers based in Powys, mid Wales. The 10 members farm a contiguous block of around 1,000 hectares of land along the Pontbren River. These hill livestock farms vary in their stocking densities and profitability. There is also a wide range in ages from 30 to 66 years of age. With the exception of the leader, all members of the group were born on their farms and were known to each other from childhood; in fact many attended the same school and chapel. Although the members had co-operated formally before, they were known to each other through community and kinship ties. Motivations for joining the group differed, but at the heart was the recognition that the farmers were caught on a 'productivist' treadmill, with high costs and high stock numbers, causing the hedges and woodlands on their farms to become degraded. By coming together as a group and through a process of social learning, the group members developed the confidence to significantly alter their farming systems and to approach WAG for collective funding to de-stock their sheep by 20% on average for the group. Also dissatisfaction with the available AES for environmental work, which were considered too autocratic and inflexible and often not relevant to their farming systems, they sought alternative funding and successfully obtained various collective funds, including a lottery funded grant administered by Wales Council for Voluntary Action, for environmental work which allowed them to have control over the implementation of environmental management. To date, the Pontbren group have planted 120,000 trees and 16.5 miles of hedgerows and established 12 ponds covering

2.2 hectares. Areas of wetland have been fenced off to ensure protection. The group has also established its own tree nursery where all trees and hedgerows are grown in group-produced compost from seeds gathered on the farms. In addition, offcuts and windfalls from trees and hedges are recycled into bedding for livestock or compost using a jointly purchased chipping machine part-funded by the Welsh Development Agency (Mills *et al.*, 2011).

There is a paucity of research on the benefits of landscape-scale projects managed through formal groups or collective agreements. This point is made very clearly by Hughes *et al* (2011) using the example of Wicken Fen, East Anglia, and they concluded that evaluation requires a clear baseline so that reporting can focus on biodiversity and stakeholder 'impacts and benefits' rather than 'pre-defined concepts of ecological success'.

Recent work evaluating Phases 1 and 2 of the Integrated Biodiversity Delivery Areas programme (Short, 2012) has highlighted subtle, but important differences in what is meant and understood by a range of stakeholders and partners as being 'landscape-scale delivery'. This needs some further analysis and consideration at a national level to tease out the range and significance of these differences. The findings are supported by another recent report (Elliott *et al*, 2011:20) who point out '*these projects are novel and challenging in terms of institutions as well as ecology*'. Bodin and Crona (2009) stress the importance of existing social networks and that the nature and characteristics of the network will impact on the type of environmental governance.

3.5.2 Advantages of approach

- Group agreements can lead to improved co-ordinated action on contiguous areas because they act as one agreement, rather than multiple agreements attempting to achieve integration.

- The scale of agreements is likely to determine the contribution to landscape-scale thresholds. There is potential to link to a targeting framework to assist in achieving connectivity and for the co-ordinated management of core sites.

- Delivery via a project based on a land ownership scale (e.g. a common or group of holdings within part of a catchment) might be more successful at engaging potential participants than projects with little local resonance based around scientific data on environmental need. However, such an approach will be limited to operating within the geographical area of small, trusted social groups.

- Voluntary group agreements can tie in to both the localism and Big Society agenda particularly if their development moves away from an NE project officer approach to more voluntary engagement: through community or voluntary group led facilitation and monitoring, bottom up approaches to developing agreements and potentially by bringing together wider interests and other sources of funding. Such a locally based approach may also bring the land management community closer together with other parts of the community. Sometimes groups can be held together by key individuals and can collapse when they are no longer involved. Incentives need to be sufficient for the group to exist without an initial champion.

- Self regulation and monitoring within formal collective agreements can reduce the need for outside monitoring as there is evidence that reputation effects in a group ensure compliance, and an element of competitiveness which result in a high standard of work.

- Operating as a group can lead to greater bargaining power for the participants. It is recognised that a collective voice is more likely to be effective than individual actions. Groups allow for the presentation of a cohesive aligned front leading to improved representation and improved lines of communication (Ingram *et al* 2008).

- Operating as a group could have social benefits if handled well and could open up new opportunities for cost sharing (e.g. machinery rings) or marketing (Mills *et al.*, 2008).

- Operating as a group on a project could open up the potential to draw in other sources of funding. Mills *et al* (2008) found that on forming a group, farmers had access to funding that would not have been available to them as individuals

3.5.3 Limitations of approach

- Costs of facilitation, which is a need common to most landscape-scale delivery, can be high: while a payment can be made for facilitation, ensuring that it is adequate to cover both farmer and facilitator costs is essential. Independent/trusted facilitation to both the farmers and agencies has been highlighted as a key consideration.

- Rigidity of prescriptions and approaches: an approach such as group agreements that gives participants greater responsibility and the ability to sub-divide the payments and tasks within an agreement between themselves might encourage them to sign up to group agreements.

- The issue of free-riders can present difficulties, if certain group members do not contribute to the collective action yet benefit from the agreement. There are examples where this issue has been overcome by groups developing a system of mutual monitoring and imposing predetermined sanctions for those who commit breaches of the collective agreement (Mills *et al.*, 2008) This does increase the transaction costs at the start and may influence the on-going costs

- Farmer interest in signing up to one single agreement across land holdings – it has been suggested that there may be some reluctance to sign up to one agreement (rather than co-ordinate individual agreements) due to loss of control. It is not clear whether this has ever been tested in practice. Trust plays an important part in the success of collective agreements. Trust, familiarity, and respect can only develop over time so collective agreements are most likely to work in situations where individuals are well-known to each other or are part of some existing local informal social networks, which will predispose them to work together (Mills et al., 2011). Any new group will take time to establish, to develop into maturity and then to deliver real change in land management. Ideally, a period of 10 years would be advisable over which to seek a significant impact upon farming practices (Mills et al., 2011).

- Membership of a group agreement introduces a significant element of risk to the individual, potentially making them responsible for the activities of other group members, particularly important if these involve breaching the terms of the agreement. Landowners and managers are very concerned and wary about this risk and the expansion and success of an approach to agri-environment delivery involving more group agreements may require a change of culture on the part of the delivery body in the way that risk of failure is apportioned. Currently breach of agreement can lead to reclaim of agreement payments placing a significant burden on agreement holders.

- Currently there is a need for better developed information and support systems around the establishment, content and management of legally secure group constitutions. Currently there is a block on this being provided by delivery bodies because of the consequent risk and liability.

- Conflict within the group and the resources needed to manage this can detract from the intended outcomes of the agreement and place insupportable demands on the group and the facilitation agency.

3.6 Application of bonus payments

This section considers two types of bonus payments; payments which are received in addition to the existing flat-rate agri-environment payment. The first is an agglomeration bonus payment within an agri-environment scheme and the second is a bonus payment derived from a public-private partnership for delivering ecosystem services.

3.6.1 Agglomeration bonus payments

3.6.1.1 Description

A bonus payment with a spatial element is known as an agglomeration bonus. Parkhurst *et al* (2002) describe it as a bonus that is paid on top of a standard payment for managing land in a biodiversity-enhancing manner if the managed patches are arranged in a specific spatial configuration. It could, for example, be an extra payment paid to farmers on top of the SPS for managing patches of land bordering other land entered into ES. Bonus payments create an incentive for farmers to voluntarily create a contiguous area across common borders. In the academic literature there are currently three strands of discussion:

- The agglomeration bonus idea requires co-operation among land owners and some research has focussed on the co-operation problem (e.g. Parkhurst and Shogren, 2007; Parkhurst et al., 2002). This research considers ways in which an agglomeration bonus payment can provide an incentive for non-co-operative landowners to voluntarily create a contiguous reserve across their common border

- Some authors have proposed an agglomeration bonus to improve the design of conservation policies by creating the right institutional arrangements to achieve co-ordinated action (Khanna and Ando, 2009; e.g. Schulte et al., 2008; Smits et al., 2008).

- Other authors discuss the cost-effectiveness/budget efficiency of the agglomeration bonus/payment idea when land is part of a contiguous habitat network (e.g. Drechsler *et al.*, 2010; Lewis *et al.*, 2011). They looked at the connectivity effect, the patch restriction effect, the surplus transfer effect and the impact on efficiency of incorporating biological information into payment selection criteria. These three effects are defined as:

    - **Connectivity effect** which arises because of the higher ecological benefits of spatially connected habitats compared to the homogeneous payment. It would be particularly effective where the management of contiguous areas of land is required to deliver landscape-scale conservation objectives for core sites or for buffering existing sites.

    - **Patch restriction effect.** Under homogeneous payments the most inexpensive patches in the landscape are likely to be selected; whereas with the

agglomeration payment the selection is restricted which thereby induces the choice of more valuable habitat patches.

- **Surplus transfer effect.** This arises because some landowners may need to be compensated for loss due to participation through what Dreschler calls side-payments from other landowners. Landowners will be confronted with the choice between not receiving any payment and offering side payments to farmers whose participation in the programme is necessary to reach the density threshold but whose individual profits would be negative without the side payments. However, there is also a danger that side-payments may create incentives to hold out so that coordination does not occur.

To date, there appears to be little use of this form of co-ordination in mainstream delivery. However, the concept has been subject to extensive experimental evaluation and game testing. In laboratory experiments the bonus mechanism was successful in prompting participants to co-ordinate their actions for a number of simple spatial configurations, although in more complex and realistic co-ordination experiments the bonus mechanism proved less effective (Parkhurst and Shogren, 2007). Dreschler *et al* (2010) used a real world case study on the conservation of the Large Blue butterfly in Germany to look at cost-effectiveness of agglomeration bonus payments against a spatially homogeneous payment. They looked at the cost-effectiveness of introducing an agglomeration bonus payment that encouraged mowing regimes that were beneficial to the butterflies. For the agglomeration payment to work, land-owners needed to co-ordinate with each other about side payments and their actions. They concluded that the approach works best for small conservation budgets and possibly for single species. This is because with large budgets there would be enough areas managed appropriately in the landscape whose connectivity would be sufficient even under homogeneous payments. Goldman *et al* (2007) also suggest that the agglomeration bonus payment could be expanded to reward conservation along a natural resource, such as a river, by providing a bonus for a hectare that borders the resources as well as the neighbour.

There are very few examples of the use of the agglomeration payment. Two examples that show elements of an agglomeration payment are presented below.

Case Studies – Example of use of Agglomeration Payment.
Ordinance on Ecological Quality (OQE)
An AES in Switzerland shows features of the agglomeration bonus. Farmers are paid a homogeneous payment for certain biodiversity-enhancing farming practices on (parts of) their land known as ecological compensation areas (ECAs). In addition, they receive, a 'network bonus', known as Ordinance on Ecological Quality (OQE) if this land is part of a contiguous habitat network (Lebeau and Righetti, 2008). This scheme is discussed in more detail in Section 4.

Danish ESA – Bunce *et al* (2000) report on an AES in Denmark which attempted to raise local participation in ESA by offering bonus payments where the agreement coverage for the target area exceeded a threshold determined by the county. Typically, a high coverage was 50% which would lead to a bonus payment of 10%. By giving these bonus payments it was hoped that the most adaptive farmers would convince their neighbours to join the measures.

3.6.1.2 Advantages of approach

Drechsler *et al*. (2010) found from experimental work that an agglomeration payment is always better than a homogeneous payment in terms of budget efficiency. This is due to the interplay of the connectivity, patch restriction and surplus transfer effects defined above.

Although there are no real world examples, the agglomeration bonus payment has considerable potential for achieving landscape-scale outcomes:

- Goldman *et al* (2007) suggest that the transaction costs of an agglomeration bonus payment scheme are relatively low for both the landowner and the managing agency as co-operative conservation involves only one landowner talking to and encouraging participation from his neighbour. There may also be cost savings as outside agencies are not required to negotiate individually with those landowners whose land would be needed for a certain spatial configuration. The negotiation partners are neighbouring landowners and conditions do arise in which each landowner might know more about his or her neighbour than the Government agency.

3.6.1.3 Limitations of approach

- As Drechsler and Wätzold (2011) acknowledge, for the agglomeration payment to work landowners would need to co-ordinate with each other about side payments and their actions. This implies that there would be additional transaction costs for the land managers compared to standard homogeneous payments which Dreschler *et al* (2010) have not included in their estimations and might reduce the cost-effectiveness of the approach. The extent of the transaction costs will depend on factors such as the local tradition of co-operation between land-owners, the information disparity across landowners about conservation costs and the number of land-owners that need to participate in negotiations.

- Schemes which require participants to work with specific neighbours on the basis of geographic criteria, such as adjacent land may not be particularly effective as Sutherland *et al* (2012) suggest that for collaborative schemes to work it is important that farmers are able to choose their collaborators due to issues of trust. Also there is increased risk of "hold outs" as neighbours try to extract higher payments which is likely to undermine the success of such a scheme.

- Parkhurst *et al*, 2002, also suggest that agglomeration bonuses can create multiple equilibria without anyone being dominant. In this situation predictive power is lost, leading to co-ordination problems. This can be overcome by individuals communicating with one another and understanding each other's intentions.

- Bonus payments are not permitted in agri-environment schemes (including ES). The World Trade Organisation (WTO) rules[9] (and European Union (EU) Regulations[10]) limit payment rates to a maximum of 100% of the costs of participation (income foregone, additional costs and transaction costs), in addition transaction costs may not exceed 20%[11] of income foregone and additional costs. However, the MESME paper (Chaplin , 2011) suggests that it might be possible to provide a bonus payment within the transaction cost provisions of the payment calculation methodology, although this would require evidence to support the basis of such costs and they would be limited by the 20% ceiling for costs of this type. Specifically, farmers would still receive the income

[9] http://www.wto.org/english/docs_e/legal_e/14-ag.pdf

[10] Council regulation (EC) No 1698/2005 Article 39 paragraph 4 states 'the payments shall be granted annually and shall cover additional costs and income foregone resulting from the commitment made. Where necessary, they may also cover transaction cost.' Commission Regulation (EC) No 1974/2006 Article 27 paragraph 10 'Member States shall determine the need to provide compensation for transaction cost as provided for in Article 39(4) and Article 40(3) No1698/2005 on the basis of objective criteria.

[11] Current Draft EU Regulations for next programming period have increased this figure to 30%

foregone element of their payment, but the additional/transaction cost payment element could be paid as a bonus.

3.6.2 Public/Private partnerships - ES with PES

3.6.2.1 Description

Another bonus payment scheme could involve a combination of public and private payments, with the ES payment supplemented by a Payment for Ecosystem services (PES) scheme. The ES scheme could be used to leverage additional payments from the private sector. A PES scheme is a voluntary agreement between sellers and buyers to deliver actions that increase or enhance ecosystem service delivery. In terms of agri-environmental activities, the 'seller' or provider is the land manager who will deliver these different actions on their land leading to enhanced ecosystem service delivery. The 'buyer' is generally linked to beneficiaries or users of ecosystem services that would be enhanced under PES.

Rowcroft *et al.* (2011) suggest that rather than revolutionising environmental protection, PES is more likely to promote enhancements in the delivery of existing ecosystem service provision. There is certainly scope for them to be used in conjunction with AES payments.

Examples of potential beneficiaries might include:

- water companies: payments for catchment and wetland restoration activities to improve water quality, reduce sedimentation and manage flood risk;
- local residents: interest in reduced flooding
- insurance groups: interest in reduced flooding or storm/hazard regulation
- recreational users: interest in enhanced recreational opportunities
- conservation groups: interest in enhanced wetland habitat

The participation of the private sector in PES has been so far sporadic and limited. In the UK, during the last ten years, water quality and more recently water quantity have become major drivers for intensive localised catchment-based restoration work. The majority of this work has been driven by water companies in an effort to reduce the costs of treating raw drinking water quality in an environment where Dissolved Organic Carbon (DOC) levels were rising steadily. The following are examples of such projects.

Case studies: Public/private partnership examples
Sustainable Catchment Management Programme (SCaMP)
United Utilities (UU), which supplies water to 7 million people in the North West of England by means of sourcing from upland surface water sources, developed, in association with the Royal Society for the Protection of Birds (RSPB), the Sustainable Catchment Management Programme (SCaMP) across their land. SCaMP was operated and funded by UU within their Bowland and Southern Estates, a land holding of 20,000 hectares, and ran between 2005-2010. The programme aim was to develop an integrated approach to catchment management incorporating sustainable upland farming, through long-term agreements, which delivers: Government targets for SSSI's of which 17,500 hectares of UU's land is designated as SSSI; Biodiversity Action Plans (BAP) for priority habitats and species; and improved raw water quality which is the primary reason why UU hold the land.

To achieve the objectives described above UU developed plans for farm management with consultation from English Nature, RSPB and the Rural Development Service. The plans identified changes to farming practice and modifications of farm infrastructure. Within the first year these plans were developed in all SCaMP areas and agreed by twenty-one tenant farmers. The management plans aimed to re-vegetate bare peat; reducing levels of stock

and manipulating the stocking calendar and introduce woodland planning. The plans gave the farmer the best possible chance of accessing Higher Level Stewardship (HLS) payments ensuring the venture was both environmentally and economically sustainable for farmers and UU. A monitoring programme was established that looked at the changes of vegetation, hydrology and water quality from the implemented land management schemes. The results of SCaMP are varied and match the objectives set within the agreements with farmers. They include:

- Two thousand sheep removed to allow vegetation to recover in which 5km^2 has be re-vegetated.
- Over 100 km of drainage grips blocked to improve raw water quality
- Half a million deciduous trees planted on stream sides and steep cloughs reducing erosion
- Twenty tenant farmers in agri-environment grant schemes
- Over 95 % of UU's SSSI's now in favourable or unfavourable recovering condition (Government target is 95%).

SCaMP 2 is planning to deliver the following across the two remaining UU estates (30,000 ha) in the Lake District and West Pennines:

- Over one million trees planted across nearly 600 hectares in the West Pennines and Lake District catchments
- Over 130 km drainage grips blocked to restore peat hydrology and promote recovery of blanket bog habitats
- Over 40 tenant farmers and commoners in agri-environment schemes
- Over 3,750 ha of deep peat moorland under restoration or maintenance through Higher Level Stewardship
- Over 2 square kilometres of bare peat to re-vegetate and restore (McGrath and Smith, 2010).

Benefits to United Utilities include:

- Protection and improvement in water quality
- Reduction in the rate of increase in raw water colour which will reduce future revenue costs
- Reduction or delay in the need for future capital investment for additional water treatment.

Such is the suggested success of SCaMP there has been an introduction of SCaMP 2 to other non-UU owned land used for the water supply of Cumbria, Rivington and the West Pennies.

Vittel, France

Since 1993, Vittel has conducted a PES programme in its 5,100 hectare catchment in the Vosges Mountains to maintain high water quality. 26 farmers in the watershed are paid to adopt best low-impact practices in dairy farming to reduce nitrates in the water source. (no agrochemicals; composting animal waste; reduced stocking rates).

The programme combines cash payments (conditional upon the adoption of new farming practices) with technical assistance, reimbursement of incremental labour costs and arrangements to take over lands and provide usufruct rights to farmers. Average payments are EUR 200 hectare/year over a five year transition period and up to 150,000 EUR per farm to cover costs of new equipment. Contracts are long-term (18-30 years), with payments adjusted according to opportunity costs on a farm-by-farm basis.

Land use and water quality are monitored over time which has provided evidence of improvement in relevant ecosystem services compared to an otherwise declining baseline. This high service value clearly makes the investments profitable.

The Vittel scheme was built on a four-year research programme by the French National Institute for Agricultural Research (INRA) and took 10 years to become operational. It is

implemented through Agrivair, a buyer-created intermediary agency that helps to mediate between parties (Perrot-Maître, 2006)

Austria – Local compensation payments.
Local compensation payments are made by municipal councils to farmers for providing landscape amenities in Alpine tourist communities. By mowing the Alpine grassland, taking care of the rural trails and road networks, preserving the vegetation along the waterways, extensive small-scale agriculture is seen as increasing the utility of those who spend their leisure time in these regions and offers a pleasant landscape for recreational purposes. In fact, sustainable agricultural production in mountain areas is considered one of the most important attractions for summer vacations in various Alpine communities. As the number of full-time farms in mountain areas is continuing to decline rapidly, several tourist-intensive communities in Austria have opted to offer an incentive for the provision of landscape services in the form of direct compensation to local farmers. These compensation payments are voluntary public expenditure by local governments, and the amount has to be agreed by local community councils (Hackl *et al.*, 2007).

3.6.2.2 Advantages of approach

- Public private partnerships which integrate the delivery of public agri-environment schemes with privately funded ecosystem service schemes could prove to be cost-effective. It may be possible to reduce the transaction costs by integrating these schemes. Rowcroft *et al* (2011) suggest that PES could be used to introduce new options to UELS or to subsidise existing options in order to deliver ecosystem services through peatland restoration. However, they warn that this would need careful scrutiny in relation to EU rules about the way money from the Common Agricultural Policy is distributed.

- It has also been suggested that a user-financed PES may have greater potential to be efficient because it can be better targeted than a Government-financed scheme (Defra, 2010). Rowcroft *et al* (2011) suggest that PES may be able to help target policy incentives to areas where they can optimise the supply of services in places where they are most needed, and where they can be most efficiently delivered and function in harmony with other environmental objectives. As we have already noted is an earlier section there is evidence that spatial targeting of payments in this way enhances the economic efficiency of payment schemes, offering the possibility of providing better value for taxpayers' money (Wunscher *et al*;. 2008).

- Perrot-Maître (2006) using the Vittel case as an illustration suggests that as well as financing PES, the private sector has much to contribute in terms of know-how, capacity, financial and business administration and networking

3.6.2.3 Limitations of approach

- Integration of public and private schemes would have to be carefully designed to reduce risks of any overlap or conflict in the delivery of environmental outcomes. It may be difficult to make the case for additionality if the schemes are delivering similar outcomes, especially when multiple beneficiaries are paying for different ecosystem services.

- There is a danger in the way that PES is currently being implemented that it may crowd out ES. There are a number of PES schemes currently competing with each other in a given area e.g. PES for water will compete with a PES for carbon, which will both

compete with ES. This may result in some environmental aims being met at the expense of others.

- An integrated public-private partnership scheme would still be voluntary in nature and it may still be difficult to obtain the necessary co-operation from all the required land managers. Bonus payment from PES would not necessarily ensure co-ordination amongst land managers.[12]

- The approach requires someone on the ground to broker such a scheme, as landholders may be unused to dealing with the private sector and lack trust in the process. This might require considerable resources in terms of time and legal expertise.

- There is the risk that corporate objectives could attract agri-environment resources away from environmental priorities.

3.7 Geographically targeted auctions

3.7.1 Description

Latacz-Lohmann and Schilizzi (2005) provides a comprehensive review of the literature on the use of conservation auctions in agri-environmental policy. Conservation auctions, are effectively reverse auctions (multiple sellers competing to sell goods or services to a single buyer, rather than buying goods or services), they induce farmers to reveal, through the bidding process, their compliance costs to the conservation agency. Farmers are asked to bid competitively for a limited number of conservation agreements.

Latacz-Lohmann & Schilizzi identify some key elements of conservation auctions. Different payment formats exist for auctions:

- **Discriminatory format** (most commonly used) – each bidder is paid an amount equal to the actual winning bid. Bid formation depends not only on the bidder's own cost of conservation activities but also their best guess of what the highest acceptable mark-up might be without the bid being rejected. This creates room for bidders to shade their bids above their true opportunity costs and thereby to secure themselves a profit or rent.

- **Uniform price format** – all successful bidders earn the cut-off price. Bid formation is based on the true opportunity costs.

- **Reserve price strategy** - conservation agencies may set a reserve price, an upper limit on what they are prepared to pay, this can be made public or not. A reserve price is used particularly if bidding competition is expected to be thin, thereby ensuring that over-priced bids are not accepted, or if there is risk of bidder collusion. This is the case when the number of potential bidders is small or when bidders learn to 'game' the auction in multiple bidding rounds. In order to set a bid price, the conservation agencies must have some idea of the sellers' costs. Without this information the upper limit could be set below the intersection of the supply and demand curves and therefore be ineffective i.e. no bidders. The danger of a pre-announced reserve price is that it can also be used strategically by bidders to collude and only bid to the reservation price which results in no competition.

[12] This is a drawback that would limit a number of other approaches.

- **Fixed budget** (most common) the agency accepts bidders based on their benefits to bid ratios until a predetermined fixed budget is exhausted. This is dependent on the ability to measure benefits, which is an essential element of the assessment metric. The size of the conservation scheme in terms of hectares of land enrolled is determined from the budget and the bids offered.

- **Fixed target** – this approach may be more appropriate for landscape scale conservation where a particular threshold level is required, as the auction is target-constrained and the agency predetermines the size of the conservation scheme and accepts bids until the target is achieved. In this case, the necessary budget is not known before the auction is completed. However, there is a danger with this approach of not achieving value for money.

- **Repeated auctions** occur where bids for the same contracts are invited over a sequence of years. The gap between the rounds would have to be large enough to make it worthwhile for a bidder to bid. This system enables bidders to analyse the results of preceding bidding rounds and use this information to update their bids. Experience with the Conservation Reserve Program in the US has shown that after a few bidding rounds the average bid was almost exactly equal to the maximum acceptable payment level from preceding rounds, implying that farmers had learned the cut-off points. To reduce this problem of learning conservation agencies can avoid publishing information about the average or the maximum accepted bid or the distribution of bids received in preceding bidding rounds. This may not be possible in the UK given the government's agenda of making government data available to the public. Alternatively, amendment of the auction rules of the auction in each bidding round could make the system less predictable, thus maintaining a degree of uncertainty among bidders.

- **Assessment metric** − In order to rank the bids in an auction, a metric is required to measure and compare the level of biodiversity provided by alternative bids. A number of metrics have been developed for conservation auctions, such as habitat hectares and the biodiversity benefits index (e.g. Wünscher *et al*., 2008). These calculate the value of each bid in terms of ecological outcomes, and express it as a single unit enabling the selection of individual projects which provide the best value for money. Gole *et al*., (2005) point out that a focus on individual bids will not necessarily select the optimal spatial configuration of conservation projects across a landscape. An alternative, less computationally intensive approach is to select projects iteratively, incorporating each newly selected site into the landscape context within which the remaining proposed sites are assessed (Barton et al., 2009).

Auctions for conservation contracts are normally designed for individual farms. Few examples exist of using conservation auctions to achieve co-ordinated landscape scale objectives. Two reverse auctions were used in the Conestoga Watershed in the US to determine which farmers to pay to implement management practices that reduced phosphorus loss to local waterways that had been degraded by high phosphorus levels (Greenhalgh *et al.*, 2007). However, these were focused on delivering single objectives, rather than designed to encourage co-ordination. A few ecological metrics do assign a value to connectivity. For example, the conservation auction in Australia's Desert Uplands region applied a metric which included a significant weighting for proximity to conserved patches of remnant vegetation within the landscape and proximity to other bids (Windle *et al.*, 2009).

Latacz-Lohmann & Schilizzi, (2005) suggest that it would be possible to design auctions to allow neighbouring landholders to submit joint bids that cover sites belonging to different holdings. However, to date, the efficiency and payment properties of joint bidding are in their

infancy and detailed auction rules are yet to be developed. Reeson *et al* (2011) explore through experiments how a conservation auction with multiple bidding rounds, in which landholders are provided with information on the location of bids from the previous round, offers a mechanism through which landholders can identify potential synergies with other bids and adjust their own bids accordingly (Rolfe et al., 2009; Windle et al., 2009). It could allow land managers to identify a co-ordinated solution without having advanced knowledge of each others' costs and likely strategies. Provided the bid assessment process places a positive value on connectivity, bids which co-ordinate with others will have a greater chance of success. However, Reeson *et al* warn that such an auction with multi-rounds may also offer greater potential for collusion and rent seeking by bidders and thus reduce the cost-effectiveness. As information on other bids is revealed, some individuals will learn that their bid has particularly high value, for example by virtue of being integral to a potential corridor. This is likely to result in such bidders raising their prices (Cason *et al.*, 2003). Reeson *et al* (2011) conclude that multi-round auctions can deliver co-ordinated outcomes most efficiently where the number of rounds is unknown to participants in advance, and provisional winners cannot raise their prices.

Auctions for delivering biodiversity outcomes are still in their infancy and data from case studies are scarce. However, Latacz-Lohmann & Schilizzi, (2005) present a number of cases from around the world where conservation auctions have been used.

Case studies: Examples of geographically targeted auctions

The Conservation Reserve Program (CRP) (USA) has multiple objectives ranging from erosion control through habitat improvement to income support for farmers. Under this programme, landholders bid for government funds to undertake environmentally sensitive land management practices. Current CRP auctions employ an Environmental Benefit Index to compare bids. This index accounts for land quality heterogeneity and weights various environmental objectives according to their relative importance. In 2005, approximately 33.5 million acres of farmland were enrolled in the CRP. From its beginning in 1986, the CRP was conceived as a multiple sign-up scheme. Researchers (Carson *et al*, 2003) suggest when bidders have the opportunity to learn from preceding bidding rounds, they will use that information to update their bids and reap higher rents, eroding the cost-effectiveness of the auction.

The Auction for Landscape Recovery (ALR) was one of 11 market-based instrument pilot projects conducted across Australia from 2003-2005 (Gole et al 2005). It was aimed at securing multiple benefits from land management improvements in Western Australia, namely biodiversity enhancement, salinity control, and groundwater recharge abatement. It was conducted over two rounds as a simple sealed-bid, price discriminating auction. A total of 55 tenders were received from 38 landholders in Round One and 33 tenders from 21 landholders in Round Two, resulting in 21 management contracts for periods of up to three years. The contracts were evaluated through both a Systematic Conservation Planning (SCP) approach, and an Environmental Benefits Index (EBI). This metric accounted for synergistic aspects due to number, size and distance of several areas. The cost-effectiveness of the ALR compared to that of a uniform price scheme varied between 315% and 207% in round 1 and 165% and 186% in round 2, depending on whether the fixed price scheme was input-based or output-based (White and Burton (2005). There was no evidence to show that the auction imposed higher administrative costs than equivalent schemes using the same amount of information to underpin the selection process. This was because most of these costs were not linked to the specifics of running an auction.

EcoTender, carried out in the state of Victoria, Australia was launched in 2005. It adopted the successful elements of BushTender and was similar in intent to the Western Australian Auction for Landscape Recovery (ALR), in that it aimed to secure multiple environmental benefits, including improvements in salinity control, biodiversity enhancement and water

quality. A specific feature of EcoTender is that it uses information from catchment-based modelling to estimate both local and catchment-wide impacts on environmental outcomes as a result of changed land use and management. Bids can be grouped or separate; that is, a landholder can submit a bid for a number of areas or separate bids for each. Pooled bids across several farmers are also allowed. Payments are not only input-based (management actions), but also include an output-based element. Landlords register their interest to participate in EcoTender and are visited by a Field Officer who advises on the environmental significance of the site and identifies on-ground actions that could be included in a five-year management plan. The landholder then uses the management plan to prepare their bid price based on how much they expect to be paid to do the environmental work. The Ecological Biodiversity Index is estimated for each bid, and contracts are then offered to those landholders who offer the highest EBI per dollar. The EcoTender was considered a success and in the first year of the EcoTender pilot successful bids covered 70% of the total area targeted.

Challenge Funding was introduced into Scottish forestry policy in 1997 with the launch of the Grampian Challenge Fund and the Central Scotland Challenge Fund. These funds operated under the umbrella of the Woodland Grant Scheme (WGS) and offered additional grants to the standard WGS grants for extending the woodland area in specific geographical areas. They were competitive in that applicants were required to submit bids to the Forestry Commission (FC) for this additional money. Both funds were closed for applicants in 2002. A judging panel awarded grants to those applicants whose plans best met the aims of the Challenge and offered the best value for money. The panel selected high-scoring, low-cost bids first. Beyond that they traded off score against cost in a subjective way. The funds were very successful in rapidly expanding the land area under forestry. Analysis of the data by CJC Consultants (2004) showed that, to secure all the bids with a fixed-rate premium would have required a budget 33% to 36% above that spent under Challenge Funding. Forestry Commission staff estimated that operating the Challenge Funds took 20% more staff time per application than fixed-rate incentives. A survey of participants revealed some dissatisfaction with the scheme due to lack of transparency and 'unfairness' in some way. There was a consensus from stakeholders that challenge funds were too uncertain for the applicant and that they should be replaced by locational premia (i.e. fixed rates per ha).

Germany – Regional conservation auction - The auction approach was used for an outcome-based agri-environment scheme in the Northheim district in Germany. A Regional Advisory Board, comprised of regional stakeholders defined the demand for ecological goods, taking into account the preferences of the local population and decided on the allocation of the budget. Interested farmers in the district then placed bids to produce these ecological goods. The following year the ecological goods were monitored and farmers remunerated if the provision of these goods was proven. Results of a survey indicated that the farmer's time spent in participating in the auction was not significantly higher than participating in existing agri-environmental programmes (Groth, 2005). Ulber *et al.* (2011) evaluated the bid prices of participating farmers to determine whether they were related to their individual opportunity costs bid and found that prices submitted in this scheme substantially exceeded individual farmers' opportunity costs leading them to question the cost-effectiveness of the conservation auction design. This project is considered in more depth in Section 4.

The following summarises the advantages and limitation of adopting geographically targeted auctions for landscape-scale conservation objectives.

3.7.2 Advantages of approach

- The literature suggests that multi-round auctions, in which bidding is spread over a number of rounds with information provided between rounds on the location of other bids in the landscape, offers an approach to cost effectively deliver landscape-scale ecosystem services. They offer a possible means of improving cost-efficiency of payments relative to the current use of flat-rate scheme payments by allocating bids to the most efficient service providers. This is because producers facing competition are less likely to 'overbid' relative to their true compliance costs (Latacz-Lohmann & Schilizzi, 2005).

- It is suggested that auctions work best where there is heterogeneity among landholders in their cost of carrying out conservation. The competitive tender mechanism can reveal these costs, as lower cost landholders are likely to submit lower prices. However, if there is limited competition, landholders are more likely to inflate their bid prices well above their true costs, and there is less benefit to be gained from running a tender (Reeson *et al*, 2011). Reeson *et al* also suggest that if landholders have broadly similar costs, and these costs can be reasonably estimated by those designing an AES, a fixed-price incentive will be preferable. However, if environmental benefits are likely to vary a metric should still be used to prioritise applications in a fixed-price scheme.

- There are claims that the amount of biodiversity benefits acquired through the first round of BushTender auctions in Australia would have cost about seven times as much if a fixed price scheme had been used instead, although some researchers question these results. Latacz-Lohmann and van der Hamsvoort (1997) who simulated farmers' bidding behaviour in a hypothetical conservation programme found efficiency gains ranging from 16 to 29%, depending on how the auction was implemented and how winners were selected. These figures compare to Challenge Fund's 33 to 36%. However, White and Burton (2005) find efficiency gains between 200 and 315% for the Auction of Landscape Recovery (ALR) pilot in Western Australia. Latacz-Lohmann & Schilizzi (2005) suggest that care has to be taken in interpreting all these figures because as they are based on different counterfactual fixed-payment rates, they cannot be compared to each other. These variations suggest that it is probably too early to make a robust assessment of the cost-effectiveness of auctions in agri-environmental management, although they all generally appear to be positive in terms of savings.

- Auctions could provide an effective mechanism for getting neighbouring landowners to work together in specific situations. If the requirement was for a particular threshold level of habitat to be achieved within a specified area an auction could be designed to deliver that habitat in blocks. This would only work if a connectivity value was applied to the assessment metric. In particular multi-round tenders, in which landholders are provided with information on the location of offers from the previous round, have the potential to promote the co-ordination required to achieve landscape connectivity (Rolfe *et al*. 2009). Between rounds landholders are provided with information showing the location of offers made in the previous round. They then have the opportunity to modify their offer, or submit a new offer, in order to better coordinate with their neighbours and so increase their chances of success.

- The MESME paper (Chaplin, 2011) suggests that geographically targeted auctions offer a means of relaxing the WTO constraint on the basis for payment calculations as bids could be interpreted as reflecting costs incurred and thus may permit a payment-by-results approach. Such an approach was used in the Northeim project, which is explored in more depth as a case study later in the report.

3.7.3 Limitations of approach

- Rollett *et al.*, (2008) suggest that one of the problems with reverse auctions is that a number of landowners who wish to manage their land in an environmentally beneficial way will not receive funding if their bid is not competitive. Despite being economically efficient this may not be an optimum strategy for AES where co-ordinated environmental activity is required across a targeted area. However, for those schemes that take a 'deep narrow' approach, such as HLS, they may be more appropriate for allocation of limited funding on a competitive basis.

- An auction can be expensive to organise and facilitate and so is more cost effective over a large area. However, larger areas could mean the need to target for a range of possible priorities, which could be harder to agree on and adds complexity to the process. This also creates a challenge for assessing bids, since the number of possible combinations rises rapidly (Reeson *et al.*, 2011). Greenhalgh *et al* (2007) suggest that considerable time is required to run auctions, particularly if the approach is new to landowners, as time is needed to explain the aims of the auction, to streamline auction rules and processes to reduce confusion and perceived complexity and to design an appropriate assessment metric.

- The efficiency and payment properties of joint bidding are barely explored in the literature and detailed auction rules are yet to be developed. Transaction costs of joint bidding for the landowners and agencies are likely to be high to the extent that these upfront costs may act as a deterrent to participation.

- In smaller targeted areas a potential problem is lack of bidding competition. If there are only a handful of conservation consortia competing against each other, there is scope for collusion. There is a danger that a tender mechanism intended to promote coordination among landholders may reduce competition and promote strategic behaviour. For example, neighbours may collude on price, or an individual near the centre of a potential corridor may be tempted to submit an offer well in excess of costs. Such strategic behaviour will erode the efficiency gains achievable in a tender, and could result in the environmental objective not being met.

- Auctions are less likely to achieve cost-savings where environmental objectives are directly related to specific features/actions in specific places, rather than generic changes in land management practice that are more universal.

- Delivering connectivity and/or complementarity through a tender (or other incentive scheme) requires it to be valued within the metric. However, this can only be done by trading it off against other attributes such as habitat extent and condition within the metric. It may also increase the costs and complexity of developing and applying the metric.

- As reserve auctions aim to encourage competition between landholders rather than co-operation they may not be the best approach for achieving co-ordination over a longer timeframe.

3.8 Summary of co-ordination approaches

The advantages and limitations of the selected co-ordination approaches discussed above are summarised below:

Local engagement in decision-making/governance/facilitation approach

Local engagement refers to situations where those using the land at the local level are engaged in determining how the national and international designations and management agreements are designed and implemented.

Advantages

- The approach has the potential to deliver landscape-scale conservation for multiple objectives, including not only biodiversity, but other benefits, such as also historic environment protection, because of the flexibility in scheme design which can adapt to the required objectives.

- The approach incorporates the idea of co-production, encouraging users to design and deliver services in equal partnership with professionals in order to make them more effective and efficient. The approach facilitates the ability to refine management prescriptions to ensure that they are practical and meet local conditions.

- May result in greater grass roots buy-in, leading land managers to value their actions for the environment more highly and providing a greater focus on outcomes within their agri-environment agreements. This could encourage a move away from purely compliance behaviour and challenge land managers to invest some personal commitment.

- Locally supported project based approaches to delivery offer greater potential to involve other funding sources and link with other projects and volunteer groups. This could reduce the costs of delivering outcomes in the long term, balanced by the extra costs of more complex negotiation and co-ordination.

- Agency integration of advice and support reduces the impact of single agency focus and broadens the scope of local management. This can also increase positive communication between the agency staff and the agreement holders at the local level.

- A move to facilitate more local discussion could have a beneficial social effect if it brings communities together.

Limitations

- A key limitation is the time and resources required for the facilitation that is needed to secure the shared vision and the individual agreements under AES. However, costs to government can be reduced if facilitation is integrated across several delivery agents, as illustrated by the ILD case study.

- Facilitation is a skilled role and the approach is dependent on the presence of very skilled facilitators who have a wide range of knowledge of the various programmes and funding sources operating within a particular area.

- Danger of ‘hold outs’ by individuals who prevent progress for their own reasons.

Public/private partnership payment approach

Public/private partnership payments involve a combination of publicly-funded AES payments with private PES payments.

Advantages

- This can be a cost-effective approach as public money can be used to leverage against a corporate interest. Private PES can be used alongside ES as part of a package (or hybrid approach to further achieve the aims of ES without actually being part of ES.. Also this approach may enable better targeting of policy incentives which will enhance economic efficiency.

- The use of private/public partnerships in delivering AES can produce significant costs savings for the government in AES up-front implementation costs.

- Payments from private companies are not subject to WTO rules, which restrict payments to income foregone and additional costs. Therefore, private companies are able to offer incentive payments in the form of capital grants or annual management grants which could be used in combination with public AES payment.

Limitations

- There is uncertainty as to how the approach obtains the necessary co-operation from all the required land managers to achieve landscape-scale objectives. Bonus payments from PES would not necessarily ensure co-ordination amongst land managers.

- Public/private partnership schemes are limited to those areas where there is a user demand for the ecosystem services. To date in the UK, this is mainly restricted to areas which can deliver improvements in water quality and quantity for the water companies. This limits the application of the approach to the wider countryside. However, there are opportunities for other users or beneficiaries of ecosystem services to become involved, such as local residents or insurance companies with an interest in reduced flooding; recreational users with an interest in enhanced recreational opportunities; or landowners with an interest in improving the environmental value of their land, such as the National Trust.

- Any scheme public/private partnership AES would have to be carefully designed and integrated to reduce any risks of overlap or conflict in the delivery of ES.

- There is a danger in the way that PES is currently being implemented that it may crowd out ES. There are a number of PES schemes currently competing with each other in a given area e.g. PES for water will compete with a PES for carbon, which will both compete with ES. This may result in some environmental aims being met at the expense of others.

Agglomeration bonus payment approach

The agglomeration bonus payment incorporates a premium which is paid on top of a standard payment for managing land that borders other land that is entered into the scheme.

Advantages

- As illustrated by the Swiss case study, an agglomeration bonus payment can prove effective in improving the connectivity of habitats across areas at a landscape-scale without the need for a collective agreement.

- The ease with which this payment could be incorporated into existing Environmental Stewardship payment structures as it is effectively a “top-up” on existing payments.

Limitations

- There are very few real world examples of the use of this approach in practice. The literature review only identified one existing example of an AES using this approach, the OQE case study.

- This approach relies on the clear identification of the desirable spatial configuration of management and the thresholds of management required to achieve specific objectives. This is challenging, especially for multi-objective schemes.

- Bonus payments are not permitted under WTO rules. However, it might be possible to provide such payments within the transaction cost provisions of the payment calculation methodology, although this would require evidence to support the basis of such costs and would be limited by the 20% ceiling for costs of this type.

- Optimal operation of the agglomeration bonus assumes that surplus receipts are transferred between individuals to offset differences in compliance costs between different landowners. The cost-effectiveness of the approach may be reduced if individual landowners do not negotiate with their neighbours to facilitate these transfers.

Geographically targeted auctions

With a geographically targeted auction farmers in a targeted area are asked to bid competitively for a limited number of conservation agreements. They can either bid as individuals or jointly.

Advantages

- Multi-round auctions, in particular, in which landholders are provided with information on the location of offers from the previous round, have the potential to promote the co-ordination required to achieve landscape connectivity.

- They offer a possible means of improving cost-efficiency of ES payments by allocating bids to the most efficient service providers as producers facing competition are less likely to 'overbid' relative to their true compliance costs.

- As auction bids could be interpreted as reflecting the income foregone costs incurred they could comply with the WTO green box eligibility rules and enable a payment-by-results approach. In contrast, payment-by-results that are based on the value of the outcome and not the cost of delivery would not be eligible.

- In England, the auction process would appeal to the more business-minded land managers, especially if it resonates with their business experiences.

Limitations

- It would be difficult to apply targeted auctions in areas where existing ES schemes exist as the current fixed payment rates might act as a point of reference in the bidding process, with bids anchored around them. However, this approach might work where a new option in a targeted area is sought, such as an option to deliver carbon sequestration.

- The up-front costs of organising and implementing an auction are likely to be high for the government agencies, particularly in the design of the assessment metric.

- Auctions appear to work best in single objective situations. With multi-objectives schemes, the assessment metric would become complex and costly to design in order to accommodate all the objectives. This complexity would be exacerbated by different

landholders including different combinations of management options in their bids. This approach would incur high upfront costs, but would ensure a uniform bid assessment process.

- If auctions are applied in spatially targeted areas to achieve connectivity there is a risk that the number of potential applicants may fall below the level required to secure sufficient bidding competition. The smaller the group of potential bidders, the lower is the level of bidding competition and the higher the risk of collusion and strategic bidding.

Table 3.1 Summary of co-ordination approaches

Assessment of effectiveness ✓ = Low ✓✓ = Medium ✓✓✓ = High ✓ = Existing ✓ = Potential	Type of Co-ordination Required				Key Advantages/Limitations
	Core Sites	Threshold	Connectivity	Buffering	
Group Supplement (HR8)	✓✓✓	✓	✓✓	✓✓	+ Enables financial costs of working as a group to be subsidised. - Difficulties in identifying financial costs and benefits
Targeting of species and landscapes	✓✓	✓✓	✓✓	✓✓	+ Enables local tailoring of management and enhances economic efficiency - Requires detailed scientific knowledge at local level
Training & support	✓✓	✓✓	✓	✓	+ Learning in a group can foster collective action - May be limited to more progressive farmers
Engagement in decision making/governance/ facilitation	✓✓✓	✓✓✓	✓✓✓	✓✓✓	+ Flexibility of approach enables delivery of all landscape-scale environmental objectives. - Requires longer lead in times and presence of local organisational structures
Group/Collective Agreements	✓✓✓	✓	✓✓	✓✓	+ Enables delivery on contiguous area because acts as one agreement - High upfront costs to develop agreement required
Agglomeration Bonus	✓✓✓	✓	✓✓✓	✓✓✓	+ Cost-effective approach to achieving connectivity. - May be constrained by EU rules on payments
Public/private partnerships	✓✓✓	✓	✓✓	✓✓	+ Cost-effective approach as public money can be used to leverage against corporate interest - Risk of overlap or conflict in delivery of outcomes
Geographically Targeted Auctions	✓	✓✓✓	✓✓✓	✓✓	+ Allocates payments to most efficient service providers - High upfront costs to design assessment metric

(Source: adapted from Chaplin 2011)

4 Case Studies

4.1 Selection of case studies

The aim of this section is to consider the co-ordination approaches outlined in the literature review through the in-depth analysis of case studies exemplifying elements from one or more of the delivery approaches. As the project specification states that case study selection is to be based on approaches which are not currently in use within existing Environmental Stewardship schemes, the following approaches have been excluded from the selection - **Group supplement, Scheme targeting and Training and support**. The remaining approaches considered are:

- Local engagement in decision-making/governance/facilitation
- Formal Group/collective agreements
- Public/private partnership payments
- Agglomeration bonus payment
- Geographically targeted auctions

Local engagement in decision-making/governance/facilitation

The local engagement approach is considered a candidate for further in-depth study for a number of reasons.

- The approach has the potential to deliver landscape-scale conservation for a number of landscape-scale objectives, including achieving threshold levels, connectivity and buffering.

- The approach embraces the idea of co-production in the delivery of public services that is currently being advocated for other areas of the public sector. The approach incorporates the idea of encouraging users to design and deliver services in equal partnership with professionals in order to make them more effective and efficient.

- Greater grass roots buy-in could lead land managers to value their actions for the environment more highly, providing a greater focus on outcomes within their agri-environment agreements. This would encourage a move away from purely compliance behaviour and challenge land managers to invest some personal commitment, it may even motivate them to go further without extra financial support.

- Locally supported project based approaches to delivery offer greater potential to involve other funding sources and link with other projects and volunteer groups. This could reduce the costs of delivering outcomes in the long term, balanced by the extra costs of more complex negotiation and co-ordination.

- A move to facilitate more local discussion could have a beneficial social effect if it brings communities together.

Formal Group/collective agreements

Although this approach has the potential to deliver greater buy-in from the land manager and can be cost-effective in reducing compliance monitoring costs, it has not been selected for further study for a number of reasons:

- For collective agreements to work effectively a degree of trust between members is required. This is most likely to be present in groups that have worked together before, or are already known to each other through social networks. Whilst such groups exist, such as Commoners Associations, their presence in the UK is limited as, unlike other European countries, UK farmers do not have a history of co-operative working. New formal groups would take time to establish, to develop into maturity and then to deliver real change in land management. In this situation, ideally, a period of ten years is advisable over which to seek a significant impact upon farming practices. Whilst draft proposals for the next ERDP indicated that transaction costs of up to 30% may be possible for groups of farmers, establishing a large number of new farmer groups over this timeframe will be challenging.

Public/private partnership payments

Public/private partnership payments involve a combination of publicly-funded AES payments with private PES payments and the approach is proposed as another candidate for case study selection. Reasons for selecting this approach are:

- This can be a cost-effective approach as public money can be used to leverage against a corporate interest. PES could be used to further achieve the objectives of ES. Also this approach may enable better targeting of policy incentives which will enhance economic efficiency.

- There are several examples of schemes involving public and private partnership payments from which experience and economic costings can be drawn.

The drawback to selecting this approach:

- Uncertainty as to how the approach obtains the necessary co-operation from all the required land managers. Bonus payments from PES would not necessarily ensure collaboration amongst land managers.

Agglomeration bonus payment

The agglomeration bonus payment is suggested as another candidate for the case studies. This incorporates a premium which is paid on top of a standard payment for managing land that borders other land that is entered into the scheme. Reasons for selecting this approach are:

- The ease with which this payment could be incorporated into existing Environmental Stewardship payment structures as it is effectively a “top-up” on existing payments.

- The transaction costs of an agglomeration bonus payment scheme are thought to be relatively low for both the landowner and the managing agency as co-operative conservation involves only one landowner talking to and encouraging participation from his neighbour.

The drawbacks to selecting this approach are:

- There are very few real world examples of the use of this approach in practice. The literature review has so far only identified one existing example of an AES using this approach in Switzerland.

- The approach does not require true co-ordinated action.

Geographically targeted auctions

Geographically targeted auctions work by farmers in a targeted area being asked to bid competitively for a limited number of conservation agreements. They can either bid as individuals or jointly. This approach is also proposed as a candidate for selection as:

- They offer a possible means of improving cost-efficiency of payments relative to the current use of flat-rate payments for agri-environment schemes by allocating bids to the most efficient service providers. This is because producers facing competition are less likely to 'overbid' relative to their true compliance costs.

- Multi-round auction, in particular, in which landholders are provided with information on the location of offers from the previous round, have the potential to promote the coordination required to achieve landscape connectivity

Whist there are merits to this approach some of the possible drawback are:

- It would be difficult to apply targeted auctions in areas where existing flat-rate ES schemes exist (most of England). However, this approach might work where a new option in a targeted area was sought, such as an option to deliver carbon sequestration, or where existing agreements across a geographic area expire within the same timeframe (e.g. must compete to renew their agreements).

- The transaction costs of organising and facilitating an auction are likely to be high for the landowners and agencies.

Initially, the selection of the case studies was to be based on a representation of each of the approaches outlined above. However, it became apparent that elements of these approaches co-exist within the same projects and schemes and they are not mutually exclusive. Therefore, a short-list of case studies was drawn up in collaboration with the Steering Group, which distinguished between different levels of the use of targeting, scheme payments and local decision making governance structures to achieve co-ordinated action between land managers at a landscape scale. The case studies selected for further in-depth analysis, with some summary information, are presented in Table 4.1

As explained in Section 2, the costs and benefits of the case studies were measured against a standard single agreement holder scheme or project. This approach was taken in order to ensure comparability of the different schemes in different countries.

Table 4.1 Selected Case Studies

	Main co-ordination approach	Project/Scheme	Targeting	Incentives	Governance
1	Local engagement in decision-making	**Integrated local delivery, England** Evolved version of the FWAG Parish Approach. Facilitation used to deliver integrated management through a local management group of all stakeholders	**High** Targeting is issue/conflict based	**Low** Standard AES payments only	**High** Local management group formed to develop solutions
2	Local engagement in decision-making; Collective agreement	**Dartmoor Farming Futures, England** 2 pilot farmer-designed AES on commons	**High** Targeted specifically at 2 commons on Dartmoor	**Low** Standard AES payments only	**High** Farmers fully involved in designing and monitoring new AES
3	Collective agreement	**Crosby Ravensworth, England** Common initially entered into CSS and now in HLS agreement	**Low/Medium** Is a conventional AES agreement	**Low/Medium** Uses conventional AES elements but land agents and graziers have had some influence on what is taken up.	**High** Process of securing AES agreements has led to a much more coordinated management of common and possibly the surrounding enclosed land and an increase in both human and social capital
4	Spatially targeted project	**Limestone Country Project**, **England** Project based, habitat targeted	**High** Targeted area of upland	**High** Payments for purchase of hardy cattle and infrastructure costs and annual payment for additional management costs, lamb marketing scheme	**Low** Farmers not actively involved in shaping project design

Table 4.1 (continued)

	Main co-ordination approach	Project/Scheme	Targeting	Incentives	Governance
5	Public/private partnership; Spatially targeted	**SCaMP/ScaMP II, England** Funded by United Utilities, RSPB project officer signing farmers up to AES	**High** Targeted at UU land, SCAMP II on private land	**Medium** UU paid for capital works on farm buildings and infrastructure	**Low** Farmers not actively involved in shaping AES design
6	Agglomeration bonus payment	**Ordinance for Ecological Quality, Switzerland** Use of type of agglomeration bonus payment to encourage ecological networks	**High** Targeted at areas of ecological networks	**High** Additional payments for areas connected to a network	**Medium** AE plan designed by canton. Erg of plan requested by farmers
7	Geographically targeted auction; Local engagement in decision-making	**Northeim Project, Germany** Project with outcome-based payments ascertained through auctions	**Medium** Targeted at county	**High** Outcome-based payment schemes using auctions	**High** Required outcomes decided by regional board
8	Geographically targeted auction	**Desert Uplands Landscape Linkage Auction, Australia** Geographically targeted auction with connectivity	**High** Auction targeted at specific area	**High** Joint bids assessed higher and joint bid bonus for farmers directly co-operating with neighbour	**Medium** Farmer decision-making in payment rate, but not management activities required

4.2 Case Study 1: Integrated Local Delivery (ILD), UK

This case study was selected as an example of using a facilitated approach to achieving co-ordinated action at a landscape-scale.

Integrated Local Delivery (ILD) arose out of a Heritage Lottery Project to bring sustainable management to areas of species rich limestone grassland in the Cotswolds. Such sites were found to be multi-objective where management objectives linked to farming, nature conservation, recreation and community involvement were often connected.

This required a partnership approach and it was on these sites that a senior advisor from FWAG (now part of FWAG South West) acted as facilitator in conjunction with a range of statutory and non-statutory partners. This evolved into the ILD approach (Short et al 2010) that brought stakeholders together within a single management framework. AES agreements are an important component of this approach, but ILD also incorporates other aspects of RDPE and other funding sources.

The facilitator's current role is senior conservation advisor within FWAG SW where she has continued to develop and implement ILD, often for Natural England on complex sites, where a joined up approach has proved to be difficult to secure or had not been considered. One of these is Walmore, a site classified under the Convention on Wetlands of International Importance (RAMSAR), a Special Protection Area (SPA) and an SSSI site that had suffered from a number of years of contested management, resulting in the designated sites being judged as unfavourable condition. Now the designated areas are in secure management agreements and all of the surrounding landowners have entered into AES, facilitated by ILD providing an integrated approach to management and a wider understanding of water levels and their importance to both agriculture and the environment. The formation of a local management group has ensured that much knowledge exchange has occurred and other funding from the EA has been used to alleviate concerns regarding flooding and the management of water levels in the area. Interestingly, ILD has also attracted interest from the EA and is to be used on at least one Pilot Catchment project. The process leads to an integrated approach.

ILD encourages co-ordinated activity across a landscape area through a 6 stage process, which highlights the need to bring stakeholders together as a problem solving process to determine the desired action, rather than the statutory agencies deciding the preferred option and consulting and implementing it. The process followed that leads to integration include:

Step 1: Once invited begin initial scoping to determine the area, individuals and statutory frameworks involved

Step 2: Map the management tasks and verify these in an inclusive and open format

Step 3: Develop a management group around key local and statutory stakeholders

Step 4: Encourage linkages and opportunities for local contribution and adoption of responsibilities

Step 5: Establish capacity and role of local management group; identify and prioritise tasks

Step 6: Implement proposals and embed management group and support.

Table 4.2 provides a summary of the MCA scores for ILD when compared to a standard AES approach.

Table 4.2 Summary of MCA scores for ILD

Criterion	Weights	Scores	Weighted scores
1a. Govt. upfront implementation costs			
Facilitation and co-ordination	*1.2*	5	*6*
Negotiating contracts	*1.2*	3	*4*
Training and advice	*1.2*	1	*1*
1b. Govt. on-going implementation costs			
Additional on-going costs	*1.2*	-1	*-1*
Monitoring and enforcement	*1.2*	4	*5*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	4	*5*
EO Benefit 2 – Buffering	*1.2*	4	*5*
EO Benefit 3 – Connectivity	*1.2*	4	*5*
EO Benefit 4 – Threshold	*1.2*	3	*4*
3. Participation costs			
Income foregone	*0.8*	2	*2*
Additional costs	*0.8*	0	*0*
Transactions costs	*0.8*	2	*2*
4. Social & human capital			
Community engagement	*0.8*	5	*4*
Environmental knowledge	*0.8*	5	*4*
Farmer cooperation	*0.8*	3	*2*
Total score		**44**	***46***
1a Govt. upfront implementation costs		3	4
1b Govt. on-going implementation costs		2	2
2 Landscape scale environmental objectives		4	5
3 Participation costs		1	1
4 Social & human capital		4	3

Criteria 1: Costs of implementation
1a. Upfront Government Costs. MCA Scores: 3 unweighted & 4 weighted
1b. Ongoing Additional Costs. MCA Scores: 2 unweighted & 2 weighted

Costs of engagement – facilitation / co-ordination. MCA scores: 5 unweighted & 6 weighted

The initial cost of facilitation for the Walmore area was secured from a multi-organisation wetland partnership (Wetlands West) of £2,500. This scoped the assets in the area and established the on-site multi-partner meetings. Subsequent individual discussions with landholders were funded through HLS using the Professional help with management plan (PAH) option route (10 x £400) plus another £1,000 from NE to cover meetings and preparation of materials. The main tasks were for facilitation and some work on ecology and

hydrology, the latter funded through the EA. Overall the process took 1 year to 18 months, using the existing Water Level Management Plan as a starting point.

Savings were made as the ILD process enabled the project officer to take a joined up approach to the preparations, this was possible through visits and in the obtaining data. Savings from economies of scale were created by reducing the number of visits and the amount of preparation for each individual application, including a reduction in transactions costs, as well as some paperwork.

The main cost of this approach is facilitation, which is required to secure the shared vision and the individual agreements under AES. The AES aspects are easy to identify and are sometimes covered by options, such as PAH, as the individual agreements that make up the project take shape. There is some overall cost, but much can be divided across all of the stakeholders and it can be externally funded (outside AES). Facilitation is a skilled role, especially in terms of respecting confidentiality (which is important as ILD deals with both individual AES agreements and the development of a partnership). Wide ranging knowledge of strategic areas (e.g. Water Framework Directive (WFD) and flood protection), in addition to AES, is also essential.

It was suggested that the ILD approach leads to substantial savings in terms of delivering a number of separate initiatives to a single landholder or incorporating these initiatives into a single visit which enables a wider engagement and integrated delivery. By combining standard AES with other related issues such as WFD, catchment sensitive farming, flood prevention and landscape-scale initiatives (either single species or broader) it is possible to integrate these issues into a single discussion with the landholder so enabling them to see this as a single plan rather than several. Thus the saving if the line is drawn at AES alone is relatively small but this project delivers far more savings by combining a number of interconnected strategic priorities.

Costs of negotiating contracts. MCA Scores: 3 unweighted & 4 weighted

The individual AES agreements are based around the scoping of assets and reconciling of the various strategies that are over laid for the area in question. Each AES agreement uses standard options and is therefore not that different from other agreements but the approach does mean that wider objectives can be included, such as WFD. There are some savings as the issue of compliance, cross compliance (e.g. soils) are all covered in the initial meeting. The level of expertise required for these meetings is high, increasing the cost; however this can avoid overlap and multiple visits to the farm/holding.

Savings can be achieved by delivering other things at the same time. An example on Walmore was the clearing of one stretch of ditch that had potential to flood properties and which would have required EA or Internal Drainage Board (IDB) involvement but was kept to a minimum through the use of ILD. Thus ILD provides a means for capital works on a multi-agency scale, the result is more than land management alone and the resulting holistic output includes preventing the flooding of properties.

The joined up approach has led to economies of scale in both administration and accounting. The level of paperwork is the same, but as the officer is more likely to be familiar with it, the time taken to complete it is reduced. The costs are comparable with the standard AES approach but there are savings as the cost of negotiating the contract is shared with other strategic priorities and initiatives resulting in a saving in the negotiating and the establishment of contracts that are more extensive and joined up, further emphasising the overall savings.

Costs associated with training and advice. MCA Scores: 1 unweighted & 1 weighted

The landscape overview of the strategic priorities across all environmental agencies and NGOs identifies the opportunities at both the farm and area level. The benefit for the farmer is increased awareness of external priorities that influence his business and this would include AES. However, FWAG is acting as a portal for both AES and other socio-economic opportunities through a wider range of contacts.

There is a need for the ILD facilitator to be constantly up-skilling as the priorities across agencies change, but this results in savings due to economies of scale and information exchange. However, the time required to train up to the level of an experienced ILD facilitator, such as the FWAG advisor in this case study, would be high. Thus for a national roll out, there would be a cost in training and advice, and success is likely to be dependent on whether a local advisor exists with the skills to be trained for the position. A key success factor is knowledge of the area and the personal skills that make an advisor accepted by both farmer and agency alike.

However, in this case study such an advisor does exist and they are skilled enough to implement the ILD approach successfully without additional training costs and overall there are some savings in advice costs as the ILD approach integrates this at the point of delivery.

Additional on-going costs: MCA Scores. -1 unweighted & -1 weighted

There are some on-going facilitation costs, such as the management and development of 'special projects' under ES and capital works. However, a key aim of the ILD approach is to root the local management group into the existing administrative structures, such as district or parish council or similar body. The aim is to reduce the on-going costs and ensure that the management group remains flexible in its membership, and is locally accountable and transparent in its actions. There are costs associated with the running of such groups, but in the ILD examples these are borne at the local level willingly because of the increased social activity. In Walmore, given the option of not meeting any more, the local stakeholders decided to continue to meet and discuss the management of the area together. Statutory agencies provide support and can be pulled in as required but keep a watching brief on the management group. A key role is that of the Secretary and the Chair and these skills are best located locally provided someone has the skills and available time.

Costs associated with monitoring/enforcement. MCA Scores: 4 unweighted & 5 weighted

The local management group is mostly responsible for training local volunteers, especially for tasks such as monitoring (indicator species or water levels) where there is reduced expertise required and possible local availability. ILD does require significant time investment in order to understand the farming situation within the area (dynamics etc) and the various strategic over-layering. This high level of understanding of requirements and monitoring need is shared across the local management group, meaning that strong compliance is more likely and appropriate management levels obtained more quickly. Enforcement is also less likely, resulting in a saving in associated costs.

It was suggested that there was a substantial saving relative to a standard AES approach largely because of the shared problem solving environment that ILD creates. The facilitation and knowledge requirements are high, in terms of required skills, but with monitoring developed locally the likelihood of outside enforcement is reduced.

Criteria 2: Benefits in terms of meeting landscape scale objectives
MCA Scores: 4 unweighted & 5 weighted

Benefits to managing core sites. MCA Scores: 4 unweighted & 5 weighted

The benefits to core sites are through the joining up of AES agreements. Although the agreements are individual to each participant they are fully aware that they are part of a wider landscape-scale project. Another benefit is an increased awareness of the core site and why it is valued as such. Overall, there is a substantial environmental benefit and increased understanding of the core site relative to a standard AES approach, but there is not one agreement or approach and not all aspects of individual AES agreements are shared with individuals because of confidentiality issues.

Benefits to buffering a specific site / feature. MCA Scores: 4 unweighted & 5 weighted

All designated sites and priorities would be included in the initial scoping. The issue of buffering would be discussed at the local management group across all partners resulting in a more holistic and sustainable approach that maximizes the benefits. ILD takes a land management by field parcel approach.

Benefits to connecting habitat. MCA Scores: 4 unweighted & 5 weighted

The links are made across land ownership and through the use of Multi-agency Geographical Information for the Countryside (MAGIC) and the local knowledge of the area, connectivity is achieved. The local management group has a role in showing the collective will and this is useful in helping individuals to make their decisions.

Benefits to meeting threshold levels. MCA Scores: 3 unweighted & 4 weighted

ILD is about connecting and integrating AES environmental options with other priorities, such as water quality. The role of the local management group is important as the agencies involved work through this group and meet all local farmers and landholders increasing the likelihood that thresholds level will be met. However, as these are individual agreements there might be some concern that a threshold level would not be achieved.

Criteria 3: Participation costs
MCA Scores: 1 unweighted & 1 weighted

Income foregone costs. MCA Scores: 2 unweighted & 2 weighted

The rates used under ILD are the standard AES payments, plus those funds secured from other sources. Under AES there is a strong use of special projects (OES)[13], especially in complex and integrated projects, such as Walmore. Income foregone is the same as AES. The facilitator, along with agency contacts, ensures there is no double funding. Farmers benefit from the joining up of environmental opportunities (AES) with economic ones through other parts of RDPE and other sources. There are some savings, because although standard AES payments are used, the inclusion of socio-economic issues increases the potential to make savings.

[13] It should be noted that the use of special projects (OES) has been reduced from around 17% of budget to no more than 3% of the within year budget for new HLS, due to a clearer understanding of Commission rules.

Additional on-going costs. MCA Scores: 0 unweighted & 0 weighted
There are no additional on-going costs to the farmer from participation in ILD. Agencies also attend fewer meetings because of the collective aspects of the management group and that there is a trust in the local resource and the role of the ILD facilitator in reporting back to the agencies the next steps. In Walmore, the process has settled down to 3 meetings a year. The overall cost is lower than that of the FEP and compliance checks and the human capital among the agreement holders is increased.

Participation transaction costs. MCA Scores: 2 unweighted & 2 weighted
The agreement holders voluntarily attend the management meetings and are involved in management beyond their own agreement. The process does develop both social and human capital with the result that those involved want to play their part in managing an area that is broadly agreed as special.

The farmer's cost for advice in developing their application is reduced, due to economies of scale as the facilitator is able to visit more farmers in a day in the targeted area, so reducing travelling costs. The participant is therefore visited by one contact on a range of issues that will ultimately form part of 'one' agreement in the participants mind despite coming from a range of funding sources. The standard approach would be for AES to be one of a number of related visits from different advisors resulting in more than one agreement that might not be interconnected either literally or in the mind of the participant. This results in a cost saving for the participant.

Criteria 4: Social and human capital
MCA Scores: 4 unweighted & 3 weighted

Local / community engagement: MCA Scores. 5 unweighted & 4 weighted

The ILD approach makes first contact with the parish. The facilitator makes them self known to the parish council, discusses with them the approach in general terms and asks about key concerns. The idea is to generate community interest and develop a shared vision. The shared process would consider which aspects and areas to target, how the agreed priorities should be delivered and what monitoring it required. The level of top-down or bottom-up varies; there are ILD case studies where the local community has invited a facilitator in to develop a way forward for an area, often a parish or similar size. In the Walmore example, there was local and national agreement that the situation needed to change, so it was a mixture of top-down need (because of poor condition for the SSSI) and local concerns about flooding and land management.

The main benefit of the ILD approach is that all stakeholders, statutory and non-statutory, deliver to a shared vision that includes local and national objectives. This would incorporate the requirements of AES, but also include other aspects, such as flood alleviation and WFD, community involvement, recreation aspects and the sustainability of farm. The latter is covered as a socio-economic benefit by ensuring there are viable farm units so the long-term management of the landscape is secured.

The approach satisfies and contributes to all of the strategies held by the various partners as these are determined at the outset of the project. This is a shared achievement among the management group, enhancing both the human and social capital.

The result is a high level of self-management through the local management group, which is trusted by statutory agencies and means that the time spent by agency staff dealing with individual AES agreements is reduced as they know that any issues will be reported to them and fewer checks are required.

Environmental knowledge and awareness. MCA Scores: 5 unweighted & 4 weighted

The farmer/landholder is a full participant in the development of the wider project as well as their own AES agreement. This increases their knowledge of both species and habitats which they are able to transfer to other parts of the farm. There is also increased communication between the local agreement holders and agencies and other interest groups. This knowledge exchange is critical and a major benefit of the approach.

Farmer co-operation. MCA Scores: 3 unweighted & 2 weighted

The report into ILD identified significant farmer co-operation from practical activities, such as hay making and ditch clearance, to offering stock for grazing and working with agencies in monitoring water levels. This is a common outcome of problem solving mechanisms.

Limitation of the approach

The largest limitation stems from agencies not buying-in to the ILD approach, as it means that their strategic priorities and expertise are not part of the process. The multi-agency buy-in is an important factor in reducing the limitations. Another important factor is the potential for the ILD approach, and the standard AES approach, to be hindered by an individual who prevents progress for their own reasons.

Advantages of the approach

There are clear advantages to the ILD approach, one of the most beneficial is the increased positive communication between the agency staff and the agreement holders. The AES agreement is seen as dynamic by both sides, which exists to improve the environmental resource on the ground. Other factors that impact and interconnect with this, such as water levels and ditch management (responsibility of IDB or EA), are included meaning that there is a wider landscape scale benefit. This reduces the impact of single agency focus and broadens the scope of local management.

ILD is able to deliver more as there are multiple hats involved and it is not solely focused on AES and the resulting re-connection of the community to the land is important for geographically and socially isolated farmers and communities.

Key Lessons

- The benefits of an integrated approach can be seen at a local and national level. The local stakeholders receive a clear joined up message from the national level. The costs are contained through the use of existing AES options covering advice, or similar options in other related programmes, such as WFD. The local stakeholders gained from this approach considerably and their behaviour and attitudes have altered because they have a greater understanding of the expectations of a number of statutory agencies. The local management group and its position within existing structures provide stability and accountability in the longer term. The initial asset scoping and facilitation skills required mean that a high level of skill and knowledge of the strategic priorities is needed.

- There is always a risk with local engagement that the required levels of trust will not be achieved. This can occur between local stakeholders or between local and national interests. Some partners are less willing to share time and resources, but for the majority the benefits of an integrated approach are clear.

- Given that this is a delivery framework that is slightly different each time, what works and what does not will vary.

- If viewed from a standard AES position the savings are less obvious, however, the benefits are much clearer when integration is considered. The approach is dependent on the presence of a very skilled facilitator who has wide ranging of knowledge of the various programmes and funding sources operating within a particular area.

Transferability to other areas and compatibility with WTO and EU rules and ES objectives

- As ILD uses existing policies and strategic frameworks there should be no clash with WTO and EU rules. ES objectives would be met through the involvement of NE as a key national stakeholder. The approach can be replicated and has been adopted in at least 20 case studies and currently incorporated into the integrated catchment management approach.

4.3 Case Study 2: Dartmoor Farming Futures (DFF), UK

A collective agreement that involves local engagement and a wider range of statutory stakeholders than conventional AES, with farmers fully involved in designing and monitoring the new AES.

Background

Dartmoor Farming Futures (DFF) is an initiative to rethink agri-environment delivery on common land and to reflect a wider range of eco-system services (e.g. carbon stored in peat, water flow and water quality, archaeology and public access alongside biodiversity), partly through the inclusion of other agencies, such as the Environment Agency and the National Park. With its origins in the Dartmoor Vision, a process to identify and prioritise land management where there is potential for conflicting requirements arising from several natural assets, the DFF initiative was proposed by the Dartmoor National Park Authority (DNPA) and the Dartmoor Commoners' Council. The proposal sought to address concerns over the ability of some HLS agreements to consider at the development stage a wide range of ecosystem services and also to tackle the lack of ownership of these agreements by farmers and commoners.

Part 1 of the pilot involved Defra and NE agreeing a rethink of AES on 2 different commons and the commoners proposing an alternative AES design. This design was offered back to NE and Defra for their agreement. The agreement was secured and the project moved on to Part 2, which involves the development of a new application and explanation of how the funding will be used subject to NE agreement, as well as the development of a monitoring and evaluation (M&E) strategy that satisfies both NE and Defra.

In Part 2, both of the commons, Haytor and Forest of Dartmoor, separately considered the ecosystems services that exist on the common. Haytor has high levels of access, geological SSSI, and much archaeology so the outcomes are linked to sustaining this man-made landscape. On the Forest of Dartmoor there is considerable carbon storage and water purification and landscape issues.

A member of the South West Upland Federation, was appointed as the facilitator to the project, in part 1, he was responsible for bringing together (and not influencing) the two commons as they considered their design. In part 2, he is helping the 2 commons to develop their outcomes and M&E strategy.

The scheme works in 2 ways. Part 1 involved the farmers meeting with the aim of agreeing a list of the ecosystem services that were relevant. Part 2 requires the commoners on each common to work as a team to develop and then deliver the outcomes and agree the work plan for each of them with Defra/NE so the outcomes are delivered as planned.

Neither the facilitator nor the commoners were told by Defra or NE how this was to be implemented. Once part 1 is complete and the outcomes are formally agreed by NE this becomes 'the scheme', and the next phase is implementation and monitoring. The aim is to operate a simpler process.

Table 4.3 provides a summary of MCA scores for DFF when compared to a standard AES approach.

Table 4.3 Summary of MCA scores for Dartmoor Farming Futures

Criterion	Weights	Scores	Weighted scores
1a. Govt upfront implementation costs			
Facilitation and co-ordination	*1.2*	2	*2*
Negotiating contracts	*1.2*	2	*2*
Training and advice	*1.2*	-1	*-1*
1b. Govt. on-going implementation costs			
Additional on-going costs	*1.2*	0	*0*
Monitoring and enforcement	*1.2*	4	*5*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	3	*4*
EO Benefit 2 – Buffering	*1.2*	3	*4*
EO Benefit 3 – Connectivity	*1.2*	3	*4*
EO Benefit 4 – Threshold	*1.2*	4	*5*
3. Participation costs			
Income foregone	*0.8*	2	*2*
Additional costs	*0.8*	0	*0*
Transactions costs	*0.8*	2	*2*
4. Social & human capital			
Community engagement	*0.8*	5	*4*
Environmental knowledge	*0.8*	3	*2*
Farmer cooperation	*0.8*	5	*4*
Total score		**37**	***38***
1a Upfront implementation costs		1	1
1b On-going implementation costs		2	2
2 Landscape scale environmental objectives		3	4
3 Participation costs		1	1
4 Social & human capital		4	3

Criteria 1: Costs of implementation
1a. Upfront Government Costs. MCA Scores: 1 unweighted & 1 weighted
1b. Ongoing Additional Costs. MCA Scores: 2 unweighted & 2 weighted

Costs of engagement – facilitation / co-ordination. MCA scores: 2 unweighted & 2 weighted

The costs of engagement are taken to mean the development and implementation of Part 1 of the pilot project. This incorporated the design of an alternative AES, as designed by the commoners, which took 6 months to achieve (about 5 months for the commoners to realise that this was a real offer and then 1 month to develop the new approach). The cost of this phase was £13,000 in facilitation costs on both commons, but this excludes the time input from NE staff. However this might have been higher due to the fact that it was a pilot specifically designing and implementing a different approach. One common has 8 active graziers the other 80, so they are very different in size and complexity.

Good facilitation has been key thus far with the facilitator trusted by both sides; NE and the commoners. This was borne out elsewhere as a similar approach was attempted in Cumbria, but this time using the existing officer and within 4 weeks it had fallen apart. It was suggested that farmers have been in AES for 20 years (15 years in ESAs and some years before that in a National Park management agreement) but never really understood what they were about. The farmers have taken AES as core funding and not engaged with the environmental obligations. The approach taken by the DFF requires them to understand and think about the environmental elements, so that they can determine an alternative but acceptable way forward.

The savings are ones of economy of scale as between the two commons there are nearly 90 farmers, covering over 11,000 hectares. As the pilot is operating under the current scheme options, no alternative to the FEP option has been determined but while some sort of audit of environmental assets is agreed it might not look like the current FEP arrangements.

Costs of negotiating contracts. MCA Scores: 2 unweighted & 2 weighted

Part 2 is the preparation of the derogation to NE that will be the basis for consent for the outcomes developed and the M&E strategy. The cost of this is £20,000 in assistance to the commoners, as is often the case in large and complex agreements with multiple legal signatories. In this case it was also decided that the opportunity to discuss a different approach with a greater number of farmers would be included. In the discussions, it was suggested that the scheme could be rolled out in a simpler format to HLS, perhaps not requiring a Farm Environment Plan (FEP) in the same format, with farmers taking more responsibility for identifying environmental assets under NE guidance.

The farmers see the development of the M&E as a positive step as it requires them to engage with NE and is then the result of a more creative dialogue between the statutory body and the deliverer and more likely to lead to a positive outcome in terms of the schemes impact on the area.

The savings are that there is reduced NE time involved in developing the prescriptions and the responsibility is shared with other agencies (such as the Environment Agency). For example, the EA will be involved in the outcomes associated with water quality. While there is normally no requirement for NE to place external costs for this stage an agreement of this size and acknowledged complexity would take up a considerable amount of time.

There are 2 sets of negotiation:

i. with the graziers about the new approach. This was straightforward on the common with 8 graziers as there was little difference to management under the ESA, but more focused on outcomes. On the other common there are 80 graziers involved and many difficult negotiations were required over 2/3 months in order to gain the confidence and trust of the farmers that more responsibility from them was required in this approach to developing an AES agreement. The graziers feel vulnerable that there is no common enemy under this approach so that whatever they agree needs to hold together. The current scheme here is worth about £1million a year.

ii. with NE and Defra about the outcomes offered by the farmers and what NE is able to offer the farmers in return. Clearly, NE has to be confident that the outcomes will be achieved and the approach can fit in with the EU regulations and requirements.

There will be savings later in the agreement as the negotiation will result in a better understanding of the agreement and the initial costs are similar or possibly less than those currently experienced.

Costs associated with training and advice. MCA Scores: -1 unweighted & -1 weighted

Most of the farmers are currently self-taught through their involvement in the classic AES schemes. This approach enables a wider, more specific process that increases the engagement between the farmers and those who are working with the public goods that the scheme is working to enhance. For example, the Dartmoor National Park Authority offered a day course on the management of archaeology in the landscape which the farmers attended. Other farmers have attended National Vocational Certificate (NVC) training evening courses. The farmers are also keen to develop and understand the process so that they can offer advice to other farmers, their neighbours, who might select this way of working in the future.

There will be an increase in the training budget, but some costs might be recovered as it is offered to private individuals. However, once the training is complete the benefits will outweigh the costs as the benefits of the knowledge gained by the agreement holders means a better agreement and one that is likely to be implemented more thoroughly. So the cost is front loaded with farmers understanding and delivering what is required. If set up right the ongoing costs for the next 9 years will be better and the outcomes more significant.

Additional on-going costs: MCA Scores. 0 unweighted & 0 weighted

As this is a pilot project the additional on-going costs are difficult to establish, as this stage has not yet been reached. However, it is anticipated that the on-going costs will be similar or slightly less than standard AES as there are savings for NE in only having to deal with one agreement rather than a number of individual agreements.

Costs associated with monitoring/enforcement. MCA Scores: 4 unweighted & 5 weighted

The farmers want more flexibility but they are concerned that at some point they could be asked to return their payments if NE and Defra are not satisfied. All progress has been in the right direction and there is a widespread consensus on what needs to change. NE is wary of EU audits and that activity is handled sensitively and in line with all the requirements.

The M&E strategy is being drafted at the moment; some of the ecosystem services are relatively straight forward:

- the water quality of the moors is either very good or good, EA can continue to check this and the outcome is that this remains good or very good or improves – certainly no room for decline.
- archaeology is on the historic register and much is under threat, so the outcome is to reduce the number on the 'at threat' register, the National Park is able to monitor this.
- SSSI monitoring is more problematic as NE say the moors are in unfavourable recovery but the farmers do not believe this as they disagree that reducing the grazing is going to make the site favourable according to the SSSI designation.

One of the groups has decided to use an ecological consultant who the farmers pay to tell them of the changes that are happening to the habitats and whether the site is in better, or worse condition and what can be changed to improve this.

Grazing is a key issue, while the NE for biodiversity suggests further reductions there is some suggestion from the EA and South West Water that for other ecosystem services, such as water quality, it might be better to increase grazing pressure. It is accepted that this

is an area where more research is required. However, under this new scheme it will be the farmers' decision, with the agreement of NE and other statutory stakeholders.

Overall, the project is promoting a reduced role for NE so there will be reduced monitoring costs to NE on M&E and there will be increased skills in species and habitat monitoring and understanding of environment change among the agreement holders, or a nominated external agent. Some have undergone relevant training through RDPE.

Criteria 2: Benefits in terms of meeting landscape scale objectives
MCA Scores: 3 unweighted & 4 weighted

Benefits to managing core sites. MCA Scores: 3 unweighted & 4 weighted

Managing core sites is a considerable benefit of the DFF approach, which looks at the multiple assets of the sites together be they carbon, water, access, biodiversity or heritage.

What is important is that the key priorities concerning the core sites are more widely disseminated and understood and consequently embedded into the scheme design and outcomes. This increases understanding amongst the farmers and agencies and as the farmers perceive it, not so dominantly focused around SSSI-related issues. The two pilots are common land and so a single agreement covers all of the key sites contained within the one agreement – the main benefit is the breadth of management objectives this approach can cover rather than the geographical area. As with other areas of common land the legal stakeholders are known, and in this case in contact with each other, which eases both the responsibilities and management.

Benefits to buffering a specific site / feature. MCA Scores: 3 unweighted & 4 weighted

The benefit of this approach is that the large scale of these sites can be set in context of what is important in terms of landscape-scale management for a range of objectives that is wider than conventional AES. The new scheme recognises that these are man-made landscapes, but that they function at a management level on a micro scale. The links with neighbours are better understood, for example on one common the grazing was thought to be about right, until they realised that the grazing levels were actually supplemented by some that strayed on to the area from a neighbouring common. So the assumption that the prescribed levels had been effective was challenged by what actually took place. The decision was not to stop this sort of activity, as in reality it led to a better outcome in terms of improved habitat and a better understanding of how grazing levels might be more effective at certain levels.

Benefits to connecting habitat. MCA Scores: 3 unweighted & 4 weighted

The flexibility that the DFF approach offers is important throughout this section on the benefits of the landscape scale. The activities developed are able to maximise the intended beneficiaries and are developed by people with local knowledge of the area that can sit alongside those of the agencies to ensure connectivity that is framed by the science but works with the local conditions.

Benefits to meeting threshold levels. MCA Scores: 4 unweighted & 5 weighted

Scale is very important and the DFF approach lends itself to cope with this environmental objective. The farmer group will enable different farming practices across the landscape so the prescriptions are internalised and linked to the land. Even though the DFF project concerns two commons previously managed under either ES or ESA, far more micro-

management is being considered than was possible under the SSSI condition assessment approaches. This more targeted approach that focuses on ecosystem services is felt by the farmers and some in NE to develop greater diversity within the landscape.

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Criteria 3: Participation costs
MCA Scores: 1 unweighted & 1 weighted

Payment rates remain fixed according to standard AES rates at the moment because the project participants are working within existing AES agreements. However, it is important to note that the payments are not distributed in the same way. The initial agreement was for the existing annual total sum to have a derogation that enabled the farmers to rethink both the distribution and the prescriptions – this is a crucial element of the project that NE will be reviewing.

Income foregone costs. MCA Scores: 2 unweighted & 2 weighted

The farmers view is that the current ESA agreement is a headage payment but under the DFF approach the active grazier receives an area payment based on their grazing area (lear) and the money is to deliver better management on that lear.

The effect is that at the agreement scale the income foregone (and hence the payment rate) is correct but the returns to individuals are proportionate to their contribution to delivering outcomes, rather than merely the number of grazing rights they hold. For an individual this can mean a difference between them and 'similar' graziers on neighbouring land which is paid at a flat rate within ES – some will be getting more and some will be getting less.

All of this is part of a very interesting discussion, the base payment has been agreed and the farm area will be the basis for this payment. Farmers understand that more outcomes mean more responsibility and activity. Both projects have set themselves 10 outcomes specific to their area.

Additional on-going costs. MCA Scores: 0 unweighted & 0 weighted

The DFF project is considering whether a move towards an area payment based around the ecosystem services that are being provided within that area is a more feasible way forward in the future. Time is crucial, it is difficult to speed up the process as it is very important to go at the speed of the group and a comfortable pace for all. The project is now at the development stage and the pace is now paying off as all accept where the project is at and what is required. For the participants there would be a greater cost in maintaining the group cohesion and activity. However, as both examples are on commons this uses existing structures. Where such structures do not exist there would be additional costs in maintaining a new structure.

Participation transaction costs. MCA Scores: 2 unweighted & 2 weighted

Participation is crucial but the culture is very different. The tendency of farmers is to focus on the money from AES rather than what it is there to achieve. This approach takes away the collective link to outcomes and there is no discussion and consistency in what is achieved. So the benefits of participation out way the costs to both the public sector and the agreement holders. As stated before, compliance will increase and farmers will be up skilled and although they might spend more time attending meetings to prepare the agreement it is because they see themselves as responsible for it and do not devolve decisions, understanding and responsibility to others, such as land agents.

Criteria 4: Social and human capital
MCA Scores: 4 unweighted & 3 weighted

Local / community engagement: MCA Scores. 5 unweighted & 4 weighted

The social capital is increased in all aspects; scheme design, targeting, delivery and monitoring. The process is about engagement and the farmer/commoner is key as it is this group that engage with the existing AES and the responsibility of determining their own outcomes that meet the needs of NE and Defra. The origins of this project are very much bottom-up and Defra and NE have provided the strategic framework within which the pilot is working. The desire at the local level is to achieve a greater understanding of what AES schemes are trying to do and to test a simpler approach that gives more of the responsibility to the agreement holders in terms of delivering the outcomes of the ES agreements and consider how ecosystem services might be included within ES.

For example, the engagement on archaeology has been quite enlightening. Some sites on the common are under threat as they are under-grazed and whatever stocking rate is advised, will continue to be so. As a result mechanical means of management were agreed with the DNPA officer and an open call for strimmers was put out. Non-commoners and others came and although they could be paid some refused as it was their contribution to the landscape.

Environmental knowledge and awareness. MCA Scores: 3 unweighted & 2 weighted and awareness

The role of the DNPA has increased the knowledge of the agreement holders and the discussion around the schemes has increased their understanding of the rationale for the management prescriptions. Since the area has been an ESA for 20 years and the sites are unfavourable recovering it has to be assumed that the prescriptions have not worked. But broadening the scheme is also important. Involving the EA is key, but has been tricky as they restructured. Farmers remain nervous of NE involvement, but trust is building.

Farmer co-operation. MCA Scores: 5 unweighted & 4 weighted

Farmer co-operation varies on each of the commons. On the small common there is already a close working relationship so the cohesion is present. The 8 graziers represent 3 families in reality, so there is little change in co-operation other than a better working environment for them to continue. On the other common this approach has greatly increase co-operation and people have spoken to each other who have not spoken for years. On the large common, the facilitator works with a sub-group of 10 active graziers and they report back to the wider group and press for a response in order to push issues through. The farmers are up for the challenge and all graziers have found it beneficial.

Limitations of the approach

- Time and the need for facilitation are the key limitations of the approach, but together this generates trust to experiment and to take risks. The two projects have taken their own routes, but are clearly working in the same direction; this will be helpful at the landscape scale.

Advantages of the approach

- The main advantages are an increased feeling of ownership by the farming community and shifting the responsibility of environmental management in the right direction. The

approach needs internal agreement and farmers have considered how this could be used elsewhere. Groups of farmers anywhere would be able to adopt this approach; it is not restricted to commoners.

- Another advantage of the approach is the ability to refine management prescriptions to ensure that they are practical and meet local conditions

Key Lessons

- The key lesson is that farmers are willing and able to take greater responsibility for scheme design and delivery. However, this does require the services of a skilled facilitator who is respected by both sides. A key task is to give the local stakeholders the space and time to develop the scheme design and the outcomes that are acceptable to both Defra and NE. The greater responsibility given to farmers has been taken seriously and it has provided a tighter bond at the local level and a willingness to engage with and to understand to a far greater level the strategic needs of the agencies.

- The time taken to achieve this is not insignificant, but in the words of the facilitator 'can't be rushed'. Whilst good progress has been made here, it is clear that this cannot be guaranteed.

Transferability to other areas and compatibility with WTO rules and ES objectives

- As the DFF operated within the boundaries of existing schemes, one ESA and the other HLS, there should be no clash with WTO and EU rules. ES objectives would be met through the involvement of NE as a key national stakeholder. The approach is a pilot and would need to be replicated for transferability to be assessed; however, neighbouring farmers are of the view that this is possible both within a common land setting and on non-common land. It would work best where there is a geographical (e.g. valley) or cultural (e.g. Forest of Dean) identity as this would aid the coming together of the local stakeholders.

4.4 Case Study 3: Crosby Ravensworth (CR)

A collective agreement that built on an existing group AES agreement but attempted to go further with more coordinated management of common and possibly the surrounding enclosed land and an increase in both human and social capital.

Background

The Crosby Ravensworth common was first entered into an AES (CSS) in 1996/7 when there was a threat to impose overgrazing regulations against the farmers grazing the common. At that time a locally respected farmer and vice-principal of the local agricultural college was introduced as a facilitator to negotiate a CSS agreement. This scheme finished in September 2009 with the new HLS starting on 1 October 2009. A facilitator was employed in 2008 to ensure that there was an effective internal agreement for the commoners; the facilitator acted as a go-between for NE and the commoners. This case study looks specifically at the process to establish an HLS agreement and therefore starts in September 2008. As it was estimated that it would take a year to negotiate the HLS agreement, facilitation started in 2008. The internal agreement was between all of the 25 farmers involved, most of whom were active graziers on the moor. Only 3 inactive graziers signed the internal agreement and subsequently the HLS agreement. Natural England, who had been heavily involved in this site over a number of years, carried out considerable groundwork and facilitation before others were involved.

As is often the case with the development of large and complex agreements, the NE officers were in constant contact with the facilitator in order to ensure that the scheme complied with HLS requirements. The facilitator needed to obtain agreement to continue the collective scheme and managed to pull in one or two more participants than the CSS agreement, but there are still some who have not signed the agreement. There are also some who have signed it but have not reduced the number of stock that they put on the common. Social bonds between the agreement holders have developed, but sometimes this is to unite them in being critical of the approach of NE or the inflexibility of the scheme.

Table 4.4 provides a summary of the MCA scores for Crosby Ravensworth when compared to a standard single ES agreement.

Table 4.4 Summary of MCA scores for Crosby Ravensworth

Criterion	Weights	Scores	Weighted scores
1a. Upfront implementation costs			
Facilitation and co-ordination	*1.2*	0	*0*
Negotiating contracts	*1.2*	0	*0*
Training and advice	*1.2*	0	*0*
1b. On-going implementation costs			
Additional on-going costs	*1.2*	-1	*-1*
Monitoring and enforcement	*1.2*	-2	*-2*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	+2	*+2*
EO Benefit 2 – Buffering	*1.2*	+2	*+2*
EO Benefit 3 – Connectivity	*1.2*	+2	*+2*
EO Benefit 4 – Threshold	*1.2*	0	*0*

3. Participation costs			
Income foregone	*0.8*	0	*0*
Additional costs	*0.8*	-2	*-2*
Transactions costs	*0.8*	-2	*-2*
4. Social & human capital			
Community engagement	*0.8*	-2	*-2*
Environmental knowledge	*0.8*	+2	*+2*
Farmer cooperation	*0.8*	+2	*+2*
Total score		**+1**	***+2***
1a Upfront implementation costs		**0**	**0**
1b On-going implementation costs		**-2**	**-2**
2 Landscape scale environmental objectives		**+2**	**+2**
3 Participation costs		**-1**	**-1**
4 Social & human capital		**+1**	**+1**

Criteria 1: Costs of implementation
1a. Upfront Government Costs. MCA Scores: 0 unweighted & 0 weighted
1b. Ongoing Additional Costs. MCA Scores: -2 unweighted & -2 weighted

Costs of engagement – facilitation / co-ordination. MCA scores: 0 unweighted & 0 weighted

The facilitator was involved to encourage farmers to sign the internal agreement that underpinned the delivery of the HLS agreement which replaced the CSS agreement. This also involved NE, solicitors, land agents, the owner of the common and the shooting interest.

The facilitator's day rate for this job was £350/day and with a final bill of about £14,000; this equates to about 40 days work between July/Aug 2008 and Nov 2009, when the HLS agreement was eventually signed. The facilitator saw each farmer individually on the farm, followed by phone calls. He still receives calls from some as they are confused by what is going on.

The internal agreement was not developed from scratch as the facilitator had access to a template for this type of work from a local land agency firm who had previous experience of developing such agreements on commons. The main economy of this approach is that one block of 4,000 ha is entered into HLS at one time, but with a number of specific objectives for different parts of the common. Some of the requirements associated with the commons agreement also had implications for enclosed land that required additional land to come into the scheme, notably the need for cattle grazing.

Costs of negotiating contracts. MCA Scores: 0 unweighted & 0 weighted

It is difficult to separate these costs from those associated with engagement but the decision to enter into HLS was relatively straightforward. The main negotiations were associated with the detail of the HLS agreement and these were very complicated and protracted. The only real issue was on stocking rates which was strongly linked to the internal agreement. The main issue with having an agreement on the fell was increasing cattle numbers from a very low base to restore habitats and many farmers were not set up for cattle farming systems.

To achieve agreement the facilitator had to visit each farmer and work out how much he/she might move from the current position regarding sheep and consider introducing or increasing cattle numbers. This involved an in-depth discussion with each farmer but as many needed the money they went with it – this was a key driver, not the environment objectives.

Costs associated with training and advice. MCA Scores: 0 unweighted & 0 weighted

There are no costs associated with training and advice that are clearly identifiable. The facilitator had to be trained up on HLS as he is a facilitator rather than an HLS specialist, but he had help from NE and others. This had a cost associated with it, but it was more important that he was taken on as someone who was respected and trusted by both sides.

Farmers were not overly motivated towards the HLS agreement and so have not undertaken any training. NE is keen to develop the idea of marketing the cattle as an environmental brand and say there is money from RDPE to develop this. NE has developed an application to RDPE for a feasibility study which is currently being assessed by the local LEADER group[14] and is fronted by a farmer. Locally it is felt that farmers need to see the cattle as an opportunity before they take up this idea, at the moment they are still seen as a chore. No one is working with the commoners on the marketing potential, Cumbria Farming Network could but the idea needs to come from the commoners themselves.

It is important to see the marketing potential as the agri-part of AES, but it is not happening because the farmers are not engaged. There is some attempt to determine how the stock are doing on the fell – in terms of weight gained/or lost. This will be used at the five year review. If they have gained then it might change the farmers' views. If they have lost weight then farmers will tell NE that they need to change things. Cattle have generally come off the common in better condition than they went on and this has led some farmers to consider increasing cattle numbers over and above those in the agreement.

The agricultural monitoring was introduced so that there was comparable data to sit alongside the environmental monitoring – some of this has happened, but not all.

Additional on-going costs: MCA Scores. -1 unweighted & -1 weighted

There are few additional on-going implementation costs. The secretary is a land agent and he is appointed to distribute the money – and he is paid for his services. The Chair is not a farmer, although his son is a grazier on the common, and he is respected by all and puts in a great deal of unpaid time. The Chair's involvement has been recognised and it has recently been agreed to give him an honorarium.

[14] The Leader approach is a delivery mechanism under Axis 4 of the RDPE 2007-2013. It is not a scheme, fund or set of objectives, but is a method of harnessing local knowledge to enable a "bottom up", community led approach to delivery of RDPE funding in rural areas. Leader is implemented through Local Action Groups (LAGs), representing public and private partners and local interest groups. LAGs can be existing partnerships set up under previous LEADER programmes; existing partnerships set up for another purpose but which follow the Leader principles; or be a completely new partnership. See http://archive.defra.gov.uk/rural/rdpe/leader.htm for further information.

Costs associated with monitoring/enforcement. MCA Scores: -2 unweighted & -2 weighted

A significant amount of monitoring is required and some of this falls to the Secretary and Chair of the commoners association. The facilitator has returned this summer to agree the UELS internal agreement.

The RPA has been involved as well as it took time to get this bit right. Also the payment received was not broken down so it had to be checked as it was not clear if anything had been taken off for non-compliance, and if so, which bit was taken out. All of this has resulted in about £10k just on monitoring and enforcement from the commoners' association perspective. This has been taken out of the contingency budget.

There are no savings in monitoring and enforcement costs that the facilitator can see as the collective agreement is much more complex.

Criteria 2: Benefits in terms of meeting landscape scale objectives
MCA Scores: 2 unweighted & 2 weighted

Benefits to managing core sites. MCA Scores: 2 unweighted & 2 weighted

The main benefit is that NE can manage one block of 4,000 ha. NE has objectives relating to the SSSI specification for the site, but it was suggested that many are sceptical that the current approach will achieve these objectives. After 2.5 years into the scheme there are about 50 cattle on the site, this will increase gradually over the five years and the current numbers are on track with the original agreement. The aim of the cattle is to manage the purple moor grass (*Molinia*) and reduce its dominance within the vegetation so that other plant species, such as heather, can become established. NE's position is that increased cattle numbers are the most effective mechanism for achieving this outcome. With such a large block of land under HLS, NE is in a position to discuss with farmers how the desired environmental outcomes are achieved thorough particular types of management. However, this is little different from a conventional AES agreement on a common.

Benefits to buffering a specific site / feature. MCA Scores: 3 unweighted & 4 weighted

NE has identified different areas where they want cattle more than other places and the recent years suggest that the cattle do not wander far. They stay around the mobile water bowser so this helps target the grazing and expand key sites/habitats. This would be more difficult to achieve if all this area was under separate agreements. The use of GPS collars will identify where cattle graze. Whilst the management is a little different from a conventional AES agreement, the use of GPS collars will assess the effectiveness of the approach. .

Criteria 3: Participation costs
MCA Scores: -1 unweighted & -1 weighted

The payments are set within HLS, but the process was not conventional. The understanding locally is that NE essentially settled on what payment would be acceptable to run with and then looked at the different prescriptions in order to see how it could be divided up. Basically, the local understanding is that the overall figures were determined at a higher level and then NE officers looked at the scheme options and supplements in order to see how the agreement could reach that figure.

Additional on-going costs. MCA Scores: 0 unweighted & 0 weighted

The additional on-going costs for the farmers are not significant. The only significant change has been for the common to be divided into 2 groups. Each group meets 3 or 4 times a year and the graziers in that area are free to attend. The forms are completed by the Chair, Secretary and other outside help, as required. Meetings with ES project staff tend to be public and take place in the local village hall. There is no connection with ES agreements on in-bye land and those that do have their own AES agreements treat them separately.

It is not clear if this approach has saved the farmers money. It is an expensive process, but seems to be the only way forward as there was little trust or respect between the two parties, although this seems to have improved more recently. The main concern is a local perception that the approach itself was too adversarial, 'do this or there is no agreement'. Farmers were not asked what they wanted to achieve out of the scheme or how the outcomes of the scheme might be achieved. The approach used was reliant on facilitation but did not provide the room for farmers to take greater responsibility. However, to some extent they were more content with this approach as it requires less responsibility – if it does not work it is not their fault.

Participation transaction costs. MCA Scores: -2 unweighted & -2 weighted

There is participation and thus transactions costs are being generated but the benefits of participation are not really realised as the farmers are digging their heels in as they feel that they are being told what to do.

Criteria 4: Social and human capital
MCA Scores: 1 unweighted & 1 weighted

Local / community engagement: MCA Scores. -2 unweighted & -2 weighted

There is some local engagement, but it is not as significant or important as it could be. Sometimes the facilitator felt that the commoners only came together because NE emphasised the actions required in order to obtain an agreement.. The Commoners Association does meet and these meetings are well attended, presumably because farmers are interested in what is going on and want to be involved. The negotiation of an agreement in this case study was largely determined by a top-down approach that required the local farmers to change their practices and introduce cattle on to the common. The requirement to increase cattle numbers from a very low base was contentious, but the facilitation enabled an HLS scheme to be developed and signed. This required some local engagement and early discussions initiated by NE early on included local councillors, the police, highways agency, LAF, Open Spaces Society among others.

There is a historic sense to this that goes back to the overgrazing issue – a bad feeling as to how this happened and was implemented. The HLS payments are divided on the same basis as the CSS and this links back to the overgrazing issues.

Environmental knowledge and awareness. MCA Scores: 2 unweighted & 2 weighted and awareness

Some who have cattle and can see the benefits of getting involved are sharing information and moving cattle to help each other out where this is possible.

Farmer co-operation. MCA Scores: 2 unweighted & 2 weighted

There is a low level of co-operation amongst the graziers and the group is not meeting its potential in terms of co-operation. Under the UELS they had the chance to adopt a more equitable system to distribute the money based on the grazing rights, but they chose very narrowly to stay with the overgrazing approach. They accept the consensus even if the vote is very close. Under this approach there will always be winners and losers.

Limitations of the approach

This example highlights the challenges of common land and therefore one of the limitations is that there is an increased risk of no agreement with this approach – in this case it was a real possibility even after being in CSS for 10 years. It only needs one or two commoners to go against the planned approach and with sheep prices increasing some will take this route in the future, although there is currently no evidence of this locally. This approach is also more expensive partly because there remains some suspicion between the various parties involved and therefore it does not benefit from co-ordination and joined up thinking. However, situations with common land vary widely with some requiring little or no external facilitation while on others the need is extensive and persistent. It would appear that Crosby Ravensworth falls into the latter category and despite previous facilitation efforts the relationship between agreement holders and NE remains variable.

Advantages of the approach

The advantages are that one block has come into HLS and the management of that whole area can be co-ordinated and integrated. There is evidence that the heather is changing and this is because of the reductions in grazing. The scheme is not just related to heather cover and one key habitat that will benefit from cattle rather than sheep grazing is the limestone vegetation.

Key lessons

- A key lesson to learn from this case study is that mediation can be an important component of facilitation. In this instance there was little agreement between national and local stakeholders. Just because there was an initial AES agreement did not make the development of the HLS agreement any easier. Even though there were misgivings, the local graziers were able to take on changes in farm practices and introduce cattle on to the common, as required by NE.

- The time taken to sign the HLS agreement was longer than similar case studies in this report and the agreement did not require anything more than what was available under ES.

Transferability to other areas and compatibility with WTO rules and ES objectives

- Because CR uses existing policies and strategic frameworks there should be no clash with WTO and EU rules. ES objectives would be met through the involvement of NE in the development of the HLS agreement.

4.6 Case Study 4: Limestone Country Project (LCP), UK

This case study was selected to illustrate the use of a spatially targeted approach in delivering co-ordinated action on a core site.

Background

The Limestone Country Project (LCP) ran between 2002 and 2008, focusing on the conservation and management of over 11,000 ha of limestone grasslands in the Yorkshire Dales designated as internationally important Special Areas for Conservation. The area has a long history of mixed sheep and upland cattle grazing, however, the recent decline in cattle farming had resulted in the degradation of habitats. The LCP aimed to restore the diversity of grasslands by encouraging farmers to return to mixed farming using traditional breeds of cattle, such as Blue Greys and Belted Galloways that are adapted to harsh winters living off the rough grasses and do not graze so intensively as sheep. The project objectives were:

- To restore and/or enhance the diversity of over 1,500 hectares of Annex 1 habitats on the site by converting 15 farming enterprises to more appropriate mixed systems involving traditional hardy cattle breeds through the provision of grants to farmers.
- To increase awareness and understanding of environmentally and economically sustainable conservation management through a programme of publicity events/materials and on site interpretation.
- To disseminate information regarding the relationships between upland land management and nature conservation to other project/land managers and policy makers through a series of demonstration events and the promotion of best practice
- To increase knowledge of the relative nature conservation management benefits of different cattle systems through a programme of survey and research.

Farmers wishing to join the project had to have entered their land into a suitable land management scheme (Environmentally Sensitive Area (ESA), Countryside Stewardship (CSS) and Wildlife Enhancement Scheme (WES) prior to an application being made to the LCP. The stocking levels and other land management operations (for example prohibition of fertiliser, limitations on supplementary feeding etc) agreed within these underpinning land management schemes provided the basic framework of the land management. The LCP then provided financial support for additional management changes by means of a "Limestone Country" Wildlife Enhancement Scheme agreement and capital grants for purchase of cattle and infrastructure changes.

The Project had a £1.27 million budget, of which £550K came from the European Union LIFE (Nature) fund. During the project period, a total 18 herds (358 animals) were established covering 1, 839 ha which exceed the project's original targets.

Table 4.5 provides a summary of the MCA scores for LCP when compared to a standard ES agreement

Table 4.5 Summary of MCA scores for Limestone Country Project

Criterion	Weights	Scores	Weighted scores
1a. Government upfront implementation costs			
Facilitation and co-ordination	*1.2*	-3	*-4*
Negotiating contracts	*1.2*	-2	*-2*
Training and advice	*1.2*	-2	*-2*
1b. Government on-going implementation costs			

Additional on-going costs	*1.2*	-1	*-1*
Monitoring and enforcement	*1.2*	-2	*-2*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	5	*6*
EO Benefit 2 – Buffering	*1.2*	0	*0*
EO Benefit 3 – Connectivity	*1.2*	0	*0*
EO Benefit 4 – Threshold	*1.2*	0	*0*
3. Participation costs			
Income foregone	*0.8*	1	*1*
Additional costs	*0.8*	-1	*-1*
Transactions costs	*0.8*	0	*0*
4. Social & human capital			
Community engagement	*0.8*	3	*2*
Environmental knowledge	*0.8*	4	*3*
Farmer cooperation	*0.8*	1	*1*
Total score		**3**	***1***
1a Govt upfront implementation costs		-2	-3
1b Govt on-going implementation costs		-2	-2
2 Landscape scale environmental objectives		1	2
3 Participation costs		0	0
4 Social & human capital		3	2

Criteria 1: Costs of implementation
1a. Upfront Government Costs. MCA Scores: -2 unweighted & -3 weighted
1b. Ongoing Additional Costs. MCA Scores: -2 unweighted & -2 weighted

Costs of engagement – facilitation / co-ordination. MCA scores: -3 unweighted & -4 weighted

The project was jointly run by the Yorkshire Dales National Park Authority (YDNPA) and English Nature. Prior to the start of the project a questionnaire was sent to 100 farmers in the core project area to identify those who might be interested in cattle grazing. This was followed up with visits by the Yorkshire Dales National Park Authority and English Nature staff to over 90 farmers in the project area to gauge their interest in farming with cattle and providing more information about the project. The LCP itself began with a launch conference for farmers in 2002 which targeted over 100 farmers in the project area. Application packs were given out at this meeting and this was then followed up with individual site visits to interested farmers.

A full-time Project Officer was employed to work on the project at a cost of around £20,000-25,000 a year. It was considered essential to have a full-time Project Officer in place to pull the project together and to work with the 18 farmers in the project. The Project Officer was also involved in the wider promotion and dissemination of the project's aims

It took the Project Officer up to 2 months to draw up the plans for each farm. The ratio of one project officer to 18 farmers worked effectively, if any more farmers had joined this would have required additional staff time. The Project Officer required expertise in whole

farming systems, including agricultural conservation grading and knowledge of the funding system, including agri-environment schemes and subsidies.

The cost of employing a full-time project officer to engage the 18 farmers in the scheme would be higher relative to engagement of the farmers into a standard AES. However, without the dedicated Project Officer support it would be unlikely that most farmers would have introduced cattle grazing onto their farms. As the project was partly externally-funded the facilitation and engagement of farmers into AES offered some savings to the government.

Costs of negotiating contracts. MCA Scores: -2 unweighted & -2 weighted

The Project Officer's role was to look at the impact on the entire farm business of introducing cattle on the farm and to develop a whole farm plan with the participants to incorporate grazing cattle. This was a three stage process. First, a baseline survey was carried out by the Project Officer to determine the current management of the farm and future infrastructure changes that might be needed in order for the farmer to enter the Limestone Country Project. This was then combined with other information to develop a whole farm management plan for each applicant. The plan was considered by a Technical Working Group comprised of YDNPA, NE and Grazing Animals Project (GAP) and the approved plan formed the basis of the farmer's final LCP agreement.

Once the LCP agreements expired agreement holders were helped with the production of a FEP and application for Environmental Stewardship, with the LCP element being matched under the HLS option HR2 – 'Native breeds at risk' plus an underlying management option HL10 – rough grassland, HK7 species rich grassland (calcareous, etc). This was an additional service offered to the agreement holders through the LCP project.

Costs associated with training and advice. MCA Scores: -2 unweighted & -2 weighted

In the initial stages of the project many of the project participants lacked knowledge about cattle management and required on-going advice to assist with management. The Grazing Animals Project provided specific technical advice. For example, one issue related to the problem of housing cattle over winter where they were getting too warm. The level of initial advice offered would have cost more than any advice received through a standard AES. After this initial advice agreement holders were able to support and advise others coming into the scheme at a later date and less advice was required over the remainder of the project.

Additional on-going costs: MCA Scores. -1 unweighted & -1 weighted

Once an agreement started the full-time project officer was on-hand to assist the project participants. Provision of regular advice during the whole of the project was provided through regular visits and direct contact from the Project Officer. The Project Officer worked on a day to day basis with the project participants, visiting them on a regular basis. She was the first point of contact for advice and would help participants deal with the many organisations involved with the farming business and changes in schemes throughout the lifetime of the project. For example, helping agreement holders move into the new ES schemes in 2006. The Project Officer was backed by a team of advisers including government conservation staff, farming advisers, land agents and business advisors

Costs associated with monitoring/enforcement. MCA Scores: -2 unweighted & -2 weighted

The Project Officer undertook two compliance checks a year on each farm. There was also continuous ecological monitoring as part of project, which included land management and key indicators species checks. As more monitoring and compliance checks were undertaken in LCP relative to a standard HLS, these are likely to have incurred a higher cost.

Criteria 2: Benefits in terms of meeting landscape scale objectives
MCA Scores: 1 unweighted & 2 weighted

Benefits to managing core sites. MCA Scores: 5 unweighted & 6 weighted

The environmental improvement of core sites was the primary environmental objective of the LCP. The project area includes the UK's most important karst region, the international biodiversity significance of which is recognised by the designation of two Special Areas of Conservation (SAC) – the Ingleborough Complex SAC and the Craven Limestone Complex SAC.

It will take 10 years before any substantial changes are realised, but the switch to cattle grazing has already resulted in some changes in species diversity, with the limestone grassland becoming more species rich. Farmers were surprised by the effects and this clear evidence of change was a key tool in promoting the scheme to future applicants. The project was seen as a pilot from the start and only targeted a small proportion of the project area. It was suggested that if the project had continued for another 5 years there was the potential to have doubled or tripled the number of farmers involved. Many requests to enter the scheme were received years after it had closed, particularly in the north of England.

Achieving the extent of farm management change across the landscape area from sheep to cattle would not have occurred without co-ordination by the LCP and would not have been possible with a standard AES scheme. The project can be considered a conservation success as 4 years after the project finished the farms are still running native cattle as a sustainable part of their farm businesses and have continued into HLS, encouraging neighbouring farms or local farms to consider entering the scheme with cattle/ mixed grazing systems. LCP has aided the uptake of some of the HLS options that may not have been viable without LCP promoting the benefits in previous years.

Benefits to buffering a specific site / feature. MCA Scores: 0 unweighted & 0 weighted

Buffering was not a specific objective of LCP and none of the farms involved in the project were adjoining, although some old LCP agreements now adjoin other HLS agreements that have similar grazing regimes. Neither was the achievement of connectivity or particular threshold levels an objective of LCP.

Criteria 3: Participation costs
MCA Scores: 0 unweighted & 0 weighted

Income foregone costs. MCA Scores: 1 unweighted & 1 weighted

The key to the success of the LCP was providing the right level of funding support to enable farmers to convert from their existing system to one that included cattle grazing. This was achieved through a set of annual and capital works grants.

To help with the loss of income and additional costs incurred during the transition from their existing, largely sheep-based enterprises to one incorporating traditional upland cattle breeds which take longer to bring to market and require the development of premium beef markets to maximise income, the participants were provided with a transition payment. This was covered by means of a "Limestone Country" Wildlife Enhancement Scheme agreement which specified breed type and stocking rates/calendar and was provided on an area basis of £30/ha. An element of covering interim costs is essential when asking farmers to change practices/management quickly within a few months or even a few years.

To assist with the management of hardy cattle on remote sites an additional set payment of £750 per agreement was paid to cover additional management costs. This payment covered the costs of visiting and inspecting cattle that had been introduced under the project onto the more remote pastures and to ensure that animal welfare was maintained and also that the land was being managed appropriately.

The most significant funding was a capital grant to help with the purchase costs of cattle. The maximum contribution under the project was 50% of additional costs of the animals when there was a replacement of existing cattle with native breeds and 75% of additional costs where cattle were being bought to replace sheep. Additional costs meant the differential between selling existing stock and buying new stock. The maximum grant available was £10,000.

In addition, capital grants were paid to cover the costs of adapting infrastructure and providing or adapting cattle handling facilities, stock protection and provision of water supply. The Project aimed to reduce the number of slat and slurry based housing systems in the area and also did not wish to return to winter housing that involved cattle being tied up all winter. The Project, therefore, supported housing based on loose house systems with straw bedded pens. There were additional costs on agreement holders in this respect and the project provided annual grants towards the purchase of straw. The estimated cost per animal was £20 and was reviewed each year.

The proportion of the overall payment rate that related to income foregone varied across the farms depending on the number of cattle purchased and payments to cover infrastructure costs. The proportion of the overall payment relating to income foregone was on average lower than a standard AES due to the significant capital payments offered as a result of the EU funding.

Additional on-going costs. MCA Scores: -1 unweighted & -1 weighted

There were some on-going additional costs for participants related to attending project meetings and assisting with monitoring work, but these were considered relatively small.

Participation transaction costs. MCA Scores: 0 unweighted & 0 weighted

The participants' transaction costs are reported to be cost neutral relative to a standard AES approach. The LCP made it easier for the participants to enter agri-environment schemes by drawing up whole farm plans and helping with AES applications. The LCP also saved the participants from having to pay for independent advice. However, the project participants also attended more meetings, particularly on the marketing side with regular monthly meetings of the beef marketing group. Marketing of the beef was not allowed under the EU life project and so the farmers attended meetings arranged by themselves or external parties – this was not arranged as a key element of LCP but was encouraged as it was key to the success and sustainability of the management.

Criteria 4: Social and human capital
MCA Scores: 3 unweighted & 2 weighted

Local / community engagement: MCA Scores. 3 unweighted & 2 weighted

The scheme was initiated from the top-down, with English Nature and the Yorkshire Dales National Park Authority identifying the priority area and applying for EU Life funding. However, whilst the local community were not involved in the design of the project, the development of the farm plans were undertaken in conjunction with the farmers. The process involved a two-way dialogue between the project and farmers. The Project Officer would produce the plans with the farmers which the Technical Working Group would then consider and approve. A certain amount of flexibility was required and the process involved some compromise on both sides. This partnership working was the main element to the success of the project and it outcomes.

Environmental knowledge and awareness. MCA Scores: 4 unweighted & 3 weighted

There was a significant increase in the project participant's environmental knowledge and awareness. Prior to the project they knew little about the species of wildlife on their farm. The Project Officer took participants over their land and showed them the flora. The project involved a much better dialogue and working relationship with the Project Officer than with a standard AES. They were far more aware of the reasons for their management actions than would have been the case for a standard AES.

Farmer co-operation. MCA Scores: 1 unweighted & 1 weighted

There was no requirement for participants to work together to manage their land within the project, although some level of co-operation between the participants would have already existed through jointly managing grazing on commons. Others, however, had never spoken to each other before. Some co-operation between participants was required for a marketing element of the project, although this was not a key element to the project as discussed above. The project paid for advisors to work with the participants to identify markets and to promote the brand. Farmers were constantly being requested by local markets/butchers for their beef but lack of continual support and the project ending just as a premium product had been developed led to the breakdown of these offers being developed/greater co-operation being agreed. It was mainly due to bad timing and no single form/contact to drive it forward. There are currently just four participants who are marketing the Limestone Country Beef brand through the local butcher and two others who operate box schemes.

Limitations of the approach

The less successful aspect of the project was the beef marketing element and the attempt to promote Limestone Country Beef as a brand. This was not a key element of the project due to limited funding and restrictions on the EU life project. Marketing required an in-depth knowledge of meat processing and marketing which the project team did not possess. The funding for the project was conservation based and the project was an environmental project not a marketing scheme. The number and variety of breeds introduced made marketing difficult as a consistency of carcass was hard to achieve. Also the farmers involved only finished 100 cattle a year which meant that the marketing initiative could only be small scale. As a result, there were insufficient resources to employ administrative or marketing assistance and the farmers had to do these tasks themselves whilst also farming. There were constant requests from local markets and butchers for the beef but lack of continual support and the project ending at the crucial time when they had just developed a premium

product led to the breakdown of these offers being developed or greater co-operation being agreed. In order to have developed the marketing side of the project, to enable premium prices for the products, the project really needed a marketing officer to focus on this aspect of the project.

Achievements of the approach

A major achievement was bringing about a change in farming systems across the landscape by re-introducing cattle grazing. It brought about a change in mindset and sowed the seeds of the possibility of re-introducing cattle grazing to the area. The project was also successful in lobbying the Government to introduce a hardy cattle supplement into the Higher Level Stewardship.

Key Lessons

- The targeted project-based approach was effective in achieving a change in farming systems. The key to the success of the Limestone Country Project was providing the right level of funding support to enable farmers to convert from their existing system to one that included cattle grazing. This was achieved through a set of annual and capital works grants. The most significant of these was a capital grant to help with the purchase costs of cattle which was key in contributing to the success of LCP.

- Another success factor in encouraging a change in grazing regimes was building a good working partnership between agreement holders/ applicants/ local community and the project.

- Co-ordinated action between farmers was not part of project objectives and little was achieved in this regard. An attempt was made to introduce a marketing element which required the farmers to work together and to contribute a small amount of money. However, this was largely because the farmers were unwilling to work together. Direct marketing of the conservation grazing product should have been factored in at beginning of the project and project staff with marketing skills employed. Future projects like LCP should be encouraged to build marketing into their projects as it is a key delivery mechanism and essential in projects remaining sustainable once agri-environment or project funding is removed. This is the greatest lesson learnt from LCP.

Transferability to other areas and compatibility with WTO rules and ES objectives

- Provided the right levels of funding and support were available it would be possible to replicate a project such as this in other uplands areas.

- As LCP uses existing AES to underpin the required management there should be no conflict with WTO and EU rules.

4.7 Case Study 5: Sustainable Catchment Management Programme (SCaMP)

This case study was selected to illustrate the use of a public / private partnership approach in delivering co-ordinated action in a target area. As this approach is delivered in conjunction with a standard public AES scheme, rather than as part of its own bespoke scheme, comparing savings and costs against flat rate AES was not always coherent.

Background

The Sustainable Catchment Management Programme (SCaMP), has been developed by the water company, United Utilities (UU) in association with the RSPB. It aims to apply an integrated approach to catchment management in two key areas of United Utilities land, Bowland and the Peak District area. The objectives of SCaMP are to meet Public Service Agreement (PSA) targets for SSSI condition; improve raw water quality and deliver UK Biodiversity Action Plan Targets. UU initially invested more than £15 million over 3 years in SCaMP.

The initial phase of the SCaMP, which ran from 2005 to 2010, aimed to address land management issues negatively affecting both wildlife and water quality on UU owned land by treating the problems at source as opposed to 'end of pipe solutions'. Common problems encountered included air pollution, overgrazing by sheep, historic drainage of internationally important blanket bog, large areas of bare eroding peat and the almost complete loss of native trees from upland cloughs.

To date, whole farm management plans have been developed with help from RSPB, identifying how land can be restored and managed for water and wildlife benefits, but critically retain economically viable farming operations. Plans with the UU tenant farmers and other stakeholders, including OFWAT and DWI, have been agreed and a number of tenants have successfully applied for appropriate agri-environment schemes, such as Higher Level Stewardship (HLS) and English Woodland Grant Scheme for each plan, which has enabled funding of capital works and remuneration for farmers for managing the land during the scheme.

SCaMP 2, which has been running since 2010, covers 57,000 hectares, of which 13,000 is designated as SSSI. It is planning to deliver across the two remaining UU estates (30,000 ha) in the Lake District and West Pennines. The main partners in SCaMP are: United utilities, Natural England, RSPB (advising how land might best be managed), Forestry Commission, Friends of Lake District, Lake District NP, Open Spaces Society (OSS) and farmers.

With over 40 tenant farmers in agri-environment schemes the main targets are:

- Over one million trees planted across nearly 600 hectares in the West Pennines and Lake District catchments
- Over 130 km drainage grips blocked to restore peat hydrology and promote recovery of blanket bog habitats
- Over 3,750 ha of deep peat moorland under restoration or maintenance through Higher Level Stewardship
- Over 2 square kilometres of bare peat to re-vegetate and restore.

UU will be engaging with tenants, regulators and government to promote the SCaMP approach, embarking on habitat restoration (reducing stock numbers and revising stock management, moorland re-wetting, woodland planting); investing in improving farm infrastructure to allow optimum farming practice; monitoring SCaMP's effect on vegetation,

hydrology and water quality to demonstrate the business case for future SCaMP investment; and preparing a SCaMP2 submission to extend the area covered on UU land.

In year 1, UU has produced detailed farm plans for the whole of the SCaMP area with some early agreements with tenants and have established monitoring plans. In year 2, they will be focussing on securing agreement from remaining tenants and starting work on the ground, with a focus on delivering on the ground and monitoring the effect in years 3-5.

The SCaMP catchment management approach has also been extended to land not owned by UU working with the National Trust and Moors for the Future at Kinder and Woodhead with a total value of £5m. Obviously there are also benefits to UU as well, for example it is acknowledged that SCaMP has been a useful brand for UU.

Table 4.6 provides a summary of MCA scores for SCaMP when compared to a standard AES approach.

Table 4.6 Summary of MCA scores for SCaMP

Criterion	**Weights**	**Scores**	**Weighted scores**
1a. Govt upfront implementation costs			
Facilitation and co-ordination	*1.2*	3	*4*
Negotiating contracts	*1.2*	1	*1*
Training and advice	*1.2*	0	*0*
1b. Govt on-going implementation costs			
Additional on-going costs	*1.2*	0	*0*
Monitoring and enforcement	*1.2*	-1	*-1*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	4	*5*
EO Benefit 2 – Buffering	*1.2*	2	*2*
EO Benefit 3 – Connectivity	*1.2*	0	*0*
EO Benefit 4 – Threshold	*1.2*	2	*2*
3. Participation costs			
Income foregone	*0.8*	1	*1*
Additional costs	*0.8*	0	*0*
Transactions costs	*0.8*	2	*2*
4. Social & human capital			
Community engagement	*0.8*	1	*1*
Environmental knowledge	*0.8*	3	*2*
Farmer cooperation	*0.8*	2	*2*
Total score		**20**	***20***
1a Upfront implementation costs		1	2
1b On-going implementation costs		-1	-1
2 Landscape scale environmental objectives		2	2
3 Participation costs		1	1
4 Social & human capital		2	2

Criteria 1: Costs of implementation
1a. Upfront Government Costs. MCA Scores: 1 unweighted & 2 weighted
1b. Ongoing Additional Costs. MCA Scores: -1 unweighted & -1 weighted

UU's costs are not necessarily greatly increased through the co-ordinated approach because the catchment team would be engaging with tenants anyway; it is part of their ordinary business. So there are no specific costs as far as UU are concerned, and in virtual terms probably not a lot more. UU factors in a 9.5% overhead as part of the overall cost and that covers all anticipated costs from beginning to end. Thus, as far as UU, the delivery body is concerned facilitation and co-ordination is considered to be largely cost neutral. As UU are bearing a significant amount of the engagement costs, in this respect savings to government are positive relative to a standard AES engagement approach.

Costs of negotiating contracts. MCA Scores: 1 unweighted & 1 weighted

Although there are many farms involved, the approach still constitutes separate agreements with individual farms – 'you're not asking farmers to get into the same room and negotiate contracts between themselves. Farmers are only interested in their own farm, even though they are aware that there are discussions with other farmers taking place it doesn't really affect them'. Overall, it was felt that there was no real difference between co-ordinated and standard schemes in terms of negotiating costs, although it was acknowledged that overall costs could be higher in relation to common land. As the project is involved in developing the agreement with the farmer there are savings to the government.

Costs associated with training and advice. MCA Scores: 0 unweighted & 0 weighted

Training and advice is not something that UU are actively doing but could become part of UUs future plans, providing training and information to 3rd parties from 2015 onwards, as part of their general business.

Additional on-going costs: MCA Scores. 0 unweighted & 0 weighted

Once the AES agreements are signed, there are no significant additional on-going costs in implementation. The project has established a national stakeholder group and two local advisory groups, one for each area. The national group meets twice a year and brings together the lead partners with Ofwat, Defra, Natural England and the Environment Agency. This group was seen by United Utilities as particularly valuable in facilitating alignment of SCaMP with the changes to agri-environment schemes that came into effect from 2007.

Costs associated with monitoring/enforcement. MCA Scores: -1 unweighted & -1 weighted

Comprehensive monitoring of the effects of land management changes in terms of water quality, hydrology, habitat and biodiversity will be carried out by consultants through the duration of the programme and the RSPB has been contracted to carry out bird monitoring.

Beyond that, the majority of enforcement is undertaken through the tenancy agreement, so there are no real differences. UU will be updating tenancy agreements and will extend tenancies to cover the HLS period, re-writing the tenancy so that it covers all aspects of the SCaMP agreement.

'NE and the paying agency will do their own checks, but the monitoring will be done by the land agent through the tenancy agreements, as would happen anyway. The only difference is in cases where there is a commons group, but many farmers are already in some kind of

agreement in relation to commons, so this would just be something else to police alongside everything else, not necessarily incurring additional costs'.

Criteria 2: Benefits in terms of meeting landscape scale objectives
MCA Scores: 2 unweighted & 2 weighted

Benefits to managing core sites. MCA Scores: 4 unweighted & 5 weighted

Figures from NE have shown that the amount of land in an unfavourable condition has fallen from 16% to 1.4%, although the real time lag is considered to be more like 30-40 years for long lasting improvements.

'It's not the co-ordination of farmers that is the issue, it's the fact that the landowner (UU) is actively engaged in the process, whereas with individual HLS agreements this isn't the case. This is the real difference, and represents the real benefit of the coordinated approach. Without UU involvement many farmers wouldn't bother because they wouldn't think there was enough in it for them'.

UU have put in a significant amount of money, which has been of benefit to farmers. So the benefit is having the large landowner involved, in this case securing water quality and income benefits for the farmer alongside environmental improvements.

Benefits to buffering a specific site / feature. MCA Scores: 2 unweighted & 2 weighted

Many plans are reported to run into one another, for example have received the benefits of fencing. 'The landowner is looking at the whole area'.

Benefits to connecting habitat. MCA Scores: 0 unweighted & 0 weighted

Although the case study undertakes some grip blocking and tree planting this is not undertaken with the aim of achieved connectivity landscape-scale objectives.

Benefits to meeting threshold levels. MCA Scores: 2 unweighted & 2 weighted

Although the respondent made no comment on this, with 40 land holdings involving 57,000 Ha, some threshold benefits would be expected.

Criteria 3: Participation costs
MCA Scores: 1 unweighted & 1 weighted

Income foregone costs. MCA Scores: 1 unweighted & 1 weighted

The advantage of the co-ordinating scheme is that the farmer's income will be supported financially for the next 10-15 years, more than they otherwise would be. 'SCaMP actually helps the farm business whereas what they get from HLS only offsets the income lost from livestock reductions. It changes depending on market conditions, but the scheme has helped farms to diversify their business and farms are more likely to be profitable through SCaMP than they would be otherwise'.

The project participant interviewed reported that he had to reduce sheep numbers because of the fencing off that was required on the commons. Apart from that, there was no real difference than would have been the case in the single scheme.

Additional on-going costs. MCA Scores: 0 unweighted & 0 weighted

The only real difference is that as well as engaging with NE and FC, participants also have to engage with the landowner (UU), especially during the development/implementation phase. Thus there is more engagement and discussions as a result of being in a coordinated scheme.

At the same time, however, UU has provided land agent advice in relation to the scheme, which reduces the cost burden on the farmer. Also the project participant interviewed reported some useful cost savings in relation to the fencing off of watercourses on the common land, where UU took care of the consultation and organized all the fencing and planting. This represents an important saving because NE would have wanted the farm to do this anyway, in order to get into the HLS, thus it saved the farmer a lot of time and hassle (and money) because UU took charge of this process

Participation transaction costs. MCA Scores: 2 unweighted & 2 weighted

The burden on agreement holders is reported to be less due to the involvement of the landowner. UU have tried to make it easier for agreement holders, helping them overcome hurdles and with less red tape. It also saves the agreement holders from having to pay for independent advice. Although overall more agreement holder time is needed, this is partially offset by the free advice and time given by UU land agents. The project participant suggested that overall the on-going transaction costs are fairly neutral relative to a standard AES approach. There are problems that the farmer would not have had to deal with if not in SCaMP, such as fencing off watercourses and doing the planting, but at the same time, UU have helped to make things easier in terms of their input into organising work and help with the farm plans etc.

Criteria 4: Social and human capital
MCA Scores: 2 unweighted & 2 weighted

Local / community engagement: MCA Scores. 1 unweighted & 1 weighted

The extent of community engagement varies and although agreement holders are aware that other agreements are being negotiated, they will not necessarily go out of their way to contact other farmers or engage more widely than they would through regular farm business. However, over time UU are beginning to recognise greater interest in SCaMP, and engagement around it in local communities. 'From a community point of view, working at the landscape scale helps to benefit everyone'. From the farmers' perspective, SCaMP has had little impact on community engagement, as neighbours are already well known to each and the scheme has not generated any more engagement than already existed.

Environmental knowledge and awareness. MCA Scores: 3 unweighted & 2 weighted

An improvement in farmer knowledge has certainly been recognised, especially in relation to biodiversity.

Farmer co-operation. MCA Scores: 2 unweighted & 2 weighted

The extent of farmer cooperation varies, and the fact that agreements are individual means that they do not have to co-operate. However, those that do not join straight away can feel like they are missing out and want to get involved.

According to the farmer, the only example of where the scheme has promoted more co-operation has been in relation to the common land, where a lakeside had to be fenced off and planted. The commons association agreed to do this in order to get the commons into the HLS. UU did all of the consultation, and organised all of the fencing and planting etc.

Limitations of the approach

SCaMP is more of a challenge in non-HLS areas; there are currently 53 projects in total, all upland farms. There needs to be enough reasons for the tenant to sign up. Sometimes only farm infrastructure (i.e. roofs, lambing sheds etc) is invested in.

SCaMP 2 is reported to have been a big challenge in respect of securing agreement across partners. There have been many opinions to accommodate in the plan, and many different views to take on board, especially in relation to common land. For example, while the Open Spaces Society (OSS) might like woodland, they dislike fences, but fences need to be erected for new woodland. Getting the different groups to recognise the wider benefits can be difficult. 'Doing anything on commons is very challenging, and once you finally have agreement from all interested parties you then need to get past the Secretary of State!'. That said, the fact that the scheme is in place does mean that community-stakeholder engagement has taken place and a degree of consensus and compromise achieved. These difficulties therefore need to be taken in the overall context of the scheme process.

Advantages of approach

The main benefits for the farm are that outside of the scheme, farms would have had to find all the capital. Some projects have budgets of around £600K. Within SCaMP 2, UU are putting up the capital grant, leaving the tenant to only find 25% of the total cost. Without the involvement of the landowner (UU), the farmer could not do as much. Thus, the main benefit of a co-ordinated approach is involvement of the landowner, which in turn increases the financial value to the farm.

One of the main advantages of a partnership approach is that it gathers its own momentum, and that it has its own brand and its own identity. SCaMP has been a useful brand for UU, and similar schemes could act as brands for other organisations, such as wildlife trusts etc. 'Branding is where you get more bang for your buck, especially with the leverage and support of working with partner organizations. RSPB, in particular, have been very supportive and are very good politically, both at a UK and EU level. Having the RSPB involved has been a major benefit in terms of getting approval within the scheme'.

Key lessons

- The use of private/public partnerships in delivering AES can produce significant costs savings for the government in AES up-front implementation costs.

- The additional payments provided by UU for farm buildings and infrastructure costs were essential in encouraging farmer engagement in the programme.

- Whilst SCaMP has proved effective in achieving AES uptake in a spatially targeted area, it has not tried to develop co-ordinated action between farmers in order to achieve landscape-scale environmental objectives.

Transferability to other areas and compatibility with WTO rules and ES objectives

- Public/private partnership schemes are limited to those areas where there is a user demand for the ecosystem services. In the UK, this has mainly been restricted to areas which can delivery improvements in water quality and quantity for the water companies. In fact, SCaMP has been identified in the Environment Agency's draft River Basin Management Plan for the North West as a model to be extended to other catchments. However, there are also opportunities for other users or beneficiaries of ecosystem services to become involved, such as local residents or insurance companies with an interest in reduced flooding; recreational users with an interest in enhanced recreational opportunities; or landowners with an interest in improving the environmental value of their land, such as the National Trust.

- Payments from private companies are not subject to WTO rules, which restrict payments to income foregone and additional costs. Therefore, UU was able to offer incentive payments in the form of capital grants which could be used in combination with public AES payment.

- Any scheme similar to SCaMP would have to be carefully designed and integrated to reduce any risks of overlap or conflict in the delivery of ES.

4.8 Case Study 7: Ordinance for Ecological Quality (OQE), Switzerland

This case study was selected to illustrate the use of features of an agglomeration bonus payment.

Background

One of the conditions that farmers in Switzerland have to meet to be eligible for direct payments is to establish ecological compensation areas (ECAs) on at least 7% of their agricultural production land. Ecological compensation areas include species-rich, extensively farmed meadows and pastures, hay meadows, flower fallow and rotational fallow, standard fruit trees, hedgerows, field coppices or woody banks along watercourses. Concerns arose that as ECAs were not outcome-orientated, farmers often registered areas that were already extensively farmed and where the loss of yield was least, and not the areas that were of greatest value for protecting threatened species. In order to target the desired objectives more specifically, a new federal ordinance, the Ordinance on the regional promotion of the quality and connectivity of ecological compensation areas in agriculture (Ordinance on Ecological Quality – OQE) was enacted in 2001 which aims to promote the connectivity of the ECAs and improve their biological quality. The aim is to use target or reference species typical for the region to connect remaining populations that have become isolated. In the case of meadows, for example, quality evaluation is carried out on the basis of indicator plants. For other types of habitat, additional criteria are also used; for example, for hedges they include structure, minimum width, origins of species, management. More specifically, the networks are used to:

- to provide flora and fauna with the essential resources (food, shelter, sites of reproduction, etc) to achieve their life cycle;
- to allow the wildlife to carry out their seasonal migrations; and
- to ensure the dispersion of fauna and flora. Dispersion makes it possible to colonize new areas and to reproduce with individuals from other populations, thus ensuring genetic mixing necessary for the long term survival of the populations.

The OQE operates at the canton level[15] and the Confederation has established minimal requirements for implementation of OQE, from which the cantons are given considerable room to manoeuvre to work out their own cantonal directives based on their regional characteristics. These directives specify the type of ECAs that would maximise the biodiversity potential in the local area and the conditions that the project must meet. The financing is jointly provided by the Confederation (80%) and by the cantons (20%). The minimum requirements of the Confederation regarding the connection of ECAs to an ecological network are as follows:

1. Objectives:
a) The objectives with respect to the promotion of floristic and faunal diversity should be defined. They are based on national, regional or local inventories or on published documents, objectives or scientific models, and take into account the specific development potential of the flora and fauna in the region concerned.

[15] There are 26 cantons in Switzerland. They operate at the lowest administrative level and each canton has its own constitution, legislature, government and courts. The Swiss Federal Constitution declares the cantons to be sovereign to the extent their sovereignty is not limited by federal law. They are responsible for healthcare, welfare, law enforcement and public education; they also retain the power of taxation. Communes, also known as municipalities, are the smallest government division in Switzerland, ranging from a population of a few hundred to large cities. Each canton defines the responsibilities of its constituent communes and the degree of centralization varies from one canton to another.

b) Areas should be developed in particular:
   1. along watercourses;
   2. along forests;
   3. as an extension of existing ecological compensation areas and nature conservation areas.

c) Synergies with projects for the conservation of natural resources and landscape planning projects should be used.

2. Procedure to be followed

a) A boundary is defined and drawn on a map. The map shows the baseline situation of the various landscape elements.

b) The final state of development of the ECAs should be drawn on a map.

c) This implementation map should show:
   1. the objectives with respect to implementation;
   2. the intermediate steps;
   3. measures required in order to achieve these objectives.

Projects and payments vary depending on the criteria set by the Canton. The average size of a project is 50-60 farmers, although they can be much larger. It is recommended that an ideal size for a network project from an administrative point of view would range from 500 to 1,000 ha.

There are 3 levels of payment which are cumulative:

- A basic payments for ECAs;
- An OQE payment for undertaking management practices that provide additional quality; and
- An OQE payment for participation in a network project

To qualify for the OQE network project payment, farmers must come together within a project to offer improved connectivity of habitats or species. The project is outcome-orientated and farmers have to focus on choosing a set of species that is characteristic of the region, or a habitat that has the potential for improvement.

The projects are run at a communal level, sometimes with several communes involved in one project. In terms of achieving connectivity, the approach is reported to have been very effective. The complete coverage is not known, but it is thought that all cantons participate. Most have established criteria for the establishment of network projects in their canton. In a short space of time, OQE payments have brought extensive network and biological enhancement of species-rich meadows and pastureland that had become endangered by intensive farming and abandonment of pastures, particularly in the mountain regions.

Table 4.7 provides a summary of the MCA scores for OQE when compared to a standard AES such as the basic ECA payments.

Table 4.7 Summary of MCA scores for OQE

Criteria	Weight	Scores	Weighted scores
1a. Government upfront implementation costs			
Facilitation and co-ordination	*1.2*	-1	*-1*
Negotiating contracts	*1.2*	-1	*-1*
Training and advice	*1.2*	0	*0*
1b. Government on-going implementation costs			
Additional on-going costs	*1.2*	0	*0*
Monitoring and enforcement	*1.2*	-1	*-1*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	1	*1*
EO Benefit 2 – Buffering	*1.2*	0	*0*
EO Benefit 3 – Connectivity	*1.2*	5	*6*
EO Benefit 4 – Threshold	*1.2*	3	*4*
3. Farmer participation costs			
Income foregone	*0.8*	-2	*-2*
Additional costs	*0.8*	-1	*-1*
Transactions costs	*0.8*	-4	*-3*
4. Social capital			
Community engagement	*0.8*	5	*4*
Environmental knowledge	*0.8*	3	*2*
Farmer cooperation	*0.8*	3	*2*
Total scores		**10**	***10***
1a. Govt. up-front Implementation costs		-1	-1
1b. Govt. on-going Implementation costs		-1	-1
2. Landscape scale objectives		2	3
3. Participation costs		-2	-2
4. Social capital		4	3

Criteria 1: Costs of implementation
1a. Upfront Government Costs. MCA Scores: -1 unweighted & -1 weighted
1b. Ongoing Additional Costs. MCA Scores: -1 unweighted & -1 weighted

Costs of engagement – facilitation / co-ordination. MCA scores: -1 unweighted & -1 weighted

At a national level, the OQE requires very little co-ordination and there is only one person employed in the Confederation to deal with OQE. However, additional costs may arise due to the need for an analysis of the region to identify the environmental priorities and target species that are characteristic of the region.

A project can either be initiated by a farmers group, a commune, an environmental association or a canton. Often the impetus for an OQE project comes from a lead farmer in the commune, who then tries to engage others in the idea by convincing them of the economic benefits. Sometimes it is the extension services or an environmental organisation in the canton who promotes the idea of a project to the farmers. If the canton is involved in initiating the project then there may be additional government costs associated with organising meetings. Also Cantons may incur some initial costs from the research required to establish the requirements for local network project.

Costs of negotiating contracts. MCA Scores: -1 unweighted & -1 weighted

Each project group member receives an individual contract. The contents of these contracts are similar to the basic ECAs contracts. The main difference is that the OQE contracts contain targets to be achieved. There is a small increase in administrative costs in order to evaluate the projects, but much of the evaluation is delegated to the canton. A small sample of projects is evaluated at the national level to ensure that the appropriate criteria are being met.

Costs associated with training and advice. MCA Scores: 0 unweighted & 0 weighted

The OQE is a bottom up approach that motivates farmers to come together. The Government has little involvement in offering advice or training. However, the farmers are encouraged to seek expert advice from ecologist and agronomists when preparing their project proposals, but the farmers are expected to cover these costs, so there is no additional cost to the government.

Additional on-going costs: MCA Scores. 0 unweighted & 0 weighted

Any on-going costs for the government, once the project has started, are similar to the basic ECAs so this is cost neutral.

Costs associated with monitoring/enforcement. MCA Scores: -1 unweighted & -1 weighted

Compliance monitoring is undertaken by the canton, with only a small sample of monitoring undertaken by the central government agency at the national level. There is no biological monitoring undertaken at the national level as this is undertaken by the cantons. For some cantons this is a considerable investment, whilst others do no monitoring. Thus there is a small increase in monitoring/enforcement costs which is borne by the Cantons.

Any penalties for non-compliance are levied on individual farmers, rather than the project. It is in the interest of farmers to ensure that the goals are met to enable the project to continue for a further 6 years.

Criteria 2: Benefits in terms of meeting landscape scale objectives
MCA Scores: 2 unweighted & 3 weighted

Benefits to connecting habitat. MCA Scores: 5 unweighted & 6 weighted

The main environmental objective of OQE is to optimize the effect of ECAs on biodiversity by creating ecological networks. The aim is to link up existing ECAs to enable dispersion of flora and fauna and to ensure the survival of meta populations.

In terms of achieving connectivity, the approach is thought to have been highly effective, particularly in the mountainous regions. The complete coverage is not known, but it is thought that all cantons participate and most have devised mechanisms which enable the establishment of projects in a comprehensive way.

Benefits to meeting threshold levels. MCA Scores: 3 unweighted & 4 weighted

Improving species threshold levels is another objective of OQE. The networks are designed with the aim of providing animals and plants the essential resources (food, shelters, sites of reproduction, etc) to achieve their life cycle. OQE requires a definition of a boundary for the project and the cantonal directives identify the minimum size for a project area. These are based on the minimal space required for the selected target species, the number, size and the type of natural or semi-natural habitats in the area and the possibility of connecting them and the location of the existing ECAs managed by farmers in the project.

Benefits to managing core sites. MCA Scores: 1 unweighted & 1 weighted

Although the protection of cores sites is not a specific objective of OQE, which is more concerned with connectivity and linking up existing ECAs, the projects do have an impact on ensuring continued environmental management of core sites.

Criteria 3: Participation costs
MCA Scores: -2 unweighted & -2 weighted

Income foregone costs. MCA Scores: -2 unweighted & -2 weighted

It was suggested that the payments offered are not based on income foregone. The Confederation does not like to give the impression that farmers are losing something by participating, rather that they are being paid for the services that they deliver.

There are 3 levels of payment, which are cumulative:

- Basic level payment for ecological compensation area. Payments will depend on the area, but for extensive meadows (Lowlands) the payment is CHF 1,500/ha[16]
- Payment for quality (OQE) - requirement to meet more demanding criteria, such as achieving 6 species on a list - payment CHF 1,000/ha[17]
- Payment for connectivity in a project (OQE) - CHF 1,000/ha.

Thus, the OQE payment is an additional cost for the Confederation which is paid in addition to the basic ECA payment. Twenty percent of the payment is covered by the Canton and 80% by the Confederation.

Additional on-going costs. MCA Scores: -1 unweighted & -1 weighted

There are few additional costs incurred by the farmer during the 6 year agreement. Once the project is running the farmers are encouraged to continue a dialogue with each other and to meet to exchange ideas and management practices, but this does not always happen if the farmers are not interested.

Participation transaction costs. MCA Scores: -4 unweighted & -3 weighted

No finance is provided by the Government for the development of the OQE project proposals. These are either solely financed by the farmer or jointly financed by the farmers and cantons. Sometimes financial support and technical assistance is provided by local environmental organisations. Usually farmers pay into a pot which is used to develop the project proposal. This sum is often the equivalent of the projects first year's remuneration.

[16] £1,038/ha
[17] £692/ha

Transaction costs can be quite substantial as the projects are required to seek professional advice from an ecologist and agronomist when developing their proposals. It is recommended that these professionals draft the proposal. The ecologist is required to analyse the baseline situation, choose the target species and establish the objectives and measurements for the project. The knowledge of an agronomist is required to ensure that the proposed measures can be adapted to the conditions and constraints of the local farming systems.

The farmer's time commitment is minimal. They may be required to attend two commune meetings at the development stage of the project and attend a farm visit from the experts. They are not specifically involved in drawing up the project proposal.

Criteria 4: Social and human capital
MCA Scores: 3 unweighted & 3 weighted

Local / community engagement: MCA Scores. 5 unweighted & 4 weighted

The OQE network projects incorporate a much higher level of community engagement compared to the basic ECA. These projects are designed to incorporate a bottom-up approach and operate at the commune level which is the lowest institutional level in Switzerland. The 26 Cantons are given the freedom to identify the environmental priorities for their locality. This includes identifying the species that are characteristic of the local area and the minimal requirements for size of area and the number of farmers involved. Most projects are developed at the level of a commune, although sometimes several communes join together for a project.

The OQE guidelines encourage that at the start of the project all the people who may be interested in the project are brought together, which may include:

- Farmer groups
- Representatives of the commune
- Environmental organisations
- Agricultural advisers
- Local naturalists, etc.

Environmental knowledge and awareness. MCA Scores: 3 unweighted & 2 weighted

Increased environmental knowledge and awareness is considered a significant outcome of the OQE network projects. Participating farmers have a much greater knowledge and awareness of the biodiversity in their region and a greater awareness of the activities that other farmers are undertaking to benefit the environment.

Farmer co-operation. MCA Scores: 3 unweighted & 2 weighted

The network projects do create more farmer co-operation compared to ECAs, particularly for biodiversity management. However, it was suggested that evidence of increased co-operation in other areas of environmental management, such as water management was less convincing.

Limitations of the approach

It was suggested that one of the main limitations of the approach is a need for good baseline data and knowledge about the current biodiversity in each area. This is required because of

the outcome-orientated nature of the project which requires a focus on a set of species that is characteristic of the region, or habitats that have the potential for improvement. The OQE policy was initially implemented before this information was available. As a result farmers had poor knowledge of the areas to prioritise and the project proposals submitted were of poor quality or were simply standard proposals that were 'copied and pasted' from others. This information needs to be available in order to define the targets at a local level. A bottom-up process is then used to decide the most appropriate management practices to enhance the target species.

Advantages of approach

The main advantage of the OQE network project is that it has enabled strategic establishment of ECAs in order to improve connectivity of habitats across commune areas. It gives a value to areas that were not considered valuable and has also halted the decline in the environmental quality of these areas.

Key lessons

- From a central Government perspective, additional transaction and on-going costs from implementing this scheme are minimal relative to a standard AES. However, some additional implementation costs are borne by the Cantons such as costs for monitoring and enforcement.

- Much of the onus is on farmers to find the funding to develop their network project proposals. Often this takes the form of the first year's scheme payment. The main costs are upfront with little requirement for on-going participation costs once the scheme is in operation.

- A broad framework is provided at national level, but the scheme is operationalised at the lowest administrative level, a canton. The cantons decide on the priority target species, and the minimum requirements for size of area and number of land managers involved.

- The OQE payments have proved extremely effective in achieving connectivity and the linking of habitats.

- The aim of the OQE payment is to use target or reference species typical for the local area to connect remaining populations that have become isolated. This requires good baseline data in order to help the cantons identify the key species that are characteristic of the local area, or habitats that have the potential for improvement through connectivity.

Transferability to other areas and compatibility with WTO and EU rules and ES objectives

- The OQE payment rate offered is in excess of payments currently offered in England, although a proportion of this payment (c. 17% i.e. first year's payment) will contribute towards the transaction costs of developing the network project proposal.

- If the incentive payments were sufficient, it would be possible to adopt this approach in England in areas where the connectivity of existing ES agreements is required. However, it is unlikely that the level of payments would match those offered in Switzerland to stay within the WTO green box.

- There is a need for good baseline data in order to identify target species and priority networks. England should hold sufficient environmental data at the local level to identify these target species and priority networks.

- There is a much stronger tradition of co-operation between landholders in Switzerland compared to England. This might hamper the creation of mutually supportive groups to develop such network project proposals.

4.9 Case Study 7: Northeim Project (NP), Germany

This case study was selected to illustrate the use of a geographically targeted auction. The project also relies on the use of local community involvement through a Regional Advisory Board.

Background

In 2003, a transdisciplinary project, co-ordinated by the University of Göttingen, was set up in the administrative district of Northeim in Lower Saxony, Germany. This district is dominated by agricultural land-use, covering around 45% of the district area (46,709 and 10,526 ha for arable land and permanent grassland, respectively), and large contiguous forest-covered areas in the hilly regions, comprising around 38% of the district area. Permanent grassland area had declined by around 20% between 1987 and 2007, mainly due to afforestation on the unproductive soils and conversion to arable production.

The Northeim project, which ran from 2003 to 2010, was funded by the Federal Ministry for Education and Research. The overall aim of the project was to increase plant species diversity on grassland and arable land. To achieve this aim, two auctions were run for grassland fields and two for arable fields. There were 3 elements to the project:

Outcome-based payments – Payments were based on achieving a certain number of species and particular indicator species in control plots in the fields. No baseline was set, instead it was at the farmer's discretion to enter the fields into one of 3 quality levels depending on the existing quality of their grassland and whether they intended to maintain or increase species levels in each field. Within the grassland auction three quality levels of species-rich grassland fields were defined. The first level represented the lowest level and required at least eight herb species per 12.6 m^2 in all control plots within the grassland field. The second and third levels corresponded to higher quality of semi-natural grasslands and were defined by comprising at least eight herb species and a particular predefined number of target species from a species list. Within the arable scheme, farmers received payments for their arable fields only if a conservation threshold of ten different arable plant species assessed in plots of 100 m^2 was achieved. The establishment of three quality grassland levels was expected to increase participation of farmers as plant diversity varies widely according to individual management and site conditions. Also providing different quality levels within the payment scheme gave farmers financial incentives to improve the quality of their grassland fields.

Auction process - A discriminative-price auction was implemented in which farmers in the Northeim District bid competitively for conservation contracts within a limited budget. Farmers submitted a sealed bid price per hectare separately for each grassland/arable site. They ranked the fields according to the quality levels and submitted bids per hectare for each of the fields based on their individual costs. Based on a fixed budget for each ecological good, bid prices per hectare were accepted from the lowest bid upwards until the budget was exhausted.

Regional Advisory Board – At the centre of the project was a Regional Advisory Board that consisted of local representatives of government agencies, nature conservation and farmers groups. They defined and expressed the demand for environmental services and identified the environmental services that were to be addressed by the conservation auction.

Table 4.8 provides a summary of the MCA scores for the Northeim project when compared to a standard flat-rate AES.

Table 4.8 Summary of MCA scores for Northeim project

Criterion	Weights	Scores	Weighted scores
1a. Government upfront implementation costs			
Facilitation and co-ordination	*1.2*	-3	*-4*
Negotiating contracts	*1.2*	0	*0*
Training and advice	*1.2*	-1	*-1*
1b. Government on-going implementation costs			
Additional on-going costs	*1.2*	-1	*-1*
Monitoring and enforcement	*1.2*	-2	*-2*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	4	*5*
EO Benefit 2 – Buffering	*1.2*	0	*0*
EO Benefit 3 – Connectivity	*1.2*	0	*0*
EO Benefit 4 – Threshold	*1.2*	2	*2*
3. Farmer participation costs			
Income foregone	*0.8*	3	*2*
Additional costs	*0.8*	0	*0*
Transactions costs	*0.8*	-1	*-1*
4. Social & human capital			
Community engagement	*0.8*	5	*4*
Environmental knowledge	*0.8*	5	*4*
Farmer cooperation	*0.8*	0	*0*
Total score		**11**	***8***
1a Upfront implementation costs		-1	-2
1b On-going implementation costs		-2	-2
2 Landscape scale environmental objectives		2	2
3 Participation costs		1	1
4 Social & human capital		3	3

Criteria 1: Costs of implementation
1a. Upfront Government Costs. MCA Scores: -1 unweighted & -2 weighted
1b. Ongoing Additional Costs. MCA Scores: -2 unweighted & -2 weighted

Costs of engagement – facilitation / co-ordination. MCA scores: -3 unweighted & -4 weighted

The University researchers were responsible for designing and implementing the tender process and facilitating the Regional Advisory Board meetings. Whilst the researchers in the project were paid for their input, two members of the research team volunteered their time for organising and facilitating the Regional Board meetings. This involved arranging meetings 3 times a year, organising the venue and compiling the agenda.

To inform interested farmers about the novel outcome-based payment scheme, three public information meetings were held to provide details about the basic procedure and the

necessary documents. In addition, a booklet with coloured photographs and short descriptions of the indicator species was compiled and given to the farmers.

The project was ambitious in its scope, comprising outcome-based payments, a tender process and a Regional Advisory Board and as such the approach was likely to have cost more to co-ordinate than a standard, flat-rate AES.

Costs of negotiating contracts. MCA Scores: 0 unweighted & 0 weighted

It was hoped that with an outcome-based payment the administrative process would be more efficient, easier to implement and more transparent than a standard AES. However, it transpired that the tender process generated a significant amount of paperwork. Applications needed to be very detailed, providing a description of each plot, including the size and location. This information then had to be fed into a database for verification. The process was thought to require the same amount of time and effort as a standard, flat rate AES payment.

Costs associated with training and advice. MCA Scores: -1 unweighted & -1 weighted

The researchers organised training field days with interested farmers to give them experience of ranking their grassland sites according to the ecological goods. This enabled the farmers to identify and monitor the occurrence of indicator species.

The researchers undertook the compliance monitoring for this project, however, if regular enforcement staff were to conduct the monitoring themselves, they may be unfamiliar with the plant diversity and would require training to improve their knowledge in order to ensure that their assessment of the plant species present was unambiguous. However, this would be a one-off cost, as once trained no further training would be required.

Additional on-going costs: MCA Scores. -1 unweighted & -1 weighted

A small amount of on-going facilitation was required, particularly to facilitate the Regional Advisory Board which met three times a year. However, there were few other additional on-going costs once the scheme was running.

Costs associated with monitoring/enforcement. MCA Scores: -2 unweighted & -2 weighted

The monitoring of the project was undertaken by the researchers, rather than the public authority. At the end of the contract period, compliance with the requirements was monitored through on-the-spot inspections. Indicator species were sampled in control plots with a radius of 2 m. The number of control plots was dependent on the total size of the field, but a minimum of 3 per field was required. In the inspection period of the first grassland auction, 137 out of 159 accepted bids were checked for compliance. This high number of checks was undertaken for scientific reasons and is a higher number than would be required for mainstream scheme. In total, 643 inspection plots were sampled. In the second auction, 116 out of 164 accepted grassland sites (71%) were checked for compliance.

As part of the compliance process rules need to be devised in the event of a grassland plot failing to meet targets due to external factors outside the farmer's control, such as adverse weather conditions. In the event of non-compliance the penalty process is less complex than a standard payment schemes. If indicator species are not present then the farmer is just not paid, rather than having to return the money.

There were a number of repeated monitoring visits, with return visits some 3-4 months later if the species were not present during the first visit. Although with some standard schemes repeated visits are also required, overall, the compliance checks for this project would have incurred greater costs than those associated with monitoring a standard AES.

Criteria 2: Benefits in terms of meeting landscape scale objectives
MCA Scores: 2 unweighted & 2 weighted

Benefits to managing core sites. MCA Scores: 4 unweighted & 5 weighted

The environmental objectives of the Northeim project were focused on improving the species diversity of grassland and arable fields areas across the district, there was no specific spatial targeting of the project. In total for the grassland auction, 40 farmers submitted 475 bids. Due to budget constraints, only 323 offers could be accepted in both auctions resulting in an area under contract of 289 and 239 hectares in 2004 and 2006, respectively. Outcomes were measured by recording the number of specific vascular plants in each control plot in the field. In addition, the total number of herb species per control plot was used as a simple indicator for grassland fields of high biodiversity value. On-the-spot inspections revealed that 85% of the grassland sites in the first auction complied with requirements, while 20 grassland sites were not rewarded. Only 10% of the grassland sites in the second auction did not fulfil the requirements and all grassland sites assigned to Level 3 met the predefined floristic criteria. In the first arable auction, 12 farmers participated and submitted a total of 26 bids. These bids comprised a total area of 43 ha. Eleven farmers participated in the second auction, submitting 48 bids in total. These bids comprised an area of 94 ha. Within the arable auctions, monitoring of participating fields revealed that 73% and 90% of the bids were successful in achieving the defined service threshold in the first and second auctions, respectively.

The amount of land signed to the outcome-based agreement within the short timeframe was considered a major achievement. Also as farmers were only paid if the outcomes were achieved, the scheme was thought to ensure a higher degree of ecological effectiveness compared to a standard AES.

Benefits to meeting threshold levels. MCA Scores: 2 unweighted & 2 weighted

The Northeim Project was focused on achieving plant species diversity of grassland and arable land and outcomes based on producing certain indicator species. Therefore achieving species threshold levels was a consideration of the project

Criteria 3: Participation costs
MCA Scores: 1 unweighted & 1 weighted

Income foregone costs. MCA Scores: 3 unweighted & 2 weighted

In the first grassland auction, a total of 159 bids from 28 farmers were contracted and bids summed up to €29,463.2 comprising a total area of 288.6 ha. In the second auction a total of 164 bids from 21 farmers were contracted. A total area of 238.5 ha was taken under contract with a total bid sum of €25,880.6. In the first arable auction all 12 bids accepted and mean bid price was €478/ha. In this auction, the pool of bidders (farmers) and consequently competition was evidently insufficient. The high available budget and lack of a previously set reserve price meant extremely high bid prices had to be accepted. In the second arable auction the number of bids was higher and thus competition between bids

occurred and bids had to be rejected, resulting in a lower mean bid price of €422. Opportunity costs were mainly associated with reduced crop yields on PES fields, which accounted for 65% of overall opportunity costs and also differed widely among farmers.

It was suggested that a high proportion of the payment related to opportunity costs or income foregone as the bids submitted were based on the farmer's assessment of the costs involved in achieving the required outcomes. However, it was also reported that farmers did not always know their opportunity costs and particularly in the case of the arable auction there was evidence that bid prices were often overestimated. It was suggested that bid prices were also strongly influenced by other factors than just opportunity costs, such as low participation rates, farmers' profit expectations, risk preferences or former experiences with AES. However, overall, it was suggested that the bid prices were lower than a standard AES, representing a saving.

Participation transaction costs. MCA Scores: -1 unweighted & -1 weighted

The farmer's transaction costs in relation to the Northeim project incorporated the acquisition of tender documents, the provision of information concerning the auction, the selection as well as classification of the sites to be offered, the calculation of the bid prices and completion of the form. Whilst some of these transaction costs would be incurred for a standard AES, it was suggested that an additional transaction cost related to the assessment of the grassland/arable fields for suitability for inclusion in scheme. Some farmers already possessed the knowledge to make this assessment, so there were few costs involved, however others paid for botanists to give an overview as to whether the field was suitable for participation. Generally, farmers had good awareness of the environmental value of their grassland fields. However, with the arable auction which was concerned with outcomes from reducing herbicides to encourage arable weeds, the farmers were less familiar with the required outcomes and needed more help and advice to make their assessment.

A survey of participants provided a breakdown of the farmers' transaction costs. There were large variations in transaction costs recorded. For some they simply acquired the relevant information with a brief phone call or email, whilst others attended meetings. Also there were variations in the number of bids submitted by each as a separate bid had to be prepared for each grassland site.

Table 1. Main results of the first survey (auction 2004/2005)

	Min	Max	Mean	Median	SD	Farmers
Acquisition (in minutes)	2	200	31.33	15	47.36	27
Reading (in minutes)	10	100	39.48	30	21.93	29
Calculation (in minutes)	5	400	90.71	55	10.48	28
Filling in (in minutes)	10	300	77.50	60	6.27	28
Hourly wage (in €)	10	25	16.76	15	5.39	21

(Source: Groth 2008)

Table 2. Farmers' transaction costs as proportion of bid sums

	1st auction (2004/2005)		2nd auction (2006)	
	Mean	Median	Mean	Median
Grassland I	9.1%	7.2%	4.5%	5.6%
Grassland II	6.5%	4.6%	3.3%	3.6%
Grassland III	4.0%	5.9%	2.1%	1.7%
Transaction	67.72	40.00	57.75	46.67

costs per farmer €				
Transaction costs per bid €	14.26	8.42	5.84	5.53

(Source: Groth, 2008)

These results show a relatively low level of transaction costs for all ecological goods. The transaction costs also decreased from the first to the second auction which suggests a potential for repeated auctions to reduce transaction costs.

It was suggested that overall the farmers' transaction costs are likely to be slightly higher than a standard AES because of the need to select and classify the fields to be entered into the scheme. It was also suggested that the farmers' private transaction costs may be accounted for in the bid price.

Criteria 4: Social and human capital
MCA Scores: 3 unweighted & 3 weighted

Local / community engagement: MCA Scores. 5 unweighted & 4 weighted

The Northeim project incorporated more of a bottom-up approach and a much higher level of local engagement compared to a standard AES. This was achieved through a Regional Advisory Board which was comprised of local representatives of government agencies, nature conservation and farmers groups. The constitutional basis of the board guaranteed that local experts on environmental and agricultural issues brought their knowledge about specific regional problems and needs into the project decision processes. This meant that the ecological aims of the project were more likely to better adapted to local conditions than would be the case with a standard AES. The Board made decisions on the design and implementation of scheme and how the money should be spent. For example, should payments be evenly distributed between the 3 grassland quality levels or more spent on higher levels? The Board were not involved and had no desire to be involved in the bid selection process.

Environmental knowledge and awareness. MCA Scores: 5 unweighted & 4 weighted

Increased environmental knowledge and awareness was considered a major achievement of the outcome-based payment approach compared to the standard, flat-rate AES payment. Due to the outcome-based payments participants were considerably more aware of the value of biodiversity. They also proactively tried to obtain more knowledge about appropriate management practices to ensure that indicator species were achieved.

Farmer co-operation. MCA Scores: 0 unweighted & 0 weighted

The length of the scheme was limited to 2 years, which was too short a timeframe to lead to any farmer co-operation. The project was seen as an interesting trial but not a good basis to achieve co-operation. However, it was suggested that the approach had the potential to work with farmer co-operatives or farmer groups.

Limitations of the approach

It was suggested that the main limitation of the approach was the difficulties encountered in devising appropriate rules in the event that a participant failed to meet their outcome targets. Farmers are exposed to production risks due to uncertain events such as droughts or floods

that may impact on the outcome of ecological goods To overcome any difficulties it was important that participants were clearly made aware of the rules and that the responsibilities for devising the rules were shared with the Regional Board. The government authorities have not adopted the approach as they believe it will create a lot of additional work. However, the outcome-based payment element of the project has been rolled out in other regional AES.

Advantages of approach

The farmers liked the outcome-based payment approach delivered through an auction mechanism as evidenced by the good take up of 30-40 farmers a year. The approach resonated well with their business experiences and meant that the environmental organisations were talking to the farmers like any other buyer or supplier. They also valued being allowed to implement their own ideas as to how to achieve the required levels of biodiversity.

Key lessons

- A key success factor was the outcome-orientated nature of scheme which encouraged increased farmer knowledge. Participants actively sort to obtain more knowledge about appropriate management practices to ensure that indicator species were achieved

- Grassland auctions were more cost effective than arable auctions, because the grassland farmers had more knowledge of their opportunity costs of undertaking the requirement management practices. Interviews with arable farmers participating in the auction revealed that they had only limited information about potential costs arising from scheme participation and were unable to calculate a reasonable bid price. To work effectively, farmers need to have knowledge of their opportunities costs of undertaking required management practices.

- The indicator species approach did not always reflect underlying presence of rare species or species covers. For example, a grassland with a low cover of indicators could be given the same value as one with high cover.

- As bid required for each individual field, the administrative burden not reduced as anticipated. In fact the auction process generated as much paperwork as a flat-rate payment scheme.

- The use of Regional Advisory Board ensured that ecological aims were be adapted to local conditions.

- Co-ordinated action between farmers was not one of the aims of the scheme. In fact, the scheme aimed to encourage competition between farmers, rather than co-operation. However, it was felt that if the scheme timeframe was longer it would have been possible to work with individual farmer co-operatives or farmer groups.

Transferability to other areas and compatibility with WTO and EU rules and ES objectives

- It would be possible to incorporate an element of outcome-based payments into ES, although outcomes would need to be easily measureable to reduce monitoring costs.

- As auction bids could be interpreted as reflecting the income foregone costs incurred they could comply with the WTO green box eligibility rules and enable a payment-by-results approach. In contrast, payment-by-results that are based on the value of the outcome and not the cost of delivery would not be eligible.

4.10 Case Study 8: Desert Uplands Landscape Linkage Auction (DULLA), Australia

This case study was selected to illustrate the use of a geographically targeted auction.

Background

Following a successful federally-funded national Market Based Incentives pilot program, the Desert Uplands Landscape Linkage Auction (DULLA) was implemented in Queensland, Australia. The purpose of the auction was to form an east-west biodiversity corridor of native vegetation on beef cattle grazing properties across the landscape. The auction was trialled by a regional Natural Resource Management (NRM) group with assistance from the Central Queensland University in helping to design and implement the auction.

The project area is sparsely populated and characterised by large-scale, extensive cattle ranches. Many of the graziers in the area are resistant to dealing with the Government and few had participated in the existing devolved environmental grants that were available.

The auction applied a multi-round tender mechanism with an assessment metric that assessed the structure and condition of habitat offered in each bid and their connections to protected areas and other bids in the tender. It included a significant weighting (44%) on linkages between bids. Bids were selected in terms of their relative value (metric score/asking price). The tender was run over three bidding rounds to allow land managers to learn about and develop confidence in the bidding process and to provide an opportunity for feedback from each round and to enable land managers to link their bids with their neighbours' bids.

Graziers first registered their interest and then received a visit from a Field Officer who discussed their proposals and provided guidance on the most suitable management actions. The landholders then decided on the most appropriate management to undertake and submitted a bid based on their own estimate of the costs of implementation.

Following the property visits, the three bidding rounds were run in quick succession, about every two weeks. Key elements of the multiple bidding processes were as follows:

- the first-round bids were assessed and land managers were provided with a map indicating the location of all bids offered in the first round; information on the cost-effectiveness of their bid (reported by quartile); and information to assist in enhancing subsequent bids.
- in the second round, land managers had an option to maintain their current bids, or amend their bids to reflect information and feedback from the first round, including options to link their bids with neighbours; and updated feedback was then provided, covering the same issues as the first round.
- in the third round, land managers finalised and submitted formal bids.

A key feature of the multi-round tenders described above is that participants had the opportunity to modify their bids, and submit additional bids, between bidding rounds. After each bidding round they were told what quartile their bid fell in and the location of other bids in the landscape (not the price). This gave them an opportunity to modify their bids to better align with their neighbours to contribute to the targeted spatial configuration, and in so doing, increase their chances of being successful in the tender.

In total, 26 bids were submitted out of a potential of 112 farmers in the area (23%) of which 22 bids were successful. These covered an area of 85 000 ha of remnant vegetation at an average cost of $2/ha/year. Although complete landscape connectivity across the Desert Uplands was not achieved, over 70% of the successful bids, accounting for over 62 000 ha (77% of the total bid area), were part of a group that formed a distinct corridor or landscape linkage with only single or part-property gaps. The results indicated that multiple bidding rounds improved auction efficiency (for the government), although there was little improvement in connectivity. Sixty-six percent more environmental benefit units could be purchased for the given budget of $A 350,000[18] between rounds one and three.

A survey of participants after the auction found that the majority were positive about the auction process and there was little adverse reaction even among the unsuccessful bidders, the majority of whom said they would enter a bid in future schemes.

Table 4.8 provides a summary of the MCA scores for the DULLA case study when compared to a standard flat-rate AES implemented in the region.

Table 4.8 Summary of MCA scores for DULLA

Criterion	Weights	Scores	Weighted scores
1a. Government upfront implementation costs			
Facilitation and co-ordination	*1.2*	-4	*-5*
Negotiating contracts	*1.2*	0	*0*
Training and advice	*1.2*	-1	*-1*
1b. Government on-going implementation costs			
Additional on-going costs	*1.2*	0	*0*
Monitoring and enforcement	*1.2*	-1	*-1*
2. Landscape scale environmental objectives			
EO Benefit 1 - Core Sites	*1.2*	0	*0*
EO Benefit 2 – Buffering	*1.2*	0	*0*
EO Benefit 3 – Connectivity	*1.2*	5	*6*
EO Benefit 4 – Threshold	*1.2*	0	*0*
3. Farmer participation costs			
Income foregone	*0.8*	3	*2*
Additional costs	*0.8*	1	*1*
Transactions costs	*0.8*	0	*0*
4. Social & human capital			
Community engagement	*0.8*	4	*3*
Environmental knowledge	*0.8*	4	*3*
Farmer cooperation	*0.8*	2	*2*
Total score		**13**	***10***
1a Govt upfront implementation costs		-2	-2
1b Govt on-going implementation costs		-1	-1
2 Landscape scale environmental objectives		1	2
3 Participation costs		1	1
4 Social & human capital		3	3

[18] £231,450 (2012 exchange rate)

Criteria 1: Costs of implementation
1a. Upfront Government Costs. MCA Scores: -2 unweighted & -2 weighted
1b. Ongoing Additional Costs. MCA Scores: -1 unweighted & -1 weighted

Costs of engagement – facilitation / co-ordination. MCA scores: -4 unweighted & -5 weighted

The costs of co-ordinating the auction were relatively high compared to a standard devolved environmental grant because there was a low level of knowledge and understanding of the mechanism amongst the NRM managers and the landholders at the beginning. As a result, extra costs were incurred in assisting NRM groups to design, develop, and implement the instrument, and in assisting landholders to formulate their proposals.

The process started with an information and awareness campaign and landholders were encouraged to submit formal expressions of interest. They then received a visit from a Field Officer who had maps of the property and discussed with landholder their options and their favoured management actions. These visits were reviewed very positively by the landholders. The Field Officers sometimes helped with form-filling, as this was a significant barrier to participation for some landholders, although they gave no advice about the pricing of the bid. Throughout the process prices remained confidential as even revealing average prices could have set a precedent for tenders in the future, possibly keeping prices artificially high. It was suggested that ideally the Field Officers should be third party agents as landholders were likely to be more trusting of the process, if it was not run by a Government agency.

It was suggested that the farmers were more willing to adopt the tender process than the NRM groups as they were more familiar with the competitive process. Auctions are an integral part of their business practices (selling cattle) and they like the competitive market situation.

Although the devolved grant process required similar elements of facilitation, including property visits by Field Officers, the costs were thought to be higher for the tender process, partly because of additional information campaign required due to the unfamiliarity with the process. However, these costs would diminish with each respective auction as landholders gained a greater understanding of how they worked. Theoretically, the costs of property visits should be the same as devolved grants, although fewer visits are undertaken with devolved grants.

The total costs for the design and implementation of an auction can range from $A 100,00 – 200,000[19]. The greatest cost related to the design of the assessment metric. This was designed by academics at Central Queensland University. It is particularly important for the metric to be well designed, as a poorly designed one can result in failure of the auction. It cost around $A 10,000[20] to design the simple Desert Upland metric. However, it can be considerably more expensive if they are more complex. The decision was taken to keep the Desert Upland metric simple, thereby increasing transparency and ease of understanding for the landholder so creating more trust in process. However, a balance has to be struck because if the metric is too simple it can lead to strategic bidding, as has occurred with the Conservation Reserve Program in the US. A simple metric can be designed in a week. There are often high expectations as to what a metric can achieve and consequently the design process is often one of negotiation and compromise.

[19] £66,129 - £132,258 (2012 exchange rate)
[20] £6,612 (2012 exchange rate)

This auction design has a one-off upfront cost and for any subsequent auctions the running costs would diminish. Also landholders would have a greater understanding of how the process works so the co-ordination costs would diminish over time. Once the administrative costs of the new mechanism design have been incurred, the operational cost of running a tender are similar to that of a grant scheme

Costs of negotiating contracts. MCA Scores: 0 unweighted & 0 weighted

The contract used for the auction was simple and the same one as used for devolved grants. As such, there were no additional costs in negotiating contracts.

There were three payment points in the contract. An upfront payment (40%) was provided on contract establishment so that landholders who incur high initial costs, such as infrastructure or capital costs, were not disadvantaged or deterred by financial constraints. The remaining funds were performance based, so they could be withheld if required. A further 30% of funds would be paid half way through the contract and the remaining 30% paid before project completion. Having three payment points meant adequate performance checks were in place without excessive demands on additional administration.

Costs associated with training and advice. MCA Scores: -1 unweighted & -1 weighted

As the auction was a new mechanism introduced to the area, a series of workshop were held for NRM staff and Field Officers. This incorporated an auction game which explained how the auction process worked. These were one-off training events and Field Officers on average have attended 3 of these events in order to obtain a good understanding of the process. These workshops were an additional up-front cost compared to devolved grants which and were required because the process was unfamiliar to project staff. These up-front training costs would diminish over time as landholders and Field Officers became more familiar with the process.

Additional on-going costs: MCA Scores. 0 unweighted & 0 weighted

There are no additional on-going costs to implement the project once it is up and running relative to a standard flat-rate environmental grant.

Costs associated with monitoring/enforcement. MCA Scores: -1 unweighted & -1 weighted

The Desert Uplands auction required a specific management option which used grass biomass as an indication of good management. Photographic evidence was used to verify that the minimum land conditions were being met. In addition, grass samples were cut and weighed at the beginning, middle and end of the scheme. Also participants had to submit progress reports prior to the release of future payments. All participants were subject to random audits. As a result this would have incurred slightly higher monitoring costs than the devolved grant schemes, which just required landholders to send in photos of monitoring points. Technically, the level of monitoring should be the same for both schemes, but a criticism of the devolved grant scheme is that there is not more monitoring.

An element of monitoring can be built into the metric. Although this was not done for the Desert Uplands auction it has been incorporated into an auction with sugar cane growers.

Criteria 2: Benefits in terms of meeting landscape scale objectives
MCA Scores: 3 unweighted & 3 weighted

Benefits to managing core sites. MCA Scores: 0 unweighted & 0 weighted

The Desert Uplands Auction was not focused on improving core sites, although auctions could be used for this purpose. It would be necessary to make clear at the outset which landholders were eligible within core sites for a particular scheme.

Benefits to buffering a specific site / feature. MCA Scores: 0 unweighted & 0 weighted

The Desert Uplands Auction was not focused on buffering but it could be possible to use it in this way as long as it was made clear that landholders did not necessarily have to have the targeted species/habitat on their property in order to participate. Providing maps which identify locations of existing habitat patches, and indicate where conservation or other management actions would be most valuable, will assist landholders in deciding whether to engage with a scheme.

Benefits to connecting habitat. MCA Scores: 5 unweighted & 6 weighted

Achieving connectivity was the main environmental objectives of this auction. It was very effective as over 70% of the successful bids, accounting for over 62 000 ha (77%) of the total bid area, were part of a group that formed a distinct corridor or landscape linkage with only single or part-property gaps. Also the auction was successful in engaging some of the more "productionist" farmers who did not normally engage with environmental schemes. Since the two year contract finished in 2008 landholders have not reverted back to their old practices.

Whilst there were areas of block connectivity there were areas of stepping stones, with gaps. The scheme was restricted by the 2 year contracts, but given a longer timeframe it might have been possible to fill in the connectivity gaps. This could have been achieved through individual negotiations and targeted payments to fill in the gaps, but then there is a danger of the process becoming bias and encouraging holdout issues.

Benefits to meeting threshold levels. MCA Scores: 0 unweighted & 0 weighted

Achieving particular thresholds levels was not an objective of the auction, but auctions such as this do have the potential to delivery threshold levels.

Criteria 3: Participation costs
MCA Scores: 1 unweighted & 1 weighted

Income foregone costs. MCA Scores: 3 unweighted & 2 weighted

Most farmers would have submitted their operating costs plus an additional sum to cover transaction costs; this was particularly the case for those who did not like dealing with the Government. They knew at the start that there would be more than one bidding round. This meant they could submit their first bid knowing that they had the option to adjust it in subsequent rounds. As the landholders did not know the market they were unsure about how to play it and in the second round some dropped their bids. Nine of the 22 bidders reduced their bid price in subsequent rounds with an average reduction of 34%. Most of the landholders would not have experienced much production losses as all they were required to do was to modify their stocking rates and the majority already had low stocking rates.

Savings for the government were made relative to a flat-rate grant as the bids more closely reflected the individual landholder's operating costs. It was estimated that the area protected in the auction would have cost 30% more if it has been priced under a fixed price grant scheme.

Fifteen bids were successful and a total of $343,000[21] (at about $2.00[22] per hectare per annum) was distributed to protect and manage a total of almost 85,000 hectares. It was considered cost-effective because the $2.00/ha was less than the indicative figure of $10/ha that the Environmental Protection Agency used in their estimation of the average annual costs of managing national Parks in Queensland.

Additional on-going costs. MCA Scores: 1 unweighted & 1 weighted

A few landholders required some infrastructure changes, such as providing additional fencing and/or watering points. Again the bidding process meant that the actual costs were reflected in the bid compared to a devolved flat rate grant where a standard payment is made. Other than this, there were no other additional on-going costs

Participation transaction costs. MCA Scores: 0 unweighted & 0 weighted

The costs for the landholder to develop varied according to the changes in management practice required to achieve the environmental outcomes. In most cases, the transaction costs would have been similar to those for a devolved grant. The landholder received a visit from the Field Officer who helped with the application; this was particularly appreciated by those who struggled with paperwork. After the first round of bidding they were then sent a map showing the location of other bids and the quartile in which their bid fell and could either retain their bid price or modify it. They were only allowed to modify it downwards, not upwards.

Overall, the landholders accepted the auction process. They liked the accountability and transparency of the process in contrast to devolved grants where applications are approved by committee. In a survey of participating landholders 84% said they would participate in any similar scheme. The main criticism was the issue of multiple bidding as the landholders would have like the whole process to have concluded quicker.

Criteria 4: Social and human capital
MCA Scores: 4 unweighted & 3 weighted

Local / community engagement: MCA Scores. 4 unweighted & 3 weighted

The impetus for implementing the auction to develop a wildlife corridor across the Desert Uplands region was top-down in that it stemmed from the regional NRM group who also had some input into the design of the auction metric. However, the landholders themselves had complete control over the design of the management practices. It was explained that the landholders had to retain a certain amount of grass biomass and they identified the best way to achieve this outcome, by for example modifying stocking rates, or erecting fencing. They had the option of either improving the grass biomass if the existing vegetation fell into Class B or maintaining it if it was classified as Class A.

Environmental knowledge and awareness. MCA Scores: 4 unweighted & 3 weighted

The landholders gained an increase in environmental knowledge and awareness relative to a devolved grant because the process was focussed on outputs rather than prescription-led. The landholders were informed of the outcomes that were of environmental value which led to discussions on the relationship between their farm practices and the environmental outputs.

[21] £223,100 (2012 exchange rate)
[22] £1.30 (2012 exchange rate)

Farmer co-operation. MCA Scores: 2 unweighted & 2 weighted

There was an element of co-operation and more so than a devolved grants, because more points were achieved if the bids were joined with their neighbours. However, they did not share management practices and those who co-operated tended to be those who co-operated anyway. One of the limiting factors in terms of optimising the linkages was the low level of participation.

Limitations of approach

The greatest limitation to the connectivity auction approach engaging the NRM groups. None of the NRM groups in Queensland have continued with the auction process, although they have in other States. They had difficulties mentally adjusting to the auction approach because the use of the metric meant a loss of control over the selection process. The metric meant that the selection was based on environmental outcomes only, and not softer options such as the number of workshops and courses attended. It would be possible to overcome these concerns by introducing extra scores in the metric for 'softer' options, such as courses attended or flora monitoring. However, these options cannot be easily translated into an environmental outcome and it would be better to promote them under a different scheme.

Another potential limitation of the approach is the occurrence of strategic bidding. There was little evidence of this happening in the Desert Upland auction as the landholders did not fully understand how the bids were scored. The more complicated the metric, the harder it is to bid strategically. However, this is one of the criticisms of the US Conservation Reserve Programme where the simple scoring meant it was easy to understand and after a time resulted in strategic bidding which reduced the cost effectiveness of the process.

Advantages of approach

The main advantage of the process is that it appealed to the landholders. They liked the accountability and market competitiveness of the approach as this matched their business experience. The process managed to engage some more "productionist" landholders who would not normally have engaged with environmental schemes. It also led to a cost-effective way of creating a corridor across the landscape, although it was suggested that further auction rounds may have helped to fill in the gaps.

Key lessons

- The DULLA with its assessment criteria focused on linked bids was effective in achieving connectivity. Most of the linked bids were achieved in the first round, with little increase in connectivity in subsequent rounds. However, the use of multiple rounds did result in significantly reduced bids, suggesting an over-estimation of costs in the first rounds.

- The auction approach was liked by the landholders involved as it resonated with their business experiences. It was felt to be more transparent than a standard approach to selecting bids. It proved effective in encouraging farmers to come together, although there was no requirement to share management practices.

- The up-front costs of developing and implementing the auction were high, although they would reduce if the auction was repeated. The greatest cost lies in designing the assessment metric as a good design is crucial to the success of an auction. The

DULLA kept the auction simple in order to ensure transparency and gain the trust of landholders in the process.

- The auction proved effective in identifying payment rates close to income foregone. This is particularly useful in situations where income foregone is difficult to calculate and where heterogeneity of different costs exist.

- More connectivity may have been achieved with a longer scheme. It may have been possible to negotiate agreements with those landholders where there were gaps, although this may have created a situation of 'holdouts'.

- The extent of overall participation was low (23%). The potential for increased connectivity would have been greater if more landholders had participated. It was suggested that the lack of available funding and lack of any previous engagement with environmental schemes meant that participation in the auction was limited. However, more participation may have deterred potential bidders due to perceptions about the reduced potential for success. Also higher participation for a set amount of funding will increase the number of unsuccessful bidders which may have a negative impact on participation rates in future schemes.

Transferability to other areas and compatibility with WTO and EU rules and ES objectives

- Auctions appear to work best in single objective situations, such as DU, where a corridor of native vegetation was required. With multi-objectives schemes, such as ES, the assessment metric would become very complex and costly to design in order to accommodate all the objectives. This complexity would be exacerbated by different landholders including different combinations of management options in their bids. Nevertheless, the incorporation of different combinations of management actions has been achieved in some auctions in Australia. The key is the focus on measuring environmental outcomes. This approach would incur high upfront costs, but would ensure a uniform bid assessment process.

- The auction process requires the measurement of environmental outcomes. Difficulties can occur in measuring successful outcomes, especially if there are multiple scheme objectives. It may be possible to only measure outcomes for some biodiversity features within ES, such vegetation (grass biomass, presence of plant species), rather than for mobile species, such as birds,

- If auctions are applied in spatially targeted areas in order to achieve connectivity there is a risk that the number of potential applicants may fall below the level required to secure sufficient bidding competition. The smaller the group of potential bidders, the lower is the level of bidding competition and the higher the risk of collusion and strategic bidding.

- In England, the auction process would appeal to the more business-minded land managers. Other, more traditional farmers might be culturally resistant to such an approach.

- Auctions would work best where new options are introduced, such as carbon sequestration. The risk of introducing auctions for existing options in ES is that the current fixed payment rates might act as a point of reference in the bidding process, with bids anchored around them.

- As auction bids could be interpreted as reflecting the income foregone costs incurred they could comply with the WTO green box eligibility rules and enable a payment-by-results approach. In contrast, payment-by-results that are based on the value of the outcome and not the cost of delivery would not be eligible.

5 Data Analysis

This section presents the results of the multi-criteria analysis scoring and identifies those case studies that demonstrate the greatest cost-effectiveness in terms of the financial costs and environmental and social capital benefits of delivering co-ordinated action at a landscape scale.

The scores for each cost benefit criteria derived during the case study telephone interviews were collated and entered into a multi-criteria analysis table (Table 5.1). The aim of this analysis was to enable identification of the most cost-effective case studies for delivering co-ordinated action at a landscape-scale. In other words, to identify those approaches which provide the most environmental benefit at a landscape-scale for the least cost to the government and the landholders.

As Table 5.1 reveals, there are two case studies, in particular, that stand-out as having the most cost-effective elements for delivering co-ordinated, landscape scale environmental objectives: Dartmoor Farming Futures and Integrated Local Delivery, both of which exemplify a local engagement approach. However, it should be noted that whilst local engagement may be the main approach used, these case studies include elements from other approaches so it is not possible to single out a specific co-ordination approach as being better than another. Close examination of the scores reveal that these two approaches produce the highest savings for the government in terms of implementation costs and scored highest in their ability to achieve all of the landscape-scale environmental objectives. However, as DFF is pilot, on-going costs were difficult to quantify and may have been underestimated.

It is also useful to examine each criterion in more detail to identify those projects or schemes which have scored highly for particular aspects; this may not be apparent from their overall score. This provides an indication of the key features which contribute to co-ordination. Taking each criterion in turn:

Table 5.1 Multi-criteria analysis cost-effectiveness scores relative to standard AES

Main Criterion / Coordination approach	**Local engagement**		**Collective agreement**	**Spatially targeted project**	**Public/private partnership**	**Agglomeration bonus payment**	**Geographically targeted auction**	
Additional Criteria / Coordination approaches exemplified	**Spatially targeted Collective agreement**				**Spatially targeted**	**Spatially targeted**		**Local engagement**
Case study	**ILD**	**DFF**	**CR**	**LCP**	**SCaMP**	**OQE**	**DULLA**	**NP**
1a. Up-front Implementation costs								
Facilitation and co-ordination	**5**	2	0	-3	3	-1	**-4**	-3
Negotiating contracts	3	2	0	-2	1	-1	0	0
Training and advice	1	-1	0	-2	0	0	-1	-1
All (Mean)	3.0	1.0	0.0	-2.3	1.3	-0.7	-1.7	-1.3
1b. On-going Implementation costs								
Additional facilitation costs	-1	0	-1	-1	0	0	0	-1
Monitoring and enforcement	**4**	**4**	-2	-2	-1	-1	-1	-2
All (Mean)	1.5	2.0	-1.5	-1.5	-0.5	-0.5	-0.5	-1.5
2. Landscape scale objectives								
EO Benefit 1 - Core Sites	4	3	2	**5**	4	1	0	4
EO Benefit 2 – Buffering	4	3	2	0	2	0	0	0
EO Benefit 3 – Connectivity	4	3	2	0	0	**5**	**5**	0
EO Benefit 4 – Threshold	3	4	0	0	2	3	0	2
All (Mean)	3.8	3.3	1.5	1.3	2	2.3	1.3	1.5
3. Participation costs								
Income foregone	2	2	0	1	1	-2	3	3
Additional costs	*0*	*0*	*-2*	*-1*	*0*	-1	1	0
Transactions costs	*2*	*2*	*-2*	*0*	*2*	**-4**	0	-1
All (Mean)	1.3	1.3	-1.3	0.0	1.0	-2.3	1.3	0.7
4. Social capital benefits								
Community engagement	**5**	**5**	**-2**	3	1	**5**	4	**5**
Environmental knowledge	**5**	3	2	4	3	3	4	**5**
Farmer cooperation	3	**5**	2	1	2	3	2	0
All (Mean)	4.3	4.3	0.7	2.7	2.0	3.7	3.3	3.3
Mean scores for all criteria	**2.9**	**2.5**	**0.1**	**0.2**	**1.3**	**0.7**	**0.9**	**0.7**
Total scores for all criteria	***44***	***37***	***1***	***3***	***20***	***10***	***13***	***11***

5.1 Government implementation costs

Implementation costs to the Government were divided into upfront costs associated with facilitation, negotiating contracts and training and advice and those that were on-going costs, related to on-going facilitation and monitoring and enforcement.

Table 5.2 High and low scoring schemes for implementation costs

Implementation costs	Highest /lowest score	Scheme /project	Reasons for score
Facilitation/co-ordination	+5	ILD	Savings from integration of delivery
	-4	DULLA	Costs of designing auction metric
Negotiating contracts	+3	ILD	Savings from economies of scale in administration and accounting
	-2	LCP	Time involved in drawing up whole farm plan
Training and advice	+1	ILD	Savings from economies of scale and information exchange
	-2	LCP	New cattle farming system so additional training/advice costs
Additional on-going implementation costs	0	OQE, SCaMP, DULLA, DFF	No additional on-going costs
	-1	NP, ILD, LCP, CR	Attending meetings and providing additional advice
Monitoring and enforcement	+4	ILD, DFF	Savings from shared problem solving, monitoring developed locally
	-2	NP, CR, LCP	Increased complexity led to more monitoring costs

5.1.1 Up-front implementation costs

Integrated Local Delivery (ILD) recorded a large saving in costs for all aspects of implementation, including the up-front costs for facilitation, negotiating of contracts and training and advice. Although the facilitation costs are high compared to other approaches, the savings derived from the integrated approach to resource management (e.g. biodiversity, flood prevention) enables the costs of the facilitator to be divided across all of the stakeholders and in some circumstances are actually externally funded (outside AES). Also the integrated process enables the project officer to take a joined up approach to the implementation of activities. This creates savings from economies of scale in both administration and accounting. Although the facilitator works with individual agreements as with a standard AES approach, the number of visits and the amount of preparation for each individual application is reduced.

In contrast to ILD, the costs of co-ordinating the DULLA by Central Queensland University were relatively high compared to a standard environmental grant due to the low level of

knowledge and understanding of the mechanism amongst the delivery agents and the landholders at the start. As a result, extra costs were incurred in assisting NRM groups to design, develop, and implement the instrument, and in assisting landholders to formulate their proposals. In particular there were high costs involved in designing assessment metric which was fundamental to the success of the auction.

There were also high costs involved in the Limestone Country Project in drawing up each whole farm plan by the Project Officer which could take up to 2 months each. These plans required considerable more work than a standard HLS as they looked at the impact on the entire farm business of introducing cattle on to the farm.

A rough estimate of facilitation/co-ordination costs for each case study is provided in Table 5.3, where data were available.

Table 5.3 Rough estimates of facilitation/co-ordination costs[23]

		Land area (ha)	No. of farms	Implementation costs (£)	Costs/ha (£)	Costs/farm (£)
2	OQE	No data available				
3	DULLA	8,500	22	100,000	1	4,545
4	NP	No data available				
5	ILD (Walmore common)	300	10	7,000	23	700
6	SCaMP1	12,000	40	150,000	13	3,750
7	DFF	11,608	88	50,000	4	568
8	LCP	1,850	18	100,000	54	5,556
9	CR	4,000	25	14,000	4	560

5.1.2 On-going implementation costs

Several projects recorded a slight increase in costs of additional on-going facilitation relative to a standard AES (NP, ILD, LCP, CR), although these costs were generally not high and related mainly to attending meetings and providing additional advice. Some savings in monitoring and enforcement costs were also recorded, particularly in relation ILD and DFF, as their shared problem solving approach and the development of monitoring locally reduced the need and expense for external enforcement. In contrast, the increased complexity of the Northeim Project, with a requirement for repeated visits to control plots, led to higher monitoring costs compared to a standard AES.

5.2 Landscape-scale environmental objectives

Both DFF and ILD scored high in terms of being able to achieve the four landscape-scale environmental objectives. Compared to standard AES agreements, these bottom-up, facilitated approaches were able to offer the flexibility to deliver against all the environmental

[23] Costs converted to £ for comparison.

objectives. In contrast, schemes such as DULLA and NP which adopted an auction mechanism based on outcomes were restricted in their ability to deliver multiple environmental objectives.

Table 5.4 High and low scoring schemes for landscape-scale environmental objectives

Landscape-scale Environmental objectives	Highest/lowest score	Project/scheme
EO Benefit 1 - Core Sites	+5	LCP
	0	DULLA
EO Benefit 2 – Buffering	+4	ILD
	0	DULLA, OQE, NP, LCP
EO Benefit 2 – Connectivity	+5	OQE, DULLA
	0	NP, SCaMP, LCP
EO Benefit 2 – Threshold	+4	DFF
	0	DULLA, SCaMP, CR

5.3 Participation costs

Estimating the private costs is important as they can provide insight into the level of farmer participation in a scheme. If AES involve simple contracts and procedures which do not put too high an informational and time burden on the participants there is a higher chance of success in terms of increasing landowner participation.

Table 5.5 High and low scoring schemes for participation costs

Participation costs	Highest/ lowest score	Scheme/ project	Reason for score
Income foregone	+3	DULLA, NP	Auction bids close to farmer's income foregone
	-2	OQE	Payments in excess of income foregone
Additional on-going costs	0	DULLA, NP, ILD, SCaMP, DFF	No additional participation costs
	-2	CR	Attendance at meetings
Transaction costs	+2	ILD, SCaMP DFF	Savings as assistance provided in HLS applications
	-4	OQE	High costs as farmers pay for expertise to develop proposals

5.3.1 Income foregone

The schemes that adopted an auction payment mechanisms (DULLA, NP) delivered payments that were closest to actual opportunity costs of farmers, representing a saving to the government relative to a standard flat-rate AES, although NP found some overestimation

of opportunity costs. Other approaches, such as OQE and LCP, offered payments in excess of opportunity costs to incentivize farmer engagement.

5.3.2 Additional on-going costs

There were additional on-going costs for participating farmers in some schemes (CR, LCP, OQE) mainly related to attending project meetings and assisting with monitoring work, although these costs were considered relatively minor.

5.3.3 Transaction costs

The transaction costs for farmers under some schemes (ILD, DFF, SCaMP) were reduced as assistance given in applying for AES reduced the administrative burden on farmers. In contrast, the OQE farmer transaction costs were high as they were required to pay for expert help from ecologist and agriculturalists when developing their network project proposals.

5.4 Social and human capital development

5.4.1 Local engagement

Several projects scored high in terms of their level of local engagement (OQE, ILD, DFF and NP). OQE, for example, is farmer-led in that they are responsible for developing the network project proposals. ILD also adopts a bottom-up approach through the formation of a local management group comprised of statutory and non-statutory stakeholders with a shared vision for the management of a targeted area. Similarly in the DFF approach, the commoners are involved in determining the scheme design, targeting, delivery and monitoring and in discussing land management with a wider range of stakeholders than just NE. The NP introduced an element of local engagement through a Regional Advisory Board, comprised of representatives of that decided on the scheme outcomes. CR received a negative score as it was felt that the threat of imposing the overgrazing regulation coerced the commoners into signing a collective AES. Twenty years later there is still a sense from the commoners that the original collective agreement was imposed on them from top-down pressure, and this perception was carried over into the negotiations for HLS in 2009.

5.4.2 Environmental knowledge

Whilst all case studies were recorded as delivering greater environmental knowledge benefits than standard AES, two scored particularly high in this regard. The nature of the outcome-based payments in the NP increased the desire for knowledge in order to optimise their management practices to achieve the required target species. Also it was suggested that the encouragement to participate in the development of the project and individual agreements adopted by the ILD approach substantially increased farmer's knowledge and information exchange compared to a standard AES approach.

5.4.3 Farmer co-operation

The achievement of co-ordinated action at a landscape-scale requires some level of farmer co-operation compared to a standard AES approach. DFF in particular scored high in this regard as the commoner's participation in the scheme development created a closer working relationship between the commoners. Co-ordinated action was not the objective of some other schemes (NP and LCP) and therefore the level of farmer co-operation was low.

Table 5.6 High and low scoring schemes for social and human capital development

Social & human capital development	Highest/ lowest score	Project/ scheme	Reason for score
Local engagement	+5	OQE, NP, ILD, DFF	Strong engagement by farmers / local organisations
	-2	CR	Feeling that commoners pressurised into group agreement
Environmental knowledge	+5	NP, ILD	Outcome-based payments increased desire for knowledge about optimum management practices. ILD -Farmer's participation in development of project and agreement increases knowledge.
	+2	CR	Limited amount of information sharing about cattle management
Farmer cooperation	+5	DFF	Closer working relationship between commoners
	0	NP	Short timeframe (2 yrs) meant not possible to achieve farmer co-operation

6 Conclusions - Key learning points for achieving cost-effective co-ordinated action at a landscape-scale

This section draws together the findings of the research and identifies some key learning points for achieving cost-effective co-ordinated management at a landscape scale. In doing so this section also identifies the elements of co-ordination approaches which are best able to deliver landscape scale environmental objectives and the circumstances where each approach would be appropriate.

The study considered 3 main aspects by which co-ordinated action might be achieved: targeting, scheme payments and governance structures. The lessons learnt for delivering these 3 main aspects are considered in turn:

6.1 Targeting

The case studies highlighted the need for targeting to achieve co-ordinated action, as all of the case studies had a defined geographical target area in which they operated. To ensure cost-effective targeting a number of points were identified:

- **Good baseline data required to identify landscape-scale environmental objectives**

Good scientific evidence and knowledge needs to underpin the selection of target areas and the desirable spatial configuration of management and the thresholds of management required to achieve specific objectives. For example, the Swiss scheme required good baseline data in order to identify the key species that are characteristic of the local area, or habitats that have the potential for improvement through connectivity.

- **Engagement of local community in identifying targeting priorities**

Local community input helps identify local priorities and ensures that schemes reflect local conditions, whilst recognising that this needs to be integrated with national priorities. The Northeim case study successfully used Regional Advisory Boards comprised of volunteer local representatives of government agencies, conservation organisations and farmers to express the local demand for environmental services and to define the species and habitats to be targeted in a conservation auction.

- **Integrated agency implementation on targeted areas can result in costs savings**

Greater coordination among those agencies seeking to affect outcomes on targeted areas could yield more efficient and effective outcomes. Achieving this aim requires a shared vision and an understanding of each other's goals and interests. It involves not just those agencies that deliver environmental outcomes, but also those with economic and social goals. If there is an expectation of co-ordinated action between farmers it should also be recognised that the farmers will be expecting co-ordination between the statutory agencies and advice providers. A key to success in both ILD and DFF is based around the premise that key national stakeholders with an interest in that area are able to integrate their advice and strategic priorities. The low scores on other projects may reflect the attempt to introduce co-ordinated activity among farmers under a single objective (e.g. biodiversity), when farmers are able to see other strategic priorities within the same area (e.g. flood mitigation or meeting WFD priorities) due to advice received from other agencies.

6.2 Scheme payments

A number of case studies highlighted the effectiveness of using financial payments to encourage co-ordinated action and collaboration between farmers at a landscape scale.

- **Use of agglomeration payments for network projects**

The use of an agglomeration bonus payment can be particularly affective in achieving connectivity objectives. The Swiss case study illustrated the success of such a payment in engaging farmers in network projects which connected parcels of land. This approach is particularly appropriate for achieving connectivity and threshold objectives, but perhaps less so for other landscape-scale environmental objectives. The limited scope of the current income forgone and additional costs methodology to incorporate such a bonus – this might be possible within the 'transaction cost' provisions of the payment calculation methodology although this would require evidence to support the basis of such costs and they would be limited by the 20% ceiling for costs of this type.

- **Use of geographically targeted auctions**

Geographically targeted auctions would prove useful where buffering, threshold or partial connectivity environmental objectives are required. However, as the auction approach is based on competition amongst agreement holders it may not be appropriate in situations which are trying to find landscape-scale collaborative solutions. The outcomes required for these auctions need to be kept simple and ideally single objective, otherwise assessment metrics become very complex and costly to design and transparency is reduced. In the UK context, this would seem to go against the priorities contained within NEWP for an integrated approach. Also to work effectively, farmers need to have knowledge of their opportunity costs for undertaking the required management practices. This was not the case for the arable auctions in the Northeim case study, as the landholders had only limited information about potential costs arising from scheme participation and were unable to calculate a reasonable bid price.

- **Use of outcome-orientated payments**

The OQE network payments, and the Northeim Project and DULLA auction payments were reliant on outcome-orientated payments, that is part of the payment was dependent on achieving particular environmental outcomes. The value of such an approach is that is encourages greater engagement of the agreement holder in identifying the most cost-effective management practices to achieve the required outcomes. Appropriate outcome indicators must be developed prior to implementation of the scheme and should be transparent and administrable, to ensure that the recognition is easy for both farmers and enforcers. Moreover, the results have to be bound to a particular management unit. Usually plant indicators are more appropriate than mobile species whose appearance is difficult to relate to individual field-scale farming actions.

Staged payments proved popular with the DULLA incorporating an initial payment to cover any upfront infrastructure or capital costs and performance related payments at a mid-point in the contract and on completion. The Northeim Project demonstrated value in providing graduated payments to reflect the level of biodiversity benefits delivered. Providing different quality levels within the payment scheme gave farmers financial incentives to improve the quality of their grassland fields.

- **Private funding for landscape-scale projects**

Private funding in combination with AES payments can be a cost-effective way of delivering ecosystem services at a landscape-scale. The involvement of utility companies, such as UU, means that the landscape scale approach is more likely because of the wider remit these companies have to a catchment. Payments from private companies are not subject to

WTO rules, which restrict payments to income foregone and additional costs and can therefore be used to incentivise farmer participation. Thus, in the SCaMP project, United Utilities was able to offer incentive payments in the form of capital grants which could be used in combination with public AES payment and helped increase farm business viability and was crucial in engaging farmers in the programme. Private funds can also contribute to on-going payments for land management and incorporate incentives payments, such as agglomeration bonuses to achieve co-ordinated management at a landscape-scale.

6.3 Governance structures

The governance structures for a number of the case studies transfer more of the decision-making to local communities and/or local landholders compared to standard approaches which can have benefits in achieving co-ordinated or collaborative action. As demonstrated by ILD and DFF, a key element to these successful "bottom-up" approaches is effective facilitation by project/scheme staff or farmer/community leaders. Facilitating or intermediary organisations can have an important role in bringing farmers together, in providing information, in building trust and acting as a broker or mediator between local actors and government.

- **Facilitated co-ordinated action of farmer groups provides economies of scale**

Facilitation involving co-ordinated action of a group of farmers in a targeted area appears to provide the greatest efficiency gains for the government and agreement holders through economies of scale. The facilitation costs are reduced significantly when there is a local acceptance towards the need for a commonly agreed way forward (as in ILD and DFF) rather than a predetermined outcome being implemented by an external agency (as in CR). Often the costs for facilitation can be contained within the existing options for advice within ES, or by match funding from other budgets (as in ILD). The approach can include existing providers but the key individual should be known to and trusted by both local and national stakeholders

- **Facilitation skills required will vary depending on local context**

The key skills of the facilitator varied within the case studies. In the ILD case study, the facilitator was required to bring together the various strategic priorities that occur within the given area, as part of the scoping of assets that occurs at the start. In this example the national agencies and local stakeholders spent more time together, than they would in a conventional AES setting, problem solving and developing the co-ordinated approach. In the DFF example, the facilitator was there to enable the farmers to create the scheme design and related outcomes and was a link between Defra and NE and the farmers.

- **Farmer engagement approaches provide greatest opportunity for achieving a range of landscape-scale environmental objectives**

Bottom-up approaches where the farmer is involved in the design of the scheme provides the greatest opportunity for achieving landscape-scale environmental objectives. This is largely because the approach provides flexibility to respond to a range of issues as they occur on the ground within the context of a single agreement. However, in the DFF example the agreement involved designing an alternative scheme within the boundaries of existing AES schemes so the total annual payment and the type of current AES activity was already known. This suggests that locally designed schemes might be most effective if they operate within clear strategic guideline

- **Bottom-up approaches reduce monitoring and enforcement costs**

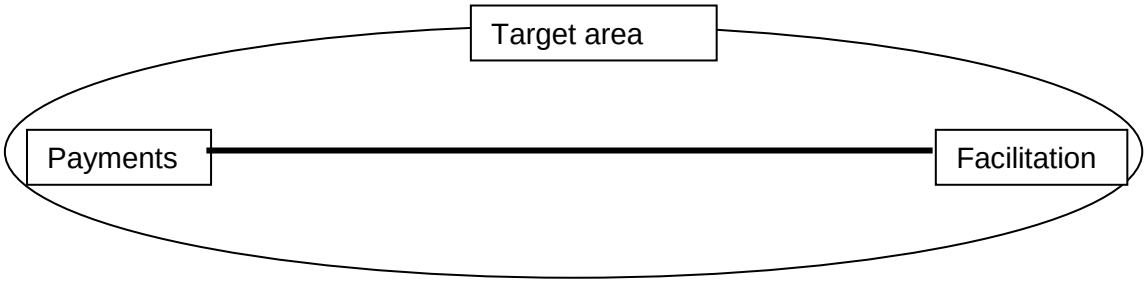
Farmer-led, 'bottom-up' co-ordinated approaches, such as DFF, are more cost-effective in terms of monitoring than those that are characterised by 'top-down' drivers, such as

legislative requirements, as the objectives become genuinely embedded and engagement is maximised, thereby reducing on-going monitoring and enforcement costs.

6.4 Overall summary

The case studies have highlighted a variety of ways in which co-ordination can be achieved using elements from a range of co-ordination approaches. A key aspect is the use of targeting. Other approaches can be viewed as lying on a continuum of those approaches that rely solely on financial payments for co-ordinated action at one end and those relying solely on facilitated approaches at the other end (See figure 6.1). From our case studies it would appear that co-ordination schemes would require an element of both of these to differing degrees and sit somewhere along the continuum

Figure 6.1 Conceptualisation of approaches to delivering co-ordinated action at a landscape-scale



Key features of a co-ordinated AES

Targeting – Voluntary co-ordinated action with an AES relies on defining a target area and identifying within this the desirable spatial configuration of management and the thresholds of management required to achieve specific objectives. This is challenging, especially for multi-objective schemes. Any spatial targeting of payments for agri-environment activities that allow for local tailoring of management prescriptions could enhance the economic efficiency of payment schemes.

Financial payments - Where simple landscape-scale environmental objectives are sought, such as connectivity of a single habitat feature, such as hedgerows or achieving threshold levels for a particular species, then financial payments, through agglomeration bonus payments or reverse auctions would appear to be cost-effective approaches. An additional 'top-up' payment for achieving farmer co-ordination, rather than an auction process would be preferable, as auctions are designed to encourage competition between farmers, rather than collaborative action. There is limited scope in the current income forgone and additional costs methodology to incorporate such a bonus – this might be possible within the 'transaction cost' provisions of the payment calculation methodology although this would require evidence to support the basis of such costs and they would be limited by the 20% ceiling for costs of this type.

Scheme payment approaches rely on outcome-orientated payments to a certain degree. Incorporating this into ES would mean identifying suitable indicators of success to enable payments by results. These indicators would need to be simple and easily measureable. .

Facilitation - In situations where more complex or multiple landscape-scale environmental objectives are sought on core sites or in target areas where full landholder participation is required, such as raising water levels, a facilitated approach would be more cost effective in delivering these objectives. There is currently little local engagement in scheme design, targeting, delivery or monitoring although national stakeholders are extensively involved in all these aspects of scheme process. Facilitation is not a formal part of the scheme, although Natural England staff provide a degree of facilitation/co-ordination, primarily for agreement related activity e.g. commonland agreements. To incorporate ES would also require skilled facilitators. The costs of facilitation can by reduced by integrating the delivery with other agencies and stakeholders interested in the targeted area, as exemplified by the ILD approach. This would require integration at the agency level – the number of initiatives (CSF, WFD) that cover similar ground would also enable a wider pool of possible facilitators and project officers to deliver the integration.

Whilst DFF and ILD were assessed as consisting of the most cost-effective elements of co-ordination approaches to achieving co-ordinated action at a landscape-scale, these approaches could be further enhanced by incorporating a financial payment that encourages co-ordinated action between farmers. The financial payment would provide a basis on which to build co-ordinated action within a locality or between core sites. The ability to pool the advice options, like PAH under HLS, would enable farmers to identify the level of resources available to develop a co-ordinated approach.

In conclusion, to achieve management at a landscape-scale requires adaption in the design and delivery of the current ES scheme to ensure a more co-ordinated approach. A clear message emerging from the case studies is that to achieve this cost-effectively will depend on the target area and the required environmental outcomes, which will impact on the choice of using financial incentives or more innovative, facilitated approaches. This implies that any scheme should avoid a 'one size fits all' approach to achieving co-ordinated action. A model of landscape-scale delivery that might work for an uplands common might not succeed on a lowland floodplain which is trying to deliver different environmental objectives. Without this local sensitivity, ES may well fall short of achieving cost-effective co-ordinated action amongst farmers across the variety of likely target areas

References

Aebischer, N.J., Green, R.E., Evans, A.D., 2000. From science to recovery: four case studies of how research has been translated into conservation action in the UK, in: Aebischer, N.J., Evans, A.D., Grice, P.V., Vickery, J.A. (Eds.), *Ecology and Conservation of Lowland Farmland Birds*. British Ornithologist' Union, Tring, UK, pp. pp. 43–54.

Amblard, L., 2011. A network perspective on agricultural watershed governance. The case of Local Agri-Environment Schemes in France. Paper presented to IASC European Regional meeting Sept 2011.

Angell, B., Francis, J., Chalmers, A., Flint, C., 1997. Agriculture and the Rural Economy Information and Advice Needs. Report to MAFF by ADAS.

Barton, D.N., Faith, D.P., Rusch, G.M., Acevedo, H., Paniagua, L., Castro, M., . 2009. Environmental service payments: evaluating biodiversity conservation trade-offs and cost-efficiency in the Osa Conservation Area, Costa Rica. Journal of Environmental Management **90**, 901-911.

Berge, E., van Laerhoven, F., 2011. Governing the Commons for two decades: A complex story. International Journal of the Commons **5**, 160-187.

Boatman, N., Ramwell, C., Parry, H., Jones, N., Bishop, J., Gaskell, P., Short, C., Mills, J., Dwyer, J., 2008. A Review of environmental benefits supplied by agri-environmental schemes. Report to the Land Use Policy Group, in: . (Ed.), *London*. by the Central Science Laboratory and Countryside and Community Research Institute.

Boyle, D., Harris, M., 2009. The Challenge of Co-production: How equal partnerships between professionals and the public are crucial to improving public services, NESTA and New Economics Foundation (NEF).

Bunce, R.G.H., Pérez-Soba, M., Elbersen, B.S., Prados, M.J., Andersen, E., Bell, M., Smeets, P.J.A.M., 2000. Examples of European agri-environment schemes and their livestock systems and their influence on Spanish cultural landscapes. Alterra-rapport 309.

Busck A, Kristensen L, Primdahl J, 2007. The Hedgerow Planting Scheme in Denmark - a case study of objectives, context, effects and implications. , in: Hodge, I., Reader, M. (Eds.), *Maximising the Provision of public goods from future agri-environment schemes*.

Carlsson, L., Berkes, F., 2005. Co-management: concepts and methodological implications,. Journal of Environmental Management **75**, 65-76.

Cason, T.N., Gangadharan, L., Duke, C., 2003. A laboratory study of auctions for reducing non-point source pollution. Journal of Environmental Economics and Management **46**, 446-471.

Chaplin, S., 2011. Landscape Scale Co-ordination: Proposals for next steps. Unpublished paper for MESME Board 24 February 2011. Natural England.

Dampney, P., Winter, M., Jones, D., 2001. Communication methods to persuade agricultural land manager to adopt practise that will benefit environmental protection and conservation management (AgriComms). Defra Report KT0107. .

Defra, 2008. ECSFDI Evaluation Report. Defra.

Defra, 2011. Natural Environment White Paper, The Natural Choice; securing the value of nature. Defra, London, UK.

Demos, 2007. The Collaborative State: How working together can transform public services.

Dolman, P., Lovett, A., O'Riordan, T., Cobb, R., 2001. Designing whole landscapes. Landscape Research **26**, 305-335.

Drechsler, M., Wãtzold, F., Johst, K., Shogren, J.F., 2010. An agglomeration payment for cost-effective biodiversity conservation in spatially structured landscapes. Resour. Energy Econ. **32**, 261-275.

Drechsler, M., Wätzold, F., 2011. Designing cost-effective compensation payments for conservation measures: Agglomeration payment, agglomeration bonus or homogeneous payment?, *Policy Mechanisms for Ecosystem Services Delivery International Workshop*, London 4/5 May 2011.

Dwyer, J., 2007. Human and social capital in rural development - an EU perspectivehttp://rurdev.aers.psu.edu/Papers/Dwyer.pdf.

Dwyer, J., Blackstock, B., Mills, J., Ingram, J., Taylor , J., Burton, R., Slee, B., Brown, K., Schwarz, G., Matthews, K., Dilley, R., 2007. Understanding and influencing positive behaviour change in farmers and land managers - a project for Defra.

England Biodiversity Group, 2011. ThinkBIG: How and why landscape-scale conservation benefits wildlife, people and the wider economy Natural England.

Falconer, K.E., 2000. Farm-level constraints on agri-environmental scheme participation: a transactional perspective. Journal of Rural Studies **16**, 379-394.

Franks, J.R., 2011. The collective provision of environmental goods: a discussion of contractual issues. J. Environ. Plan. Manag. **54**, 637-660.

Gallagher, K., 1999. Farmers field schools (FFS): A group extension process based on adult non-formal education methodsK Gallagher - FAO Global IPM Facility

Garforth, C., Angell, B., Archer, J., Green, K., 2002. Improving access to advice for land manager: a literature review of recent developments in extension and advisory services. Report to the Defra by School of Agriculture, Policy and Development at University of Reading, ADAS and John Archer Consulting.

Goldman, R.L., Thompson, B.H., Daily, G.C., 2007. Institutional incentives for managing the landscape: Inducing cooperation for the production of ecosystem services. Ecol. Econ. **64**, 333-343.

Gole, C., Burton, M., Williams, K.J., Clayton, H., Faith, D.P., White, B., Huggett, A., Margules, C., 2005. Auction for landscape recovery. WWF-Australia.

Goosen, M.D., 2009. Cooperation, Coordination, Collaboration: Asking the Hard Questions. **18**.

Greenhalgh, S., Guiling, J., Selman, M., St John, J., 2007. Paying for Environmental Performance: Using Reverse Auctions to allocate Funding for Conservation, *Environmental Markets: Reverse Auctions No. 3*

Grice, P.V., Radley, G.P., Smallshire, D., Green, M.R., 2007. Conserving England's arable biodiversity through agri-environment schemes and other environmental policies: a brief history. Aspects of Applied Biology **81**, 7-22.

Groth, M., 2005. Auctions in an outcome-based payment scheme to reward ecological services in agriculture – Conception, implementation and results *45th Congress of the Regional Science Association in Amsterdam, 23-27th August 2005*.

Hackl, F., Halla, M., Pruckner, G.J., 2007. Local compensation payments for agri-environmental externalities: a panel data analysis of bargaining outcomes. Eur. Rev. Agric. Econ. **34**, 295-320.

Homburg, A., Stolberg, A., 2006. Explaining pro-environmental behavior with a cognitive theory of stress. Journal of Environmental Psychology **26**, 1-14.

Hughes F, Stroh P, Adams W, Kirby K, O, M., S, W., 2011. Monitoring and evaluating large-scale, 'open-ended' habitat creation projects: A journey rather than a destination. Journal for Nature Conservation.

Jacobson, C., Hughey K, Allen W, Rixecker S, Carter R, 2009. Toward more reflexive use of adaptive management. Society and Natural Resources **22**, 484-495.

Kasperson, R., 2006. Rerouting the stakeholder express. Global Environmental Change **16**, 320-322.

Khanna, M., Ando, A., 2009. Science, Economics, and the Design of Conservation Programs in the U.S. J. Environ. Plan. Manag. **52**, 575-592.

Landolt G, Haller T, 2011. Alpine common property institutions under change: conditions for successful and unsuccessful collective action of dairy farmers in the Canton Grisons of Switzerland. Paper presented to IASC European Regional meeting Sept 2011,.

Latacz-Lohmann, U., Schilizzi, S., 2005. Auctions for Conservation Contracts: A review of the theoretical and empirical literature. Report to the Scottish Executive Environment and Rural Affairs Department

Latacz-Lohmann, U., Van der Hamsvoort, C., 1997. Auctioning conservation contracts: a theoretical analysis and an application. American Journal of Agricultural Economics **79**, 407-418.

Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., Wynne, G.R., 2010. Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra.

Lebeau, R.P., Righetti, A., 2008. Current status of the practical implementation of ecological networks in Switzerland. Knowledge for Ecological Networks: Catalysing Stakeholder Involvement in the Practical Implementation of Ecological Networks.

Lewis, D.J., Plantinga, A.J., Nelson, E., Polasky, S., 2011. The efficiency of voluntary incentive policies for preventing biodiversity loss. Resour. Energy Econ. **33**, 192-211.

Lewis, V., 2010. EFNCP England study tour to Spain. Available at: http://www.efncp.org/projects/common-land/

Lyon, F., Clarke, S., Harris, F., M, W., D, G., 2005. Learning and research for sustainable agro-ecosystems by both farmers and scientists. Research report for ESRC. RELU award 0084. November 2005. .

McGrath, M., Smith, M.S., 2010. ustainable Catchment Management Programme (SCaMP): From hilltop to tap. http://www.rspb.org.uk/ourwork/projects/details.aspx?id=tcm:9-218780http://www.catchmentchange.net/catchment-conversations/scamp-conference-2010.

Mills, J., Gaskell, P., Short, C., Manley, W., Kambites, C., Lewis, N., Clark, M., Boatman, N., 2012. Attitudes to Upland Environmental Stewardship Scheme, Peterborough.

Mills, J., Gibbon, D., Ingram, J., Reed, M., Short, C., Dwyer, J., 2011. Organising Collective Action for Effective Environmental Management and Social Learning in Wales. The Journal of Agricultural Education and Extension **17**, 69-83.

Mills, J., Ingram, J., Reed, M., Short, C., Gibbon, D., Dwyer, J., 2008. Evaluation of key factors that lead to successful agri-environmental co-operative schemes

Natural England, 2010a. Entry Level Stewardship: Environmental Stewardship handbook, third edition (NE226).

Natural England, 2010b. Higher Level Stewardship: Environmental Stewardship handbook, third edition (NE227).

Ostrom, E., 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press, Cambridge.

Ostrom, E., 2005. Understanding Institutional Diversity Princeton. Princeton University Press, NJ.

Parkhurst, G.M., Shogren, J.F., 2007. Spatial incentives to coordinate contiguous habitat. Ecol. Econ. **64**, 344-355.

Parkhurst, G.M., Shogren, J.F., Bastian, C., Kivi, P., Donner, J., Smith, R.B.W., 2002. Agglomeration bonus: an incentive mechanism to reunite fragmented habitat for biodiversity conservation. Ecol. Econ. **41**, 305-328.

Paton, S., Grice, J., 2004. Researching Farmers: Who is the Expert? Social Innovations in Natural Resource Management, in: Richard, C., Aitken, L. (Eds.), *A Handbook of social research in natural resource management in Queensland*, pp. 55-57.

Perkins, A.J., Maggs, H.E., Watson, A., Wilson, J.D., 2011. Adaptive management and targeting of agri-environment schemes does benefit biodiversity: a case study of the corn bunting Emberiza calandra. J. Appl. Ecol. **48**, 514-522.

Perrot-Maître, D., 2006. The Vittel payments for ecosystem services: a "perfect" PES case? International Institute for Environment and Development,, London.

Phillips, J., R, W., Fisher, S., Noble, D., 2010. Targeting agri-environment schemes for farmland birds in England, *BOU Proceedings – Lowland Farmland Birds III.*

Prager, K., Freese, J., 2009. Stakeholder involvement in agri-environmental policy making â€“ Learning from a local- and a state-level approach in Germany. Journal of Environmental Management **90**, 1154-1167.

Prager, K., Nagel, U., 2008. Participatory decision making on agri-environmental programmes: a case study from Sachen-Anhalt (Germany). Land Use Pol. **25**, 106-115.

Reeson, A.F., Rodriguez, L.C., Whitten, S.M., Williams, K., Nolles, K., Windle, J., Rolfe, J., 2011. Adapting auctions for the provision of ecosystem services at the landscape scale. Ecol. Econ. **70**, 1621-1627.

Ribot J, 2006. Choose democracy: environmentalists' socio-political responsibility. Global Environmental Change **16**, 115-119.

Riddell, I., 2001. Monitor farms and farmer discussion groups in New Zealand (summary).

Robinson, G.M., 2006. Ontario's Environmental Farm Plan: Evaluation and research agenda Geoforum **37**.

Rolfe, J., Windle, J., McCosker, J., 2009. Testing and Implementing the Use of Multiple Bidding Rounds in Conservation Auctions: A Case Study Application. Can. J. Agric. Econ.-Rev. Can. Agroecon. **57**, 287-303.

Rollett, A., Haines-Young, R., Potschin, M., Kumar.=, P., 2008. Delivering environmental services through agri-environment programmes: a scoping study. Report for Land Use Policy Group

Rowcroft, P., Richardson, J., Coventry, S., Smith, S., Clarke, L., Thomson, K., Reed, M., 2011. Barriers and Opportunities to the Use of Payments for Ecosystem Services. Report to Defra.

Schekkerman H, Teunissen W, Oosterveld E, 2008. The effect of 'mosaic management' on the demography of black-tailed godwit Limosa limosa on farmland. J. Appl. Ecol. **45**, 1067-1075.

Scholtz, J.T., Berardo, R., Kile, B., 2008. Do Networks Solve Collective Action Problems? Credibility, Search and Collaboration. The Journal of Politics, **70**, 393-406.

Schulte, L., Rickenbach, M., Merrick, L., 2008. Ecological and economic benefits of cross-boundary coordination among private forest landowners. Landscape Ecology **23**, 481-496.

Short, C., Fisher R, Mills J, Jones O, Kambites C, Manley W, Cairns, A and Gaskell P (2012) 2012. Integrated Biodiversity Delivery Area Programme Evaluation: Phase 1 and Phase 2 of IBDA Development Report to Natural England, Gloucester.

Short, C., Griffiths R, Phelps J, 2010. Inspiring and Enabling Local Communities: an integrated delivery model for Localism and the Environment. Report to Farming and Wildlife Advisory Group and Natural England., Cheltenham.

Smits, M.J., Driessen, P., Glasbergen, P., 2008. Governing agri-environmental schemes: lessons to be learned from the new institutional-economics approach. Environment and Planning C: Government and Policy **26**, 627-643.

Sutherland, L.-A., Gabriel, D., Hathaway-Jenkins, L., Pascual, U., Schmutz, U., Rigby, D., Godwin, R., Sait, S.M., Sakrabani, R., Kunin, W.E., Benton, T.G., Stagl, S., 2011. The ˜Neighbourhood Effect': A multidisciplinary assessment of the case for farmer co-ordination in agri-environmental programmes. Land Use Pol. **29**, 502-512.

Ulber, L., Klimek, S., Steinmann, H.-H., Isselstein, J., Groth, M., 2011. Implementing and evaluating the effectiveness of a payment scheme for environmental services from agricultural land. Environmental Conservation **38**, 464-472.

Uthes, S., Matzdorf, B., Müller, K., Kaechele, H., 2010. Spatial Targeting of Agri-Environmental Measures: Cost-Effectiveness and Distributional Consequences. Environ. Manage. **46**, 494-509.

Wilson, G.A., 2004. The Australian Landcare movement: towards 'post-productivist' rural governance? Journal of Rural Studies **20**, 461-484.

Windle, J., Rolfe, J., McCosker, J., Lingard, A., 2009. A conservation auction for landscape linkage in the southern Desert Uplands, Queensland. The Rangeland Journal **31**, 127-135.

Wunder, S., Engel, S., Pagiola, S., 2008. Taking stock: A comparative analysis of payments for environmental services programs in developed and developing countries. Ecol. Econ. **65**, 834-852.

Wunscher, T., Engel, S., Wunder, S., 2008. Spatial targeting of payments for environmental services: A tool for boosting conservation benefits. Ecol. Econ. **65**, 822-833.

Appendix 1 Questionnaire

Questionnaire – Project\Scheme Co-ordinator

Introduction

The Countryside and Community Research Institute (CCRI) is undertaking a project for Department of Environment, Food and Rural Affairs (Defra) and Natural England exploring different mechanisms for delivering co-ordinated agri-environmental schemes, looking at the pros and cons of each and examining in more detail the cost-effectiveness of the approaches used in 9 landscape-scale projects or schemes and their applicability to the Environmental Stewardship scheme used in UK. Multicriteria analysis will be used to compare the different approaches exploring the economic costs and benefits of each approach, the circumstances where the approach is most appropriate and its usage limitations and compatibility with WTO and EC regulations.

1 Could I ask you to briefly explain how the scheme was developed, how you got involved and what your main role in it is?

2 Please could you briefly describe how the scheme encourages co-ordinated activity across a landscape area?

3 Taking a broad view, what would you say are the main costs and benefits of the approach relative to individual (flat-rate) AES agreements?

Costs
Benefits

Thank you for that useful overview, we will come back to these costs and benefits as we progress through the interview.

We have identified 4 main criteria around which to try and quantitatively assess the costs and benefits of the coordination approaches, and the remaining questions are structured around these. The 4 criteria are:

- Costs of implementation
- Landscape scale environmental objectives
- Costs of participation
- Social Capital

You'll see that 2 refer to broadly potential costs and 2 relate to areas of potential benefit, but to ensure that we capture as many costs and benefits as possible we have broken each criteria down into between 3 and 4 sub-criteria.

For each sub-criteria there are two related questions, one where I'll ask you briefly to outline what the relevant cost/benefit is, and where possible to give an idea of the scale in financial terms and, in order to summarise the assessment, whether it was more or less than a standard (flat rate) agri-environment scheme (AES) and one where I'll ask you to very quickly score the cost or benefit on a scale of -5 to 0 for costs and from 0 to +5 for benefits.

Thus, there are a total of 28 questions relating to the criteria, although in each case the second question, which asks you to score the cost or benefit, won't take much time at all.

This approach will allow us to produce a net cost-benefits score for each of the approaches we are looking at in the study, which should be helpful for future policy and planning for each one.

Sub-criteria – Glossary
Glossary providing a more detailed breakdown of each sub-criteria:

Income foregone - loss of income through land coming out of production, reduced stock numbers

Additional costs – additional management costs required to implement the scheme prescriptions, including on-going co-ordinator/facilitation costs, attendance at meetings once agreement running etc.

Implementation transaction costs – costs of producing guidance, negotiating contracts, meetings with potential agreement holders, facilitation of groups before agreement signed

Participation transaction costs – cost of reading guidance material, completing application form, meeting with project officers, attendance at meetings etc before agreement signed.

Core sites: Active co-ordination between farms on core sites involving multiple farmers/land managers. This may be critical for some sites e.g. raised water-levels.

Buffering: Edge effects occur when the value of biodiversity is eroded from small protected sites. This loss can be reduced by buffering the site edges or by having larger protected sites. Therefore, active co-ordination of all or the majority farmers bordering a specific site is required.

Connectivity: Many protected sites are well managed but geographically fragmented forming isolated havens in a wider landscape. Linking together areas to make ecological

corridors and connected networks will allow sub-population interaction, permit species re-establishment following local loss or extinction, promote genetic diversity and allow greater adaptability. Connectivity requires adjacent farms to provide similar linked management as creation/corridors/stepping stones. Active co-ordination between farmers is not required but would be beneficial.

Threshold: The marginal benefits from conservation are typically small until some threshold level of action is reached. Thus, threshold requires a proportion of farmers and land managers within an indentified area to implement certain measures. Active co-ordination between farmers and land-managers is not required.

Criteria 1: Costs of implementation

Costs of engagement – facilitation / co-ordination

4 Could you briefly outline the nature and extent of the cost involved in any facilitation or co-ordination required to engage land managers in the scheme?

Probe for: *Actual amounts where possible; the personnel and organizations involved, expertise required, staff time involved, duration of the activity, whether this is an on-going activity or an upfront cost; differences relative to individual AES agreements*

5 Has the scheme enabled your organization/government to make any savings with respect to implementation costs?

Probe for: *differences relative to individual AES agreements; effects of economies of scale; any reductions in paperwork, accounting or administration*

6 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat-rate) AES agreements, could you please provide an overall score for the net costs of **farmer engagement** for the scheme

Costs of negotiating contracts

7 Could you briefly outline the nature and extent of the costs involved in setting up the scheme contract?

Probe for: *Actual amounts where possible; the personnel and organizations involved, expertise required, staff time involved, duration of the activity, whether this is an on-going activity or an upfront cost; differences relative to individual AES agreements*

8 Has the scheme enabled your organization/government to make any savings with respect to the costs of negotiating contracts?

Probe for: *differences relative to individual AES agreements; effects of economies of scale; any reductions in paperwork, accounting or administration*

9 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat-rate) AES agreements, could you please provide an overall score the net costs of **negotiating contracts** and setting up the scheme

Costs associated with monitoring enforcement

10 Could you briefly outline the nature and extent of the costs involved in monitoring and enforcement of the scheme?

Probe for: *Actual amounts where possible; the personnel and organizations involved, expertise required, staff time involved, duration of the activity, whether this is an on-going activity or an upfront cost, differences relative to individual AES agreements*

11 Has the scheme enabled your organization/government to make any savings with respect to the costs of monitoring and enforcement?

Probe for: *differences relative to individual AES agreements; effects of economies of scale; any reductions in paperwork, accounting or administration*

12 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat-rate) AES agreements, could you please provide an overall score the net costs of **monitoring and enforcement** for the scheme

Costs associated training and advice

13 Could you briefly outline the nature and extent of the costs involved with providing training and advice within the scheme? This involves both training and development of organisational staff, as well as advice provided to the farmer.

Probe for: *Actual amounts where possible; the personnel and organizations involved, expertise required, staff time involved, duration of the activity, whether this is an on-going activity or an upfront cost*

14 Has the scheme enabled your organization/government to make any savings with respect to the costs of training and advice?

Probe for: *differences relative to individual AES agreements; effects of economies of scale; any reductions in paperwork, accounting or administration*

15 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat-rate) AES agreements , could you please provide an overall score for the net costs associated with **training and expertise**

Criteria 2: Benefits in terms of meeting landscape scale objectives

Benefits to managing core sites

16 Please could you describe how the scheme helps to co-ordinate the management of core sites that involve multiple farmers /landowners.

17 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat rate) AES agreements, could you please provide an overall score for the net benefit that is delivered by the scheme in helping to co-ordinate the management of **core sites** that involve multiple farmers / landowners

Benefits to buffering a specific site / feature

18 Please could you describe how the scheme helps to buffer specific sites / features.

19 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat rate) AES agreements, could you please provide an overall score for the net benefit that is delivered by the scheme in encouraging farms bordering a specific site/feature to **buffer** it by undertaking certain management on specific areas of land

Benefits to connecting habitat

20 Please could you describe how the scheme helps to create connected habitats/corridors/stepping stones

21 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat rate) AES agreements, could you please provide an overall score for the net benefit that is delivered by the scheme in encouraging adjacent farms to provide similar **connected** habitat as creation/corridors/stepping stones.

22 Benefits to meeting threshold levels

23 Please could you describe how the scheme encourages farmers in an area to meet a particular threshold level for habitat / species

24 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat rate) AES agreements, could you please provide an overall score for the net benefit that is delivered by the scheme in encouraging a proportion of farmers in an areas to meet a particular **threshold** level for habitat / species

Criteria 3: Participation costs

25 Please could you provide details of the payment rates for the scheme?

Probe for: Actual payment rates, flat-rate payment or payments based on individual options selected, payments for management or for outcomes.

Income foregone costs

26 Please could you briefly outline the proportion of the payment rate that is related to income foregone (loss of profit)?

Probe for: Actual amounts where possible; variations due sector etc

27 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat-rate) AES agreements, could you please provide an overall score for the proportion of the payment rate that is likely to be income foregone.

Additional on-going costs

28 Please could you briefly outline the proportion of the payment rate that is related to additional costs incurred as a result of the scheme requirements?

Probe for: Actual amounts where possible, time involved

(For clarification, additional costs relate to additional management costs required to fulfil option requirements, and also other annual on-going costs such as attending meetings/events, training once the agreement is active)

29 Has the scheme enabled farms to make any savings with respect to additional costs?

Probe for: *differences relative to individual AES agreements; effects of economies of scale; any reductions in paperwork, accounting or administration*

30 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat-rate) AES agreements, could you please provide an overall score for the proportion of the payment rate that is associated with additional costs

Participation transaction costs

31 Please could you briefly outline the proportion of the payment rate that is related to transaction costs incurred as a result of the scheme requirements?

(For clarification, participation transactions costs relate to costs associated with completing application forms, meetings with project officers, meeting with group members prior to submitting the agreementetc)

Probe for: Actual amounts where possible; time involved in application process, meetings etc.prior to agreement

32 Has the scheme enabled farms to make any savings with respect to transactions costs?

Probe for: *differences relative to individual AES agreements; effects of economies of scale; any reductions in paperwork, accounting or administration*

33 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual (flat-rate) AES agreements, could you please provide an overall score for the proportion of the payment rate that is associated with transactions costs.

Criteria 4: Social capital

Local / community engagement

34 Please could you provide details of any local (and community) engagement in scheme design, targeting, delivery and monitoring

Probe for: *Degree of community involvement generated*

35 On a scale of -5 to +5, where -5 substantial dis-engagement +5 is a substantial engagement relative to individual (flat rate) AES agreements, could you please provide an overall score for the level of local engagement in the scheme design, targeting, delivery and monitoring

Environmental knowledge and awareness

36 Please could you provide details of how farmer's participation in the scheme leads to increase environmental knowledge and awareness

Probe for: *evidence of farmers increased knowledge of species and habitats, transferability of knowledge to other parts of farm; any negative effects*

37 On a scale of -5 to +5, where -5 is a substantial decrease +5 is a substantial increase relative to individual (flat rate) AES agreements, could you please provide an overall score for the level of increase in environmental knowledge and awareness as a result of scheme participation

Farmer co-operation

38 Please could you provide details of how farmer's co-operate in the scheme.

Probe for: joint design of agreement, membership of group etc.

39 On a scale of -5 to +5, where -5 is a lack of cooperation +5 is a substantial farmer co-operation relative to individual (flat rate) AES agreements, could you please provide an overall score for the level of farmer co-operation resulting from participation in the scheme

Finally,

40 Are there any advantages and limitations in the approach taken by the scheme to achieving co-ordinated action amongst farmers and landowners?

Probe for: *nature and extent of increased awareness*

41 How could the limitations you have identified be overcome?

42 Is there anything that the scheme has enabled that would have been impossible otherwise?

43 Overall, would you say that coordinated action is preferable to conventional agri-environment approaches?

Thank you very much for your time

Questionnaire – participant farmer

Introduction

[Background to the Economic of Coordination study and what it is trying to achieve]

1 Could I ask you to briefly explain how you became involved in the scheme/project?

2 Taking a broad view, what would you say are the main costs and benefits of the scheme/project to you relative to individual AES agreements?

Costs   Benefits

Thank you for that useful overview, we will come back to these costs and benefits as we progress through the interview.

We have identified 2 main criteria around which to try and quantitatively assess the costs and benefits to farmers of the projects/schemes, and the remaining questions are structured around these. The 2 criteria are:

1. Costs of participation
2. Social Capital – benefits of co-ordination

You'll see that 1 refers to broadly potential costs and 1 relates to areas of potential benefit, but to ensure that we capture as many costs and benefits as possible we have broken each criteria down into between 3 sub-criteria.

For each sub-criteria there are two related questions, one where I'll ask you briefly to outline what the relevant cost/benefit is, and where possible to give an idea of the scale in financial terms and, in order to summarise the assessment, whether it was more or less than a standard agri-environment scheme and one where I'll ask you to very quickly score the cost or benefit on a scale of -5 to 0 for costs and from 0 to +5 for benefits.

Thus, there are a total of 14 questions relating to the criteria, although in each case the second question, which asks you to score the cost or benefit, won't take much time at all.

This approach will allow us to produce a net cost-benefits score for each of the projects/schemes we are looking at in the study, which should be helpful for future policy and planning for each one.

Criteria 1: Participation costs

3 Please could you provide details of the payment rates for the scheme?

Probe for: Actual payment rates, flat-rate payment or payments based on individual options selected, payments for management or for outcomes.

Income foregone costs

4 Please could you briefly outline the extent to which the payment rate has increased or decreased your overall income?

Probe for: Actual amounts where possible; variations due different options etc

5 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial profit relative to individual AES agreements, could you please provide an overall score for the extent to which the payment rate is likely to cover income foregone (loss of profit).

Additional on-going costs

6 Please could you briefly outline the extent to which the payment rate covers additional on-going costs incurred as a result of the scheme requirements?

(For clarification, additional costs relate to additional management costs required to fulfil option requirements and also other annual on-going costs such as attending meetings/events, training once the agreement is active)

Probe for: Actual amounts where possible

7 Has the scheme enabled farms to make any savings with respect to transactions costs relative to individual AES agreements?

Probe for: differences relative to individual AES agreements; effects of economies of scale; any reductions in paperwork, accounting or administration, monitoring and enforcement

8 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual AES agreements, could you please provide an overall score for the extent to which the payment rate is likely to cover additional costs

Participation transaction costs

9 Please could you briefly outline the extent to which the payment rate covers the transaction costs incurred as a result of the scheme requirements?

(For clarification, participation transactions costs relate to costs associated with looking for information on the scheme, completing application forms, meetings with project officers, meeting with group members etc)

Probe for: Actual amounts where possible:
- Search costs: time involved in searching for information; attending events, training
- Negotiation costs - time /expense involved in application process, attending meetings etc.
- Monitoring and enforcement costs – keeping records, inspection visits

10 Has the scheme enabled farms to make any savings with respect to transactions costs relative to individual AES agreements?

Probe for: differences relative to individual AES agreements; effects of economies of scale; any reductions in paperwork, accounting or administration, monitoring and enforcement

11 On a scale of -5 to +5, where -5 is a substantial cost and +5 is a substantial benefit relative to individual AES agreements, could you please provide an overall score for the extent to which the payment rate covers transactions costs.

Criteria 4: Social capital

Farmer engagement

12 Please could you provide details of any ways that you have been involved, if at all, in scheme design, targeting, delivery and monitoring

Probe for: Degree of farmer/community involvement generated

13 On a scale of -5 to +5, where -5 substantial dis-engagement +5 is a substantial engagement relative to individual AES agreements, could you please provide an overall score for the level of your engagement in the scheme design, targeting, delivery and monitoring

Environmental knowledge and awareness

14 Please could you provide details of how your participation in the scheme has lead to increased environmental knowledge and awareness, if at all.

Probe for: evidence of the farmer's increased knowledge of species and habitats, transferability of knowledge to other parts of farm; any negative effects

15 On a scale of -5 to +5, where -5 is a substantial decrease +5 is a substantial increase relative to individual AES agreements, could you please provide an overall score for the level of increase in your environmental knowledge and awareness as a result of scheme participation

Farmer co-operation

16 Please could you provide details of how you have co-operated with other farmers in the scheme.

Probe for: joint design of agreement, membership of group etc.

17 On a scale of -5 to +5, where -5 is a lack of cooperation +5 is a substantial farmer co-operation relative to individual AES agreements, could you please provide an overall score for the level of farmer co-operation resulting from participation in the scheme

Finally,

18 Are there any advantages and limitations in the approach taken by the scheme to achieving co-ordinated action amongst farmers and landowners?

Probe for: nature and extent of increased awareness

19 How could the limitations you have identified be overcome?

20 Is there anything that the scheme/project has enabled that would have been impossible otherwise?

21 Overall, would you say that coordinated action is preferable to conventional agri-environment approaches?

Thank you very much for your time.

Appendix 2 Weighted MCA scores for case studies

Criterion	*Weight*	ILD	*ILD (W)*	DFF	*DFF (W)*	CR	*CR (W)*	LCP	*LCP (W)*	SCaMP	*SCaMP (W)*	OQE	*OQE (W)*	DULA	*DULA (W)*	NP	*NP (W)*	All (Mean)	*All (Mean W)*	Criterion means	Criterion means (W)
1a. Up-front Implementation costs																				**-0.1**	***-0.1***
Facilitation and co-ordination	*1.2*	5	*6*	2	*2*	0	*0*	-3	*-4*	3	*4*	-1	*-1*	-4	*-5*	-3	*-4*	-0.1	*-0.1*		
Negotiating contracts	*1.2*	3	*4*	2	*2*	0	*0*	-2	*-2*	1	*1*	-1	*-1*	0	*0*	0	*0*	0.4	*0.4*		
Training and advice	*1.2*	1	*1*	-1	*-1*	0	*0*	-2	*-2*	0	*0*	0	*0*	-1	*-1*	-1	*-1*	-0.5	*-0.6*		
1b. On-going Implementation costs																				**-0.3**	***-0.3***
Additional facilitation costs	*1.2*	-1	*-1*	0	*0*	-1	*-1*	-1	*-1*	0	*0*	0	*0*	0	*0*	-1	*-1*	-0.5	*-0.5*		
Monitoring and enforcement	*1.2*	4	*5*	4	*5*	-2	*-2*	-2	*-2*	-1	*-1*	-1	*-1*	-1	*-1*	-2	*-2*	-0.1	*-0.1*		
2. Landscape scale environmental objectives																				**2.1**	***2.4***
EO Benefit 1 - Core Sites	*1.2*	4	*5*	3	*4*	2	*2*	5	*6*	4	*5*	1	*1*	0	*0*	4	*5*	2.9	*3.3*		
EO Benefit 2 – Buffering	*1.2*	4	*5*	3	*4*	2	*2*	0	*0*	2	*2*	0	*0*	0	*0*	0	*0*	1.4	*1.6*		
EO Benefit 3 – Connectivity	*1.2*	4	*5*	3	*4*	2	*2*	0	*0*	0	*0*	5	*6*	5	*6*	0	*0*	2.4	*2.6*		
EO Benefit 4 – Threshold	*1.2*	3	*4*	4	*5*	0	*0*	0	*0*	2	*2*	3	*4*	0	*0*	2	*2*	1.8	*2.0*		
3. Participation costs																				**0.3**	***0.3***
Income foregone	*0.8*	2	*2*	2	*2*	0	*0*	1	*1*	1	*1*	-2	*-2*	3	*2*	3	*2*	1.3	*1.2*		
Additional costs	*0.8*	0	*0*	0	*0*	-2	*-2*	-1	*-1*	0	*0*	-1	*-1*	2	*2*	0	*0*	-0.3	*-0.2*		
Transactions costs	*0.8*	2	*2*	2	*2*	-2	*-2*	0	*0*	2	*2*	-4	*-3*	0	*0*	-1	*-1*	-0.1	*-0.1*		
4. Social capital																				**3.0**	***2.7***
Community engagement	*0.8*	5	*4*	5	*4*	-2	*-2*	3	*2*	1	*1*	5	*4*	4	*3*	5	*4*	3.3	*3.0*		
Environmental knowledge	*0.8*	5	*4*	3	*2*	2	*2*	4	*3*	3	*2*	3	*2*	4	*3*	5	*4*	3.6	*3.3*		
Farmer cooperation	*0.8*	3	*2*	5	*4*	2	*2*	1	*1*	2	*2*	3	*2*	2	*2*	0	*0*	2.3	*1.9*		
Total scores		**44**	***46***	**37**	***38***	**1**	***2***	**3**	***1***	**20**	***20***	**10**	***10***	**14**	***11***	**11**	***8***	17.5	*17.6*		
1a. Up-front Implementation costs		3	4	1	1	0	0	-2	-3	1	2	-1	-1	-2	-2	-1	-2				
1b. On-going Implementation costs		2	2	2	2	-2	-2	-2	-2	-1	-1	-1	-1	-1	-1	-2	-2				
2. Landscape scale objectives		4	5	3	4	2	2	1	2	2	2	2	3	1	2	2	2				
3. Participation costs		1	1	1	1	-1	-1	0	0	1	1	-2	-2	2	1	1	1				
4. Social capital		4	3	4	3	1	1	3	2	2	2	4	3	3	3	3	3				